

ABSTRACTS OF THE SAA 80TH ANNUAL MEETING

THE ANNUAL MEETING of the Society for American Archaeology provides a forum for the dissemination of knowledge and discussion. The views expressed at the sessions are solely those of the speakers and the society does not endorse, organizers, not the society.

SYMPOSIUM ABSTRACTS

[1] Symposium · PRESIDENTIAL FORUM: ORDERLY ANARCHY IN PREHISTORIC CALIFORNIA
(SPONSORED BY SOCIETY FOR CALIFORNIA ARCHAEOLOGY)

In his recent book, *Orderly Anarchy: Sociopolitical Evolution in Aboriginal California* (U.C. Press 2014), Robert Bettinger develops a provocative new model to explain the emergence of the exceptionally small socio-political units observed in most of Native California at the time of contact. He proposes that the key development that promoted the evolution of California's unusually small polities was privatization of stored plant food, which incentivized the intensive use of abundant but costly plant foods (pinyon and acorn). Such privatization is argued to have resulted from the appearance of bow and arrow technology which permitted the formation of smaller, family-centered social units more inclined to invest in costly resource procurement because proceeds went directly to offspring and close relatives. Over time, these developments led to decreased opportunities for movement and inter-group alliance, encouraging instead extremely small-scale, family-size units that interacted via a system that Bettinger terms "orderly anarchy." In this session scholars from inside and outside California will discuss and evaluate Bettinger's case for socio-political evolution in indigenous California.

[2] General Session · SITES, SETTLEMENTS, AND SPATIAL ANALYSIS IN SOUTH AMERICA

[3] General Session · ARCHAEOLOGICAL APPLICATIONS OF X-RAY FLUORESCENCE

[4] General Session · ADVANCES IN ARCHAEOLOGY TECHNOLOGY

[5] Forum · DIVERSE DIGITAL ARCHAEOLOGIES - A CAA-NA & DDIG EVENT
(SPONSORED BY DDIG AND CAA-NA)

The Digital Archaeology community is growing. The methods, practices and research activities drawing on and contributing to the domain continue to expand, including everything from geophysical surveys to agent based modeling to text mining to ontology development to multimedia presentations of public heritage projects. This forum takes advantage of the diversity and breadth of interests of the digital archaeologists present at the SAA to exchange ideas and discuss key developments and new directions. In this forum discussants will briefly present their digital archaeology research and articulate how their work contributes to the broader domain. Presentations will be followed by a general discussion of the advantages and challenges of the diversity of digital archaeology, focusing on ways to bring together digital archaeologists working on different types of projects and promote communication. This forum aims to create the foundations for ongoing conversation between various specialists, interest groups and stakeholders within the SAA, CAA and the Digital Archaeology community at large.

[6] Poster Session · GEOARCHAEOLOGICAL AND SOURCING STUDIES IN THE AMERICAN WEST

[7] Poster Session · GIS MODELING AND GEOSPATIAL ANALYSIS: STUDY OF LANDSCAPES AND SETTLEMENT PATTERNS

[8] Poster Session · REMOTE SENSING AND GEOPHYSICAL SURVEY

[9] Poster Session · XRF IN ARCHAEOLOGY

[10] Poster Session · GEOARCHAEOLOGY AND GEOCHEMISTRY**[11] Poster Session · GEOPHYSICAL SURVEYS, GIS, AND SETTLEMENT PATTERNS IN PERU AND BOLIVIA****[12] Poster Session · MATERIAL CULTURE / OBJECT STUDIES****[13] Symposium · ARCHAEOLOGY AND THE STATE**

The relationship between archaeologists and the State is subject to significant debate. Depictions range from Trigger's colonialist, nationalist and imperialist to the utilitarian conceptions of State responsibility for the past as present in the day-to-day of cultural resource management, if one could even consider these as opposite ends of a spectrum at all. This session seeks to collate contemporary conceptions of archaeology's connection to and representation within wider State objectives and structures. Does archaeology persist as a tool for the formation and maintenance of nationalist and capitalist narratives or does it serve to resist, even overcome, State mechanisms of control? The potential answers to this question are diverse, nuanced and critically engage with some of the fundamental elements of archaeological identity. Examples from different jurisdictions, from the past and the present, contextualize the ongoing exchanges between archaeologists and the State as reflective of wider social movements and philosophical horizons. Archaeology's very inclusion within and/or resistance to State structures emphasizes the broader political arenas to which the products of archaeology are applied. Ultimately this session seeks a heightened awareness of archaeology's position within the dynamics of governance to better grasp the broader implications of archaeological practice.

[14] Symposium · CONNECTING HIGHLANDS AND LOWLANDS – TOWARDS A HOLISTIC APPROACH TO UPLAND AND LOWLAND SYMBIOSIS IN THE PAST, PRESENT AND FOR THE FUTURE

Highlands and lowlands, in many parts of the world, are presented in past and present political and popular discourse as fundamental dichotomies. With few exceptions, our narratives of civilization cast highlands and their societies in the light of lowland ideologies of power and identity. Mountain people, despite much de facto demographic fluidity and cultural and economic interdependence, are invariably portrayed in unfavorable terms in texts and iconography, where they become the 'other' to ordered, urban and agricultural lowland life. This has shaped not only historical and modern perceptions of highland societies but also archaeological practice. Archaeologists have tended to shy away from the investigation of transitional/highland regions as methodologically difficult and culturally marginal. Anthropologists and cultural ecologists, by contrast, have become more concerned with highland societies as their lifestyles and landscapes are increasingly threatened by current political and economic regulations and the realization that lowland ecosystems can only be understood and preserved in conjunction with surrounding uplands. In this session, we want to engage a wide variety of scholars, practitioners, photographers and documentary makers in a rare transdisciplinary dialogue that will facilitate the development of a holistic approach to the study of highland-lowland interconnectivity today and in the past.

[15] Symposium · NEW DIRECTIONS IN HISTORICAL ARCHAEOLOGY: THEORY, METHOD, AND PRACTICE

One of the strengths of historical archaeology is its inherent interdisciplinarity. As a result of its multidisciplinary nature, historical archaeology is quick to adapt cutting edge social theory hand-in-hand with methodologies from the environmental and geosciences while maintaining a political and intellectual commitment to collaboration with descendant communities. These synergies result in more holistic archaeological interpretation. The papers in this session, demonstrate how historical archaeology with its interdisciplinary nature and close ties to modern communities is ideally suited to developing collaborative projects that integrate a diverse array of disciplines and perspectives.

[16] Symposium · RELIGION, HISTORY AND PLACE IN THE ORIGINS OF SETTLED LIFE IN THE MIDDLE EAST.

This session explores the role of religion and history making in the origin of settled life in the Middle East. There are three particular foci that the session will address. The first concerns the repetitive building of houses or cult buildings in the same place. It can be argued that the long-term social relationships that are characteristic of delayed return agricultural systems need to be based on historical ties to place and to ancestors. At Çatalhöyük history houses have been identified, but repetitive building constructions throughout the Neolithic of the Middle East could have played similar roles. The second focus concerns the possible cosmological layout of settlements. Many Natufian, PPNA and PPNB sites in the Middle East demonstrate a degree of organized layout and sectors have been identified. At Çatalhöyük there is a clear north-south and west-east significance to house and settlement layout. How widely is cosmological patterning found? Third, what is the timing of the emergence of a concern with history making in place and cosmological layout? At what point in regional sequences do such features emerge and with what does their appearance correlate? Can such correlations be used to suggest the causal processes that produced such features?

[17] Symposium · INNOVATIVE INTERPRETIVE APPROACHES IN MICROWEAR AND RESIDUE ANALYSES

There have been major advances in microwear and residue analyses in recent years regarding method development. Interpretive methods, however, have not been in step with these new methodological developments. In this symposium we present new ways of applying microwear and residue analysis for the study of human culture, economics, social organization, and site formation. With greater understanding of the potential contribution of these techniques, we hope to extend the breadth of their use and further expand their applications in archaeology.

[18] Symposium · IDENTITIES IN THE VIKING WORLDS

In the past decade a number of projects have brought the concept of identities to the forefront of Viking Age research. Projects have focused on how identities are created, maintained, and manipulated in both the Scandinavian homelands and the wider world of the Viking diaspora. Closely related is a better developed understanding of relationships between the various nodes connected as part of networks created by trade, migration, settlement and conquest. These relationships allowed for a flow of people, resources, objects, and ideas both out of and back into homelands new and old. With the increased use of scientific techniques the nature of Viking research is becoming increasingly multidisciplinary; genetics, isotopic analyses and network theory have been added to the existing repertoires of archaeology, history, linguistics and toponymics and more. The aim of this session is to take stock of current research, and to evaluate how new evidence may challenge, confirm or corroborate both former research into Viking identities and the different approaches.

[19] Symposium · FORENSIC ARCHAEOLOGY

This session aims to highlight recent projects from those active in forensic research and case work. As forensic archaeology continues to grow as a discipline and is utilized with increasing frequency by law enforcement officials, case studies are of great use to those engaged in forensic field work. In addition, research is essential to strengthening the theoretical foundations of forensic archaeology. This session also features research projects that will be of benefit to future forensic work and criminal justice. Those involved in research have the opportunity to address areas untouched by current practitioners. By bringing together researchers and practitioners, this symposium aims to create meaningful dialog and spur collaboration.

[20] Symposium · UNTANGLING THE INTANGIBLE: RECONSTRUCTING IDEOLOGIES, BELIEFS, AND RELIGION IN THE PAST

Identifying the material expression of beliefs, ideology, and religion has in recent years become a topic of increased importance to archaeologists seeking holistic explanations for past human behavior. Studies of ideology, beliefs, and religion have wide-ranging applicability. For example, since beliefs and ideology are integral to economic, political, and religious power, focus on prehistoric and historic belief systems is particularly apropos to studies of social complexity and the emergence of socio-economic inequality. Further, elucidating the immaterial and reconstructing prehistoric cosmologies is central to interpreting landscapes and worldviews of prehistoric hunter-gatherers and pastoralists. Here, participants are asked to present their methodological and theoretical approaches to ideology, beliefs, and religion in archaeology with the aim to build on emergent scholarship on ideology and religion in the past; demonstrating how they are empirically identifying and studying the intangible. Potential topics include, but are not limited to, memory making, material culture as metaphor, landscape creation, materiality, mortuary studies, symbology and iconography, and the link between sacred narratives/texts and the archaeological record. Discussions on how ideology and belief systems in political, economic, and/or religious contexts may cross-cut traditional concepts and disciplinary boundaries are especially welcome.

[21] Symposium · ADVANCES IN THE ARCHAEOLOGY OF WEST MEXICO AND THE SURROUNDING AREAS

Since it is difficult to clearly define the geographic extent of West Mexico and the interactions in which social groups in this region participated, this session includes archaeological research taking place both within the classic area of West Mexico, as well as the surrounding areas. Paper topics include ethnoarchaeological studies of pseudo-cloisonné and negative ware ceramics, analyses directed at more clearly defining the regional chronology of the northern frontier area, studies of interaction within the Río Verde-San Pedro, Los Altos de Jalisco, El Bajío, and the Basin of Mexico, mortuary practices in Colima, the study of ritual fire and political organization in Postclassic Michoacán, and recent efforts involving the negotiation of archaeology and local politics in the Lake Pátzcuaro Basin. The range of topics in this session illustrates the diversity of archaeological projects currently being conducted in Jalisco, southern Zacatecas, Colima, and Michoacán.

[22] Symposium · HOUSEHOLD RITUALS IN THE ANCIENT AMERICAS – FROM PATIO GROUPS TO PUEBLOS

In this session we would like to explore the role of household ritual practices in society, specifically their role in social change. We are interested in the reflexive relationship between domestic and public rituals in ancient American societies. For instance, how do rituals performed at different scales and in different contexts affect or structure socio-political relations? Archaeologists working in different regions of the Americas have approached such issues from various theoretical perspectives and employing various methodologies. They have addressed ritualization, resistance, kinship, and gender, among other anthropological themes. By bringing together a diverse group of scholars, we hope to provoke new ideas, questions, and debates about ritual activities carried out in residential contexts.

[23] Symposium · INTERROGATING IDENTITY: THE FLUIDITY OF SOCIAL BOUNDARIES IN AFRICAN ARCHAEOLOGY

The concept of identity within archaeological discourse is sometimes uncritically linked to modern or historically-known ethnic groups and political entities. At the same time, archaeologies of identity that consider multiple scales of identification (tied to gender, kinship, locality, subsistence regime, status, religion, mobility, and ethnicity, to name a few) have made important contributions to the field, moving us far beyond the old “pots equal people” paradigm. In African archaeology, for example, there is growing recognition that the human past is characterized by intricate socio-economic mosaics, where foragers, herders, agriculturalists, and individuals who transcended these categories can be essential constituents of complex polities. In these environments, interpersonal and intergroup interactions both reify and erode various social boundaries, demonstrating that identities are both enduring and highly mutable. The papers in this session seek to further this discourse by interrogating the twin issues of interactions and identity within Holocene African archaeology. Presenters use a broad range of methodological techniques and cover topics from throughout the continent.

[24] Symposium · ELLOS FUERON LO QUE HICIERON: ACTIVIDADES DE LA ELITE Y GRUPOS NO ELITARIOS EN LAS TIERRAS BAJAS MAYAS

En 2012, Douglas y Gonlin definieron los grupos domésticos con base en las diversas actividades llevadas a cabo por sus miembros, resaltando de esa manera la importancia de estudiar tales actividades para entender la vida de los Mayas antiguos. Como es bien sabido, los antiguos Mayas desempeñaron una mirada de actividades de carácter económico, ritual y político. Lo que la gente hizo y cómo lo hizo, sin embargo, varió con base en varios factores, tales como tiempo, geografía y estatus.

Esta sesión tiene como objetivo explorar las actividades económicas, políticas y rituales llevadas a cabo por grupos de diferente estatus (por ejemplo, grupos de élites y grupos no elitarios) que habitaron las diversas regiones que integran las tierras bajas mayas para poder entender como la conducta de estos grupos fue similar o diferente. Las organizadoras buscan un amplio rango de metodologías para esta sesión.

[25] Symposium · ADVANCES IN THE METHOD AND APPLICATION OF CERAMIC PETROGRAPHY: INTERNATIONAL PERSPECTIVES ON KEY ARCHAEOLOGICAL QUESTIONS, PART I

(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP (GIG))

Over the last 30 years the archaeological application of petrographic analysis has gained methodological and theoretical traction. Ceramic petrography, in particular, has emerged as a key methodological tool because it provides insights into technological practice, the choice and manipulation of raw materials by ancient potters, and methods of forming and firing conditions. Petrography has the advantage of being a visual technique whose observations are easily combined with macroscopic study of fabric, form, and decoration. A holistic approach that combines such observation with chemical (e.g. INAA, ICP-MS, XRF), mineralogical (especially XRD), and microstructural (SEM) data, in addition to geological information provides a powerful analytical strategy for understanding the social, political, economic, and environmental contexts of ceramic production, distribution, and consumption. Such information is vital for developing robust interpretations of ancient social organization and change. We have invited a group of scholars whose work highlights advances in ceramic petrography for understanding, technological traditions and change, identity, ceramic production and exchange, migration, and the social context of consumption. Many of the papers highlight new methods for combining petrography with other analytical strategies to address social process. As such, the session provides an analytical exchange among researchers with diverse intellectual backgrounds and research interests.

[26] Symposium · STAYING OUT OF SMALL, SQUARE HOLES: THE CONTRIBUTIONS OF STEPHEN KOWALEWSKI TO THE UNDERSTANDING OF HUMAN SOCIETIES AT REGIONAL AND GLOBAL SCALES

Stephen A. Kowalewski is best known for his work in Mesoamerica, especially the full-coverage regional surveys in the Valley of Oaxaca and the Mixteca Alta that have increased our understanding of Zapotec and Mixtec societies. Kowalewski's broadly comparative research has advanced understanding of the long-term and diachronic trajectories of multiple societies across the world. In this session we invite fellow archaeologists to gather, reflect upon, and discuss the great intellectual and personal influence that Steve and his work have had on our lives, our work, and our continuous attempts to gain a large scale, "big picture" understanding of the societies and the social phenomena we investigate. The invited papers in this session showcase current research taking place in various world regions with a special emphasis on how Steve's wit and wisdom continue to guide and resonate in our research, our development, and our professional careers.

[27] Symposium · CRISIS AND OPPORTUNITY: LEGACY COLLECTIONS AND ARCHAEOLOGICAL RESEARCH IN THE 21ST CENTURY

(SPONSORED BY MUSEUMS, COLLECTIONS AND CURATION COMMITTEE)

Museum curators, archaeologists, and researchers are forging ahead with creative and innovative ways of dealing with the day-to-day realities of the curation crisis in the 21st century. This crisis is a national phenomenon. However, recent collaborations between museum staff, academic and professional archaeologists, students, and local archaeological organizations, presents an opportunity to demonstrate the research and curation value of connecting students and researchers with existing scholarly assets – such as legacy collections - in lieu of creating new collections. This session highlights current research with existing archaeological collections from the American Southwest, and provides a forum to continue the dialogue on addressing the curation crisis.

[28] Symposium · NOSE TO TAIL: AN INTERDISCIPLINARY LOOK AT DOGS IN THE PAST

The relationship between humans and dogs has long been a focus of archaeological inquiry and continues to capture the interests of researchers from different disciplines and the general public. This session takes an interdisciplinary approach to understanding the human-dog connection in the past by presenting research from archaeology, ethnography, cognitive psychology, genetics and biology. Presentations will provide insight on the complexity of the human-dog relationship by exploring the deep history of this connection. From understanding wolf cognition as a template to dog domestication, genetic variation, ancient dog health, dogs as technology, and the more sacred dog-human bond, a broad analysis of dogs in the past will be presented.

[29] Symposium · ARCHEOLOGICAL STEWARDSHIP AND SCIENCE IN THE NATIONAL PARK SERVICE

In fulfilling its near century-old mission, the National Park Service (NPS) preserves, protects, and interprets archeological sites of breathtaking diversity throughout the United States. These range in scale and type from Paleo-Indian quarries to historic plantations and homesteads to submerged aircraft. NPS archeological programs are implementing education and civic engagement projects for diverse audiences across the country. At the same time, they are responding to new fiscal realities and significant challenges including climate change, increased looting and vandalism of sites, and energy development. This session demonstrates the depth and diversity of recent NPS archeological practice by presenting a sample of park-based recent research, outreach, and planning by the agency's archeologists.

[30] Symposium · THE INTERSECTION OF SACREDNESS AND ARCHAEOLOGY

As more and more of our physical landscape is being altered through rapid growth and development, the cultural landscape is also being changed and challenged. These changes often reflect the interests of some members of society, while the interests of others, including those of Native communities and many archaeologists, environmentalists and others who understand the importance of knowing the past, are disregarded. The latter group is dedicated toward preserving special places, and continuing to provide for Native people the ability to celebrate their traditions and focusing on defining the sacred landscape. What is sacred? Who defines sacred, and with what parameters? And, how is sacredness determined? Is it a legal term that is defined by the courts? And, are there degrees of sacredness? Can sacred and profane co-exist? What role do Native oral traditions play in defining a sacred landscape? Is a sacred landscape static, or can it be fluid and change? The term sacred can be applied to rock art sites, formations on the physical landscape, rituals, artifacts, evidence of past activities, and even, intangible oral traditions. This symposium will explore the many facets of sacredness that challenges the participants to view sacredness with an emic perspective.

[31] Symposium · FROM FORAGERS TO EMPIRES: RECENT RESEARCH ON THE SOUTH COAST OF PERU

From Paracas and Nasca to the Inca Empire, for thousands of years the South Coast of Peru was a hub for the evolution of indigenous societies in the Andes. This symposium focuses on the most recent research undertaken on the South Coast. From the dry Nasca Valley to the Paracas Peninsula, from the coast to the highlands, and from the Middle Preceramic through the colonial and Republican period, participants focus on

foodways, ritual, pilgrimage, exchange, production, identity and a host of other issues that shed new light on our understanding of this region's prehistory.

[32] Symposium · RE-EVALUATING THE MARGINALITY OF CALIFORNIA'S ISLANDS: IMPLICATIONS FOR ARCHAEOLOGICAL INTERPRETATION

Compared to the mainland, the islands off the Pacific coast of Alta and Baja California have long been considered marginal habitat for ancient hunter-gatherers. Marine and terrestrial island ecosystems were changed considerably, however, by severe overgrazing and overfishing during historic times, and are only beginning to recover under modern management practices (removal of grazing animals, etc.). The perception of marginality has greatly influenced our interpretation of a variety of archaeological issues including the antiquity of first settlement; productivity of island floras, freshwater, and mineral resources; human population density; and the nature of regional exchange networks. Recent advances in archaeological and historical ecological research, combined with field observations of recovering ecosystems suggest the islands may not have been the marginal habitats they once appeared to be. While older models developed through the perspective of island marginality may hold true, it is important to reconsider our interpretations of past and present archaeological data, and re-evaluate long-held assumptions, given these new insights. Ultimately, a reexamination of the effects of perceived marginality on the history of archaeological interpretations on California's islands may have broad implications for other island archipelagos worldwide.

[33] Symposium · COGNITIVE ARCHAEOLOGY

The study of cognitive archaeology began to emerge in the 1970s, and is now becoming a discipline in its own right. Cognitive archaeology aims to understand the mental abilities of past human ancestors through rigorous application of scientific techniques in archaeology, psychology, neuroscience, anthropology, and primatology. One of the main goals of cognitive archaeology is to develop new ways to interpret prehistoric cognition from the archaeological record. We are now in an exciting phase of cognitive archaeology as many disciplines come together to create new synergies. In the process of developing this new cross-disciplinary field, it is important to establish legitimate and replicable research methodologies. Collaborations between disciplines can help to validate methods and results.

This symposium aims to bring together established and emerging cognitive archaeologists to showcase their latest research and theories, consider the range of potential for the discipline, and clarify misconceptions. At the end, participants will discuss at length to create a manifesto of best practice for cognitive archaeology.

[34] Symposium · ARCHAEOLOGIES BY COMMUNITY MANDATE: PRACTICING COLLABORATIVE AND COMMUNITY-ENGAGED RESEARCH

(SPONSORED BY INDIGENOUS PEOPLE'S INTEREST GROUP AND COMMITTEE ON NATIVE AMERICAN RELATIONS)

Postcolonial archaeologies, the entanglements surrounding the conservation and management of cultural resources, and the frictions of legislative compliance have made pushing research for research's sake increasingly unsustainable. As a result, many archaeologists have sought to practice an archaeology in which descendant communities, as well as other sectors of the public with vested interests, play an active role. Descendant and public involvement in archaeological and historical research is of particular importance among historically overlooked or disenfranchised communities as these groups are increasingly identifying opportunities for empowerment through collaborative projects and community-based activities. This session seeks to explore the challenges and rewards of practicing collaborative and community-engaged archaeologies. Issues we seek to address include collaborative successes, failures, resolutions to contentious situations, and the theoretical underpinnings of engaging with community and public archaeologies.

[35] Symposium · THE FRISON INSTITUTE/GEOARCHAEOLOGY INTEREST GROUP SYMPOSIUM: ARCHAEOLOGY AND GEOARCHAEOLOGY OF ROCKSHELTERS AND CAVES

(SPONSORED BY THE FRISON INSTITUTE/GEOARCHAEOLOGY INTEREST GROUP)

Archaeologists have targeted rockshelters and caves for more than a century because they are easy to find, are often less affected by regional erosion and have better preservation than open-air sites. In its early history, archaeology treated caves and rockshelters as artifact mines and, later, as sources of artifact chronology. But, as fixed, sheltered places on the landscape, rockshelters and caves also offer a window onto how settlement systems shift from the point of view of a particular class of sites. At the same time, rockshelters and caves can be geologically complex and their contribution cannot be tapped without acknowledging this fact. Papers in this session examine the archaeology and geoarchaeology of rockshelters as a class of sites whose characteristics can inform about more general properties of the changing cultural system(s) using those sites.

[36] Symposium · DIFFERENCE IN ARCHAEOLOGICAL THEORY AND PRACTISE

The programs of processual, contextual, and symmetrical archaeology have sought to inter-relate the material and the social components of community life in various ways that either prioritise or equalise their respective roles. An alternative, however is that they are inherently non-correspondent, functioning in different ways that can be both complimentary and in conflict. This session seeks a way of approaching the material past that systematically recognizes the differences between textual and archaeological sources of information and incorporates the role of the friction inherent in the social world between verbal meaning, social action and the material. A systematic inquiry is required which incorporates the principle of potential non-correspondence allowing for the possibilities both of correspondence and friction and disjunction between materiality and sociality. The aim is to approach the archaeological record as a relational phenomenon derived from potential non-correspondence between the social and the material, across many spatial and temporal scales. The session will explore theoretical issues, applications and methodological extensions of the issues of material – social dissonance. The inertia of the material, costs of maintenance, the creative effects of non-correspondence and the disjunctions between textual and archaeological sources of information are explored as crucial components of the archaeological process.

[37] Symposium · THE QIJIA CULTURE OF NORTHWEST CHINA – ENTERING A NEW ERA OF RESEARCH

The Qijia Culture plays a central role both in terms of the history of archaeology in Northwest China and as a tradition that occupies a critical time and place in the social and technological transitions that underlie the "origins of Chinese civilization." Occupying a vast territory covering much of the modern province of Gansu, as well as adjacent areas of Qinghai, Ningxia and Shaanxi, the Qijia Culture dates to the end of the third and early second millennia BC and witnessed important transformations in subsistence practices, the adoption of new plant and animal domesticates, developments in metallurgy and pottery production, dramatic environmental events and climate change, the introduction of new types of prestige goods, among other shifts. This panel includes presentations of new research on various aspects of the Qijia Culture that reflect renewed interest in this cultural tradition and provide new insights on the important transformations that occurred.

[38] Symposium · THE MANAGED MOSAIC: PAPERS IN HONOR OF SCOTT L. FEDICK

For the last thirty years, Scott Fedick's research has changed the way that we view how the ancient Maya engaged in agriculture and managed forest resources. He is also the epitome of how to conduct collaborative and interdisciplinary research. This session includes the "managed mosaic" of Fedick's career: a number of his current and former students, mentors and collaborators, who will present on their research as part of the Yalahau Regional Human Ecology Project, and the way in which Fedick has informed and influenced their work.

**[39] Symposium · RECONSIDERING THE "EPIC" IN THE EPICLASSIC PERIOD OF MESOAMERICA
PART 1: REGIONAL INTERACTIONS**

The Epiclassic period (AD 600-900) embodies “epic” in both its noun and adjective forms, referring to heroic narratives and something that is impressive and grand in scale. The volumes “Mesoamerica After the Decline of Teotihuacan” and “Twin Tollans” (both Dumbarton Oaks) illuminated this period, yet given a recent resurgence of scholarship devoted to the Epiclassic, further assessment is timely. The declines of Teotihuacan and the Classic Maya cities were nuanced processes, as were the growth and development of the cities that arose in response to new economic and political opportunities. Papers will address specific aspects of the Epiclassic period, including the evolution of new population centers, exchange patterns, language, and other symbol systems; the value of visual culture in helping to discern social change; archaeological evidence that affirms or suggests new chronologies; and archaeological evidence that expands the original idea parameters of the Epiclassic. Finally, some papers will offer theoretical models for approaching this crucial era in Mesoamerica and ponder the validity of the Epiclassic period as it is currently understood. The first part of this two-part symposium focuses on regional developments and interactions in Mesoamerica.

[40] Symposium · HUMAN ADAPTATIONS TO ENVIRONMENTAL CHANGE DURING THE TERMINAL PLEISTOCENE AND EARLY HOLOCENE - PART 1

Climate change at the end of the Pleistocene was both rapid and global in extent, with important consequences for the human environment. This symposium will draw together regional perspectives on the patterns of environmental change and human adaptation that marked the last glacial-interglacial transition, against a background of continuing improvements in the quality and temporal resolution of the archaeological and paleoenvironmental records. Participating scholars will explore whether, and to what extent, a causal relationship can be documented between environmental instability and changes in demographic patterns, subsistence strategies and social organization at different temporal and geographical scales during the Late Pleistocene to Early Holocene.

[41] Symposium · THE EVOLUTION OF INTENSIVE PLANT USE BY COMPLEX HUNTER-GATHERERS: ARCHAEOBOTANICAL RECORDS FROM CALIFORNIA

Subsistence systems in California have been greatly elucidated in the past two decades through study of the continually expanding archaeobotanical record. This symposium presents recent research by scholars working in coastal, island and inland settings of California. The California archaeobotanical record offers insights into the evolution of intensive and sedentary hunter-gatherers who maximized their use of a well-endowed but highly varied environment. The breadth of papers will demonstrate the range of research issues that have been addressed using California archaeobotanical data, and what this record can offer to archaeological problems elsewhere in similar contexts.

[42] Forum · 3D MODELING AND PRINTING IN ARCHAEOLOGY: TRANSFORMATIVE INNOVATIONS/APPROPRIATIONS

(SPONSORED BY SUSTAINABLE ARCHAEOLOGY/IPINCH)

Burgeoning digital technologies are rapidly, and radically, transforming the practice of archaeology. 3D modeling and printing, in particular, are seen as a democratizing access to human heritage, allowing fragile materials to be handled and displayed in proxy, allowing complete replicas to be assembled from digitized fragments, and offering new ways to interpret the material record. But 3D models can be shared and disseminated broadly online, altered and appropriated, and distance the application and use of these printed forms from original heritage. So what are the challenges to this material equivalent of mp3s? Who gets to decide what can and can't be printed, when, or when access should enable commodification? 3D digital technologies pose new challenges to transformative archaeologies, ethical re-alignments of practice, and working together with descendant groups, while making tangible in new ways old assumptions about ownership of archaeological material. This forum will explore the implications of the emerging ease of creating, using, and re-purposing digital assets and representations for Intellectual Property and Cultural Property rights discourse, and will provide an opportunity to discuss the “constituents” of claim and ownership in archaeology within the context of broader discourses emerging now over 3D digital modeling, printing, and distribution of material.

[43] Symposium · CREATIVE PUBLIC-CENTERED APPROACHES TO COMPLIANCE ARCHAEOLOGY

(SPONSORED BY SAA PUBLIC ARCHAEOLOGY INTEREST GROUP)

Public engagement is an important component of compliance projects. The involvement of the public in compliance archaeology is inherent in the National Historic Preservation Act as well as many state historic preservation programs. The benefits of such involvement are numerous and provide an important opportunity to inform the public about the importance of archaeology and stewardship of the archaeological record. However, the integration of diverse constituencies in such efforts is not without its challenges, and it has long been recognized that when involving the public in such projects, there is no such thing as a single public engagement model that fits all situations. This symposium provides an overview of the ways that American archaeologists have engaged the public in compliance work and the creative archaeological programs that have been developed as a result of publicly funded archaeology projects.

[44] General Session · HISTORICAL ARCHAEOLOGY OF PLANTATIONS AND ENSLAVED PEOPLES**[45] Symposium · NEW AND INNOVATIVE APPROACHES TO OVERSEAS CHINESE ARCHAEOLOGY**

In the last half of the nineteenth century nearly 400,000 people emigrated from Southern China to the United States. Upon arriving in the country these "Overseas Chinese" individuals lived and worked in myriad places, from the bustling streets of large, urban Chinatowns to sparsely populated rural railroad and mining camps. While there is no single Overseas Chinese narrative the efforts of these individuals has left lasting marks including large and small Chinatown communities, the expansion of industries such as agriculture and mining, and even the completion of the Transcontinental Railroad. This session explores the material traces of the Overseas Chinese who came to the United States in the nineteenth century. Rather than focusing on a particular aspect of life or region of the country, this session instead draws its strength by highlighting the diversity in geographic location, community scale, and daily practices experienced by Chinese people in the United States. Paper topics include in-depth single-site analyses, broad surveys of related sites such as railroad camps, thematic inquiries along lines such as health and diet, and novel theoretical and methodological strategies for Overseas Chinese archaeology.

[46] General Session · ARCHAEOLOGY OF THE INCA EMPIRE**[47] General Session · ARCHAEOLOGICAL SURVEY AND LANDSCAPE ARCHAEOLOGY IN THE EUROPE, ANATOLIA, AND AFRICA****[48] General Session · CONTRIBUTIONS TO MODELING IN ARCHAEOLOGY****[49] Poster Session · ARCHAEOLOGY IN ASIA****[50] Poster Session · GLOBAL HISTORICAL ARCHAEOLOGY****[51] Poster Session · ARCHAEOLOGY OF THE MEDITERRANEAN REGION AND CLASSICAL WORLD****[52] Poster Session · ARCHAEOLOGIES OF ISLANDS AND ATOLLS OF OCEANIA****[53] Poster Session · PALEOANTHROPOLOGY AND THE ARCHAEOLOGY OF THE STONE AGE**

[54] Poster Session · NEW PERSPECTIVES ON THE ROMANIAN BRONZE AGE

The Bronze Age was a period of dynamic social, economic, and political transitions in Europe. However, the archaeology of Romania has been significantly understudied and is often unaccounted for by Western scholars. With its varied physiographic and cultural zones, and situated at the crossroads of European-Eurasian interactions, Romania is growing in its importance to larger models of social change in the Carpathian Zone and Central and Eastern Europe. In this session, we bring together scholars working in the region on projects that explore different facets of social, economic, political organization at multiple scales across Romania.

[55] Poster Session · MULTIDISCIPLINARY STUDIES OF ANTHROPOGENIC CHANGE, SUBSISTENCE, SOCIAL ORGANIZATION, REGIONAL INTERACTION, AND TECHNOLOGY AT THE LAS CAPAS SITE, BC 1200-400, SOUTHERN ARIZONA

Recent research at the Las Capas site (AZ AA:12:111) near Tucson, Arizona, has resulted in discoveries about Early Agricultural Period (B.C.1250-A.D.50) foraging, horticulture, and hunting in southern Arizona, for which there exists no known ethnographic analog. To date, 3,153 excavated features have yielded thousands of analyzed flotation, pollen, and soil samples, tens of thousands of analyzed osteological specimens, and hundreds of thousands of artifacts. The combined effort makes Las Capas arguably the most intensively studied archaeological site in the United States. This publically-funded project encompassed a broad range of analytical efforts. This poster session presents the findings of specialists from the leading edge of the fields of AMS-dating, archaeozoosteology, ceramic analysis, lithic analysis, ground stone analysis, human archaeozoosteology, marine shell analysis, mortuary analysis, ostracode analysis, paleoethnobotany, palynology, pedology, and stratigraphic geochronology. The occupants of Las Capas were among the earliest practitioners of maize horticulture in the United States, and combined gardening and irrigation with a system of extensive foraging, logistical and residential mobility, and long distance travel or exchange.

[56] Symposium · PHOTONS IN THE FIELD: NEW APPROACHES TO THE USE OF PORTABLE X-RAY FLUORESCENCE (PXRF) IN ARCHAEOLOGICAL FIELDWORK

In recent years there have been many pioneering advances in the field of science that have led to a symbiotic relationship between scientific enquiry and archaeology that has significantly advanced current academic knowledge. However, many of these scientific methods must operate in a controlled laboratory environment and often necessitate the destruction—in whole or in part—of the artefact under investigation such as with isotope, DNA, X-ray Diffraction or Atomic Absorption Spectroscopy analysis. These factors, along with issues relating to time, finance, legality and/or the export of cultural heritage, inhibit the application of various scientific studies in numerous research contexts. Within this problematic scientific environment came a ground-breaking technology, portable X-ray Fluorescence (pXRF): a non-destructive, portable instrument for elemental compositional measurement. This symposium seeks to examine the viability of pXRF in the field and its potential employment to resolve these issues. It will focus on the benefits, scope and limitations of using this specific form of equipment, and investigate how this technology can contribute to quantitative analysis of anthropological and archaeological materials.

[57] Symposium · CONFLICT AND SOCIETY IN VIKING AGE SCANDINAVIA

Though significant advances have been made in the study of Viking Age Scandinavian societies, much of our knowledge continues to be governed by long-established theoretical and methodological approaches. Despite this, several aspects of Viking Age society have recently been subject to extensive re-evaluation. New and continuing developments in the isotopic, genetic and paleopathological analysis of skeletal assemblages have, for example, shed considerable light on the origins, demography and lifestyles of both Viking and insular populations. The reconsideration of material culture, historical and anthropological data has similarly provided new insights into the mechanisms underpinning the raiding, conquest, colonization and state formation that characterize the Viking Age both within and outside of Scandinavia.

This session provides a multi-disciplinary forum for the appraisal of new and innovative studies into the origins and evolution of the Viking Age in addition to the accompanying violence that so often defines the

period. The long-term implications of these developments will also be considered, providing further insight into the development of societies both in Scandinavia and across the Viking world.

[58] General Session · NEW METHODS IN ARCHAEOOMETRY IN MESOAMERICA

[59] Symposium · "DIY DIGITECH" IN ARCHAEOLOGICAL FIELDWORK: INNOVATIVE ADAPTATIONS OF LOW(ER)-BUDGET DIGITAL TECHNOLOGIES

The Do-It-Yourself (DIY) approach spans disciplines: typically associated with arts and crafts, hobbyists, and anti-consumerism, DIY adaptations and re-purposed implementations of extant digital technologies are gaining scholarly traction. In archaeological application, "DIY Digitech" amplifies this discourse. Archaeologists have long relied upon in-house solutions and adapting tools to solve logistical and investigatory problems, but only recently have low-cost digital technologies begun to reconfigure the archaeological toolkit. Consumer digital media devices offer new solutions for documentation and data manipulation, with metadata leveraged for organization, preservation, and knowledge-sharing purposes. Digital mapping tools are smaller, more precise, and linkable to server-based GIS technologies, and increasingly featured in multipurpose devices, such as tablets and smartphones. Remote sensing has taken flight, with home-built drones and modified point-and-shoot cameras facilitating low-cost mapping projects. Computing tools such as image filtering and audio analysis are enabling non-invasive research methods, additionally invaluable for site conservation. Fieldwork has always been where concept and reality collide; it requires yet another moment of DIY adaptation, and innovative collaborations with specialists. The wired-DIY ethic equips "techie" archaeologists to gain experience and knowledge at the speed of light. We highlight case study DIY innovations in archaeological fieldwork in diverse sites.

[60] General Session · ARCHAEOLOGY OF THE MOCHE

[61] General Session · ZOOARCHAEOLOGY, DIET, AND FOODWAYS AT HISTORIC PERIOD SITES

[62] Symposium · ONE OF CALIFORNIA'S EARLIEST VISITORS: THE DISCOVERY OF TRANSBAY MAN

(SPONSORED BY WILLIAM SELF ASSOCIATES)

The unexpected discovery of a well-preserved Native American burial 55 feet beneath the Transbay Transit Center site is incredibly exciting. The matrix surrounding the skeleton has provided unparalleled preservation of the human remains and the organic materials surrounding the burial. The adult male was wrapped in a large woven mat and fragments of a wood implement that resembles an atlatl were found at his hand. To date none of the burials recovered from San Francisco, the Bay Area, or central California, have preserved evidence of this nature. AMS radiocarbon dating indicates an age of 7570 cal BP, increasing the importance of this find in terms of the history of San Francisco and the history of native peoples throughout California. Burials from this time period are exceptionally rare, and the context in which the burial was found was deeper, older, and wetter than expected. This individual represents the potential to trace some of the earliest people to inhabit California, and to make a connection between them and the material culture and traditions that we know from historic period observations of living natives.

[63] Symposium · PROPER ID REQUIRED: DIFFICULTIES IN DISCERNING PAST IDENTITIES

Extrapolating identity from material culture has always been a complicated and challenging aspect of archaeological work. Over the past four decades, exploration of identity has evolved from primordialist roots to an understanding that this is a fluid social construct which varies significantly with place, time, and cultural references. The goal of accurately understanding and representing the past, instead of simply reflecting current social constructs or biases, continues to challenge archaeologists. Past communities created,

adopted, or appropriated diverse identities for complicated reasons which we may not understand. The objective of this session is to explore past and present interpretations of material correlates of identity in variable geographic, cultural, and temporal settings. Identity can be reflected in the use and creation of material culture, the spread and exchange of ideas and objects, as well as the construction or curation of monuments and the built landscape. However, identity can also be misrepresented, consciously and subconsciously, for myriad reasons. Therefore, we seek papers that reflect upon how we project the familiar present, be it nationalities, genders, or structures, onto the past, and how that past is reified in the present. There is no temporal or geographic restriction on this session.

[64] General Session · ARCHAEOLOGY OF THE PALEOLITHIC IN ISRAEL AND JORDAN

[65] Symposium · IT WAS THE BEST OF TIMES, IT WAS THE WORST OF TIMES: MOBILITY AND SUBSISTENCE IN A TALE OF TWO SITES IN THE SMITH RIVER BASIN OF NORTHWESTERN CALIFORNIA

This symposium will present information from several sites that have been investigated in recent years in the Smith River Basin of northwestern California, an area in which little archaeological work has been done in recent decades. Red Elderberry Place (CA-DNO-26), a habitation site in Jedidiah Smith State Park on a low terrace above the main branch of the Smith River, contains evidence of multiple occupations spanning the Early Holocene (ca. 9000 -7000 B.P.) to the late 19th Century Tolowa, including plank houses dating to several of these occupations. Approximately 25 river kilometers upstream from Red Elderberry Place, excavation at the Hurdy Gurdy Bridge site (CA-DNO-1028) at the confluence of Hurdygurdy Creek and the South Fork that contained evidence of intermittent occupation from the Early Holocene to the late Contact Period. This symposium will update the prehistory of the Smith River Basin and provide insight into how mobility and subsistence strategies changed through time and differed between points along the river in response to changing social and natural environments.

[66] General Session · ARCHITECTURE, RITUAL, AND TRADITION

[67] General Session · NEOLITHIC AND BRONZE AGE CHINA

[68] Forum · EVALUATING AND REWARDING 21ST CENTURY ARCHAEOLOGICAL SCHOLARSHIP

New forms of scholarly communications, especially open access data-sharing, have gained prominence in public policy and academic administration. Publishers increasingly provide support for data citation, data references, and comprehensive reporting, and funders expect and even require these behaviors. In February 2013, the White House announced a mandate for open access to data and publications resulting from federally-funded research. Data sharing and other digital contributions (including blogging and other social media) support many of the research, stewardship, community engagement, and pedagogical goals of archaeology. Innovative approaches to scholarly communications can advance many of the SAA's Principles of Archaeological Ethics, including stewardship, public understanding and outreach, timely reporting, and preservation of scholarly content. However, since we lack consensus on understanding and evaluating new forms of scholarship, digital contributions often remain on the margins of entrenched practice. To encourage advances in communicating archaeology, we need to recognize and reward quality and innovation in digital communications. This panel will share perspectives on promoting quality and professional recognition for new forms of archaeological communications, with an aim to develop recommendations for the SAA to review, endorse, and promote to universities (including search and promotion committees) granting agencies, and others who evaluate digital archaeological scholarship.

[69] Forum · THE PROSPECTS AND CHALLENGES OF FAUNAL DATA INTEGRATION AND COMPARATIVE ANALYSIS

This forum provides an opportunity to briefly present the methodological and substantive results of a National Science Foundation-funded project that integrates faunal data from more than thirty projects. The integrated data are being used to explore the relationships of demography and environment to resource depression and turkey intensification in the late prehistoric (AD 1200-1500) US Southwest. Each short presentation will be followed by questions and discussion with attendees at the forum. Kintigh will introduce tDAR (the Digital Archaeological Record) and its tools that enable the integration of multiple datasets; Clark will discuss a taphonomic protocol that she has developed and we have implemented to evaluate the degree to which the project datasets are sufficiently similar to permit meaningful comparative analysis; Spielmann will summarize the results of the resource depression analysis, and Schollmeyer will discuss an analysis of lagomorph distribution that she undertook with the integrated Southwestern data. Neusius and Styles will discuss their recently funded NSF grant that expands research on taphonomic processes and changes in the use of fauna to the eastern US.

[70] Forum · INTEGRATING AND INNOVATING: EFFECTIVE USES OF TECHNOLOGY IN ARCHAEOLOGICAL MANAGEMENT IN MILITARY SETTINGS.

(SPONSORED BY MILITARY ARCHAEOLOGICAL RESOURCES SUBGROUP (MARS))

The management of cultural resources in military installation settings provides a number of challenges, ranging from fiscal constraints to safe and routine access to resources and urgent mission timelines. To effectively work within this challenging environment, it is necessary to find creative strategies to tackle identification, evaluation, and monitoring of archaeological resources. While new technology always carries a risk of becoming a Pandora's box, this particular path can be avoided by following a thoughtful process in management needs and can even be cost effective by exploring available technologies existing within the organization. This forum will focus on technological innovations and collaborations in the unique management environment of military settings.

[71] Forum · GENDER DISPARITIES IN RESEARCH GRANT SUBMISSIONS

(SPONSORED BY SAA BOARD OF DIRECTORS)

In 2013 a SAA Task Force on Gender and Rates of Research Grant Submissions was created to understand why "senior" (i.e., post-Ph.D.) women were not applying for research grants at the same rate as men. The rates were particularly striking for National Science Foundation (NSF) Archaeology Program grants but the pattern was also true for those applying to the Wenner-Gren Foundation for Anthropological Research over a shorter period of time. A number of different hypotheses to explain the disparities have been generated, including those suggested by attendees at last year's SAA forum. This forum will present the results of the SAA Task Force's research, which includes quantitative and qualitative data collection and analyses, to better understand why the disparities are present. Also participating in the forum are program officers from NSF, Wenner-Gren Foundation for Anthropological Research, and National Geographic Society, who will provide data they have collected on their respective programs.

[72] Symposium · ARCHAEOLOGY AND TOURISM

On a national and international level archaeological sites have great social, cultural, and economic value. Archaeological sites are integral parts of regional histories, heritages, and identities. They are also often major tourist attractions. The economic potential has increased the pressure on archaeological sites to accommodate greater influxes of tourists and on the authorities in charge to open up more sites to tourism. Tourism expands local opportunities and brings in revenue but it can also have serious impacts on sites. Archaeotourism must be considered carefully and entered cautiously. Steps must be taken to maintain the integrity of the site as both a cultural resource and as a subject for research and scholarship. If negotiated properly, many future possibilities lie in the cooperation between cultural managers and tourism experts. In this session we will explore the possibilities and best practices of presenting archaeological research and communicating the importance of archaeological heritage to an interested public as well as share innovative approaches to archaeotourism involving local communities, technology, and more.

[73] Symposium · SIMULPAST -- SIMULATING THE PAST TO UNDERSTAND HUMAN BEHAVIOUR

Social and environmental transitions represent key aspects to better understand human behavior. From a complex systems perspective, the most decisive questions about human societal systems are related to the transitions between phases of equilibrium. Therefore, the study of these transitions is extremely interesting in order to move forward with our current understanding of human behavior at macro-, meso- and micro-level. In that respect, ancient societies present a great opportunity to build a virtual laboratory in which to model, explore and simulate different hypotheses and theories about social and environmental transitions. This session will act as a showcase of the final results of the SimulPast project (www.simulpast.es). The philosophy on which SimulPast is based is transdisciplinary, evading the traditional division that sees the Humanities and Social Sciences and the often-called “Hard Sciences” as mutually impermeable areas of knowledge. Indeed, the research strategy on which the project has worked crossed many disciplinary boundaries to create a holistic approach.

[74] Symposium · HUMAN ADAPTATIONS TO ENVIRONMENTAL CHANGE DURING THE TERMINAL PLEISTOCENE AND EARLY HOLOCENE - PART 2

Climate change at the end of the Pleistocene was both rapid and global in extent, with important consequences for the human environment. This symposium will draw together regional perspectives on the patterns of environmental change and human adaptation that marked the last glacial-interglacial transition, against a background of continuing improvements in the quality and temporal resolution of the archaeological and paleoenvironmental records. Participating scholars will explore whether, and to what extent, a causal relationship can be documented between environmental instability and changes in demographic patterns, subsistence strategies and social organization at different temporal and geographical scales during the Late Pleistocene to Early Holocene.

[75] Symposium · CONSTRUCTION OF A COMMUNITY: RECENT FINDINGS FROM CEREN, EL SALVADOR

Archaeological research at Cerén continues to contribute to key questions within Mesoamerica and beyond regarding how quotidian practices both constructed and were impacted by the social and political landscape of this community. The fortuitous sudden burial of the site beneath meters of volcanic ash resulted in the preservation of structures, artifacts, a sacbe, and agricultural fields. This session explores the variety of data collected in the 2013 field season, with specific focus given to the exploration of the Cerén sacbe, associated artifacts, and paleobotanical discoveries. Additionally, various papers within the session situate Cerén in a comparative perspective with other research throughout Mesoamerica.

[76] Symposium · CAPITAL, CRAFT, AND CONSUMPTION IN MESOAMERICA AFTER THE SPANISH INVASION

The contributors to this session examine the archaeological consequences of uneven capitalist development for urban and rural communities in Mesoamerica over the last 500 years. As Thomas Piketty has claimed, industrial capitalism generally widens the gulf between rich and poor. Yet, natural disasters, economic depression, and warfare often diminish available capital and disrupt its accumulation, thus leveling economic disparities in some periods. In Spain's former American colonies the periodic economic upturns and downturns of the global economy severely affected generation of wealth, the development of monetary and debt instruments, market growth, and the organization of commodity chains from the sixteenth century down to the present day. These vicissitudes created uneven trajectories of local and regional development as Spain's American colonies became severely undercapitalized in the wake of the European invasion and again following the wars of independence. The papers in this session focus on the archaeological consequences of shifts in capital, commodity and craft production, and consumption at regional, local, and household scales. Shifts in the social construction of class, identity, and place are manifest in the archaeological record — in landscape configurations, architecture, ceramics, tools and technology, zooarchaeological and paleoethnobotanical remains, and mortuary patterns and ritual practices.

[77] Symposium · AN ARCHAEOLOGIST'S GEOLOGIST: A SYMPOSIUM IN HONOR OF WILLIAM R. DICKINSON

No other geologist has contributed more to Pacific Islands archaeology than William "Bill" Dickinson. His pioneering work in the 1960s on identifying sources of temper sands in prehistoric pottery provided a rigorous technique for understanding modes of ceramic production, interaction and exchange. His continuing pursuits in this field across the spread of Oceania provide an archaeological service and insights that truly are outstanding. His research on sea level change, paleo-shoreline documentation and island geomorphologies are central to our modeling of human colonization in the Pacific, and fundamental to our discovery and understanding of associated sites. And despite his parallel career as an internationally renowned and decorated geoscientist, he has been a prolific author/co-author of over 125 publications on geoarchaeology and ceramic petrography. This symposium honors Bill's five decades of interdisciplinary collaboration with Pacific archaeologists, and the many significant contributions he has made.

[78] Symposium · WHAT WAS CHACHAPOYAS?: TOWARDS A CULTURAL GEOGRAPHY OF THE NORTHEASTERN PERUVIAN ANDES

Like other areas of the eastern Andes, the region of Chachapoyas in northeastern Peru holds great potential for understanding the relations that took place over time between Andean and Amazonian societies. While research has lagged behind neighboring regions, Chachapoyas archaeology has now reached a point where it is possible to contribute to these and other topics. Nevertheless, many questions must still be addressed, first and foremost of which concerns basic chronology and cultural geography: to what and to whom do we actually refer with the terms "Chachapoyas" and "the Chachapoya"? Others include: what was the relationship between better documented Late Intermediate Period societies (post-AD 900) and earlier ones? Did cultural or biological connections exist between these populations? How should we interpret sub-regional variations in material culture such as residential architecture, ceramics, and mortuary treatment? Is variation so substantial as to impair the argument that greater "Chachapoyas" was a meaningful concept to pre-Inka populations, or to undermine its worth for contemporary scholars? Are persistent characterizations of Chachapoyas as "remote" and/or "isolated" supported by archaeological data? By responding to these core questions, we aim to finally bring the archaeology of this important region into dialogue with broader scholarship across prehispanic South America.

[79] Symposium · ADVANCES IN THE METHOD AND APPLICATION OF CERAMIC PETROGRAPHY: INTERNATIONAL PERSPECTIVES ON KEY ARCHAEOLOGICAL QUESTIONS PART II

(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP (GIG) OF THE SAA)

Over the last 30 years the archaeological application of petrographic analysis has gained methodological and theoretical traction. Ceramic petrography, in particular, has emerged as a key methodological tool because it provides insights into technological practice, the choice and manipulation of raw materials by ancient potters, and methods of forming and firing conditions. Petrography has the advantage of being a visual technique whose observations are easily combined with macroscopic study of fabric, form, and decoration. A holistic approach that combines such observation with chemical (e.g. INAA, ICP-MS, XRF), mineralogical (especially XRD), and microstructural (SEM) data, in addition to geological information provides a powerful analytical strategy for understanding the social, political, economic, and environmental contexts of ceramic production, distribution, and consumption. Such information is vital for developing robust interpretations of ancient social organization and change. We have invited a group of scholars whose work highlights advances in ceramic petrography for understanding, technological traditions and change, identity, ceramic production and exchange, migration, and the social context of consumption. Many of the papers highlight new methods for combining petrography with other analytical strategies to address social process. As such, the session provides an analytical exchange among researchers with diverse intellectual backgrounds and research interests.

[80] Symposium · ISSUES IN BUILDING RADIOCARBON CHRONOLOGIES

The use of radiocarbon dates to reconstruct historical patterns of demography and behavior proceeds via processes of sample selection, measurement, calibration, compilation, exploratory data analysis, analytical statistics, and interpretation. This session brings together scholars refining facets of these processes in an effort to advance the overall ambition of making history visible via c14 dating. Topics include marine reservoir calibration, population dynamics via summed probability, Bayesian analyses of c14 data sets, methodological issues in measurement, calibration issues and systemic biases, taphonomic effects, and the potential for developing continental databases.

[81] Symposium · WORLDS FOREVER CHANGED: THE IMPACT OF CONFLICT AND COLONY IN THE "NEW WORLD"

The first contact between non-native foreign colonizers and indigenous peoples of the "New World" unquestionably resulted in permanent and widespread impacts. These impacts varied widely depending on the structure of existing native social organizations, the make-up and motivation of the colonizing groups, and the type or extent of the contacts. This session will explore the effect of, and activities surrounding, some key examples of first contact in the New World. Case studies drawn from a broad geographic range from the American northeast, southeast, and southwest are offered in comparison to other studies from central America and the Andean region.

This session will explore indigenous relations, colonizing strategies, and evidence of conflict and resistance. Independent lines of evidence range from changes in subsistence, architecture, various technologies, inter-societal relations, and settlement systems. This session will examine the ultimate outcomes that various regional contacts had on both the affected indigenous groups and their colonizers. Some studies will describe impacts upon less commonly discussed indigenous groups on the margins of contact areas. In particular, the long-lasting consequences of conflict and colonization resulted in profound cultural reorganization and produced effects that still resonate in present-day societies even after a span of nearly 500 years.

[82] Symposium · THE "NEOLITHIC HOUSE": WORLDWIDE COMPARISONS

The archaeological records of many regions of the world show transitions from sites with either no recognizable shelters or rare small ephemeral ones, to settlements with substantial domestic architecture; this shift is typically, though not always, associated with the adoption of agriculture and increased social complexity. Decades of research have demonstrated examples of parallels in these transitions worldwide. However, these developments also show major differences in the specifics of their architectural and domestic patterns, their economic and social contexts, and equally importantly in the theoretical frameworks within which the developments are analyzed.

This session aims to build inter-regional archaeological and ethnographic comparisons of these architectural transitions, asking authors to examine data on the shift to substantial structures in their regions, and to consider how such shifts may best be approached. The aim is not to reach a single grand synthesis, but to take advantage of the diversity among the regional cases and theoretical approaches to elucidate differences as well as meaningful commonalities. Similarly, this multi-regional approach will allow exploration of where contrasting theoretical traditions in archaeology hinder comparison or alternatively may suggest benefits of applying complementary theoretical approaches to cases where they have not previously been applied.

[83] Symposium · PRESERVATION, PROTECTION, AND OUTREACH PROGRAMS IN NATIONAL PARK SERVICE ARCHAEOLOGY

For nearly 100 years, the National Park Service (NPS) has preserved, protected, and interpreted archaeological resources throughout the United States. While many such efforts take place in park units, NPS also conducts programs and initiatives that are national and international in scale. NPS archeologists are responding to the threats posed by climate change, reaching out to youth and other constituencies, supporting enforcement of the laws that protect archaeological sites, and working with partners to develop solve pressing problems in heritage conservation. This session demonstrates the depth and diversity of recent NPS archeological practice by presenting large-scale initiatives mounted by NPS parks and programs.

[84] Symposium · SIMULATING SOCIAL COMPLEXITY TO UNDERSTAND THE ARCHAEOLOGICAL PAST

The large scale patterns that we commonly detect in the archaeological record are often not a simple sum of individual human interactions but a complex interwoven network of dependencies among individuals, groups, and the environment in which they live. Unraveling this web is a hard task. Complexity science's answer to the challenges of understanding such non-linear, unpredictable, complex systems is computational modelling. Tools such as Agent-based Modelling, System Dynamics Models, Network Analysis or Equation-based Models are extensively used in virtually every scientific discipline and in the last decade have also gained ground in social sciences, anthropology and archaeology.

In this session we present computational approaches to understanding the past, showcasing the innovative ways archaeologists have used simulation and model building to understand the complex societies they study. The session aim is to provide platform to discuss the potential and limitations of computational modelling in archaeology and highlight specific areas where it can be linked to more traditional empirical research.

[85] Symposium · COMMUNITIES THROUGH TIME: SOCIETAL CONTINUITY AND TRANSFORMATION IN THE NORTHERN SAN JUAN REGION

Decades of archaeological research in the northern San Juan region have yielded an abundant, rich, and complex body of data regarding the Pueblo occupation of the region, which was underway by 500 B.C. and continued until the complete depopulation of the region by Pueblo peoples late in the thirteenth century. During that occupation of this challenging landscape, communities formed and evolved, varying from clusters of family farmsteads to aggregated communities to large nucleated villages, with concomitant societal adaptations and innovations. These developments were key in enabling Pueblo farming families to survive for many centuries on this semi-arid landscape plagued with climatic variability and periodic drought. Myriad facets of Pueblo society and lifeways transformed in profound ways and then coalesced into a cohesive and enduring foundation for the centuries of Pueblo culture that followed in regions to the south. The papers in this session draw upon the rich body of empirical data for the northern San Juan region to produce diachronic syntheses that elucidate—within the context and setting of the community—long-term adaptation, transformation, and continuity in settlement patterning, subsistence systems, technologies, intra- and inter-regional interactions, regional chronology, and the increasing complexity of social, political, economic, and ritual systems.

[86] Symposium · CIRCULATION OF PEOPLE, THINGS & IDEAS: PRACTICES OF MOBILITY IN THE UPPER USUMACINTA BASIN

Several lines of research in the Upper Usumacinta Basin have recently expanded what we know about its kingdoms and the changing relations with their surrounding regions in pre-Hispanic times. What has emerged from these studies is a highly geographical and politically fragmented landscape in which circulation of people, things and ideas was a highly politicized practice too. Furthermore, different historic periods witnessed different practices of mobility due to seasonality, regional alliances or conflicts, and boundaries which left traces in the archaeological and epigraphic record. The idea for this symposium originated from the need to address these practices from anthropological and archaeological perspectives bridging the divide between transport and social research. Specifically, what this symposium wants to discuss is how people, things and ideas circulated through this fragmented landscape and dissect the issue of transportation into three main questions: 1) How can archaeology ground the experience of moving through this landscape from a phenomenological, geographical and political perspective? 2) How did people organize movement in the Upper Usumacinta basin in terms of transport technologies and social organization? 3) What is the evidence for materials and ideas circulating in the Upper Usumacinta basin?

[87] Symposium · FROM TAPHONOMY TO HUMAN ECOLOGY: PAPERS IN HONOR OF GARY HAYNES

Since beginning his career in academia nearly 40 years ago, Gary Haynes has pursued a wide range of interests that have taken him all over the world to places across the continental US, Canada, Alaska, Australia, Russia, Poland, England, Spain, France, and Zimbabwe. Thematically, his research interests run the methodological-theoretical gamut from basic field archaeology, taphonomic and actualistic studies, environmental archaeology, and animal behavior, to Pleistocene human dispersals in Africa, Eurasia and the Americas, human foraging behavior, transition to agriculture in southern Africa, and paleoecology and human-environment interactions. His research endeavors in Africa have also acquired an applied character that focuses on recording and preserving a rich rock art tradition, archaeological sites, studies of elephant behavior and conservation biology to inform on human-animal interactions in Hwange National Park Zimbabwe and beyond.

With this session colleagues, former students, and friends come together to present on research topics encompassing a broad spatial and deep chronological perspective, thereby highlighting Gary Haynes' multifaceted interests. We acknowledge his propensity for critically evaluating the archaeological record and maintaining an open mind. We celebrate his contributions to prehistoric archaeology and the subfields of taphonomy, environmental archaeology, human dispersals studies, and human-environment interaction research.

[88] Symposium · RECONSIDERING THE "EPIC" IN THE MESOAMERICAN EPICLASSIC PERIOD PART 2: INTERREGIONAL INTERACTIONS

The Epiclassic period (AD 600-900) embodies "epic" in both its noun and adjective forms, referring to heroic narratives and something that is impressive and grand in scale. The volumes 'Mesoamerica After the Decline of Teotihuacan' and 'Twin Tollans' (both Dumbarton Oaks) illuminated this period, yet given a recent resurgence of scholarship devoted to the Epiclassic, further assessment is timely. The declines of Teotihuacan and the Classic Maya cities were nuanced processes, as were the growth and development of the cities that arose in response to new economic and political opportunities. Papers will address specific aspects of the Epiclassic period, including the evolution of new population centers, exchange patterns, language, and other symbol systems; the value of visual culture in helping to discern social change; archaeological evidence that affirms or suggests new chronologies; and archaeological evidence that expands the original idea parameters of the Epiclassic. Finally, some papers will offer theoretical models for approaching this crucial era in Mesoamerica and ponder the validity of the Epiclassic period as it is currently understood. The second part of this two-part symposium focuses on broad-scale interactions involving multiple sites and regions of Mesoamerica.

[89] Symposium · MICRO-WORLDS, MATERIALITY AND HUMAN BEHAVIOUR: MAGNIFYING MATERIAL SCIENCE IN EXPLANATIONS OF TECHNOLOGY

Studies of innovation and cultural transmission in material culture are scholarly obsessions as well as fundamental building blocks for regional and global archaeological narratives. The traditional emphasis on macroscopic artefact traits to explore shifting patterns of cultural variation remains dominant whilst the use of material science data to examine these questions, particularly in the context of production technology, has been slow to develop. Traits that define style and form take precedent over composition and texture. This session explores how we can better utilize material science data in building explanatory models for the evolution of technologies worldwide. It brings together a range of cross-disciplinary research projects that span different materials and continents, yet all using elemental and microscopic analyses to investigate variability in artefact production processes. Participants will demonstrate the utility of micro-scale characterizations for exploring themes ranging from purely aesthetical and sensorial to environmental and mechanical stimulants of change. Seeing no fundamental difference in the abilities of micro- and macro-scale artefact traits to address archaeological problems, we wish to probe the extent to which materials science data can generate new insights on patterns of technological behavior.

[90] General Session · PRACTICES AND PRODUCTS OF CULTURAL RESOURCE MANAGEMENT IN NORTH AMERICA

[91] Poster Session · GLOBAL STUDIES OF OBSIDIAN: ANALYTICAL TECHNIQUES AND ARCHAEOLOGICAL INTERPRETATIONS

[92] Poster Session · LITHIC MATERIALS AND TECHNOLOGIES IN NORTH AMERICA

[93] Poster Session · SOCIAL CONTEXTS OF ARCHAEOLOGICAL PRACTICE IN THE FIELD, LAB, AND CLASSROOM

[94] Poster Session · MUSEUMS AND COLLECTIONS

[95] Poster Session · ARCHAEOLOGY IN COMMUNITIES: HERITAGE, PRESERVATION, AND ENGAGED ARCHAEOLOGIES

[96] Poster Session · COMPARATIVE ARCHAEOLOGY OF URBAN SITES

[97] Poster Session · CRM, KINTEEL, AND THE COMMUNITY OF WIDE RUINS

Northland Research, Inc. completed excavations on the Wide Ruins Road on the Navajo Nation in the summer of 2014. Excavations yielded important archaeological data and provided tangible public benefit to the community of Wide Ruins. Project data also generated research questions that had not been fully considered prior to the beginning of the project. These posters cover a range of topics related to the Wide Ruins project including; its important public benefit, the social significance of recovered fauna, an assessment of the role of oral history in today's archaeology and commentary on significance testing for this road project.

[98] Poster Session · PROJECT ARCHAEOLOGY STATE PROGRAM HIGHLIGHTS: CELEBRATING 25 YEARS

Project Archaeology started 25 years ago at the Bureau of Land Management in Utah. Since then, it has grown with established programs in 36 states. This poster session celebrates the diversity, complexity, and partnerships of Project Archaeology with submissions from a selection of state programs, including Florida, Colorado, Oklahoma, Iowa and Montana. Some state programs are 25 years old and have gone through a generation of changes. Some are very new and bring vital energy that feeds this synergetic network. In addition to geographic diversity, the Project Archaeology products developed by each state vary as the educational goals and archaeological resources differ. Come meet the people representing Project

Archaeology in your state and learn how to get involved.

[99] Poster Session - TEACHING ARCHAEOLOGY IN THE TWENTY-FIRST CENTURY: ACTIVITIES FOR THE COLLEGE CLASSROOM

(SPONSORED BY COMMITTEE ON CURRICULUM)

Hands-on activities are one of the best tools available to promote complex problem-solving in student-centered archaeology classrooms. Yet, original activities are difficult to devise, requiring a substantial time commitment and, frequently, multiple iterations before maturing into a productive learning tool. Ideally activities that originate within a limited circle of colleagues can be adapted and revised to fit diverse academic situations and instructors. This poster session is designed to share effective activities developed by the presenters over the years. Activity handouts, along with ancillary materials, are provided and each activity is explicitly connected to the Principles for Curricular Reform of the SAA Committee on Curriculum: Stewardship, Diverse Pasts, Social Relevance, Ethics and Values, Written and Oral Communication, Fundamental Archaeological Skills, and Real-World Problem Solving.

[100] Symposium - MAYAARCH3D: BUILDING A 3DWEBGIS DOCUMENTATION AND ANALYSIS SYSTEM FOR COMPLEX ARCHAEOLOGICAL SITES

The MayaArch3D project is developing a new research tool that offers the possibility to combine 3D-Models and the functions of Geographical Information Systems (GIS) for the documentation and analysis of archaeological sites on one internet platform. This symposium will present the project goals, pipeline, and results of this international, interdisciplinary project led by the German Archaeological Institute, and funded by the German Ministry of Education and Culture from 2012- July 2015. The first several papers present the technical pipeline: from data collection and post-processing, to data structuring and segmenting. Following papers will present the system architecture, system tools, and demos of the online tool. Another set of papers presents the first archaeological use cases and two discussants round up the session.

[101] Symposium - GLASS AND GLASS TECHNOLOGY: MULTI-DISCIPLINARY APPROACHES TO ARCHAEOLOGICAL RESEARCH

Glass is not as ubiquitous as other archaeological materials, such as ceramic, but when present it provides important clues about the community that left it behind as it participated in many different aspects of its life. Indeed, this material was used to manufacture prestige objects, architectural elements, personal ornaments or utilitarian items. The study of ancient glass participates in the general understanding of ancient societies, their structure, interaction and evolution. Inferences are made by studying the composition of glass assemblages, the typology of objects, the recipes and manufacturing techniques. This session aims at presenting exemplary case studies that involve many of the interdisciplinary approaches recently developed to study ancient glasses, glass technologies and the people that used them. These approaches combine and integrate archaeology with anthropology, art history, chemistry, materials science and other fields. The goal is to stimulate discussion about the unique contribution of ancient glass studies to the understanding of our past, and demonstrate how glass studies have matured in recent years to provide conclusions with broad interpretation.

[102] Symposium - NEW INSIGHTS INTO PAINTED POTTERY FROM NORTHWEST CHINA

This panel considers the origin, context, production, and circulation of painted pottery from Northwest China with broad perspectives. Used by people of varied backgrounds and in different contexts, these objects are dated around 8000 to 2000 years ago, from the Neolithic through Early Iron Age. Today, many museums throughout the world hold these ancient pots in their collections. Previous studies provide limited knowledge beyond chronological typologies of vessel forms and decorations. With new methods and data, participants of this panel develop and rethink hypotheses of population movement, cross-regional connection, material

exchange, technological diffusion, stylistic imitation, and cultural identity behind these well-known objects. New studies consider the ceramics as well as other findings, such as millet, textiles, leather vessels, and cowrie seashell. As comparable motifs can be noticed among painted pottery from China, Central Asia, Southeast Europe, and Southeast Asia, the geographic scope of discussion includes China and other regions of the Eurasian Continent in regional and cross-regional perspectives.

[103] General Session - GIS, REMOTE SENSING, AND ARCHAEOLOGICAL MAPPING STUDIES

[104] Forum - MAKING THE TOUGH CHOICES: FINDING WORK/LIFE BALANCE AS AN ARCHAEOLOGIST

As our culture changes faster than the archaeological profession, how do we make the best choices to balance the competing demands of our personal and professional lives? This forum aims to continue and broaden the discussion of such important work/life balance issues as: dual-academic couples, when and how to manage having children, childcare in the field, caring for elderly parent, when to retire, and how to keep your sanity along the way. Panelists come from across the discipline, seeking to clarify the issues and suggest creative solutions.

[105] Symposium - LIFE IN THE DIMINUTIVE REALM: HUMAN ADAPTATIONS TO SMALLER ISLAND ENVIRONMENTS

(SPONSORED BY JOURNAL OF ISLAND & COASTAL ARCHAEOLOGY)

In the archaeological study of islands worldwide, research has generally focused on larger land masses. This is primarily based on the assumption that human colonizing groups require certain necessities—suitable land for cultivation, easier access to resources such as fresh water, and room to expand as populations grow. However, it is becoming increasingly demonstrated that smaller islands within archipelagos were equally, if not more, attractive for settlers due to their superior marine and/or terrestrial resources, isolated locations for ritualized activities, and more manageable defense. Smaller islands, however, are also more susceptible to human impacts given myriad social and natural processes. In this symposium, we will explore how people settled and lived on small islands in various parts of the world, with an emphasis on how they differ from other settings. Potential topics are diverse and will encompass a range of issues and theoretical perspectives—from historical ecology and ethnoarchaeology, to more specific case studies and comparative analyses. The overall goal is to present how current research on smaller islands is changing how these seemingly peripheral and less important locales are pivotal to our understanding of human survivability in aquatic environments.

[106] Symposium - CALIFORNIA ARCHAEOLOGY AND CLIMATE CHANGE

(SPONSORED BY SOCIETY FOR CALIFORNIA ARCHAEOLOGY)

The impacts of anthropogenic climate change are currently eroding California's cultural heritage. Over the past three years, the Society for California Archaeology (SCA) has been organizing efforts to address these impacts and survey the state's coastline before thousands of archaeological sites are lost. Across the state, different agencies, tribes, university anthropology programs, avocational societies, and volunteers have been working collaboratively in conducting field studies and bringing their results to a larger public through different media venues. To date, over 80 volunteers from 7 universities, working on the lands of multiple state and federal agencies, have donated their time to survey public lands.

In addition, agencies and tribes have been conducting their own studies in the hopes of managing impacts at a local level through their site-specific expertise. Tribes in particular face special challenges in protecting ancestral collection and ceremonial areas on public lands and have created their own tribal preservation programs. This symposium presents a cross-section of these efforts and offers different models for preparing for climate change for archaeologists and cultural resource preservationists worldwide.

[107] Symposium - RECENT DOCTORAL RESEARCH ON COLOMBIAN ARCHAEOLOGY

In recent years there has been a renewed interest in the archaeology of the so-called "Intermediate Area" within American archaeology, leading to more doctoral students studying these cultures and areas with new ideas. Both American and Colombian archaeology students have been tackling new questions and using new methods to better understand the complex history of Colombia's ancient cultures. The purpose of this symposium is to bring together doctoral candidates and recent graduates conducting research in Colombia in order to facilitate engagement and discussion of the most recent work being done for this region. This session will highlight the research that students of Colombian archaeology are undertaking and include diverse projects and perspectives. Additionally, student researchers from both the USA and Colombia will be participating and will benefit from the exchange of ideas with one another and this platform provides an opportunity to meet, network, and potentially develop future collaborations with fellow archaeologists studying Colombia's rich history.

[108] Symposium - ARCHAEOLOGY AND THE NEW MATERIALISM

The papers in this session take up different engagements with "new materialism", demonstrating both the potential of archaeology to contribute to this transdisciplinary discussion, and some of the challenges inherent in a project that is far from unified and still emergent.

One touchstone of new materialism has been the redefinition of matter as something beyond any specific physical stuff, as active, in Jane Bennett's felicitous term, Vibrant Matter, engaged in what Karen Barad characterizes as "intra-active becoming", "a congealing of agency". While on the surface these statements seem close to archaeological glosses on materiality and the agency of non-humans, one of the goals of this session will be to explore how new materialism goes beyond these well-integrated themes in archaeological research, and what changes new materialism might demand.

Interrogation of boundaries between humans, other animals, and other things in the world in new materialism culminates in the pursuit of new ontologies, especially non-dualistic ontologies. This again has many connections with existing archaeological approaches to "relational" ontologies. Contributors to this session are challenged to specify how the ontological relations they pursue align with new materialism and its existing archaeological precedents.

[109] General Session - PROTOHISTORIC AND HISTORIC ARCHAEOLOGY IN THE NEW WORLD**[110] General Session - RESOURCE USE, ENVIRONMENTS, AND LANDSCAPES****[111] Symposium - REPRESENTACIONES GRÁFICO RUPESTRES EN EL ESTADO DE OAXACA, NUEVAS INVESTIGACIONES EN LA ARQUEOLOGÍA DEL PAISAJE**

El estado de Oaxaca es ampliamente reconocido por su amplia gama de contextos en el registro arqueológico, desde vestigios que dan cuenta del poblamiento americano hasta las grandes construcciones prehispánicas como Monte Albán. Uno de estos elementos que han sido relativamente poco estudiados en este estado son las representaciones gráfico rupestres, las que nos ofrecen elementos para el análisis de las sociedades antiguas desde puntos de vista como el arte, religión, tecnología, siendo una gran fuente de información sobre las sociedades que las crearon. Dentro de este gran tema, en esta sesión se presentarán trabajos recientes en relación a los contextos con representaciones gráfico rupestres que se han trabajado últimamente en el estado de Oaxaca, desde perspectivas relativas a su investigación, protección y difusión como patrimonio arqueológico.

[112] General Session - BERINGIA AND THE ARCTIC**[113] General Session - THE HOUSEHOLD AS ANALYTICAL UNIT**

[114] General Session · ARTIFACTS AND THEIR PRODUCTION IN PREHISTORIC NORTH AMERICA**[115] General Session · THE ARCHAEOLOGY OF EAST AND SOUTHEAST ASIA****[116] Symposium · ARCHAEOLOGIES OF COLONIALISM AND EVERYDAY LIFE IN THE INDIAN OCEAN WORLD**

This session draws together several case studies from the IOW that look at the experiences, environment and conditions of everyday life within colonial contexts, and engage with archaeology's dualistic role in understanding the complexities of the past and heritage in the present. Colonialism in the Indian Ocean world, on the surface, seems analogous to colonialism within the Atlantic world. The same European colonial powers established plantations and trading posts, often on remote islands, built by the labor of enslaved and indentured Africans, Chinese, and South/South East Asians. Yet, more than anything, the vast research and literature on the Atlantic has also taught us that there are a multitude of variables within each colonial context that make the experiences of both colonizers and the colonized distinct. These case studies are new explorations that offer unique comparisons for historical archaeologies that engage in particular with diaspora, indenture and post-slavery contexts.

[117] Forum · PERFORMING THE PAST/PRESENT

Enriching the metaphor of archaeology as craft, this session will embrace the role of the archaeologist as participant/performer in the process of data recovery and interpretation. Presenters—and the audience—are encouraged to 'perform their data, its analysis, its interpretation' during the session; collaborators working in disciplines outside of archaeology are especially welcome to join. Suggestions include dramatic readings, live music, and experimental replication. Presenters should offer remarks that justify the choice of particular media for the performance. These remarks and discussions throughout the session will serve as opportunities to consider the contributions of explicit performance to the general (session-wide) and particular (presenter) craft(s) of archaeology undertaken. Furthermore, critically examining the archaeology-craft metaphor, we will question the alignment of archaeology with technology; does archaeology have its own chaîne-opératoire, and, if so, what are its stages and their attendant products? We also aim to explore whether explicit performance can facilitate a re-orientation of the discipline as more three-dimensional, advocated in the past on behalf of emotion and materiality. Finally, we will recognize the ethical implications of archaeological performance: does it reify the objectification of archaeological materials? Alternatively, does it advance the conceptualization of archaeology as imagined and archaeologists as social constructions?

[118] Poster Session · SITE FORMATION PROCESSES AND TAPHONOMY**[119] Poster Session · ENVIRONMENTAL ARCHAEOLOGY AND HUMAN ECOLOGY****[120] Poster Session · PREDICTIVE MODELS, SURVEY, AND SITE DISTRIBUTIONS****[121] Poster Session · ARCHAEOLOGICAL TECHNOLOGIES, TECHNIQUES, AND METHODS****[122] Poster Session · EXPERIMENTAL ARCHAEOLOGY AND ACTUALISTIC STUDIES****[123] Poster Session · THE AFTERLIFE OF ARCHAEOLOGICAL INFORMATION: USE AND REUSE OF DIGITAL ARCHAEOLOGICAL DATA**

Archaeological projects generate a lot of data. High value, interpretable data are published in the final report or other publications, but a great deal of additional data remain inaccessible. What happens to these invaluable supporting data (e.g. field notes, photographs, raw data sets, GIS files, etc.) after the final product is complete? This poster session explores ways that archaeologists who practice in many different settings (academic, agency, CRM) preserve and make available their digital archaeological products for future use.

[124] Poster Session - CROWDSOURCING, CO-CREATION, AND COLLABORATION THROUGH VIRTUAL CURATION

In his 2010 book *Cognitive Surplus*, Clay Shirky writes that “The dramatically reduced cost of public address, and the dramatically increased size of the population wired together, means that we can now turn massive aggregations of small contributions into things of lasting value.” A similar sentiment can be extended to virtual archaeological curation—the creation of intangible digital models from tangible pieces of the past. The participants in this session are developing protocols and pooling efforts to create digital diagnostic type collections and other tools that aid will aid archaeologists with making quicker and more accurate identifications, and enhancing their analyses of existing collections. Crowdsourcing and directed collaboration reduces duplication of efforts while expanding the research and potential of digitally preserving the past. Virtual curation also encourages co-creation efforts at colleges and in the community.

[125] Poster Session - THE ACID TEST: EXPLORING THE UTILITY OF THE DIGITAL INDEX OF NORTH AMERICAN ARCHAEOLOGY (DINAA) FOR USE IN APPLIED RESEARCH

(SPONSORED BY DIGITAL INDEX OF NORTH AMERICAN ARCHAEOLOGY (DINAA))

The Digital Index of North American Archaeology (DINAA) develops interoperability models for large, administrative archaeological resource inventory databases. As of September 2014, DINAA has integrated fifteen US State Historic Preservation Program databases that contain information on a half-million archaeological resources. Sensitive attributes, or information that could potentially threaten a cultural resource, are systematically scrubbed and never shared. DINAA provides a web-based tile-map interface that can filter site attributes and cultural time periods across incompatible database systems. Data are rendered within a spatially decimated (ca. 20-km²) tile grid, and query results can be exported in several formats or linked through stable web identifiers (e.g. JSON, GeoJSON, CSV, Microsoft Excel). This poster symposium explores analyses of settlement patterning, spatial distribution, resource management issues, and record comparability using data provided through DINAA. Other presentations emphasize interoperability and the power of linked data applications by making primary datasets available and connecting to DINAA through Universal Resource Identifiers (URIs). The application interface is hosted and developed through the Alexandria Archive Institute (Open Context). The research team includes members from 15 preservation offices, the University of Tennessee, Indiana University, Open Context, Michigan State University, and Grand Valley State. The National Science Foundation provided initial funding.

[126] Poster Session - DEVELOPMENTS IN FIRED CLAY CERAMIC REHYDOXYLATION DATING (RHX DATING)

Michigan Technological University, California State University-Long Beach, and Arizona State University scientists have been collaborating on a critical assessment of the novel RHX Dating technique, pioneered by Wilson et al. (2009). The proposed technique asserts that the methodical process of mass gain in fired clay ceramics, as the ceramic fabric's remaining clay crystals form atomic bonds with hydroxyl molecules, can be measured and calculated as a clock to identify the number of years before present that the ceramic was last fired. The three laboratories have run dozens of trials with varied methods, gaining valuable insight into the problems and promise of development. The posters in this session present overviews of data analysis which support cautious optimism for future development of the technique.

[127] Symposium - ANTELOPE CAVE: A DRY ANCESTRAL PUEBLOAN (VIRGIN ANASAZI) SITE IN NORTHWESTERN ARIZONA

Antelope Cave was excavated in the 1950s by crews from the Museum of Northern Arizona and UCLA and in the 1980s by BYU archaeologists. Prehistoric peoples lived at the site intermittently for 4000 years, but the most intense occupation occurred during the Pueblo I Period (AD 800-1000). The dry environment inside the cave provided for the recovery of thousands of perishable objects in addition to ceramic, stone, and bone artifacts. This symposium, based on the materials recovered from Antelope Cave, presents new research that expands our knowledge of the Ancestral Puebloan adaptation to the semi-arid environment of the Arizona Strip.

[128] Symposium - HISTORICAL ARCHAEOLOGY OF THE AMERICAN WEST

The American West has been defined in myriad ways, including geographically, environmentally, historically, and culturally. Whatever definition is used, however, it is clear that common trends and themes, such as culture contact, colonialism, labor, migration, and identity, are visible through historical archaeological studies. This symposium will include papers from across the American West and throughout the historic period in order to explore some of these themes and survey the current and future state of research.

[129] Symposium - EL HOMBRE EN LA CUENCA DEL RIO LERMA. PASADO Y PRESENTE

El presente simposio, reúne a especialistas de diferentes campos disciplinarios cuyas investigaciones confluyen en el estudio de uno de los sistemas hidrológicos más importantes de México; el río Lerma. Este río cuyo origen está en el valle de Toluca, constituyó un escenario ideal para el desarrollo de las sociedades humanas desde tiempos pretéritos. A lo largo de un cauce de más de 1200 kms, existieron flujos de poblaciones que se trasladaron de una región a otra, en un proceso continuo que posibilitaron las relaciones interculturales desde al menos el periodo Preclásico. En efecto, el Lerma enmarcó el asentamiento y desarrollo de las primeras formas de organización social, hasta aquellas sociedades complejas que enfrentaron a los conquistadores europeos; así mismo hacia el periodo colonial dio cabida a las relaciones interétnicas que transformaron los paisajes otrora imperantes. Ha sido también un referente de desarrollo económico y político durante todo el siglo XIX y hasta los tiempos actuales. Los avances de investigación logrados a la fecha, permiten apreciar que a lo largo de los siglos, los pobladores asentados cerca de sus riberas desarrollaron estrategias para aprovechar su gran potencial como generador de recursos, incluido su propio caudal.

[130] General Session - RECENT METHODOLOGICAL ADVANCES IN MESOAMERICAN AND MAYA ARCHAEOLOGY**[131] General Session - ARCHAEOLOGICAL AND BIOARCHAEOLOGICAL PERSPECTIVES ON VIOLENCE, CONFLICT, AND WARFARE****[132] General Session - MARKERS AND METHODS IN BIOARCHAEOLOGY AND FORENSIC ARCHAEOLOGY****[133] General Session - ARTIFACTS AND ARTISANS IN ANCIENT MESOAMERICA****[134] Symposium - ARCHAEOLOGICAL RESEARCH IN THE CAÑETE VALLEY, PERU**

This session focuses on current archaeological research performed in the Cañete Valley located in the Peruvian south-central coast. Speakers will present results from excavations and/or surveys which took place in different archaeological sites pertaining to different temporal periods, mainly the Early Intermediate Period, Middle Horizon, Late Intermediate Period and Late Horizon (Inca) The objective of this session is to share and exchange information from the different research projects focused on the valley in order to obtain a more regional perspective on the historical trajectory of the area.

[135] Symposium - FORAGING SPECTRA: HUNTER-GATHERER DIVERSITY IN PREHISTORY

While the term hunter-gatherer refers to a mode of subsistence, disparate cultures fitting these economic criteria have traditionally been grouped together despite variation in demography, mobility, foraging behavior, and sociopolitical organization. This diversity is primarily known from ethnographic data and most investigations of hunter-gatherers tend to build detailed pictures of human society through ethnographic analogy rather than archaeological evidence. To take additional steps toward documenting the range of diversity in forager lifeways, this session is designed to honor and draw inspiration from Robert Kelly's *The Foraging Spectrum*. Its central goals are to contribute to anthropological theory generally, and archaeological methods specifically, by examining the range of variability in prehistoric foragers extending beyond the ethnographic record. Individual papers cover a broad array of geographic areas and time periods and draw upon topics raised in Kelly's original work. This explicit use of new archaeological data, methods, and theories will highlight novel forms of foraging and social systems available only in the deep past.

[136] Symposium - NEWS OF THE WEIRD (ARCHAEOLOGY)

(SPONSORED BY MEDIA RELATIONS COMMITTEE)

This exciting symposium examines the interplay between archaeological fact and fantasy. Archaeological discoveries contribute to the public's consciousness of the ancient world. Unfortunately, fantastic elements also merge with verifiable data in disconcerting ways. Fanciful elements of the ancient world will be addressed along with how the media perceives archaeological data. This symposium is sponsored by the Media Relations Committee.

[137] Symposium - ATLANTIC CROSSING: SIDE VIEWS ON ROCK ART

Rock art studies have followed different paths in America and Europe (and other world regions for that matter). The reason lies in the constitution of the discipline. In Europe prehistoric art was an integral – and, at times, controversial – part of the discovery of the fossil man and the approach to this artistic phenomenon was tinged with questions about chronology and sequence. In areas such as North America, prehistoric art does not seem to have played an equivalently conspicuous role in the academic development of archaeology. In addition, the persistence of native peoples favored a more anthropologically-informed approach to rock-art studies, allowing closer attention to issues such as the social significance of these carved and painted images. This session brings together a series of papers dealing with different conceptions about the analysis of rock art conducted by researchers from different parts of the world, in order to reflect on how different research traditions have informed approaches to this unique archaeological manifestation.

[138] Symposium - NEW RESEARCH AND EMERGING SCHOLARS WORKING ON PUBLIC LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT

The Bureau of Land Management is responsible for the stewardship of more than 247 million acres of public lands, comprising 10% of the total area of the United States and containing some of the most significant heritage resources in the nation. Federal mandates require the BLM to manage these resources in a multiple use context that meet historic preservation goals while simultaneously providing for varied uses of the nation's land for present and future generations. An important element of this balancing act is proactive archaeological research to benefit both the academic discipline and the public. Archaeological research contributes vital information to develop effective management approaches through the identification of context, significance, and landscape level relationships. Investigations of the past also benefit the public as the basis for heritage values education by providing research opportunities for students and seasoned scholars. By jointly developing research programs that address these relationships, the BLM works to more effectively promote and support archaeological investigations that will be of the greatest value to the public. This symposium highlights recent and ongoing archaeological investigations conducted on BLM lands to underscore the significant role of public land management agencies in facilitating, conducting and sponsoring academic archaeological research.

[139] General Session - EXPERIMENTAL ARCHAEOLOGY**[140] Symposium - CHRONOLOGY, EXCHANGE, IDENTITY: ELEMENTAL ANALYSIS OF GLASS BEADS FOR ASSESSING REGIONAL INTERACTION**

Archaeologists working around the world now investigate population mobility, timing of movements and trade events, and other human interactions at various scales. Glass objects are an ideal artifact category for addressing these questions because of their portability and durability, their relatively homogeneous makeup, and, in many cases their known provenience information. Glass beads can also serve as material signifiers of class, ethnicity, age, and gender; therefore, clarifying basic chronologies of interaction and patterns of exchange can reveal aspects of social signification and identity performance in past cultures. Elemental analysis techniques such as laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS), portable X-ray fluorescence (pXRF), and scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDS) unite the efforts of a geographically diverse group of researchers in this symposium. Shared analytical techniques provide data that archaeologists interpret to increase understanding of interaction on past landscapes in North America, Africa, Europe and Asia. They face similar challenges in assessing data sets, identifying chemical patterns, and archaeological interpretation. Convening these scholars provides an opportunity to contextualize findings through even broader inter-regional and global perspective informed with discussion of diverse theoretical approaches to the interpretation of exchange and use of glass beads.

[141] Symposium - PRECERAMIC AND EARLY AGRARIAN COMMUNITIES IN THE BASIN OF MEXICO: NEW PERSPECTIVES

In the spirit of encouraging new excavations at known sites and the discovery of additional evidence for early transitions to settled community life, the goal of this session is to share preliminary results from recent fieldwork in the Basin of Mexico, particularly relating to the extensive period between the Late Preceramic and Late Formative periods. In spite of the importance of this period of time, ranging between at least 7000 and 2000 14CYBP, relatively few new advances have been reported over the past four to five decades, particularly insofar as the preceramic is concerned. A limited number of sites in the Basin have been examined in a focusing on the transition from preceramic hunter/fisher-gatherer groups to the establishment of settled agricultural communities during the Middle and Late Formative periods.

Geoarchaeological and paleoenvironmental approaches, together with new excavations in preceramic occupations in sites such as Tepexpan, Texcoco, San Gregorio Atlapulco, and early settlements such as Altica and Cuicuilco, are contributing to the improvement of hypothesis concerning the transition from hunter-gather economies to agrarian communities. New techniques and methodological approaches afford an opportunity to broaden our knowledge of these earlier periods before they are transformed beyond our reach.

[142] Symposium - THE TECHNOPOLITICS OF ANCIENT INFRASTRUCTURES

Technopolitics rejects any essential division between technological phenomena and political phenomena as subjects for analysis. Realizing political goals is always a technological problem and vice versa. Traditionally, however, archaeology has tended to separate out the investigation of ancient politics from ancient technologies, and so it is this divide that this session seeks to challenge. And while infrastructure frequently does appear in narratives of ancient states – its analysis is often overdetermined by the abstract political goals and ideological frameworks for which it is a “vehicle”. Yet, the politics of any infrastructural project is far from exhausted in the initial moment of its design and construction. Infrastructure can endure for centuries, during which time it can undergo degradation, re-appropriation, renovation or collapse. Studying such phenomena requires a deep engagement with the material and technological fundamentals of all infrastructure, fully integrated with, rather than artificially extracted from, its political context. Papers are therefore sought which will engage with past infrastructural projects from a broadly technopolitical perspective – and so seek to undo the long-running relegation of technological problems to a space outside the realm of politics within archaeological theory.

[143] Symposium - CACHE CAVE IN CONTEXT: UNVEILING NEW DISCOVERIES IN SOUTH CENTRAL CALIFORNIA

This symposium presents the findings from two seasons of fieldwork at the site of Cache Cave, which contains the largest known assemblage of perishable artifacts yet recorded within the larger Chumash linguistic area or that of its immediate neighbors. While cache sites were once relatively ubiquitous across the greater Chumash area, due to antiquarian and other looting activities, no major cache site has ever been studied using modern archaeological techniques. Field work in 2012 at Cache Cave uncovered not only a cache cave site having remarkable preservation with material in context, but one that dwarfs any previously known site in the sheer quantity of its assemblage. Subsequent work in 2014 has defined and documented the extent of the cave complex, explored in detail some of the cave deposits, and further refined our knowledge of site structure and chronology. This allows not only the first in depth, systematic analysis of any kind on this important site type, but an investigation of the largest cache cave ever discovered in the region. Papers presented here offer our initial views of the site and its assemblage in various contexts, as well as findings from habitation and special-use sites in the cave's vicinity.

[144] Symposium - THE MATACANELA ARCHAEOLOGICAL PROJECT 2014

The Matacanela Archaeological Project is a two season effort to more fully understand the transformation of Gulf lowland society at the end of the Classic period and through the Postclassic period. The Classic-Postclassic transition throughout Mesoamerica and the southern Gulf lowlands was characterized by shifting political, economic, and ideological frameworks, climatic and environmental change, and migration. In this session, we present the findings of the first season of field research, situate Matacanela within its broader regional and temporal contexts, and consider avenues for future research. We incorporate the perspectives of archaeologists, iconographers, and members of the community.

[145] Symposium - TRIBES, CHIEFDOMS AND EARLY STATES IN LATE PREHISTORIC JAPAN

This session presents the results of recent research into the archaeology of chiefdoms and early states in late prehistoric Japan. The time period under consideration spans from ca. 500 B.C. to 600 A.D. During this time period, local societies evolved from tribal-level to chiefdom-level, and eventually from the third to fifth centuries A.D. several regional societies were united to form the central polity at an early-state level. The social and cultural evolution during this time period is characterized by strong regional differentiation in the speed and process of evolution and patterns of interaction with other regions, although the major subsistence base was wet rice agriculture. Moreover, interaction with the Chinese continent and Korean peninsula played a major role in the development of social complexity. In the middle third century, highly standardized keyhole-shaped burial mounds appeared in many regions of Japan, but strong regional differences remained. In this session, we want to emphasize this interplay between autonomous local polities and the central polity in the process toward more complex society.

[146] Symposium - THE ARCHAEOLOGY OF COMMON SENSE

Rather than colloquial wisdom, Clifford Geertz argued, common sense was culturally constructed, historically contingent, and in need of querying. As such, like myth or art or knowledge, common sense was a cultural system in need of anthropological attention. Though his concern was for the ethnographic present, investigators of ancient and historic remains have much to contribute to common sense's analysis. Their expansive time frames can reveal the processes that work so assiduously to turn history into human nature. In this session, contributors are asked to identify and interrogate contemporary commonsensical notions—about gender, sexuality, race, ethnicity, class, time, etc.—that find their way into scientific studies and/or popular presentations of the past. This naturalization of the cultural is not without consequences, and contributors may also deliberate about the socio-political effects, whether intended or not, of reifying common sense. Finally, as a counter to universalizing and presentist narratives of the past, contributors are encouraged to offer evidence from their contextualized archaeological and bioarchaeological studies that highlight the varied ways to be human.

[147] Symposium - HERE BE DRAGONS: ARCHAEOLOGY IN NORTH CENTRAL BELIZE

Starting in the 1970s with excavations at Altun Ha, and continuing into the 21st century with work at Lamanai, Ka'Kabish, Chau Hiix and sites in the Hillbank area, and other locations, North-Central Belize has been the focus of considerable archaeological work. This symposium is intended to highlight work done in this region of Belize. By bringing the work done by projects in this area together, along with research spanning the Middle Formative through to the Historic period, we hope to integrate the research produced by these projects into a larger regional discussion of Maya politics and society.

[148] Symposium - NEW PERSPECTIVES IN FOLSOM ARCHAEOLOGY

In the past decade, our knowledge of Folsom adaptations has improved dramatically. While Folsom peoples were undoubtedly highly mobile and hunted bison, work since the early 2000s has provided a much more nuanced view of their subsistence and settlement systems. Folsom sites located in a variety of environments (including the high elevation intermountain basins in the Rockies and the prairie woodlands east of the Great Plains) have shed new light on the diversity of Folsom lifeways, and analyses of new and extant collections have improved our understanding of Folsom technological organization. The primary goal of this symposium is to report on innovative recent research on Folsom technology, mobility, and settlement systems that adds insight to our reconstruction of Folsom adaptations. Individual papers within the session span a wide geographic range, include new methods for addressing variability in the Folsom archaeological record, and draw on concepts from a plethora of theoretical frameworks to contribute to a contemporary synthesis of how Folsom Paleoindians flourished during the Terminal Pleistocene.

[149] General Session - GLOBAL STUDIES IN ROCK ART ANALYSIS AND INTERPRETATION**[150] General Session - THE ARCHAEOLOGY OF THE PALEOINDIANS AND EARLY NEW WORLD OCCUPATIONS****[151] Symposium - NEW PERSPECTIVES ON THE IZAPA STATE**

Long-known as an important Late Formative political site, Izapa was one of a string of early states extending down the Pacific coast from Chiapas to El Salvador. Izapa's extensive sculpture, part of a pan-regional public art style, demonstrates ties with both the Guatemalan Highlands and Isthmian traditions. Philip Drucker first brought Izapa to world attention during the 1940s in the pages of National Geographic Magazine. In the 1960s, the New World Archaeological Foundation (NWAf) established a ceramic chronology and produced wonderfully detailed maps and drawings of the monumental architecture and sculpture that define the site core. Yet, despite these early efforts, surprisingly little is actually understood about how Izapa's residents lived or the world they inhabited. This session brings together a dozen scholars whose recent work provides new insights on Izapa. Reanalysis of NWAf data as well as recent excavations and regional settlement survey contribute to improved understanding of the chronology, demography, and economy of Izapa and its sustaining area. New perspectives on the site's iconography and writing place the site's public art and elite culture in regional context. These exciting new data situate Izapa and the Pacific coast as one of the centers of early Mesoamerican civilization.

[152] General Session - MARINE ZOOARCHAEOLOGY AND MARITIME ECONOMIES**[153] General Session - ETHNOARCHAEOLOGY, ETHNOHISTORY, AND ETHNOGRAPHY IN ARCHAEOLOGY****[154] Symposium - CONSUMING LANDSCAPES**

Landscape and foodways studies in archaeology and beyond have increasingly touched on social questions, but the former have mostly expanded our understanding of the management of past environments, while the latter have focused on discourses of social identity. This session aims to combine these two often separate perspectives in order to investigate how foodways and landscape are, and were, entangled. 'Consuming Landscapes' refers to the multiple ways in which historical trajectories of food, especially their relationships with particular geographies are used, called upon, and restructured in a social discourse. We welcome contributions across disciplines that investigate how people perceive and engage with their landscapes in different periods and places as revealed by the production, movement, consumption and/or disposal of food. Such a framework can be particularly productive in the examination of the ways social networks and power relationships are created, transformed, and altered along with territorial appropriation, expansion and conquest, and in highlighting ideologies related to such geographical movements. We bring together contributions from a wide range of specialists to expose and encourage a continuing interdisciplinary dialogue to foster the emergence of a more integrated practice in the study of food and social and cultural landscapes.

[155] General Session - GLOBAL STUDIES IN GEOARCHAEOLOGY

[156] Symposium - THE PRESENCE OF THE HUNTER AND GATHERER GROUPS IN THE NORTHWEST MEXICO REGION: RECENT FINDINGS

Due to booming development in the Northwest Mexico region and the presence of more archaeologists in these arid areas, several projects have unveiled interesting details about the presence and ways of life of hunters and gatherers groups that lived and died in this apparently desolate space. The material evidence left behind for us, is not much, but those material context provide a glimpse into how they interacted with their environment and how they built a cultural landscape. In this symposium we will present the latest discoveries regarding these groups in the Northwest Mexico region.

[157] Symposium - FROM POLLEN TO POTTERY: NEW INSIGHTS ON THE INTERPLAY OF SOCIETY AND ENVIRONMENT IN SOUTH AMERICA DURING THE LAST 2000 YEARS

(SPONSORED BY AHRC / FAPESP)

In this symposium we want to explore ecological changes in South America, and human engagement with those processes during the last two millennia, particularly around AD1000. To discuss these points it will bring together researchers from a range of disciplines including archaeology, environmental science and paleoecology. The main aim of the symposium is to advance our understanding of the complex interaction between society, its built landscapes and the wider environment, highlighting the effects of these factors amongst each other. Strong interactions between these components have been provisionally identified in South America by interdisciplinary studies combining archaeology and paleoecology. Key areas to be explored are the current resolution of paleoecological data, the methodologies used to investigate human-environment interaction and the extent to which relevant disciplines can convincingly argue that human responses to change are negligible, passive or exploitative. The symposium will provide a context in which regional research projects can be re-evaluated at a continental scale, and where future engagement between investigators can be developed. This is an invitation to participant to integrate both disciplines and data with the combined objective of advancing our understanding of the interplay between of society and ecology.

[158] Electronic Symposium - SMOKE, FLAMES, AND THE BODY IN MESOAMERICAN RITUAL PRACTICE

Papers in this electronic symposium address the evidence for the ritual use of smoke and flame in Mesoamerica, particularly as pertaining to the human body in life and death. In the past and contemporary indigenous worldview, heat and flame are animate forces and signify strength and vitality; the most powerful of individuals are embodied with immense heat. Moreover, fire is transformative; both a means to destroy but also to transport offerings to otherworldly places. The source of all heat is, of course, the sun, the central force in the Mesoamerican cosmos. Today, the importance of heat and flames is evident in a spectrum of ritual practices, which range from the use of sweat baths to the burning of incense and other offerings. In Pre-Columbian times, human bodies were among the most valuable substances burned. The papers in this

symposium represent a diversity of case studies pertaining to the application and meaning of heat and fire in ancient, historic, and modern Mesoamerica and are drawn from archaeology, bioarchaeology, epigraphy, iconography, ethnohistory, and ethnography. This session will be followed by a more detailed symposium to be held at the Dumbarton Oaks Research Library and Collection in October, 2015.

[159] Forum · RESILIENCE, ARCHAEOLOGY AND GLOBAL WARMING: WHAT WE CAN LEARN FROM PAST HUMAN RESPONSES TO CLIMATE CHANGE THAT CAN HELP US TODAY

What archaeologists are learning about past adaptations to climate change can help inform how society can become more resilient in the face of global warming. Climate impacts including sea level rise, coastal erosion, intense wildfires and extreme weather events – are a growing threat to archaeological sites and cultural landscapes, and are broadly challenging our society.

This forum will provide an opportunity to hear about and discuss cutting-edge thinking on what we can learn from archaeological studies of past societal responses to climate change. Equally we will look at the ways in which rapidly changing climatic conditions are threatening archaeological sites across the United States, as well as the cultural heritage of descendent communities including Native Americans, First Nations and Native Hawaiians, from whose traditional ecological knowledge much can be learned. The forum will address impacts in a range of coastal and mountain sites, as well as begin to explore the thorny question of prioritization of cultural heritage protection in a changing climate.

[160] Forum · TWENTY-FIRST CENTURY ISSUES AND CHANGES IN CURATING COLLECTIONS
(SPONSORED BY COMMITTEE ON MUSEUMS, COLLECTIONS AND CURATION)

This forum will be a moderated discussion highlighting exciting changes in technology that make accessibility and research more dynamic with curated collections, such as 3-D scans, interactive web database modules, and podcast exhibitions. While technology offers new avenues for engaging material culture in innovative ways there are still challenges to be confronted and overcome such as the curation crisis, orphaned collections, new deaccessioning regulations, exhibition language, managing digital data long term, and intellectual property rights. Panelists will present concrete examples to introduce these topics, allowing ample time for open conversation and interaction with the audience as we (archaeologists, museum professionals, descendent community members, and educators) face these issues together.

[161] Forum · BUILDING ARCHAEOLOGICAL RESEARCH COMMUNITIES WITH CYBERINFRASTRUCTURE

Effectively addressing compelling, large-scale research problems demands dramatically enhanced collaboration among researchers. This forum discusses successes and challenges in building research communities with online, digital platforms, such as the Digital Archaeological Record (tDAR). Forum panelists will consider approaches for creating these communities with existing infrastructure and strategies for building and maintaining these groups. In addition, they will explore opportunities to devise innovative collaborative research efforts with emerging technologies and tools.

[162] Poster Session · MACRO, MICRO, AND ISOTOPIC STUDIES IN ARCHAEOBOTANY

[163] Poster Session · ANIMAL EXPLOITATION IN ANCIENT NORTH AMERICA

[164] Poster Session · ZOOARCHAEOLOGY AND CERAMIC STUDIES IN THE CARIBBEAN

[165] Poster Session · FAUNAL ANALYSIS IN HISTORICAL ARCHAEOLOGY

[166] Poster Session - ZOOARCHAEOLOGY AND FAUNAL ANALYSIS**[167] Poster Session - THE ROBUSTNESS AND VULNERABILITY OF FOOD PRODUCTION AND SOCIAL CHANGE: AN EVALUATION OF INTERDISCIPLINARY CONCEPTS USING ARCHAEOLOGICAL DATA, MODELS AND ETHNOGRAPHIC OBSERVATIONS**

Our session is broadly focused on the production of food, which encompasses the beliefs, practices, technologies and resources that individuals draw upon to obtain food. Systems of food production create feedbacks between humans and ecosystems, which can lead to the coevolution of social norms and practices and the composition of ecosystems, path dependency and rapid social transformations (i.e. regime changes). Our session aims to bring together a geographically and conceptually diverse set of contributions to investigate feedbacks between social systems and ecosystems, with a central focus on how strategies of food production modify such feedback processes. In particular, we seek to critically integrate interdisciplinary concepts like robustness, resilience and vulnerability to investigate the recursive relationships between human food practices, ecosystem dynamics, and social changes documented through the long gaze of the archaeological record. Drawing on archaeological, ethnographic data and/or models, the contributions to this session are focused on: (1) examining the trade-offs between strategies designed to cope with environmental change over the short-term and the ways these strategies influence the resilience and create new vulnerabilities for societies over the long-term; (2) discussions of the data, methodologies, and infrastructure needed for research of such trade-offs in social-ecological systems.

[168] Poster Session - PRELIMINARY RESULTS FROM THE TSE-WHIT-ZEN PROJECT: ZOOARCHAEOLOGY AND GEOARCHAEOLOGY OF A 2000 YR OLD LOWER ELWHA KLALLAM VILLAGE ON THE STRAIT OF JUAN DE FUCA, WASHINGTON STATE

Tse-whit-zen, a large ancestral village of the Lower Elwha Klallam Tribe, located on the southern shore of the Strait of Juan de Fuca, Port Angeles, WA, was extensively excavated in 2004 as part of a transportation project. Multiple houses spanning the last 2,000 years were documented with exceptionally fine geo-stratigraphic control, and faunal samples were collected that allow for detailed reconstruction of animal use over this period. In 2012, our team began a project to study a large sample of Tse-whit-zen's faunal remains and synthesize its geo-stratigraphic records to address several goals: 1) evaluate the effects of abrupt and gradual environmental events (earthquakes, climate change, and shoreline development) on local animal populations during the past 2,000 years; 2) study sequences of faunal records from three different households of varying social rank to understand how social factors influenced response to environmental change; 3) train students in zooarchaeological and geoarchaeological analysis; 4) work with the Lower Elwha Klallam Tribe as they develop a museum and educational programs related to this important site. This symposium will provide an overview of the project and preliminary results.

[169] Symposium - ARCHAEOLOGICAL RESEARCH IN THE CHINCHA VALLEY, SOUTHERN PERU

In this symposium we focus on recent archaeological finds in the Chincha valley on the Peruvian South Coast, with a particular focus on the iconic Paracas culture. Paracas is the first complex society in this area. It was central to the work of such luminaries as Max Uhle, Luis Lumbreras, and Julio C. Tello. Paracas is named for the Peninsula less than 50 km to the south of Chincha. Paracas materials have been found in many valleys throughout the southern coast (from Chincha to Palpa). Our data from Chincha strongly suggest that this was the center of this culture. Likewise, the later Chincha culture is known from ethnohistorical sources as a large trading state (the Chincha Kingdom) that ultimately allied with the Inca Empire. In this symposium we will present and interpret a huge corpus of new data from four years' research at Paracas and later sites in the valley that refines and revises our understanding of the prehistory of this region.

[170] Symposium - TRADE, EXCHANGE, PRODUCTION AND CONSUMPTION IN PRE-COLUMBIAN AND COLONIAL LOWER CENTRAL AMERICA (PANAMA NICARAGUA AND COSTA RICA)

This symposium examines material manifestations and theoretical aspects of trade, exchange, production and consumption in pre-Columbian and colonial Panama, Costa Rica and Nicaragua. Both organic (plant and animal) remains and a variety of artifact classes (including, but not limited to, ceramics, stone tools and shell artifacts) are examined and discussed. The production, use and discard of material goods are examined with attention paid to evidence of craft specialization and long- and short-range trade and exchange. Production and consumption of perishables, especially plant and animal foods, is examined in terms of identification of regional consumption patterns and possible human effects on these resources and past environments. This symposium hopes to renew interest in this dynamic geographic region linking Mesoamerica and Andean South America.

[171] General Session · LITHIC AND TECHNICAL STUDIES IN NORTH AMERICAN PREHISTORIC ARCHAEOLOGY

[172] Symposium · HOUSEHOLD AND RITUAL IN THE EASTERN OLMEC HEARTLAND

The Olmec (1200-400) are one of the best-known early complex societies in Mesoamerica, yet scholars know very little about the organization of their social, economic, ritual, and political systems. This can be attributed to the fact that most fieldwork has been conducted in elite areas of large centers, and we lack household scale data from smaller sites. Recent investigations at the Middle Formative sites of Los Soldados and Arroyo Pesquero help resolve this bias by collecting household and ritual data at a medium sized site and a special purpose site in the La Venta region. The papers in this session utilize data from subsurface testing (GPR and augering) and excavations to reveal information on economic, ritual, and political organization of Middle Formative Olmec in the Eastern Heartland.

[173] General Session · MISSISSIPPIAN ARCHAEOLOGY

[174] General Session · EXPLORING TECHNOLOGICAL AND SOCIAL BOUNDARIES IN THE AFRICAN STONE AGE

[175] Symposium · THE FORGING OF COMMUNITIES IN COLONIAL ALTA CALIFORNIA, 1769-1834

Interaction between Native Californians and colonists, soldiers, and priests representing the Spanish state in Alta California after 1769 began a process of constantly fluctuating relationships between native and non-native people. The establishment of the missions and presidios—and the subsequent expansion of colonial settlements—created new and dynamic relations and communities within and between colonists and native people across California. These communities were dynamic at various scales, and were based, at least in part, on notions of mutual dependency and benefit amongst and between community members. As the colonial presence and reach expanded in Alta California, some of these communities became increasingly multi-ethnic. This session thinks about the nature of community in colonial Alta California. How were communities formed and re-formed? How did community members identify themselves and identify with the community? What criteria were used to create and reformulate community? When were communities homogeneous or multi-ethnic? How were these communities unique or overlapping with others? This session entails case studies of the concept of community, drawing from examples of colonial establishments (missions, pueblos, presidios, mercantile outposts) and Native Californian locales to better understand the nature of interaction, dependence and benefit, and identity.

[176] Symposium · ANTHROPIC ACTIVITY MARKERS: ARCHAEOLOGY AND ETHNOARCHAEOLOGY

People tend to recurrently use specific areas of their living space, producing an accumulation of evidences (chemical and/or physical) that represent the result of the activity performed. The possibility to identify and connect this evidence to the activity that generated the record is pivotal to our understanding of past human behavior. Ethnoarchaeology and experimental archaeology drive the inferential reasoning that creates the models connecting the distribution/concentration of proxies with specific activities. We define these models as 'anthropic activity markers' and propose a transdisciplinary approach to reduce problems of equifinality whereby the same pattern might be caused by several activities. In particular, the analysis of the spatial distribution of the fingerprints under study is considered fundamental for the definition of anthropic activity markers. This session aims to gather contributions from scholars in different fields, willing to challenge this issue from different points of view and at different scales (landscape and domestic or productive structures), going from a macro- to a micro-scale, from "space", to "place". We invite contributions that include different approaches, such as remote sensing, archaeological prospection, botanic analyses, chemical analyses, archaeozoology, microdebitage, and micromorphology. Archaeological and ethnoarchaeological contexts are welcome to show the potentiality of the approach.

[177] Symposium - BIOGRAPHIES OF ENCLOSURE IN GLOBAL CONTEXT

Cross-culturally, naturally occurring hilltops, terraces, and other prominent locations have been the focus for long-lived and/or recurrent human activity. These places have frequently been enclosed with ditches, ramparts and palisades, creating culturally-prescribed arenas for human action. The practice of enclosure frequently forms just one element in the complex biographies of such places and is not always necessarily related to defense. At various points in their biographies, such places might be social and/or political centers, elite residences, centers of exchange, liminal zones where communication could be made with the gods, spirits or ancestors, funerary sites, or places of refuge. Despite the potential interpretive gains to be derived from cross-cultural analysis of the biographies of enclosed places, attempts to critically compare sites in different temporal and geographical contexts have been generally lacking. This session will address this lacuna, drawing on research from several parts of the world. Papers will focus on biographical approaches, the agency of natural places, and the role of enclosure in materializing social memory and identity.

[178] Symposium - 2015 FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF DAVID HURST THOMAS

(SPONSORED BY FRYXELL AWARD FOR INTERDISCIPLINARY RESEARCH)

David Hurst Thomas is the 2015 recipient of the Fryxell Award for Interdisciplinary Research in archaeology. The Fryxell Award is presented in recognition for interdisciplinary excellence of a scientist who need not be an archaeologist, but whose research has contributed significantly to American archaeology. The award is made possible through the generosity of the family of the late Roald Fryxell, a geologist whose career exemplified the crucial role of multidisciplinary cooperation in archaeology. The 2015 Fryxell Award recognizes the area of general interdisciplinary studies. The fundamental nature of Dr. Thomas' research is, and has been since the beginning of his career, interdisciplinary. For over four decades, he has engaged in pioneering research that has incorporated human biology, history and ethnohistory, experimental archaeology, paleoethnobotany, zooarchaeology, and geoarchaeology. This approach has been at the heart of large-scale, long-term, research projects focused on broad anthropological questions. The scope of this work includes projects in the Great Basin, the Georgia Coast, and the missions of California and the American Southwest, and addresses core questions including inquiries into human mobility and foraging subsistence strategies, the transition to farming, the rise of social inequality, and the impact of colonialism on Native American societies.

[179] Symposium - USE-WEAR, EXPERIMENTAL ARCHAEOLOGY AND RESIDUE ANALYSIS IN THE PEOPLE'S REPUBLIC OF CHINA, A SESSION IN MEMORY OF GEORGE H. ODELL

This symposium is dedicated to the memory of George H. Odell and the influence his publications and friendship had on scholars around the world. The session's focus is on the analysis of use-wear traces and residue traces on various artifact types from the Peoples Republic of China. A number of scholars have been engaged in these types of analyses and their methods and results will be of interest to the international community. The topic is not restricted to a particular artifact class. Therefore papers addressing use-wear and/or residue analysis on bone tools, ground stone tools, flaked stone tools, ornaments, ceramics and other artifact types are encouraged. Papers should strive to integrate the analysis into broader interpretations of meaning in terms of the organization of production, production technology, function, style, chaîne opératoire, craft specialization or other appropriate theoretical constructs. Analytical approaches utilizing ethnoarchaeological and or experimental archaeological approaches are encouraged. There are no restrictions on time period or geographical area. Papers ranging from the analysis of *Homo erectus* remains to the Dynastic period are encouraged.

[180] Symposium - LANDSCAPES OF PRODUCTION: RECENT RESEARCH ON THE ARCHAEOLOGY OF FIELD AND IRRIGATION SYSTEMS

Archaeologists examine agricultural landscapes to address a range of questions on ancient ecologies and economies. At the same time, understanding the creation, management, expansion, intensification, and abandonment of field and irrigation systems can be hampered by problems of visibility, preservation, and chronology. This session highlights recent research in the archaeology of agricultural landscapes from areas around the world, and includes novel theoretical and methodological approaches as well as syntheses of long-term, interdisciplinary projects. The session brings together researchers with different study areas, training, and perspectives to share ideas and information and inspire new directions in research.

[181] Symposium - SPACE AND TIME IN THE UPPER PALAEOLITHIC: A MIXED TRADITIONS APPROACH TO THE STUDY OF PREHISTORY

The goal of archaeological research throughout the "history of prehistory" was chronology. While the construction of refined culture histories in any study area is necessary, it confines us to a diachronic vision that limits the construction of synchronic, and ultimately human, interpretations. Throughout the 1960s and 1970s two figures, Binford in North America and Leroi-Gourhan in France, turned archaeology on its side rather than on its head; diachronic process was not forgotten, but horizontal surface excavation, spatial analysis and paleoethnographic interpretation, as well as experimental and ethnoarchaeological research, removed the blinders from prehistory. This allowed archaeologists to start synchronically investigating prehistoric cultures rather than prehistoric timelines. The time has come to combine synchrony and diachrony and investigate the evolution of behaviors throughout the entirety of the Upper Paleolithic. This symposium will thus highlight horizontal approaches to the Upper Paleolithic, which often use spatial analysis at local and regional scales. This will allow us to evaluate progress made since Binford and Leroi-Gourhan, and highlight international research and projects integrating spatial, experimental, and ethnoarchaeological data. It will provide a first sketch of a synchronic and diachronic Upper Paleolithic, and present ways for advancing in the marriage of these two concepts of time.

[182] Symposium - GAMES PEOPLE PLAY: PREHISTORIC GAMES OF INDIGENOUS NORTH AMERICANS

Session participants will discuss evidence for games and gaming among selected ancient indigenous people of North America. Presentations will focus on the material evidence of ancient games in the archaeological record and/or the role of games and gambling in ancient North American societies. The inspiration for the session is Stewart Culin's (1907) monumental publication *Games of the North American Indians*, in which the author provides a comprehensive overview of the myriad of games played by traditional people in North America. The goal of the session participants is to investigate the deep roots of some of the traditional games documented by Culin.

[183] Symposium - EXCAVATING THE HOUSE: RESIDENTIAL ARCHITECTURE IN THE MAYA AREA

This session adds to the growing body of work on ancient Maya residential structures from the Preclassic through the Postclassic period. The archaeological analysis of Maya residences (including their refuse, offerings, architecture, and location) whether elite or commoner, is fundamental to understanding the basic structure of Maya societies. From houses we can learn about the sociopolitical and socioeconomic strategies of individual communities, and possibly even individuals, through documenting evidence of settlement structure, general consumption, trade, and ritual. In addition, the analysis of residential complexes is requisite to understanding the daily life of their users, and the manner in which they organized the surrounding landscape and exploited their environment. Defining differences between households within one polity at one place in time or over periods of time can provide crucial information on what supported the success of a given polity or contributed to its failure.

[184] Symposium - REGIONAL PERSPECTIVES ON THE TIWANAKU COLLAPSE: "POST-EXPANSIVE" CHRONOLOGY, CULTURAL TRANSFORMATION AND ETHNOGENESIS IN THE SOUTH CENTRAL ANDES

Tiwanaku-derived ceramic traditions and associated settlement systems are found throughout the south central Andes. This symposium focuses on the definition and dating of "post-expansive" Tiwanaku traditions in Bolivia, Peru and Chile. In the past, Tiwanaku-derived traditions were derided as epigones, representing artistic decadence and cultural and political decline. Recent research shows continuities in affiliation and practice, as well as cultural change and the genesis and expansion of autonomous successor groups through an era marked by conflict, political balkanization, iconoclasm, migration, hybridity, cultural transformation, and ethno genesis. We ask participants to consider regional patterns of continuity and change concurrent with the decline of the greater Tiwanaku system after ca. AD 1000. What elements of Tiwanaku style and lifeways show continuity across time and space, and which were not retained? Were post-expansive traditions associated with Tiwanaku descendants or local or transcultural populations? Does the dating of post-expansive styles and settlements suggest a timing and directionality to the Tiwanaku collapse? Through comparative study of Tiwanaku's successor traditions, we hope to open a wider conversation of both the collapse and the lasting heritage of the Tiwanaku civilization.

**[185] Symposium - CASE STUDIES IN CHERT SOURCING AND IDENTIFICATION
(SPONSORED BY PREHISTORIC QUARRIES AND EARLY MINES INTEREST GROUP)**

The purpose of this symposium is to provide an opportunity for researchers engaged in identifying and sourcing chert to present new data, methods, and techniques in the form of case studies. The ability to identify and source chert has experienced several advances in the last few years. This ability is focused around new methodologies and multi-technique approaches, rather than macroscopic identification alone. In particular, chert typology is de-emphasized in favor of determining formational and diagenetic processes through multi-technique approaches including instrumental analysis, petrographic thin sectioning, and exhaustive regional studies of macroscopic properties. Multiple instrumental techniques will be presented including Instrument Neutron Activation Analysis (INAA), Fourier Transform – Infrared Spectroscopy (FT-IR), Inductively Coupled Plasma - Mass Spectrometry (ICP-MS), petrographic thin section analysis, and many more. Each of these techniques has unique advantages for answering specific anthropological questions concerning human behavior. Case studies will focus on presenting methodological approaches to include sampling, technique, data, implications of research, and future studies.

**[186] Symposium - 'SIEMPRE A LA VANGUARDIA': A TRIBUTE TO DOLORES PIPERNO
CONTRIBUTIONS TO THE ORIGINS AND SPREAD OF AGRICULTURE
(SPONSORED BY COA)**

This symposium will present a collection of papers in recognition of Dolores Piperno honoring her leading contributions to paleoethnobotany and the archaeology of the Americas, as well as her inspirational mentorship. The symposium will celebrate Dolores' methodological and theoretical contributions to the study of plant domestication and ancient human impact on landscapes around the world. Dolores' cutting-edge innovations are innumerable and ground breaking; they range from the study of behavioral ecology, phytoliths, starch grains, pollen, molecular biology, dating, and much more. Papers from long-time

colleagues, former students, and friends will show how her major contributions to the discipline are of current and future relevance. Presentations will also focus on new data and cutting-edge developments in paleoethnobotany inspired by her work.

[187] Symposium - SEE HOW WE ARE: REPRESENTING IDENTITY IN THE ANCIENT AMERICAS

"Identity" is a broad term that can be used in a number of ways, with varying meanings. Focusing on the definition "presentation of a group or individual's perceived qualities to other members of the group or to outsiders," this session explores the way in which identity has been defined in the Pre-Columbian Americas. Identity types can be political, ethnic, social, gendered, or involve leadership, while strategies of representation may include landscape modification, architecture, body modification, costume, or visual arts. Chief among the questions to be explored is what kinds of identities were important, and what strategies for representing membership in an identity group were used. Issues of alterity, propaganda, and conflict, as well as the creation and maintenance of normative structures, are explored.

[188] Symposium - PUBLIC PERCEPTIONS OF ARCHAEOLOGY

Since the beginning of public archaeology, we, as archaeologists, have held both legal and ethical obligations to share information with the public in a way that promotes understanding and appreciation in a shared heritage. The development of various public heritage education and stewardship initiatives, such as Project Archaeology, USFS's Passport in Time, and Archaeology in the Community, has begun to provide archaeologists with thoughts on how to meet both legal and ethical obligations. Yet, we, as archaeologists, are increasingly asked to justify to the public the value in and importance of stewardship of the archaeological record. Although, many public perceptions of archaeology still dictate who archaeologists engage with, the use of the term and how we view the "public" varies. Understanding the needs and interests of the many publics interested in archaeology will help us understand the obstacles we face in sharing information. In this symposium we will explore innovative approaches and best practices for sharing information through various engaging public initiatives.

[189] Symposium - EXAMINING WEBS OF SOCIAL RELATIONS: NEW RESEARCH IN WEST MEXICAN ARCHAEOLOGY AND WEST MEXICO-U.S. SOUTHWEST CONNECTIONS

In the history of research on prehispanic Mesoamerican cultures, far West Mexico has long been relegated to a position as a peripheral backwater on the northwestern fringes of the complex cultures of highland and southern Mesoamerica. However, the rich diversity of cultural traditions and social developments in West Mexico also have been recognized as being distinct from yet connected to other indigenous societies in Mesoamerica and the U.S. Southwest. A surge in archaeological research in the past decade has begun to draw renewed attention to this often-overlooked region and this recent work has begun to clarify our understanding of the prehispanic history of the coastal lowlands and interior highlands of West Mexico. This session is a platform for highlighting new archaeological research by junior and senior scholars in West Mexico with a sub-focus on examining how the webs of social relations in far West Mexico intersected with the social webs of Pueblo cultures of northwest Mexico and the U.S. Southwest.

[190] Symposium - ARCHAEOLOGY IN CONTEXT: THE INFLUENCE OF THE GEOARCHAEOLOGICAL CAREER OF PAUL GOLDBERG

(SPONSORED BY SAA GEOARCHAEOLOGY INTEREST GROUP)

In May 2014, Dr. Paul Goldberg officially retired as Professor of Archaeology at Boston University. Over the past four decades, he has dedicated himself to collaborative research and the study of archaeological sites and landscapes at multiple scales. In the process he has helped revolutionize our understanding of site formation processes. Although he is best known for his work with micromorphology in archaeology, Paul has an exemplary record of geoscience-based research and teaching in all aspects of archaeology. In addition, he has participated in some of the key debates about the evolution of our own species. His influence has been considerable, not just in North America, but across the world. Typical of individuals who make innovative and remarkable contributions to archaeology, Paul has moved from being a lonely voice on the edge of the field to the center of a revolution in archaeologists' abilities to learn about human behavior from

imperfect records. This symposium seeks to honor Paul Goldberg's long career and demonstrate his numerous contributions to archaeology through the work of others.

[191] Symposium - EVOLUTIONARY THEORY AND ARCHAEOLOGY, PART I: CULTURAL TRANSMISSION, CULTURAL EVOLUTION, AND EVOLUTIONARY ARCHAEOLOGY

Once found only at the margins of the discipline, evolutionary theory has become commonplace in archaeological inquiry. Not surprisingly, evolutionary approaches to understanding past behavior from culture material have undergone an adaptive radiation, filling niches defined by different research questions and data. The research featured in this session is most closely allied with the subset of approaches that includes cultural transmission theory, cultural evolution, and evolutionary archaeology. We aim to make the powerful new methodological tools employed in these growing sub-fields accessible to a wider audience. A secondary goal is to bring together a large group of evolutionary-minded researchers to discuss outstanding problems of shared interest and to plant the seeds for future collaboration. Discussants will comment on the research presented in the context of their own ideas about where we as a group should focus our future efforts to benefit the discipline as a whole.

[192] Symposium - THE GEOARCHAEOLOGY OF SUBMERGED, INTERTIDAL, AND WETLAND PLACES: ADVANCES IN METHOD AND THEORY OF PREHISTORIC ARCHAEOLOGY UNDERWATER - 2015

This symposium is organized to exhibit recent advances and discoveries from prehistoric sites in fully submerged, intertidal, or now wetland places. These projects include both Academic and CRM projects. These examples are fully geoarchaeological in scope because such research is fundamentally involved with Pleistocene and Holocene sea level fluctuations, coastal and marine geomorphic processes, paleoclimatology, and geophysical remote sensing techniques. Topics will include both freshwater, wetland, intertidal, and fully marine or lacustrine examples, and presenters will discuss survey methods, sediment sampling and analysis, paleogeographic reconstructions, and site predictive models, agency issues for CRM, and Native consultations. A central theme will be the discipline-wide importance of these projects and how submerged prehistoric sites are contributing to our understanding of the past.

[193] Symposium - INTERPRETING CHANGES IN ANCIENT MAYA SOCIETY: FROM LANDSCAPE AND ARCHITECTURE TO EVERYTHING IN BETWEEN

The Maya are notorious for actively manipulating their natural and built environment. As complex cities developed, there was continuous alteration of core centers and surrounding spaces as well as of the material remains found within them. This tradition of constant change has led to theoretical questions of the meaning, in addition to practical questions of the function, of these spaces and artifacts. This session attempts to identify changes and interpret the meaning and functions of spaces, built and natural, and material remains found within them through a comparative Mesoamerican lens. At a macro level, some cases look at the changing layout in these organic cities attempting to understand the meaning of complexes. At a micro level, these investigations attempt to understand the meaning of change in material remain patterns. While the material remains archaeologists work with are static, this session attempts to identify the meaning of these materials in moments in time where they serve as evidence of change.

[194] Symposium - THE AZTECS AND THEIR WORLD: INTERDISCIPLINARY CONTRIBUTIONS OF FRANCES BERDAN

The past forty years have seen enormous advances in the scholarly understanding of Aztec society. There have been major methodological, conceptual, and empirical advances in historical scholarship, archaeology, and art history. This period also encompasses the first forty years of the ongoing scholarly contributions of Frances Berdan (Ph.D., 1975). Incredibly, Frannie has had her hand in most of the significant advances in all three disciplines. Like the Aztec glue she has studied, Frannie brings together diverse approaches in her work with diverse scholars. In this session, leading scholars take stock of these advances and the role

played by Frances Berdan. Because her perspective is broad and comparative, we also include some non-Aztec themes that bear on Aztec scholarship.

[195] Forum • CARING FOR HOMELANDS: TRIBAL HISTORIC PRESERVATION IN THE UNITED STATES

(SPONSORED BY INDIGENOUS POPULATIONS INTEREST GROUP, COMMITTEE ON NATIVE AMERICAN RELATIONS)

Since the 1992 amendments to NHPA over 154 federally recognized tribes now operate their own Tribal Historic Preservation program. In addition to these programs numerous other federally, state and non-recognized tribal communities operate similarly oriented cultural resources departments. These programs are charged with the responsibility of preserving, maintaining, and revitalizing tribal cultural resources for future generations. This forum brings together Tribal Historic Preservation and Cultural Resource Managers from across the United States to discuss the current state and future trajectory of tribal resource management. This forum is part of an ongoing attempt to highlight the unique issues that tribal communities encounter when attempting to care for cultural resources that extend well beyond the tangible remains associated with the archaeological record. Panelists will address how their offices and communities define tribal historic preservation; discuss how they developed their plan for managing tribal cultural resources; and share the strategies they use on the ground to implement these plans. Of particular focus is examining how each program balances the requirements of state and federal heritage preservation regulations with the specific needs and cultural values of the communities whose interests they protect.

[196] Symposium • PRECLASSIC KAMINALJUYU, GUATEMALA: NEW INTERPRETATIONS ON SOCIAL PROCESSES

Kaminaljuyu is one of the most important sites in Mesoamerica and has been a major focus of archaeological research by many scholars. The currently prevalent chronology of Kaminaljuyu, established mostly by relative ceramic dating, implies that various social and political institutions developed significantly earlier in the southern Maya area than in the Maya lowlands during the Preclassic period. Evaluations of new and existing data, however, suggest that this chronology needs to be revised substantially. Such a chronological revision indicates that scholars also need to question existing interpretations of the role that Kaminaljuyu and the Maya highlands played in the development of centralized polities in the Maya area. Session participants will discuss relevant data, including ceramics, radiocarbon dates, and stone monuments, and present new interpretations on social processes.

[197] Symposium • RESEARCH DESIGNS AND DAMAGE ASSESSMENTS: APPROPRIATE RESPONSE TO TREAT IRREVOCABLY EFFECTED PLACES

Despite efforts by regulatory and law enforcement agencies, damage to important places still occasionally occurs. Often this damage not only affects the scientific value of a place, but also the importance of that place to indigenous communities. The issue we explore here is what are the appropriate and ethical responses that can be employed to "mitigate the adverse effect?" Is further traditional archaeological research (e.g. excavation) a valid response to treat the already damaged portion of the place or site that retains integrity? And is it the only response? We explore the range of treatments available and address the need for regulatory amendments to insure that damaged places are treated appropriately.

[198] General Session • MESOAMERICAN ARCHAEOLOGY: CENTRAL MEXICO AND THE GULF COAST

[199] Symposium • DIGITAL ANALYSIS OF THE NATURAL AND CULTURAL INTERFACE

(SPONSORED BY ICAHM)

Powerful digital technologies support innovative new analyses of the interface between nature and culture, an interface that profoundly influences site distribution, landscape evolution, and ultimately the sustainability or degradation of our habitats and surroundings. In this session, we examine and analyze the natural/cultural

landscape at many scales, from site to region. We draw attention to a widening array of technologies and approaches, such as the analysis of data collected by satellite and aerial platforms, including drones; increasingly sophisticated applications of geographic information systems; on-ground geophysical methods; and incorporation of geoarchaeological and paleo-environmental investigations, ethnohistory, and archival research. Contributors have utilized diverse technologies and approaches to explore the dialectic between nature and culture, the understanding of which grows more crucial as our landscapes everywhere on earth are being modified at an ever-increasing pace. Case studies offer perspectives from many geographic locations, environments, and social settings.

[200] Symposium · MACROSCOPIC APPROACHES TO ARCHAEOLOGICAL HISTORIES: INSIGHTS INTO ARCHAEOLOGICAL PRACTICE FROM DIGITAL METHODS

The history of archaeology, like most disciplines, is often presented as a sequence of influential individuals and a discussion of their greatest hits in the literature. Two problems with this traditional approach are that it sidelines the majority of participants in the archaeological literature who are excluded from these discussions, and it does not capture the conversations outside of the canonical literature. Recently developed computationally intensive methods as well as creative uses of existing digital tools can address these problems by efficiently enabling quantitative analyses of large volumes of text and other digital objects, and enabling large scale analysis of non-traditional research products such as blogs, images and other media.

[201] General Session · MUSEUMS, COLLECTIONS, AND CURATION

[202] Poster Session · BIOARCHAEOLOGY IN THE UNITED STATES AND CANADA

[203] Poster Session · BIOARCHAEOLOGY AND MORTUARY ARCHAEOLOGY IN SOUTH AMERICA

[204] Poster Session · ADVANCES IN BIOARCHAEOLOGICAL METHODS

[205] Poster Session · GLOBAL STUDIES IN BIOARCHAEOLOGY AND MORTUARY ARCHAEOLOGY

[206] Poster Session · BIOARCHAEOLOGY AND MORTUARY ARCHAEOLOGY IN MESOAMERICA

[207] Poster Session · BIOARCHAEOLOGY AND MORTUARY ARCHAEOLOGY IN EUROPE: METHODOLOGICAL AND ETHICAL PERSPECTIVES

[208] Poster Session · MORTUARY ASSEMBLAGES FROM URACA, AN EARLY WARI-ERA CEMETERY IN THE MAJES VALLEY OF AREQUIPA, PERU

During the Andean Middle Horizon (600 - 1000 AD), the spread of the Wari Empire across the Peruvian Andes caused rapid political and economic restructuring, which in turn effected changes in diets, religious practices, and mortuary customs in many regions throughout Peru. Research so far in the south-coastal Majes Valley (Department of Arequipa) suggests that the spread of Wari influence did not change dietary practices. However, social hierarchization seems to have intensified during the Middle Horizon in the Majes Valley, and mortuary customs seem to have become more complex. Recent excavations at Uraca, a cemetery site with sectors spanning the Middle Horizon, show similarities in tomb construction, body position and treatment, and preference for certain types of textile offerings across sectors. However, the northern and southern sectors exhibit differences in ceramic types, animal offerings, textile implements, rates of cranial

trauma, and styles and methods of manufacture of human trophy head offerings. The differences observed may be due to different dates of use, or due to the cemetery sectors being reserved for different social groups (i.e., commoners vs. elites; warriors or priests vs. craftsmen, etc.) during the same time period.

[209] Symposium · THE DISCOVERY, EXCAVATION, AND LESSONS OF IRONWOOD VILLAGE, AN EARLY HOHOKAM BALLCOURT SETTLEMENT NEAR TUCSON, ARIZONA

(SPONSORED BY PALEOWEST ARCHAEOLOGY)

Encroached upon by the urbanization of the Tucson metropolitan area, what was thought to be a modest, nameless artifact scatter was archaeologically opened as part of a compliance-based mitigation project. What surprisingly emerged was Ironwood Village, a primary ballcourt community where hundreds of Hohokam lived, gathered around ballgames and communal feasts, and died between about A.D. 600 and 850. This remarkable site, the manner of its discovery, and treatment of its archaeological and consultative opportunities offer a variety of insights and lessons that aren't of the usual sort. This symposium views the rare discovery of Ironwood Village in its various contexts—prehistoric, archaeological, and methodological.

[210] Symposium · EXPLORING SOCIAL CHANGE IN THE EPIPALAEOLITHIC AND EARLY NEOLITHIC OF THE NEAR EAST

The Epipaleolithic and early Neolithic saw some groups of mobile hunter-gatherers become increasingly sedentary, cohabiting in larger, more stable groups and increasingly elaborate material environments. This change had significant implications not only for economies and environments at the time, but also for the social relationships between the people living in these earliest villages and between groups now 'fixed' in specific parts of the landscape. However, the nature and indeed even existence of social groupings at the time – household, social group ('village') or broader 'cultures' – remains contentious, as individual and group identities seem unlikely to have been static, clearly defined or internally homogeneous. Questions about social relations remain some of the most difficult to answer using archaeological data, and the potentially non-analogue nature of social identities and groupings is a further stumbling block to research in the area. This session will thus the breadth of archaeological proxies, methods and concepts that can be used to investigate social relations among people during this period of dramatic social change.

[211] General Session · NEOLITHIC SETTLEMENTS AND LANDSCAPES

[212] General Session · ZOOARCHAEOLOGICAL STUDIES IN THE SOUTHWESTERN UNITED STATES

[213] Symposium · CURRENT ARCHAEOLOGICAL RESEARCH: APPLICATIONS IN THREE-DIMENSIONAL GEOGRAPHIC INFORMATION SYSTEMS

The application of geographic information systems in archaeological research has become widespread over the past decade. Archaeologists focusing on Mesoamerica have discovered GIS and allied technologies including remote sensing and GPS have the potential to solve many questions regarding ancient locational decisions. The technology can also be used to perform analysis in three and four dimensions. This symposium includes papers on the advanced use of three-dimensional GIS to solve a variety of archaeological problems.

[214] General Session · ARCHAEOLOGY OF SOCIAL ORGANIZATION IN THE ANCIENT NEAR EAST AND LEVANT

[215] Symposium · CHERT SOURCING CASE STUDIES PART II: LANDSCAPE DISTRIBUTION AND PREHISTORIC SOCIETIES.

(SPONSORED BY PQEMIG)

The first part of this session explored the methods and techniques used to establish a chemical signature for chert. In the second part of the symposium, we explore how a wide range of raw materials – including chert as well as metals - are transformed into objects that, in turn, leave a signature in the material culture of past societies. Building on data generated from the geochemical analysis of chert and other raw materials, papers in this symposium will explore themes such as the site location and the availability and accessibility of sources of raw material; the scale of raw material procurement at quarries and mines; the “curation” of items and their meaning beyond utility; and sourced materials and their role in ritual.

[216] Symposium - MAPPING OUT POTTERY PRODUCTION AND EXCHANGE IN THE LATE CLASSIC VALLEY OF OAXACA, MEXICO

Over the past two decades, our understanding of craft production and exchange in the Valley of Oaxaca, Mexico has changed dramatically, in part owing to new excavations, and in part to the re-analysis of existing collections using robust chemical and mineralogical techniques. This symposium presents current research efforts to document the sources of pottery production during the Late Classic or Xoo phase (ca. 550-850 AD), and to track the movement of ceramic vessels from producers to consumers based on their trace-element composition. As part of a large regional study, natural clays were sampled throughout the Valley of Oaxaca and characterized via INAA to document spatial variability in clay composition. Over 1300 ceramic vessels from key Late Classic sites (including Monte Albán, Jalieza, and Dainzu-Macuilxochitl) have been similarly analyzed, and their locus of production determined based on similarities to clays and ceramic production debris. These trace-element studies provide a rigorous means for monitoring both the spatial organization and intensity of exchange among communities, and greatly enhance our understanding of the ancient Zapotec economy during the decline and/or political reorganization of the Zapotec state.

[217] Symposium - TAMTOC: CHARACTERIZING AN URBAN SOCIETY. RECENT INVESTIGATIONS.

Tamtoc is one of the most important settlements in Northeastern Mexico, wherefore it is essential to address the phenomenon of the urban society, which inhabited this ancient city, with an interdisciplinary approach. The aim of this symposium is to characterize the constituents proper of the historical and cultural development of this urban society which managed to develop one of the most distinctive settlements in the so called Huasteca region during prehispanic times. The contributors are going to present the results of a variety of recent investigations intended to promote the dialogue and increase the awareness of the issues discussed here.

[218] Symposium - SUSTAINING HERITAGE: NEW DIRECTIONS FOR ARCHAEOLOGY

(SPONSORED BY SAA HERITAGE VALUES INTEREST GROUP; ICAHM/ICOMOS)

Sustainability at its core depends on proactive engagement and a preemptive outlook that embraces durability, balance, and equity. As a concept and aspiration, it entered development and conservation well before archaeology or heritage studies. So, what does sustainability mean for the preservation of the past? How can current global needs be met without compromising resources for future generations? In well-documented ways, heritage is particularly vulnerable to the pressures of our globalized society. Archaeological materials in context provide unique sources of information and experience. They are under increasing threat, whilst methods and definitions that we employ in heritage studies concurrently constantly expand and produce new material. The focus of this session is 'sustaining heritage.' The challenge is to move beyond established epistemological approaches to consider how the heritage of the past can embrace a sustainable future, while accurately formulating and communicating these issues with necessary impact. What does it mean when the future is privileged or at least accorded the same degree of importance as the present, or indeed the past? Session papers address these issues and examine how balance, continuity, and inter-generational equity – enfolded in sustainability – apply to archaeological heritage.

[219] Symposium - CURRENT INVESTIGATIONS IN THE PETÉN LAKES REGION, GUATEMALA

The lakes region of Petén, Guatemala, an area stretching from Lake Sacpuy in the west to Lake Sacnab in the east, has been the target of archaeological investigation for the past two decades by a series of projects that began with the Proyecto Maya-Colonial in 1994. For the last six years (2009-2014), research has focused on the sites Nixtun-Ch'ich', Tayasal, Muralla de Leon, and Zacpetén, including both new excavation

and laboratory analyses. This session presents some results of this recent work. Survey at Nixtun-Ch'ich' has revealed evidence of complex city planning, while a separate survey project at Muralla de Leon has brought to light new details about the site's defensive system. Analysis of both human and faunal remains recovered from various sites in the region continues to aid in discerning how indigenous traditions changed after the area was conquered by the Spaniards in A.D. 1697. In addition, studies of obsidian and chert are helping us to understand exchange systems, as well as stone tool production and use, and recent ceramic analysis is revealing new details about the Preclassic period in the Petén Lakes region.

[220] General Session · ARCHAEOLOGY AND BIOARCHAEOLOGY OF THE SOUTHEASTERN UNITED STATES

[221] Electronic Symposium · OPEN METHODS IN ARCHAEOLOGY: HOW TO ENCOURAGE REPRODUCIBLE RESEARCH AS THE DEFAULT PRACTICE

(SPONSORED BY DIGITAL DATA INTEREST GROUP)

Scientific progress famously depends on the evaluation of findings through replication. Likewise, while social sciences and humanities subjects may not always espouse this exact vision of how we build knowledge, many researchers in these fields would argue that they too can benefit from greater discursive transparency. However, as archaeology and other research areas have become more complex, especially with the use of computationally intensive methods, it has become increasingly difficult to reproduce findings and efficiently build on past research. While exact replication of results is sometimes not feasible because of limitations of time and resources, minimal standards of reproducibility are emerging as a norm of practice in contemporary computational and biological sciences. These include opening methods up for inspection by sharing and recognizing code and data as citable research objects, and in some cases including them directly and at an early stage in the peer review process. However, there remain some significant and continuing impediments to enabling such transparency in archaeology. In this session, we therefore wish to discuss our prevailing norms in archaeology, showcase some current best practice in terms of open methods, and advocate future directions for improving the reproducibility of archaeological research.

[222] Forum · TELLING ARCHAEOLOGY: !WRITE!SPEAK!ENGAGE!#WINNING#BESTFORUMEVER
(SPONSORED BY STUDENT AFFAIRS COMMITTEE)

At a time when making our work accessible to the public is critical, we too often abdicate authority and responsibility to engage with our communities. We can no longer afford this. Developments in new technologies, requirements of granting agencies, and our own professional ethics necessitate a sea change in how we make our work accessible to the public. This forum brings together a panel of successful ambassadors for archaeology. Their skills are popular writing, public speaking and social media. Panelists will speak informally about their methods, successes (and failures), and give advice to students and young professionals as they engage with this essential professional skill. Followed by Q&A.

[223] Forum · CONS OR PROS? SHOULD ARCHAEOLOGISTS COLLABORATE WITH RESPONSIBLE COLLECTORS?

(SPONSORED BY ETHICS AND PUBLIC EDUCATION COMMITTEES)

Since the beginnings of professional archaeology, diagnostic points (e.g., arrowheads) have been a particularly informative segment of the North American archaeological record. For at least as long, they also were a favorite object of private collection. One aggregate result is that collectors held or hold many more points and other artifacts than archaeologists do. We cannot prevent private collection, although we can try to influence how well collections are documented and curated. Private collection is highly selective so affects the archaeological record disproportionately to the number of artifacts taken. If it impoverishes the record that archaeologists document in resource management, the question naturally arises: Should we consider those effects? Addressing the question engages ethical issues that can argue for or against documentation of private collections. This forum considers the pros and cons of documenting private collections in the course of preservation studies and explores positive and negative ethical implications.

[224] Forum · DIALOGS IN CALIFORNIA ARCHAEOLOGY

Since the 80th Annual SAA meeting will take place in California, it is an opportune moment for archaeologists and Californian Indian communities to reflect about the state of relations between descendant communities and the archaeological community. In this forum, we will hear from tribal community members and scholars as well as archaeologists who engage with tribal communities. This forum will explore the needs, challenges, and successes that California Indian communities experience when managing, protecting, and studying cultural resources. Some questions and topics that will be considered are as follows: What resources and training are needed in tribal communities to effectively manage cultural resources? What cultural training and sensitivities do archaeological researchers need to seek out to work collaboratively with California Indian communities? How can/do/should CRM companies, agencies, and academic researchers engage with communities? What improvements can be made within California cultural resource management laws such as CEQA? What are some examples of promising collaborative archaeological research projects in California today, and why? In answering these questions, this session will suggest how California archaeologists and California Indian communities can make archaeological research more relevant and beneficial to tribal communities.

[225] Symposium · TRIBAL HERITAGE MANAGEMENT PROGRAMS IN ACTION AT THE GILA RIVER INDIAN COMMUNITY, ARIZONA

Many Native American communities have developed their own archaeology programs and taken over management of cultural resources from Federal agencies. This has increased interactions between non-tribal archaeologists and members of native communities, and resulted in greater numbers of Native Americans becoming trained archaeologists. This synchronism has fostered new understandings of the past and has led to research that is scientifically valid while also reflecting tribal cultural concerns. Archaeologists have benefited from increased exposure to traditional knowledge and beliefs, and Tribes have developed new avenues for communicating their knowledge of the past in ways that will reach a broader audience. Papers in this session highlight the diverse investigations undertaken by the Gila River Indian Community's Cultural Resource Management Program and Tribal Historic Preservation Office in south-central Arizona. Presentations highlight recent findings from archaeometry investigations, controlled experimental studies of traditional technology, wildland fire archaeology program deployments, rock art preservation efforts, and large-scale cultural resource management investigations.

[226] Symposium · THE CUTTING EDGE OF AMERICAN PALAEOETHNOBOTANY

Retiring paleoethnobotanical scholars have gained a great deal of information about the archaeological past throughout their careers. The larger discipline is only now realizing how important this is to our understandings about the past. This session will both learn about some of these crucial discoveries as well as honor those who have made them. Five senior scholars will present what they believe have been the big issues in their research and also what they tackled within paleoethnobotany during their careers. A complimentary group of five younger paleoethnobotanical scholars then will address the same question, what is seen as the goals they seek in their careers within the discipline. A final discussion will allow all to consider how paleoethnobotany contributes to the bigger issues within our discipline as well as how the main research issues have developed over the past thirty years.

[227] Symposium · ENTANGLED ENCOUNTERS IN THE CENTRAL ANDES: PROCESS, OUTCOME AND LEGACY

The Andes are known for their ethnic and highly compressed ecological diversity, which has influenced the degree and kind of human population movements and interactions that defined sociopolitical developments for millennia. This is particularly true for the Central Andean coast and highlands, which were populated by various polities entangled in many different ways. Though interdisciplinary research has focused on this topic since the 1950s, archaeological studies have prioritized monumental sites and the publications have been sparse, thus limiting our understanding of the diverse geo-political interactions in the region. This symposium discusses the different types of interaction between different ethnic, residential, and/or political groups on the western slopes of central Peru. For this symposium, interaction is defined as the complex behaviors and processes by which different types of inter-group relationships, identities, and agencies were established through a range of competitive/cooperative behaviors including, but not limited, to raiding, warfare, trade, alliance-building, spouse exchange, co-residence, and any combinations of these and other practices. The goal of the symposium is to better understand the nature and outcome of distinct groups interacting across

the varied social and physical landscapes, and how these entanglements shaped their geo-political landscape throughout the pre-Hispanic and early Hispanic periods.

[228] Symposium · EVOLUTIONARY THEORY AND ARCHAEOLOGY, PART II: APPLICATIONS OF HUMAN BEHAVIORAL ECOLOGY, MACROEVOLUTIONARY APPROACHES, AND COSTLY SIGNALING

This session complements Evolutionary Theory and Archaeology, Part I. The research featured in this session explores applications of human behavioral ecology, macroevolutionary approaches, and costly signaling in archaeological contexts. As with the first session, we aim to examine new conceptual and methodological tools that allow for the conduct of evolutionary-based archaeology as well as identify appropriate domains of application. Furthermore, we aim to bring together a group of evolutionary-minded researchers to discuss outstanding problems of shared interest and to plant the seeds for future collaboration. Discussants will comment on the research presented in the context of their own ideas about where we as a group should focus our future efforts to benefit the discipline as a whole.

[229] General Session · ARCHAEOLOGY IN THE SOUTHWESTERN UNITED STATES

[230] Symposium · THOSE DAM SITES: RECENT ARCHAEOLOGICAL RESEARCH IN THE DAKOTAS

Historically, large federally funded projects have been a catalyst for archaeological inquiry in the Dakotas. In the middle of the 20th century, the construction of massive and numerous dams, used for hydropower, irrigation, navigation, and recreation, spurred salvage projects in the region. But the continuing legacy of the Missouri Basin Project is not the only story. With a combination of cultural resource and academic projects, archaeology is flourishing in the Dakotas. Whether using the tried and true methods or incorporating technological advances, archaeologists have utilized a diverse set of tools to solve problems, both from a research standpoint and in the development of unique approaches to heritage management.

[231] Symposium · ADVANCES ON THE INVESTIGATION OF CHALCHIHUITES CULTURE

A century ago, Manuel Gamio put the Chalchihuites area on the archaeological map, but since then, research there has been very sporadic and slow. Charles Kelley and his group of researchers at Southern Illinois University conducted the largest study on the limits of the current states of Durango and Zacatecas. They demonstrated the great potential for archaeological research in this region. At present, a wide range of studies have been conducted, but the results have been poorly disseminated. Therefore, it is the goal of this symposium to give an updated view of the Chalchihuites cultural tradition, through a balanced set of research perspectives.

[232] Symposium · LANDSCAPE AND SOCIAL ORGANIZATION DURING THE LATE INTERMEDIATE AND LATE HORIZON PERIODS IN THE LOWER LURIN VALLEY, PERUVIAN CENTRAL COAST

(SPONSORED BY INSTITUTO DE ESTUDIOS PERUANOS)

Landscape and Social Organization during the Late Intermediate and Late Horizon Periods in the Lower Lurin Valley, Peruvian Central Coast. This symposium explores changes in the social landscape of the Peruvian Central Coast during the Late Intermediate and Late Horizon Periods. Composed of a number of rural communities developed under the influence of Pachacamac, one of the most feared religious centers of the Andean world, this region experienced drastic changes when the coastal shrine fell under Inca control at the onset of the Late Horizon Period. Along with evidence of population increase, a previously unknown hierarchical organization emerged in the lower valley as the consequence of the Inka Empire's control of Pachacamac. Papers presented in this symposium will develop different aspects about the organization of the rural communities that formed the social landscape of the lower Lurin, their relationship with Pachacamac, and how it changed as a consequence of the Inca invasion. Data presented in this symposium was collected during the 2012, 2013 and 2014 field seasons of the Instituto de Estudios Peruanos (IEP)

Field School in Archaeological Methods.

[233] Symposium - EVOLUTION AND ECOLOGY IN OCEANIA

The diverse islands of Oceania are model locations for the study of human ecology and evolution. This session addresses the dynamic interaction between the prehistoric inhabitants of Oceania and their island environments. Papers in this session will address theoretical and substantive issues from a range of ecological and evolutionary approaches. We also welcome submissions with a focus on new methods used to address ecological and evolutionary questions. These may include, but are not limited to, geospatial techniques, genetics, geochemical and isotopic methods, paleoecological techniques, and simulation modeling. Geographically, the papers in the session will encompass the whole of Oceania. Session contributions will explore a variety of topics across diverse island ecosystems, for example, responses to climate change, social network and community analysis, human impacts on island environments, socio-cultural evolution, cultural transmission, niche construction, and settlement and mobility. Synthesis and review papers are also welcome.

[234] Symposium - THE DYNAMISM OF CONTACT AND EXCHANGE IN EARLY CENTRAL AND EAST ASIA

In recent years, an increasing number of new methods and analyses have been made available to assist in exploring issues pertaining to contact and exchange in the archaeological studies of the eastern Eurasian continent. Borderland and Frontier Studies, for instance, offer new ways of examining places where interaction and exchange created conditions that are neither exclusively of the steppe or sown. This in turn has led to the reassessment or abandonment of many paradigms that once dominated the archaeology of these regions. This session aims to bring together scholars working across regions such as these in Central and Eastern Asia. In looking at contact and exchange presenters in this session will not only focus on the movement of goods and raw materials, but will also explore spatial patterning in the transmission of ideas and technology, and the social behavior of objects throughout these regions during the prehistoric and early historic periods.

[235] Symposium - CURRENT PRACTICE IN DIGITAL PUBLIC & COMMUNITY ARCHAEOLOGY

Today, along with many other domains, archaeology has entered an age in which digital technology is having an undeniably transformative impact on all areas of disciplinary practice. Unfortunately, while the discussions about digital field, lab, and analytical methods are well developed, the discussion about the application of digital technology within the context of public engagement and outreach has been comparatively neglected. This is unfortunate as digital technology clearly holds enormous promise for new ways of meaningfully interacting with a wide array of publics. It is within this context that the papers presented in this session will serve two purposes. First, they will highlight key, exemplar projects that can act as models for the thoughtful application of digital technology within public and community outreach and engagement. Second, and perhaps more importantly, they will act as a platform to interrogate deeper, underlying issues and challenges that stem from the use of digital technology within a public archaeological context.

[236] Symposium - PROJECT ARCHAEOLOGY MAKES A DIFFERENCE: THE NEXT 25 YEARS

If every citizen understood archaeology and worked for the protection of sites and artifacts, how would it change the profession of archaeology? How would it change education? How would it change the world? Project Archaeology began in 1990 as an anti-vandalism education program for the state of Utah. Since then it has grown to serve 36 states and District of Columbia with archaeology education. More than 12,000 educators have participated in professional development events and used high-quality education materials in their classrooms or learning venues. Project Archaeology has grown far beyond its anti-vandalism roots and seeks to teach a deep conceptual understanding of scientific and historical inquiry, stewardship that is based on deep cultural understanding, and a long-term view of what it means to be human. This symposium traces the history of the program from its infancy to national acclaim and looks forward to a future of broad and

deep impact on archaeology, education, and the human condition.

[237] Symposium - THEORIZING AND EXCAVATING NEIGHBORHOODS

(SPONSORED BY ARCHAEOLOGY DIVISION OF THE AMERICAN ANTHROPOLOGICAL ASSOCIATION)

The 'neighborhood' encompasses complex social and analytical phenomena linking households, settlements, and regions. This session investigates the 'neighborhood' as a concept, a heuristic, and a social formation as well as the relationship between those dimensions. On a theoretical level, what anthropological concepts does the 'neighborhood' imply or highlight (e.g., kinship, space, economy)? How might we conceive of 'neighborhood' when planning, conducting, and reporting research? As anthropologists, we aim to examine and compare how neighborhoods are configured, produced, and supported at different times and places in human (pre)history. What emic forms of neighborhoods existed (e.g., the Aztec calpulli, Andean ayllu, and Old Babylonian batum)? How can archaeologists study neighborhoods as imagined as well as physically constructed or culturally practiced? Methodologically, we wish to examine how archaeologists can address neighborhoods in all the many formations and configurations that may exist. Of course, we also would like to examine the limitations of 'neighborhood' as a heuristic and to discover what directions might move us through and beyond the neighborhood. Contributors are encouraged to place the study of neighborhoods within broader analyses of urbanization, early towns, rural settlements, and the production of regional landscapes.

[238] Symposium - CROSS-CULTURAL ENCOUNTERS/ENTANGLEMENTS IN ISLAND SOUTHEAST ASIA AND THE WESTERN PACIFIC

Cultures in island Southeast Asia and the Western Pacific had intense encounters with neighboring groups as well as with European colonizers through time. These interactions had both benign and hostile aspects. For the islands in insular Southeast Asia and the Western Pacific, these interactions have shaped the history and identity of the peoples who inhabit the region. This session aims to discuss the archaeological signatures that have implications in how we understand the complex cross cultural interactions in this part of the world. We solicit submissions of papers that deal with Neolithic migrations, Islamization, pre-colonial slavery and trade, European encounters, and highland-lowland contacts.

[239] Symposium - FIRE AND HUMANS IN RESILIENT ECOSYSTEMS IN THE AMERICAN SOUTHWEST

Twenty-first century landscape fires transform ecosystems, damage heritage resources, and threaten human communities across the globe. Although policymakers tend to consider contemporary fire problems a unique feature of an industrialized and warming world, human communities have lived in fire-prone settings for millennia. Deep, place-based knowledge of fire impacts on ecosystems undoubtedly facilitated the sustainability of these human communities. Active research in the Jemez Mountains of northern New Mexico integrates ethnographic, archaeological, paleoclimate, paleoecological, and simulation data to reconstruct the dynamic histories of ecological and human communities, their fire regimes, and the vulnerability of these communities to climate changes. Presenters in this symposium articulate the research strategies and results of interdisciplinary investigations that underpin collaborative efforts to understand the long-term relationships between dense human settlements, land-use, climate change, and landscape fire dynamics to build a science and traditional knowledge-based framework for improved management of fire-prone Southwestern forests.

[240] Symposium - THE PRACTICES OF DEATH: THE ARCHAEOLOGY OF MORTUARY RITUAL IN ANCIENT EGYPT AND SUDAN

Excavations and surveys in Ancient Egypt and Sudan have provided archaeologists with a wealth of information about the practices surrounding death, unearthing not only the physical remains of the deceased and their grave goods, but also material related to mortuary ritual ranging from the written and visual to the environmental. This richness of material has fostered a long tradition in regional archaeology of focusing on conspicuous display as a direct reflection of deceased individuals. However, the social persona expressed through mortuary ritual may reflect less on the 'lived life' of the departed than it does the motivations of the

survivors who organized the funerary rites and the negotiated relationship between the dead as ancestors and society as a whole. To that end, this symposium will present diverse levels of analysis, with papers drawing from primary mortuary material such as osteological evidence and material culture, and larger contexts such as texts, iconography, architecture and landscape. Questions posed will serve to elucidate the recursive relationship between society and its members as presented in the mortuary sphere. Addressing these issues in Egypt and Sudan comparatively promotes discussion of the complexity of ancient northeast Africa as a whole.

[241] Symposium · NEW PERSPECTIVES ON THE ARCHAEOLOGY OF TECHNOLOGICAL CHANGE

In the last 35 years, technology has been reclaimed as a worthy focus of study in anthropological archaeology. Yet despite a broad consensus that technology is deeply intertwined with social and cultural processes, archaeologists have developed widely varying approaches to the analysis of technological behavior. Archaeologists studying technology are often divided by geographical scope, theoretical approaches, and materials specialization. The proposed session seeks to highlight the variety of perspectives on one dimension of this multi-faceted topic: the study of technological change. Drawing on their particular areas of research, participants will develop and explore common themes in the study of technological change. The papers will address the following broad thematic questions: (1) How is technological change addressed at different temporal and spatial scales? What methodologies do archaeologists use to analyze behavior from the level of individual decision making to macro-scale adoption patterns? (2) What features of technologies, their practitioners, and their social contexts affect spatial and chronological patterns of adoption? Conversely, how does the study of technological adoption patterns modify our understanding about the social structure of a society? (3) How does the spread of technology across significant social, cultural and geographic boundaries differ from the spread of technology within social groups?

[242] Symposium · THE DIMENSIONS OF RITUALITY 2000 YEARS AGO AND TODAY

The Mayan archaeological record has ceramic vessels containing remains of contents of food and beverage and other materials used in ceremonial and offering rites, as well as paint, such as cinnabar, hematite, plaster and bitumen, used in body preparation. The record also contains censers and braziers, designed for burning or heating different kinds of incense and copal; musical instruments, such as ocarinas, whistles, and ceramic drums, fabrics, robes, headdresses, jewels, fetishes and figurines, even bones. All these are vestiges of materials which strongly appeal to perceptions, such as sight, smell, taste, sound and touch. This suggests that those ritual events were a feast for all senses which represent plenitude and sensuality, rhythm, dance and theater -- an ode to life. This is particularly conspicuous when evident in funerary contexts, which translate funerary ritual into a feast of life, imbuing death with the power of giving birth to life, as a life bringer. This symposium presents papers which address and discuss some of these vestiges, which provide evidence for the dimensions of this ancestral rituality and its current manifestations.

[243] Symposium · THE GEOARCHAEOLOGY OF SUBMERGED, INTERTIDAL, AND WETLAND PLACES: ADVANCES IN METHOD AND THEORY OF PREHISTORIC ARCHAEOLOGY UNDERWATER 2015 -- PART 2

This symposium is organized to exhibit recent advances and discoveries from prehistoric sites in fully submerged, intertidal, or now wetland places. These projects include both Academic and CRM projects. These examples are fully geoarchaeological in scope because such research is fundamentally involved with Pleistocene and Holocene sea level fluctuations, coastal and marine geomorphic processes, paleoclimatology, and geophysical remote sensing techniques. Topics will include both freshwater, wetland, intertidal, and fully marine or lacustrine examples, and presenters will discuss survey methods, sediment sampling and analysis, paleogeographic reconstructions, and site predictive models, agency issues for CRM, and Native consultations. A central theme will be the discipline-wide importance of these projects and how submerged prehistoric sites are contributing to our understanding of the past.

[244] Symposium - LOWLAND MAYA TERRITORIES: LOCAL DYNAMICS IN REGIONAL LANDSCAPES

Postclassic Maya territories are considered by many to have been stable, but internally variable political units, retaining their integrity through time despite their incorporation into larger multi-polity networks. Given their temporal stability, territories were social and economic entities that transcended geopolitics alone. As cultural constructions, territories played an important part in structuring and shaping politics, identities, economics, and ritual practices. During the Classic and Preclassic periods, we suggest that territories were in flux, reacting and changing to both internal and external stimuli. This dynamism is exemplified by shifting political capitals, settlement patterns, and migration patterns through time within regional landscapes. In this session, we examine the ways archaeologists investigate the dynamics of Maya territories, including macro-analyses of regional surveys, aerial remote sensing, ceramic spheres, art and architectural styles, migration patterns, settlement patterns and hierarchies, as well as micro-analyses of site dynamics such as architectural histories, household demographics, and exchange relations. The papers in this session illustrate the importance of multi-scalar and multi-evidential perspectives to understand the boundaries and organizations of territories, how the locus of political power changed through time, and what factors contributed to their perseverance or assimilation.

[245] Symposium - MOVING FORWARD IN CASAS GRANDES ARCHAEOLOGY

Forty years ago, Charles Di Peso's ideas regarding the Casas Grandes Medio period were published in one of the most comprehensive, synthetic works in Southwestern archaeology. His interpretations were initially met with skepticism by Southwestern archaeologists, and were largely rejected. Since that time, archaeologists in the area have focused on increasing our empirical knowledge of the Medio period archaeological record. Our knowledge has grown to the point that region wide cultural historical syntheses are again being considered. Much of this research has prompted scholars to reevaluate many of Di Peso's ideas that seem to fit our improved knowledge, while also providing the basis for better arguments in many contexts. This session builds on this work, allowing participants using diverse theoretical perspectives and different data sources to explore the Medio period's social dynamics and chronology using recent field and laboratory analyses. Through these discussions, archaeologists working in the area can both illustrate the intense interest that has strengthened archaeological knowledge of Casas Grandes prehistory, and continue facilitating the alternative interpretations necessary to build upon Di Peso's initial work.

[246] Symposium - CAMINOS PERDIDOS Y VÍAS OLVIDADAS: TRADE ROUTES AND EXCHANGE NETWORKS IN LATE PRE-HISPANIC CENTRAL AMERICA

Twenty-first century archaeological research focusing on southern Central America is producing a substantial amount of knowledge concerning a culture area that has long suffered a reputation for being "poorly known." Despite an increase in data, scholars still have a comparatively limited understanding of how the various regions and polities within this culture area interacted with each other and with their more distant neighbors to the north, south, and east before the arrival of Europeans. Many discussions of trade and exchange among different regions remain largely speculative. Papers in this session will attempt to take a fresh look at archaeological and ethnohistorical evidence for the lost social networks and trade routes that once carried Maya jades to Costa Rica and copper bells from Panama to West Mexico.

[247] Poster Session - ARCHAEOLOGY AND ETHNOHISTORY OF THE INCA**[248] Poster Session - MAYA ARCHAEOLOGY****[249] Poster Session - ARCHAEOLOGY IN MESOAMERICA****[250] Poster Session - ARCHAEOLOGY IN SOUTH AMERICA**

[251] Poster Session - ARCHAEOLOGY IN PATAGONIA**[252] Poster Session - CERAMIC ANALYSIS IN SOUTH AMERICA****[253] Poster Session - COMPARATIVE APPROACHES TO POSTCLASSIC MESOAMERICAN CERAMICS**

The ability to compare data sets is vital for establishing frameworks for understanding human behavior within and between sites and time periods. Ceramic data sets can be difficult to compare because of differing classification schemes and sampling procedures. Importantly, however, ceramic production and consumption influence and are influenced by multiple aspects of human societies, including resource procurement and availability, political economy, and social status. In this session, we bring together scholars working on ceramic artifacts during the Postclassic period (AD 1000-1521) in central and western Mesoamerica to highlight research in comparative studies. The Postclassic in this region experienced widespread political changes, including the development and consolidation of the Aztec and Purépecha Empires, and distinctive ceramic traditions associated with the multiple social groups within these empires. The papers here present ongoing intra-site, inter-site, regional, and temporal approaches to studying Postclassic ceramics. This session contributes to an ongoing dialogue on how we can compare ceramics and the complex links between changing regional and local politics and production.

[254] Symposium - INTENTIONAL DESTRUCTION OF CULTURAL HERITAGE: EVIDENCE AND RESPONSES IN SYRIA AND IRAQ

Intentional destruction of cultural heritage during intrastate and ethnonationalist conflict is a well-known but little studied phenomenon often designed to erase the presence and history of a rival social or ethnic group. Cases of purposeful damage have been widely reported during recent events in Syria and Iraq. Yet despite considerable scholarship directed toward violations of civil and political rights during these and other conflicts, there is a general tendency to view damage to cultural heritage as an unfortunate collateral outcome, rather than as a common tactic of intimidation and subjugation. Although prior research suggests that the purposeful destruction of cultural heritage may escalate a conflict, few studies have identified factors leading to escalation or what practical measures may protect heritage sites and the people who care about them in a conflict situation. This symposium explores this problem in the context of recent events in Syria and Iraq. In looking at a series of cases of the intentional destruction to heritage sites, panelists will discuss the social dynamics involved, methods employed in documentation, interventions that have occurred or are currently underway, the legal implications of damage to cultural heritage, and the responsibilities of museums and other heritage professionals.

[255] Forum - FEAR (FEAR AND ITS EXPRESSIONS IN THE ARCHAEOLOGICAL RECORD)

Throughout human history we have found much more to fear than fear itself. Arguably, many important decisions in our lives are influenced, in part, by fear. But what impacts has fear, in its variable expressions, had on the development of human societies and their relationships with other groups and their environments? Can archaeologists investigate fear in the past through the material correlates of attempts to overcome the unknown and the known but loathed? Can we identify what people in the past dreaded? Can we examine early manifestations of fear, identify their roles in the emergence and transformation of social institutions, or provide new insights on contemporary issues?

This forum grows out of a symposium held at the 2012 annual meeting of the American Anthropological Association. In this forum, we seek to expand on that symposium's momentum and encourage public discussion of issues that emerged from that meeting. Among these are the social implications and definitions of different forms of fear (e.g. anxiety, dread, horror, loathing, terror, etc.), how these might be monitored archaeologically through materialized records of actions undertaken to reduce, encourage, or use fear in the past, and how fear contributed as a motivator to social change.

[256] Symposium - LOW IMPACT, HIGH RESOLUTION: ONGOING INVESTIGATIONS IN EAGLE NEST CANYON

Eagle Nest Canyon is a box-canyon tributary to the Rio Grande near Langtry, Texas in the Lower Pecos Canyonlands. This short canyon played an outsized role in 1930s-1980s Lower Pecos archaeology through seminal excavations at three of its rockshelters, most famously Bonfire Shelter. In 2013 Texas State University's Ancient Southwest Texas Project launched a long-term collaborative research program to investigate the human and natural history of Eagle Nest Canyon, share what we learn, and conserve the Canyon's rockshelters for future generations. The 2014 season focused on Skiles Shelter, Kelley Cave, Horse Trail Shelter, and Eagle Cave, while the 2015 investigations will concentrate on the latter. "Low impact, high resolution" characterizes our investigative philosophy and methodology. This symposium summarizes work accomplished to date, including investigative methods and results, 3D modeling, site formation processes, geoarchaeology, archaeobotany, and the ongoing spring 2015 field session.

[257] Symposium - THE LEGACY OF THE RÍO SONORA PROJECT AND OTHER EARLY RESEARCH IN SONORA, MEXICO

The 1960s and 1970s were a seminal period for archaeology in the state of Sonora, Mexico. These decades saw the first intensive large-scale research as well as the establishment of a regional office in Hermosillo of the National Institute of Anthropology and History (INAH), led by Beatriz Braniff and Arturo Oliveros. This session focuses on the work of Richard Pailes and his compatriots who coordinated archaeological research in the low sierra region of Sonora. These early investigators repeatedly ventured into archaeologically-unknown territory. Their efforts provided us with extensive knowledge about the prehistory of what came to be known as the Rio Sonora and Serrana regions. Many of the questions posed by the Rio Sonora project and related efforts remain salient today. Publications from this project continue to serve as the foundation for new research projects and constitute the definitive source material for those who conduct work in eastern Sonora. This session intends to acknowledge the work of this era. Papers are presented that reflect positively and critically on this early work. A special emphasis also is placed on recent investigations that build on this early research with new perspectives and techniques.

[258] Symposium - UNDOING AND REDOING ARCHAEOLOGICAL PRACTICE: ARCHAEOLOGY AS TECHNIQUE ACROSS PREHISTORY, HISTORY, AND THE CONTEMPORARY

Archaeologies of the contemporary have begun to rethink and repurpose the tools (material, methodological, and epistemological) of archaeological practice, in order to study the contemporary moment, responding to a variety of new theoretical and political commitments. Similarly, a motley crew of 'social archaeologists' (for lack of a better term), working in a wide variety of prehistoric and historic contexts, have been exploring their dissatisfactions with traditional archaeological methodologies (and their attendant epistemologies) and the constraints they place on our understandings of the past (and present). The purpose of this session is to open a conversation between these groups, centered on understanding how archaeological methodologies function as techniques (in the Foucauldian sense) that anchor and participate in the production of certain forms of knowledge. It welcomes contributions that explore the histories and genealogies of archaeological techniques and knowledges, re-think archaeological methodologies through their use in answering questions about the contemporary moment or the past, and/or consider the multiple, complicated temporalities and geographies that can be produced through archaeological practices. The hope is that this session will provoke conversations that transgress the boundaries of the contemporary and the past in fruitful ways, critically interrogating archaeology as a powerful technique of knowledge production.

[259] Symposium - INTERREGIONAL INTERACTION AND DYNAMIC CULTURAL PROCESS IN MESOAMERICA

Archaeologists have long recognized the crucial role of interregional interaction in the development and cultural dynamics of ancient societies. In Mesoamerica, however, an expanding awareness of details in the archaeological, art historical, and epigraphic records suggests that the relationship between interaction and shifting sociocultural processes is highly complex and nuanced. The aim of this symposium is to explore the multiple potentialities of movement, migration, exchange, and interaction as catalysts for dynamic variability in cultural systems, complementing standard approaches that often focus on unidirectional causation (i.e., the appearance of talud-tablero architecture or the tripod vessel form as unilaterally indicative of a specifically "Teotihuacan" or the more nebulous "Central Mexican" presence and influence). Although not

limited to specific temporal, spatial, or cultural contexts within Mesoamerica, papers examine the role that interregional exchange played in the creation of systems of shared ideologies, the production of regional or “international” artistic and architectural styles, shifting sociopolitical patterns, and dynamic changes in cultural practices, meanings, and values. The aim of this symposium is to contribute to contemporary debate by highlighting, engaging, and provoking questions pertinent to our understanding of the relationship between interregional interaction and dynamic sociocultural processes in multiple Mesoamerican cultural histories.

[260] General Session · MODELING LANDSCAPE USE AND CULTURAL DEVELOPMENT

[261] General Session · PUBLIC OUTREACH AND EDUCATION

[262] Symposium · RECENT ARCHAEOLOGICAL RESEARCH IN THE UPPER GILA

The Upper Gila cross-cuts a number of archaeological regions in Arizona and New Mexico and includes the area surrounding the Gila River and its tributaries east of the San Pedro River. The purpose of this symposium is to highlight the diversity of occupation and time depth in the region. Although the Upper Gila is rich with archaeological sites, archaeological research is lacking compared to neighboring regions. This symposium brings together researchers working throughout the Upper Gila to share their recent research efforts related to the Early Agricultural, Early Pithouse, Mimbres Late Pithouse, Classic, and Salado periods. These investigations showcase the research potential in the Upper Gila region.

[263] General Session · STUDIES OF MAYA SETTLEMENTS AND PUBLIC ARCHITECTURE

[264] General Session · MOLECULAR ANALYSIS IN BIOARCHAEOLOGY

[265] General Session · HISTORIC CEMETERIES IN THE UNITED STATES

[266] General Session · SACRED LANDSCAPES AND RITUAL SPACES AMONG THE ANCIENT MAYA

[267] General Session · THE LOOTING OF ARCHAEOLOGICAL SITES

[268] General Session · STUDIES IN ARCHAEOBOTANY AND PALEOETHNOBOTANY

[269] Symposium · QUEERING THE FIELD: ARCHAEOLOGIES OF SEXUALITY, GENDER, AND BEYOND

(SPONSORED BY QUEER ARCHAEOLOGY INTEREST GROUP)

Queer as a theoretical tool was formalized in the 1980's and 1990's as a result of the discourse concerning definitions of gender, sex, and sexuality. Although queer theory began as a way to interrogate heteronormative assumptions around sexual identity and sexual oppression, it more broadly questions any and all notions of fixed difference. The queer movement challenges the very notion that anything is “normal” or stable, from the construction of social identity to institutional structures and practices. In archaeology, this has led to a diverse body of research that includes topics such as family structure, kinship, intersectionality, chronology, social identity, and bodily performance. Although queer archaeology has grown enormously in the last 15 years, it remains at the outskirts (pun intended) of archaeological discourse. In this light, this session explores what queer is and its applicability to archaeological research. Session participants will explore recent archaeological case studies using the following questions as a frame: What is queer (queer theory) and why use it in archaeology? Is there a unified sense of what it means to “do” queer archaeology? In what ways has queer theory impacted the field and in what ways can it? And where do we go from here?

[270] Forum • THE ENGAGED CLASSROOM, CONTINUED: SELECTING TEACHING MATERIALS FOR ARCHAEOLOGY COURSES*(SPONSORED BY PUBLIC EDUCATION COMMITTEE)*

Archaeology courses offer ample opportunity to engage students by using a variety of resources, although the sheer volume of possibilities can become overwhelming. Our discipline is one of infinite curiosity and discovery, which translates well when bringing in reading materials, films, and websites. However, selecting these materials can be a challenge, particularly for new instructors. It takes time to review potential materials and ensure that they will enhance student learning and mesh with your own pedagogical approach. Following the same interactive, collaborative format as last year's Engaged Classroom forum, the goals for this year's session are (1) for participants to build a library of supplementary materials to stimulate student learning in archaeology courses; and (2) to develop strategies for selecting materials based on pedagogical principles rather than convenience. Our discussants will present some of their favorite resources and share tips for replicate their decision process. Forum attendees will then collaboratively outline ways to review course materials, allowing participants to learn from the successes and challenges others have experienced.

[271] Forum • ISSUES AND DIRECTIONS IN STARCH GRAIN RESEARCH

Over the past 30 years, starch grain analysis has developed into an integral component of archaeological and paleoenvironmental research and has begun to shed new light on many important topics. Many aspects of starch grain research remain unresolved, though, despite the proliferation of starch grain studies. Some of the issues that will be discussed in this forum include: quantification methods, testing the effectiveness of recovery practices, understanding modes of starch preservation and modification, and efforts to expand comparative studies. Researchers from around the world will offer their perspectives on how to address these issues and provide insights into how the discipline can move forward.

[272] Poster Session • THE ARCHAEOLOGY OF SUBSISTENCE STRATEGIES IN THE SOUTHWESTERN UNITED STATES**[273] Poster Session • PREHISTORIC ARCHAEOLOGY IN THE SOUTHWESTERN UNITED STATES****[274] Poster Session • CERAMIC ANALYSIS FROM SITES IN THE SOUTHWESTERN UNITED STATES****[275] Poster Session • PREHISTORIC ARCHAEOLOGY IN THE SOUTHEASTERN UNITED STATES****[276] Poster Session • STONES, BONES, AND CACAO IN THE PREHISTORIC SOUTHWESTERN UNITED STATES****[277] Poster Session • PUEBLOS AT THE PASSAGEWAY: A REASSESSMENT OF BURIAL COLLECTIONS FROM NUVAKWEWTAQA, CHAVEZ PASS, ARIZONA**

For several centuries (13th – 15th C AD) Nuvakwewtaqa was comprised of three large pueblos that harbored a large population of ancestral puebloan people. It has been argued that the location and size of the pueblos correspond with their position along a major trade route - a transitional zone between forest and desert ecotones on the Colorado Plateau. A recently completed Forest Service sponsored NAGPRA Documentation project presents reassessments of the burial assemblages excavated by ASU (Chavez Pass Project 1976-1982) in cooperation with the Coconino National Forest. The site had been subjected to decades of looting which made past analysis of the disturbed burial contexts and surface scatters challenging. New insights into the people and material culture of Nuvakwewtaqa are presented which demonstrate that extensive regional ties provided the necessary conditions for the establishment of a center of population and trade during the dynamic regional changes of late prehistoric times.

[278] Poster Session - NEW PERSPECTIVES ON SALADO

The widespread Salado phenomenon, largely defined by distinctive polychrome pottery, has perplexed archaeologists in the US Southwest for decades. Many current views associate this pottery with an ideology that helped integrate culturally diverse communities during the tumultuous late pre-contact period (A.D. 1250-1450). This session focuses on recent excavations and preservation efforts in southwestern New Mexico while bringing together perspectives from other regions to examine the intriguing variability and shared elements that characterize Salado communities. Examinations of architecture, ceramics, and ground and chipped stone from new excavations and past projects enrich our understanding of Salado at different spatial and temporal scales. This large data set allows for detailed consideration and debate on Salado at a synthetic level.

[279] Symposium - INVESTIGATING THE TRAFFICKING OF CULTURAL OBJECTS: NOVEL AND INTERDISCIPLINARY APPROACHES

Significant advances have been made in curbing the trafficking of cultural objects and regulating the illicit trade in this material. By embracing a multidisciplinary approach, scholars, practitioners, governments, and stakeholders are increasingly able to move beyond ethical and theoretical debates towards empirical research and valuable data gathering and analysis. As cultural property researchers are drawing upon new technologies and methodologies developed in such diverse fields as archaeology, law, computer science, criminology, development studies, policing, sociology, and beyond novel approaches to the study and, ultimately, the disruption of the illicit trade in cultural objects are emerging.

This session will contain current multidisciplinary research into the illicit trafficking of cultural objects. Topics of particular interest are use of new technologies to monitor either looting or the antiquities market, regulatory analysis and development, field work results, and applications of methodologies from outside archaeology to address this problem.

[280] Symposium - GREAT LAKES ARCHAEOLOGY: CURRENT RESEARCH AND PERSPECTIVES

There is a long history of archaeological research in the Great Lakes region, and much of that research has taken place in the last decade or is ongoing. A number of projects combine traditional and innovative methodologies to offer new insights into the once-obscure worlds of ancient hunter-gatherers' lives. This symposium brings together scholars studying Great Lakes archaeology to present their current and recent research investigating ancient daily practices through the study of a diverse range of topics, including: technological organization and innovation, craft production, subsistence and cuisine, cultural interactions, and human-landscape interactions.

[281] Symposium - NEW RESEARCH ON THE ARCHAIC PERIOD IN THE NORTHEAST: THE PAST 20 YEARS

Research in the Northeast over the past 20 years has contributed a wealth of new data and insights into Archaic Period lithic technologies and settlement patterns using interdisciplinary approaches and collaborative efforts among archaeologists, Native American tribes, geologists, geomorphologists, chemists, and paleoecologists to name a few. These new applications are allowing us to gain a better understanding of human agency on the landscape on a small-scale, local level, and a refinement of large-scale, multi-regional level models. New data from Archaic sites in Massachusetts, Connecticut, Rhode Island, Maine, New Hampshire, and New York are presented to highlight what we knew then, what we know now, and what it is we still want to know

[282] Symposium - A NEW DEAL FOR WESTERN ARCHAEOLOGY
(SPONSORED BY HISTORY OF ARCHAEOLOGY INTEREST GROUP)

The New Deal agencies established during the Great Depression were important 1930's economic programs that are a dynamic part of American history. This symposium will focus on analysis of these Alphabet Soup agencies, as they were commonly known, and the cultural heritage projects that were sponsored west of the Mississippi River, including those devoted to archaeology and to standing structures. These Western New Deal projects were supported by many of the Federal agencies: Civilian Conservation Corps (CCC), Civil Works Administration (CWA), Public Works Administration (PWA), National Youth Administration (NYA) and the Works Progress Administration (WPA). Contrary to what some scholars have implied, we show that New Deal archaeology is not confined to the southeastern United States.

[283] Symposium - NEW PERSPECTIVES ON THE ARCHAEOLOGY OF ECONOMICS IN CHINA

Archaeological research in China has traditionally focused on long distance interactions between groups of cultures. An unfortunate result of this approach has been to stress the movement of goods over the sociopolitical implication of the interactions. This session aims to draw attention to the anthropological aspects of economy by focusing on processes of production, exchange, and consumption at a local scale. Contributors will examine the relationship of subsistence and utilitarian economies to local systems of social organization. A focus on small-scale communities rather than large culture areas has required researchers to pursue innovative methods and theories. This session will thus also explore the application and significance of this scholarship to the broader field of Chinese archaeology.

[284] Symposium - 20 YEAR RETROSPECTIVE OF NATIONAL CENTER FOR PRESERVATION TECHNOLOGY AND TRAINING SPONSORED ARCHAEOLOGY.

(SPONSORED BY THE NATIONAL CENTER FOR PRESERVATION TECHNOLOGY AND TRAINING)

Since 1994, the National Center for Preservation Technology and Training, a component of the National Park Service (ncptt.nps.gov), has engaged in state-of-the-art research in archaeological treatments and technologies. The Center provides grants, education, research, and training opportunities in the areas of archaeology and collections, architecture and engineering, materials conservation, and historic landscapes. To date, over \$9 million dollars have been spent on sponsored research via our grants program. This symposium is a 20 year retrospective and is focused on the innovative contributions of the award recipients to the archaeological sciences and technologies. Specifically, the researchers will be re-examining their original work and addressing the impact to their respective fields, how their work has influenced their research, and progress in their study areas since the initial award. This seminar includes papers that cover topics ranging from the development and fielding of magnetic susceptibility, archaeogeophysics, multi-beam swath bathymetry, and a friction cone-penetrometer, to plasma extraction ^{14}C analysis, site location probability models, lithic characterization, ceramic thin-section analysis, freshwater shell artifact and temper sourcing, aerial archaeology, and Native American consultation protocols.

[285] Symposium - THE SOCIAL LIVES OF FORTS: RECONSIDERING THE SOCIAL CONSTRUCTION OF ANCIENT FORTIFIED SETTLEMENTS AND THEIR DIVERSE ROLES IN POLITICAL ORGANIZATION

In the past, populations often shifted their settlements to more defensive patterns, settling in nucleated, fortified villages and towns, or in the shadow of hilltop redoubts. The monumental scale and/or strategic position of fortified constructions have historically led to a limited view of fortresses as engines of war. In this session, we look beyond the walls to consider the underlying social, political, and ritual dynamics that are entailed by phases of defensive settlement. What were the sociopolitical ramifications of living in fortified communities? How did the diverse economic, territorial, and political stakes of conflict shape these communities? Were horizontal divisions in identity or specialization within fortified communities emphasized, or elided? While fortified communities may have afforded new opportunities for political leaders, they may also have been associated with resistance to vertical distinctions and an ethos of conformity and solidarity. Participants from a broad spectrum of geographic and theoretical positions explore the diverse ways in which past populations (re)organized themselves in contexts of threat, however constituted. Papers will advance the study of fortifications beyond military strategy, and into anthropological arenas of social practice, economic organization, political landscape production, and regional scale interactions that unfolded under the shadow of such conflict.

[286] Symposium · RECENT ADVANCES IN THE SETTLEMENT AND LANDSCAPE ARCHAEOLOGY OF SOUTHWEST CHINA AND SOUTHEAST ASIA PART I: THE MACRO PERSPECTIVE: SPATIAL ANALYSIS AND SUBSISTENCE SYSTEMS

Since the beginnings of archaeological research in Southwest China and Southeast Asia, the focus has largely been on burial material. Whereas the burial customs, personal decoration, and weapon and tool assemblages that accompanied the deceased are by now fairly well known, the world of the living is far less well explored. During the last few years, however, there has been increasing interest in the settlement archaeology of the region, ranging from smaller-scale investigations of sites, to a broader landscape approach. A considerable number of field projects throughout Southwest China and Southeast Asia have greatly advanced our understanding of the daily lives of prehistoric and early historic inhabitants of the area. This session assembles papers that introduce some of the results of these research projects, providing an overview of our current knowledge in this field and pointing out new avenues of research. The first part of the session takes on the macro perspective of large-scale spatial analysis and long-term developments.

[287] Symposium · ANCIENT ARCHITECTURE AND SPATIAL TECHNOLOGY: A GLOBAL PERSPECTIVE

Spatial technology is our primary tool for in-field and remote recording of ancient architecture. Advances in our ability to detect and record architecture as part of the archaeological record have come from greater access to high precision surveying instruments and a variety of remote sensing techniques, including laser scanning. In turn, spatial modeling to perform analyses and create 3D representations can provide insights in to the past. Since architecture is used as a metric to reconstruct social organization, identity, and other key elements of the past, it is crucial that we engage the question of how advances in spatial technology have shaped the ways in which we investigate and interpret architecture in the archaeological record. The purpose of this symposium is to bring together case studies and regional reviews that reflect on the myriad of ways we study ancient architecture. The geographical and temporal scope of the session is purposefully broad to encourage dialog between different regions and research problems.

[288] Symposium · IHOPE (INTEGRATED HISTORY AND FUTURE OF PEOPLE ON EARTH) - INTERNATIONAL AND INTERDISCIPLINARY PROJECTS WORKING TO MAKE THE PAST BETTER SERVE THE FUTURE.

(SPONSORED BY IHOPE)

IHOPE (Integrated History and Future of People on Earth, <http://ihopenet.org/>) works to mobilize the record of “completed long term human ecodynamics experiments of the past” for better integration of long-term perspectives into planning and scenario construction aimed at building resilience and future sustainability. A component of the Future Earth: Transformations Towards Sustainability theme (<http://www.futureearth.org/themes/transformations-towards-sustainability>), IHOPE provides archaeology with a voice in the acronym-rich realm of international Global Environmental Change research programs. IHOPE works to integrate regional-scale transdisciplinary approaches to cases of resilience, transformation, and collapse. This session provides a sampling of IHOPE projects and perspectives, including: environmental impacts of the Northern Crusades in the Baltic, the integrative work of the IHOPE Maya group, cross regional case comparisons connecting the Desert Southwest and North Atlantic islands, the connection of Local and Traditional Knowledge to millennial scale sustainable resource management, to archaeological consideration of early large scale human impacts in China as part of an investigation of the “roots of the Anthropocene”. IHOPE and its sister organization GHEA (Global Human Ecodynamics Alliance, www.gheahome.org) welcome new participants and perspectives to make past better serve the future.

[289] Symposium · MIND THE GAP: ARCHAEOLOGICAL APPROACHES TO NULL DATA SPACES

One of the basic tenets of archaeological practice is locating material remains and pinpointing their location. In doing so we often create arbitrary islands of data, both spatial and temporal; clusters on a map or timeline surrounded by blank space. Despite awareness that these 'empty' or null spaces were integral parts of past

landscapes, they are often left out of or dismissed by archaeological interpretations. When gaps in spatial knowledge are equated with gaps in cultural knowledge and/or landscape use, null data areas become cordoned off behind seemingly rigid boundaries. Instead, archaeologists can problematize these spaces and theorize about the methodological, cultural, and natural processes that create and perpetuate gaps. In this session presenters with different temporal, spatial, and methodological specialties will confront the gaps in their data in an effort to create a comparative dialogue of how we treat empty space.

[290] Symposium - MANY FACES, MANY PERSPECTIVES: ARCHAEOLOGY AND COMMUNITIES IN PRACTICE.

(SPONSORED BY PARA LA NATURALEZA, A DIVISION OF THE PUERTO RICO CONSERVATION TRUST, AND THE UNIVERSITY OF PR)

The concept of community archaeology often assumes a relationship between scientists and communities as short-term interaction driven by work recruitment and a one-sided transfer of knowledge. However the boundaries delimiting specific "communities", separated among themselves and from the "scientists", are created and often arbitrary. In this view, archaeologists or scientists often assume a hierarchical position in regards to the production and distribution of knowledge. Local people, grouped as communities, have a silenced perspective of the importance, value and reason behind these type of projects. In this session we emphasize on the importance of shared knowledge and the blurring of boundaries between scientists and communities of diverse compositions. This approach promotes for the identification of new faces and new perspectives, allowing a transformation of the interaction between the academic and non-academic communities, and a more fluid production, accumulation and transfer of knowledge. The presentations and discussions brought forth in this session seek to propose a new view on a topic that has many faces and many perspectives, using practice to enhance the potential contributions that community archaeology can make to scientists and to communities alike.

[291] Symposium - PEOPLE WITHOUT COLLAPSE: PERIPHERIES AS ACTIVE PARTICIPANTS IN CULTURAL TRANSFORMATIONS

Eric Wolf's seminal work, *Europe and the People Without History* (1982), drew our attention to the periphery as an important locus of anthropological inquiry. By examining "people without history," Wolf was able to show that social complexity before the modern era was not a process that laid solely in the development and decline of isolated societies. Rather, both ancient and modern forms of social complexity rest upon the interconnections among peoples at global scales. This perspective has especially significant import for the archaeology of collapse, as it suggests that our frame of inquiry needs to be much wider than it has traditionally been. Specifically, we must consider the "peoples without collapse" - those groups that are generally excluded from collapse narratives, either because their complexity is non-hierarchical, or because they lie on the periphery of hierarchically-organized states, city-state networks or empires. Some processes of collapse may be most visible in peripheral areas, and the actions and changes that occur in these areas may play important roles in collapse as experienced in political and economic core areas. Ultimately, a focus on periphery areas and peoples provides insight into the relative stability of different social institutions in societies experiencing cultural transformation.

[292] Symposium - GLOBAL PERSPECTIVES ON LITHIC TECHNOLOGIES IN COMPLEX SOCIETIES

The stone tools from later complex societies are usually dealt with by archaeologists in cursory ways or ignored completely. On the one hand, archaeologists working on such contexts generally view stone tool technology as epiphenomenal to the various theoretical issues that dominate modern research. On the other hand, lithic specialists are not inherently drawn to these contexts because they are generally characterized by either the production of expedient tools or by highly distinctive production sequences requiring further research specialization. This session aims to bring more attention to the diversity of stone tool technology produced within complex societies from around the world, showing that lithics can provide a wealth of information about the daily lives of people in complex societies. Furthermore, papers in this session

demonstrate that lithic analysis articulates with many aspects of modern archaeological theory in cogent ways. By presenting stone tool technologies from complex societies in cross-cultural perspective, this session will encourage the exchange of methodologies and interpretive frameworks in the interest of generating novel theoretical insights.

[293] Symposium - ANCESTRAL NATIVE AMERICAN ARCHAEOLOGY OF THE SAN FRANCISCO BAY AREA

San Francisco Bay is the second largest estuarine system on the west coast of North America. The remarkable biotic diversity of the bay, with its surrounding valleys, uplands and vast tidal delta supported a great mosaic of individual tribal polities for several thousand years. During the Late Holocene, dramatic trends toward more complex forms of social organization, economic diversification and extensification is abundantly evident in the archaeology of the region. This symposium, composed of a wide-ranging collection of presentations, explores aspects of social complexity, subsistence pursuits and economic diversity within an area that was one of the great population centers of Tribal North America.

[294] Symposium - BUILDING THE HUNTER-GATHERER'S PALEOSCAPE ON THE SOUTH AFRICAN COAST: ENVIRONMENT, LANDSCAPE, AND FORAGING RESOURCES

This symposium summarizes our climatic and environmental modeling, chronology, and experimental studies of resource productivity in the ancient paleoscape of the Cape Floral Region (CFR) of South Africa. Traditional paleoanthropological approaches to paleoenvironmental data seek to increase the resolution of both records in order to show meaningful correlations. Although heuristically useful, these strategies typically fail to illuminate causal relationships because they lack connective theory. To build that connective theory we need to 1) understand the links between our paleoenvironmental proxies and the distribution of resources relevant to foragers 2) construct "paleoscape" models of the distribution of those resources under different climate conditions, 3) simulate forager actions and decisions in those paleoscaping, and 4) compare the model output to empirical archaeological observations. The CFR, a floristically hyper-diverse ecosystem bordered by a super-rich coastal zone presents a useful laboratory for the development and testing of paleoscape models. Our project is a large international consortium exploring the co-evolution of people and ecosystem by creating the paleoscape models of the CFR, simulating how hunter-gatherers utilized this changing ecosystem, and then testing these models with high resolution paleoenvironmental and archaeological data, and here we focus on the contextual results.

[295] Symposium - FROM THE FIELDS TO THE PALACES OF THE PREHISTORIC MAYA: HONO(U)RING THE CONTRIBUTIONS OF THE LATE PETER D. HARRISON

As a young archaeologist Peter Harrison's main interest was in ancient Egypt, but a trip to Tikal at the age of 19 changed everything. He received his BA and MA in Anthropology from the University of Toronto and his PhD from Pennsylvania in association with the Tikal Project. He spent four years working on the Pennsylvania Tikal Project with a focus on the Central Acropolis. Subsequent fieldwork included the Uaymil Survey Project in Quintana Roo, Mexico, and groundbreaking research on Maya agriculture at Pulltrouser Swamp, Belize. His numerous publications on the Maya span more than fifty years and a wide variety of topics, including Maya palaces, architecture, settlement patterns, agriculture, and hieroglyphs, to name a few, and can be found in the bibliographies of virtually every publication on the prehistoric Maya. Additionally, beyond his intellectual contributions to Maya archaeology, Harrison established a foundation to help fund the work of young scholars. His sudden passing in 2013 has left a void in Maya archaeology, professionally and personally, and in this session we hono(u)r his numerous contributions to our discipline.

[296] Symposium - A SENSE OF QUESTION: PAPERS IN HONOR OF JAMES F. O'CONNELL

One of the enduring challenges in archaeology is the use and development of anthropologically informed approaches to the past. Pioneering work by James F. O'Connell has and continues to make significant contributions in anthropological archaeology across time and space. From early archaeological work in Surprise Valley under Robert Heizer, to ethnoarchaeological research among the Alyawara in central

Australia and later among Hadza hunter-gathers in Tanzania, his research scope is global. With significant and ground-breaking archaeological contributions focused on questions about site structure, function, and chronology, his contributions continue to shape the field as a whole. His archaeological and ethnoarchaeological research established human behavioral ecology as a working theoretical paradigm in anthropology and especially archaeology. His theoretical contributions span important, big-picture questions and include investigations of the foraging strategies of Plio-Pleistocene hominins, the colonization of Australia, megafauna extinctions, and the evolution of modern life histories. His work with Alyawara and Hadza hunter-gatherers refocused the field of ethnoarchaeology away from simple description and promoted the use of theory-driven testable hypotheses. Papers in this session include new and on-going research inspired by the work of James O'Connell, as well as overviews summarizing his contributions to specific domains.

[297] Symposium · LITHICS COWGIRL, HOUSEHOLD ARCHAEOLOGIST, DIGITAL DOYENNE: A SESSION DEDICATED TO RUTH TRINGHAM

Throughout her incredibly active, extraordinarily creative career as an archaeologist, Ruth Tringham has transformed experimental lithic technology, re-animated "faceless blobs" with her Neolithic narratives, and explored digital technology in archaeology from punch cards to virtual worlds. With field projects at Selevac and Opovo-Ugar Bajbuk, Serbia; Podgoritsa, Bulgaria; Çatalhöyük, Turkey; and the San Francisco Presidio, California, Tringham investigated fire and burning in household contexts, mudbrick architecture, senses of place, multimedia-driven fieldwork and embodied multisensorial interpretations of the past. Tringham taught at University College London, Harvard, and then at the University of California, fostering innovative pedagogical techniques and cultivating the careers of her students over 45 years of teaching. Her fearless, passionate, fun-loving approach to life fuels her research as well as her life outside of academia, as she is an accomplished singer, dramatist, kayaker and (would-be) bee-keeper. This session celebrates Tringham's wide-ranging impact on lithics, household archaeology, feminist practice, and digital archaeology with presentations from her colleagues and students throughout the years.

[298] Symposium · THE SEVENTH FIELD SEASON OF THE PROYECTO TEMPLO MAYOR: RECENT INVESTIGATIONS ON THE SACRED PRECINCT OF TENOCHTITLAN

The fortuitous discovery of the Tlaltecuhli Earth Goddess monolith in 2006 generated new investigations in the ruins of Tenochtitlan's sacred precinct. Since March 2007, an interdisciplinary and international team organized by the Instituto Nacional de Antropología e Historia has carried out topographic studies, geophysical prospection, microchemical analysis, and archaeological excavation in Mexico City's historic center. These activities have produced new data regarding the precinct's urban planning, the architectural and functional evolution of its religious structures, and the symbolism and economy of Mexica rituals carried out at the foot of the Templo Mayor in the decades prior to Spanish Conquest.

[299] Symposium · BUILDING A BIOARCHAEOLOGY OF CARE

'Bioarchaeology of care' is a formal framework for analyzing cases of past caregiving in a contextualized and systematic manner. In bioarchaeology, health-related care is inferred from evidence in human remains that indicates survival with a disabling pathology when the individual would likely not have reached the actual age at death without care. Caregiving practices can potentially reveal a society's norms, values and beliefs. Additionally, caregiving can provide insights into societal knowledge, skills and experiences as well as political, economic, social and environmental variables. Despite its potential for providing a window into such aspects of past behavior, caregiving has been neglected as a topic for archaeological research. To alleviate this problem the Index of Care was created as an on-line instrument supporting application of a bioarchaeology of care methodology. 'Building a Bioarchaeology of Care' consists of perspectives from three continents for developing theory and practice into a cohesive framework. Presenters will discuss the possibilities and pitfalls for Index of Care use, explore approaches for integrating care analysis in other areas of archaeology (e.g. mummification literature in context of caregiving), identify new directions for research, and propose strategies for communicating findings and stimulating debate.

[300] Symposium - SOLVING ARCHAEOLOGICAL RESEARCH PROBLEMS IN ROCKY MOUNTAIN AND PLAINS PREHISTORY

Rocky Mountain and Great Plains archaeologists utilize a wide variety of methods to solve research problems in regional prehistory. From lithics to fauna to ethnoarchaeological data and beyond, this symposium highlights current research that advances and solves problems across a wide variety of topics. From the peopling of North America to human adaptation during the altithermal to the rise of agriculture to the complexity of bison hunting, this symposium highlights the diverse state of prehistoric archaeological research in this vast region of the interior of North America.

[301] Symposium - PEOPLE THAT NO ONE HAD USE FOR, HAD NOTHING TO GIVE TO, NO PLACE TO OFFER: THE MILWAUKEE COUNTY INSTITUTION GROUNDS POOR FARM CEMETERY

Based on Wisconsin's Territorial Act of 1838 and state statutes enacted in 1849 provision for the welfare of the poor became the legal responsibility of local governing including the Milwaukee County Board of Supervisors. The various formal institutions of Milwaukee County were established to provide care for the indigent, sick, orphaned and homeless as well as the burial of individuals from those categories. From 1878 through 1974 Milwaukee County utilized four locations on the Milwaukee County Grounds for burial of more than 7000 individuals. Archaeological excavations in 1991 and 1992 and in 2013 resulted in the recovery of over 2800 individuals from one of those cemetery locations. This symposium presents historical, archaeological and osteological research related to those excavations. Specific paper topics include analyses of historical documents and material culture assemblages, spatial patterning within the cemetery limits, the relationship between Milwaukee County and local medical schools, molecular identification of *Mycobacterium tuberculosis* in human skeletal remains, evidence for autopsy or medical school use of individual corpses, a refined method of juvenile age assessment, the application of strontium analysis for the establishment of identity, and the application of portable X-ray fluorescence technology to the excavation and analysis of human remains.

[302] Symposium - CURRENT PROBLEMS IN ARCTIC RESEARCH

Given heightened coastal erosion, decreased permafrost levels and melting ice patches, Arctic archaeologists are facing issues not previously experienced even a decade before. In addition, circumpolar communities are beginning to take ownership of their history and more collaborative relationships are emerging. This symposium will showcase current archaeological research across the Arctic, highlighting new questions that are arising as we struggle to stay ahead of changing climatic conditions and addressing old questions related to human resilience in the North.

[303] Symposium - MURAL PAINTING AND THE ANCIENT AMERICAS

Artist and activist Judy Baca argues that: Muralism is a work made in relatedness. Related to the people that surround it; related to the place it is in and made in a public voice. Mural paintings made either in twentieth-century Los Angeles or in eighth-century Guatemala are works that are often time-, place-, and community-specific. A medium whose life can be brief, the ties between murals and the time, place, and communities make their ephemerality all the more poignant.

The last thirty years of archaeological research have uncovered extraordinary mural paintings throughout the Americas. Advances in technical, material and art historical research have provoked reassessments of long-known painted walls. This symposium seeks to generate interdisciplinary and inter-regional dialogue on the meanings and functions of mural paintings from diverse chronological, geographic, and cultural settings. The papers presented in this panel move beyond formal and iconographic descriptions to address the ways in which context matters in the production of meaning, and how archaeological inquiry might open new vistas on murals as temporally, spatially, and socially related works.

[304] Symposium - SOCIETY AND ECONOMY IN THE HOHOKAM WORLD: NEW EVIDENCE AND INSIGHTS FROM CANAL SYSTEM 2, PHOENIX, ARIZONA

Beginning in the A.D. 500s and continuing into the 1100s, the pre-Classic Hohokam established large agricultural villages along vast canal systems headed on major rivers in southern and central Arizona. One of the largest and best known of these systems is Canal System 2, which encompasses much of modern-day Phoenix on the north side of the Salt River. Linked by hundreds of miles of canals, the people residing in villages along Canal System 2 established long-lasting social and economic connections that facilitated sharing water for crops, pooling labor to maintain canals, and trading goods crafted by artisans, which were validated and bound together through shared social practices and obligations. The papers in this symposium cite a variety of data sources—including information obtained from recent excavations at two large Canal System 2 villages, La Ciudad and La Villa—to examine the social and ritual organization of pre-Classic villages, canal system integration, labor organization, canal construction and maintenance, agriculture, and regional-scale craft production and exchange. Leveraging new evidence and recent investigations, the symposium papers provide new insights into the social and economic fabric of Canal System 2 during the pre-Classic period.

[305] Symposium - ARCHAEOLOGICAL APPROACHES TO SUBJECTIFICATION

This symposium explores archaeological approaches to subjectification: the practices whereby people recognize authority and recognize themselves as subjects to authority. Archaeology can offer a novel perspective on subjectification because it is uniquely positioned to document the places and things (and their attendant practices) that, over time, manifest claims to identity, underline social boundaries, or undermine a political regime's claim to authority. But even though places and things are mainstays of the archaeological analytic, few archaeologists examine the roles that these materials have played in practices of subjectification. Papers in this symposium draw on recent archaeological data to discuss the contexts in which places and things, in both ancient and modern worlds, became powerful vectors of subjectification that authorized a person's actions, positioned people within social hierarchies, or defined what it means to be a kind of person. These papers contribute an archaeological perspective to contemporary theories that describe subjectification as a continual process by which social differences between authorities and subjects are created, reproduced, or fractured in particular settings and circumstances. The symposium therefore provides theoretical and methodological insights into how archaeologists might understand the political processes, everyday practices, and moments of crisis during which objects shape subjects.

[306] Symposium - CONTEXTUALIZING MAYA HISTORY AND ARCHAEOLOGY PART I: REFLECTIONS ON THE 25TH ANNIVERSARY OF FOREST OF KINGS

This symposium celebrates the 25th anniversary of the publication *Forest of Kings* by Linda Schele and David Freidel. This book was a landmark in Maya archaeology in several respects. It was the first book to synthesize the explosion of epigraphic and iconographic studies that began in conjunction with the first Palenque Mesa Redonda meetings and fuse it with archaeological research. Using data from a series of important sites as well as vignettes, Schele and Freidel created a broad narrative of ancient Maya society that had a wide ranging impact on the field for its innovative and sometimes controversial interpretations. Further, *Forest of Kings* was published in a format that was not only accessible to the scientific community, but to the general public, which had a tremendous influence on how the ancient Maya as an idea was consumed by the lay community. The symposium is divided into two sessions. Papers presented in Part I focus on several themes including Maya ideology and cosmology, rise of complexity, and the central Maya lowlands in the Classic period. This symposium is a reflection on the impact the book had on the field and how far we have come since its publication.

[307] General Session - ARCHAEOLOGIES OF IDENTITY AND HUMAN EXPERIENCE IN THE PAST

[308] Forum - CARING FOR KNOWLEDGE ON STONE: ROCK ART CO-MANAGEMENT WITH INDIGENOUS AND LOCAL COMMUNITIES

(SPONSORED BY INDIGENOUS POPULATIONS INTEREST GROUP AND COMMITTEE ON NATIVE AMERICAN RELATIONS)

Many indigenous communities hold responsibilities to care for, protect and preserve sacred sites and cultural places. Rock art sites around the globe are some of the most important of those places, and increasingly Indigenous communities expect to play a central role in their preservation, care, interpretation and management. In many cases, the concerns and challenges that indigenous communities have in relation to rock art are similar to or intersect with those of archaeologists. At times indigenous peoples' approaches to care, protection and preservation conflict with archaeological methods. Discussants in this forum are involved in the care and/or management of rock art in various locations around the globe. Participants include indigenous community members as well as historical preservation professionals, state and federal archaeologists, and academic researchers. We will discuss co- and joint management models, exchange strategies for effectively caring for rock art in ways that are in accordance with indigenous protocols, and share points of conflict and how they were/might be resolved. We will also consider cultural tourism and the implications of listing rock art sites as a Traditional Cultural Property or World Heritage Site designation.

[309] Symposium - THE STUDY OF BIOLOGICAL MICROREMAINS AS A TOOL FOR RECONSTRUCTING PALEOENVIRONMENT IN HUMAN TRANSITION PERIODS

Human evolution is closely linked to climate, environment and the way in which human populations utilized the available resources. In this session, we attempt to make a step forward in the current knowledge on the paleoecological and paleoenvironmental conditions using biological microremains (phytoliths, pollen, diatoms, starches, dung spherulites, fungi, etc.). The integration of these tools represents a new avenue of study in paleoenvironmental data analyses. We will focus on four decisive episodes for the history of humankind and we will examine the way in which these conditions influenced the evolution and development of human knowledge: a) the emergence of *Homo habilis*; b) appearance of *Homo erectus* c) anatomically modern *Homo sapiens* and d) first agricultural and herding practices. These four moments represent significant advances at the social, intellectual, and economic level and gave place to important changes that continue to modify our behavior.

[310] Poster Session - CALIFORNIA ARCHAEOLOGY

[311] Poster Session - FROM COLONIAL TO CONTEMPORARY: ARCHAEOLOGY OF THE RECENT PAST IN THE UNITED STATES

[312] Poster Session - THE HOUSEPIT 54 PROJECT AT BRIDGE RIVER, BRITISH COLUMBIA: ARCHAEOLOGICAL PERSPECTIVES ON DEMOGRAPHY, CULTURAL INHERITANCE, AND HOUSEHOLD HISTORY

The Bridge River Archaeological Project is a long-term research partnership between The University of Montana, Department of Anthropology and Xwisten, the Bridge River Indian Band. The project seeks to understand the long-term history of the Bridge River housepit village with a focus on demographic change, technological evolution, socio-economic variability, and household sociality. This research permits us to develop studies that impact discipline-wide discussions of the evolution and organization of complex forager-fisher communities. The current phase, supported by the National Endowment for the Humanities, focuses on Housepit 54, deeply stratified house feature at the north end of the village. With at least 14 anthropogenic floors dating ca. 1100 to 1450 cal. B.P. and excellent preservation of faunal and macrobotanical remains, Housepit 54 provides us with the remarkable opportunity to examine persistence and change in household traditions on an intergenerational basis. This poster session presents results of ongoing research developing from our 2012 through 2014 field seasons. Posters examine dating and stratigraphy, cultural inheritance, demography, food collection and processing, technological traditions, social relationships, and approaches to artistic interpretation.

[313] Poster Session - NEW PERSPECTIVES ON EARLY MIGRATIONS IN THE WESTERN CARIBBEAN

Building a regional picture of the early peopling of the Western Caribbean is a challenging task. One of the main issues is the lack of a consistent, large scale chronological framework that would allow us to reconstruct the timing, direction(s), frequency(s) and causes of past population movements. Our session

focuses on skeletal remains as ancestors that provide both biological and cultural information, and examines the identity of the early migrants, their mode of subsistence and reasons behind their migrations. We present research on ancient DNA (aDNA), archaeology of subsistence practices (including paleoethnobotany and isotope analyses), mortuary archaeology, paleoenvironmental reconstruction, and analyses of place names (toponymy) in order to contextualize ancestral remains within their historical, cultural, natural and ideational worlds. We particularly encourage discussion of data sets on chronometric and stratigraphic dating of relevant sites in the region. The presented results point to the multidirectionality of early migrations and to the complexity of interactions between the islands and the adjacent continental regions, calling for different scales of inquiry into the process of early peopling of the Western Caribbean.

[314] Poster Session - CERAMICS AS MEANS TO ENDS AND MEANS OF EXPRESSION IN TERMINAL CLASSIC NORTHWESTERN HONDURAS

As perhaps the artifact most commonly recovered from most Mesoamerican sites, ceramics have figured prominently in efforts to reconstruct culture history and describe sociopolitical and economic patterns at various spatial and temporal scales. Much of this work has focused on analyzing pottery vessel fragments for the information they can provide on manufacturing techniques, vessel functions, and meanings conveyed primarily through stylistic modes. As valuable as these studies have been they are often stymied by our inability to identify who fashioned ceramic containers, at what scales, and how manufacturing processes might have been implicated in the exercise of power over others or the power to resist such pretensions. The contributions other fired-clay objects might have made to these processes are often ignored because their rarity in assemblages frustrates efforts to investigate them systematically. This session addresses both issues by presenting evidence gathered in the Naco valley and its environs concerning: the diverse ways pottery vessels were fashioned here during the Terminal Classic (AD 800-1000); how that variation was possibly related to local political and economic processes; and, what technological, formal, and distributional studies of a very unusual ceramic artifact, the candelero, contribute to understanding these developments.

[315] Poster Session - MATERIALITY, EXPERIENCE, AND "IRISHNESS": THE IRISH AND IRISH-AMERICAN EXPERIENCE THROUGH TIME

Drawing upon archaeological research, oral histories and historical records, this session seeks to understand the long-term nuances of household and community change by way of diverse assessments stemming from a single region. Researchers working along the western coast in Ireland and among Irish immigrant communities in the United States seek to develop a multi-faceted understanding of the changing social and economic contexts of daily life on both sides of the Atlantic Ocean. The perspectives presented here utilize various comparative assessments produced from a range of methodologies and theories in illuminating local understandings and everyday life within coastal, rural and urban communities. This includes a range of studies from the Medieval through twenty first century which shed new light upon the cyclical habitation and abandonment of coastal Ireland and exploring the subsequent changes in household and community in Ireland and abroad as a byproduct of Irish migration. This research demonstrates the potential for developing nuanced interpretations for changing concepts about space, place and social/geographic landscapes in both coastal Ireland and urban United States.

[316] General Session - THE STUDY OF LANDSCAPES IN BELIZE: GIS, LIDAR AND VIRTUAL REALITY

[317] General Session - ARCHAEOLOGY OF CENTRAL MEXICO

[318] Symposium - NARRATIVES AND DISCOURSES ON THE FORMATIVE PERIOD: REFLECTIONS AND NEW EPISTEMOLOGIES FROM THE SOUTH CENTRAL ANDES

Almost ten years ago, L.G. Lumbreras stated that the concept of "Formative" was unable to account for the diversity of social processes occurring in the Central Andes during the last three millennia BCE. Through a genealogical review of the concept and a critique of its use in different contexts throughout South America, he argued for the existence of multiple "formatives" with different characteristics and timelines. Nevertheless,

this periodization has remained a key device for organizing archaeological data and for characterizing sociocultural transformations in the Andes, even while many archaeologists are aware of its implications. Often, modern notions of progress, evolution, adaptation, technological development, nature and culture — among others— serve as conceptual foundations upon which grand narratives about the past are constructed. These teleological accounts presuppose the existence of a universal rationality, firmly rooted in modern capitalism, engendering totalizing discourses that obscure local histories. The purpose of this session is to critically explore new approaches to the study of the “Formative” process in the South Central Andes. We encourage papers that offer alternate views to this phenomenon, reassessing the role of agriculture, technology, sedentism, and domestication in the history of these groups, while proposing other epistemological possibilities for constructing effective narratives.

[319] Symposium · NATURAL FORMATION PROCESSES
(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP)

This session provides a broad overview of natural formation processes that have affected the distribution of artifacts, ecofacts, and features. The main objective is the important task of calling attention to the identification and interpretation of natural formation processes and agents of postdepositional disturbance, and how they contribute to our conceptualization of past human behavior. Together these patterns build on strong theoretical and practical foundations in geoarchaeology, which posit a dynamic relationship between a site's systemic context and the physical and biological processes. Here contributors highlight examples of natural formation processes, postdepositional disturbance, and other natural factors that contribute to our understanding of the archaeological record, regardless of scale (from macroscopic to microscopic), or location (from the Arctic to the tropics) and how scientists from around the world are handling them.

[320] General Session · MODELING SITE LOCATION AND COMMUNITY ORGANIZATION ALONG THE NORTHWEST COAST OF NORTH AMERICA

[321] General Session · HUMAN ENVIRONMENTAL IMPACTS

[322] Symposium · NOT JUST BLOGGING ARCHAEOLOGY - MEDIA AND SOCIAL MEDIA'S INFLUENCE ON ARCHAEOLOGY

Since the time of Renfrew and Binford, archaeology as a profession has embraced both a scientific methodology and the new tools science offers. From radiocarbon dating and geophysics to 3D imaging, these tools have enhanced the way we understand and communicate the human past. Now, the internet and 21st century technology offers new, multivocal venues through which we can relay archaeological information to the profession, enthusiasts, and the general public. From blogging and podcasting to YouTube videos and television series, communicating archaeology has never been easier. Anyone can start a blog, shoot some video, or record a podcast. Technology has reduced the cost of access and can allow archaeologists to speak directly to the public and peers. This session seeks to ask the following questions: is the use of social media helping or hurting archaeology? Are there drawbacks? Have we created an easy resource of archaeological information for looters? How has social media, via Facebook, Twitter, LinkedIn, and Instagram, to name a few, influenced archaeology in practice and the public's view of archaeology? This session solicits input from bloggers, podcasters, and film producers, each with a unique perspective rooted in the medium they've chosen to represent archaeology.

[323] Symposium · TERMINAL CLASSIC TO POSTCLASSIC IN THE NORTHERN LOWLANDS

The Terminal Classic represents a time of change for the Maya of the Northern Lowlands. Major social, political, settlement and economic shifts accompanied the collapse of government under divine kings. This session will explore changes involving site organization, architectural tradition, and economic exchange that paved the way for a Postclassic that, while diminished in extent, was firmly rooted in ancient tradition.

[324] General Session - CERAMIC STUDIES IN THE SOUTHWESTERN UNITED STATES**[325] Symposium - POST-CONFLICT ARCHAEOLOGY**

Increasingly archaeological sites and artefacts are becoming ideological and opportunist targets for destruction and damage during conflicts. In what ways should archaeologists respond to these challenges to the archaeological record? The purpose of this session is to explore the minefield that is conflict-damaged archaeology: a subject which demands an effective response from archaeologists, but which can potentially place archaeologists themselves in conflict with concerned interest groups. Political and moral issues are always entangled in any response and emotions intensified, however such issues need to be faced, discussed and debated by archaeologists. Equally, questions around 'ownership' of archaeology and moral imperatives require reflection. What is clear however, is that archaeologists who work in areas where sites have been, or are being, damaged by conflict need to consider what their strategies and responsibilities are, and most importantly, how they can obtain information from these sites. The key issues this session aims to address are how might conflict-damaged sites be investigated, documented and safeguarded from further damage? We would like to encourage papers which seek to explore post-conflict archaeology; and particularly how archaeological material targeted and damaged in conflict situations can be assessed and how archaeologists can gather meaningful information from such sites.

[326] General Session - ARCHAEOLOGY OF THE AMAZON REGION**[327] General Session - STUDIES OF ARTIFACTS AND DOCUMENTS IN HISTORICAL ARCHAEOLOGY****[328] Symposium - MIGRATION AND MOBILITY IN THE NEW WORLD**

Migration has long been considered a major topic within archaeology due to its focus on the relationship between people, objects, space, and time. In more recent years significant advances in computer modeling, biomolecular methods, and other tools often used in archaeology have allowed researchers to explore new facets of prehistoric migrations and mobility. In this symposium, we will explore the various methods archaeologists utilize to examine migration and mobility in a variety of different environments, ranging from small islands to broader continental regions. Potential topics are diverse and will encompass a range of methodological approaches and case studies—from biomolecular analyses of bone to agent-based modeling. The overall goal is to present how these approaches can be used individually or in tandem to explore motivating factors, consequences, and trajectories of prehistoric human movement.

[329] Debate - ARTIFACT IDENTIFICATION AS OUTREACH

(SPONSORED BY PUBLIC ARCHAEOLOGY INTEREST GROUP)

Archaeologists have taken considerable strides in recent years to engage with the public about archaeology through outreach events. While the SAA Principles of Archaeological Ethics (and similar codes from sister organizations) espouse the importance of public outreach, very few guidelines are provided about appropriate forms of outreach. As professionals are frequently sought out by the public in order to identify artifacts owned or encountered by non-archaeologists, several individuals and organizations have considered hosting or have hosted events that invite the public to bring their artifacts to be identified. This session seeks to create a moderated professional debate about the merits and ethical challenges of artifact identification sessions as public outreach events.

[330] Forum - OUT IN THE FIELD: QUEER EXPERIENCES AND CHALLENGES IN ARCHAEOLOGY

(SPONSORED BY QUEER ARCHAEOLOGY INTEREST GROUP)

The Queer Archaeology Interest Group (QAIG) was officially established at the 2014 SAAs in Austin in part to provide a forum for the discussion of and action on issues of interest to LGBTQI members, allies, and archaeologists interested in studies of sexuality. Archaeologists who identify as LGBTQI---like other minority archaeologists---face many challenges in their careers including discrimination in hiring, tenure, partner

benefits, and promotion in academic and non-academic career tracks, sexual- and gender-harassment, and the under-representation of minority perspectives in archaeological training and practice. Additionally, LGBTQI archaeologists face issues of gender presentation and identity that have rarely been discussed openly. This forum, sponsored by QIAG, brings together LGBTQI archaeologists of diverse backgrounds and career tracks to discuss their experiences and to begin to develop action-items for improving queer experience in archaeology. The forum will follow a moderated Q&A format, with questions submitted by the SAA membership in the months leading up to the 2015 SAAs. There will also be a period for open discussion by the participants and questions from forum attendees.

[331] General Session - ARCHAEOLOGY AND ZOOARCHAEOLOGY IN THE MIDWEST AND GREAT LAKES REGION

[332] General Session - BIOARCHAEOLOGY AND MORTUARY ARCHAEOLOGY IN EUROPE

[333] General Session - CLIMATE CHANGE AS AN ARCHAEOLOGICAL SUBJECT

[334] Symposium - ENGAGING WITH THE PUBLIC AND THE PAST: THE ARCHAEOLOGICAL LEGACY OF BRIAN FAGAN

Throughout his career, archaeologist Brian Fagan has consistently marshaled an unparalleled amount of cross cultural comparative data to address social phenomena with roots that stretch deep into our human past. As one of the country's best known authors of popular archaeology, Brian's scholarship on a wide range of anthropological themes is exemplified in dozens of widely-read books. As an influential public intellectual, Brian has led the charge in making anthropology accessible to students, scholars and the public alike. In the spirit of his lifelong contributions to the discipline --and with an eye towards public engagement, papers in this symposium employ cross cultural data from archaeological hot-spots worldwide to address and problematize the nature of prehistoric human-environment interactions. In doing so, we acknowledge Brian's legacy of research on the environment and its role in shaping society--both ancient and modern, as well as inform on the history of human vulnerability in prehistoric populations across the globe.

[335] Symposium - FROM HOUSEHOLDS TO COMMUNITIES: BRIDGING SCALES IN SEARCH OF CONFLICT, COALESCENCE, AND COMMUNITAS

Archaeological examinations of households and communities have increased dramatically over the past two decades. Many of these studies examine the ways in which people define themselves while simultaneously shaping the social relationships, physical spaces, and material objects that comprise their world. Despite the considerable insights such studies have generated, it is often difficult to bridge the scalar and theoretical differences between individual case studies focused at either household or community level. Contributions to this session seek to bridge these distinct scales of investigation through the examination of specific archaeological case studies that explicitly recognize that communities are not simply the byproducts of households pursuing their own autonomous strategies nor are households merely passive reflections of social, political, and economic relationships within the communities of which they are a part.

[336] Symposium - COLLABORATIVE AND COMMUNITY ARCHAEOLOGY

Public/Community/Stakeholder archaeology - call it what you will, is here to stay. It is an important aspect of a paradigm we as a profession continue to embrace. This session focuses on archaeology projects involving varied and innovative collaborative efforts that focus on partnerships with local communities – the public service / value aspect of our scientific effort.

[337] Symposium - HUMAN-ENVIRONMENT INTERACTIONS & HUMAN ECOLOGY IN WESTERN ARCTIC PREHISTORY

Northern sea ice levels are at an historical and millennial low, and nowhere are the effects of recent climate change more pronounced and destructive than in the Western Arctic, with the erosion and subsequent loss of coastal archaeological sites in this area being yet another casualty. However, the remarkably well-preserved but threatened archaeology of the Western Arctic is shedding important new light on the dynamics of the complex relationship between prehistoric Inuit/Eskimo cultures and past ecosystems. Organic artifacts and bioarchaeological material from sites in this region are feeding diverse but complementary interdisciplinary studies of diet, population genetics, zooarchaeology, paleoentomology, climate change and culture history. Working alongside local descendant communities, archaeological research can also inform understanding of the impact of contemporary climate change on northern communities. This session aims to explore aspects of human-environmental interactions, human ecology and prehistory in the Western Arctic through the lens of contemporary climate change and recent archaeological research. Our objective is to include researchers from a variety of perspectives and methodological specialties in order to explore temporal and spatial variation and dynamism in human ecology and human-environment interactions in Western Arctic prehistory, and to consider the implications of such research for academic and indigenous stakeholders.

[338] General Session - MESOAMERICAN RITUAL, ICONOGRAPHY AND MORTUARY ARCHAEOLOGY

[339] Symposium - ISLANDS AND INVASIVES: THE ARCHAEOLOGY OF PLANT AND ANIMAL TRANSLOCATIONS

Globalization has led to the rapid spread of invasive species, but the movement of species through trade networks and human migration is an ancient phenomenon extending back at least 20,000 years. The time depth of ancient translocations of non-domesticated animals often blurs the division between natural and cultural worlds and challenges ideas of “pristine” land or seascapes. Islands, with bounded landscapes and limited resources, are particularly susceptible to dramatic environmental and cultural changes following the introduction or invasion of new taxa. This session explores the mode of dispersal, the impacts, and the methods used to study the translocation and invasion of wild and domestic plants and animals to island environments. The investigation of ancient species translocations by humans can help document the structure and function of both ancient and modern ecosystems, the evolutionary history of domesticated and wild plants and animals, human-environmental relationships in the past and present, and provide data for the conservation of contemporary ecosystems.

[340] Symposium - SOUND OF THEORY

The folk have sung, on YouTube: enough of personalities. This session brings in responsible scientists, responsible in that they respond to empirical data, to stakeholders, communities, and descendants, and to basic principles of the historical sciences, including IBE, inference to the best explanation. Evidence-based practices let theory flow from encountered data, evaluated not only from Western Enlightenment suppositions of universal regularities, but also from the realities understood by communities from other cultural epistemologies. Ethics as well as politics must not be magicked away from archaeologists' work toward inferences to the best explanations

[341] Symposium - EXTREME ALPINE FORAGING: EXPLAINING HIGH ALTITUDE RESIDENCES IN THE GREAT BASIN

Why would foraging families spend their summers atop the highest places in their world? Great Basin archaeologists have long believed that the extreme alpine heights were used almost exclusively for logistic hunting of bighorn in prehistoric times. This all changed with the discoveries at Alta Toquima (central Nevada) and the White Mountains (southeastern California), where multiple residential sites occur at elevations exceeding 11,000 feet. This session compares and contrasts archaeological evidence from both areas, and begs the question of why—despite decades of searching—no comparable alpine residential complexes have been located anywhere else in the Intermountain West.

[342] Symposium - BEDROCK FEATURES (MORTARS, SLICKS AND GROOVES): DOCUMENTATION, ANALYSIS AND INTERPRETATION

Recent advances in global studies of bedrock features (e.g. mortars, slicks, grooves, etc.), suggest that these reflect a more varied, multifaceted archaeological phenomenon than previously thought. Nonetheless, while there are an increasing number of studies dealing with these sometimes enigmatic features, we still understand very little about their archaeological, cultural and spiritual contexts. The complex nature of bedrock features suggests that changes in their basic attributes (morphology, metrics and context) across time and space reflect variation in production and utilization on the one hand and economic and social aspects on the other. We seek to include papers with various theoretical and methodological approaches to the study of bedrock features, with no geographic or chronological limitations. Papers can focus on functional studies of bedrock features (e.g. use-wear and residue analyses), methodological or documentation aspects, ethnographic or ethno-archaeological studies, and descriptive analysis of specific sites rich in bedrock features. Papers addressing the symbolic or ritual significance of bedrock features, such as their use in ceremonial contexts, or as shrines or landmarks, are most welcome.

[343] Symposium - HOMOL'OVI: A GATHERING PLACE

In 1985 the Homol'ovi Research Program (HRP) was established at Arizona State Museum (ASM) to focus on the late prehispanic occupation of the middle Little Colorado River valley, as expressed in the aggregated villages of the Homol'ovi Settlement Cluster. In 2011 research expanded to study use of the landscape going back to Basketmaker II to provide context to the large, late pueblos. This symposium presents recent analyses and syntheses of the extensive body of research conducted by ASM for the past 30 years. The symposium will represent the diverse research initiatives of HRP including identity of groups who established and populated the late 13th/14th century villages; the materiality of depopulation and room closure; social and ritual construction, practice and material expression; the pre-aggregation social landscape; regional exchange; innovation and the role of new technologies in community building.

[344] Symposium - CONTEXTUALIZING MAYA HISTORY AND ARCHAEOLOGY PART II: REFLECTIONS ON THE 25TH ANNIVERSARY OF FOREST OF KINGS

The publication of *Forest of Kings* by Linda Schele and David Freidel in 1990 was a landmark in Maya archaeology. It was the first book to synthesize the explosion of epigraphic and iconographic studies that began in conjunction with the first Palenque Mesa Redonda meetings and fuse it with archaeological research. Using data from a series of important sites as well as vignettes, Schele and Freidel created a broad narrative of ancient Maya society that had a wide ranging impact on the field for its innovative and sometimes controversial interpretations. Further, *Forest of Kings* was published in a format that was not only accessible to the scientific community, but to the general public, which had a tremendous influence on how the ancient Maya as an idea was consumed by the lay community. This session is a reflection on the impact the book had on the field and how far we have come since its publication. The participants are a mix of scholars who were participants in the debates and/or worked at some of the sites discussed in the book, students of Schele and Freidel, and younger generation scholars who are working with some of the same questions.

[345] Symposium - FOOD GLOBALIZATION IN PREHISTORY

Over the last decade, an unprecedented growth in research activity across Asia and Africa has brought to light substantial evidence of extensive movement of domesticated species prior to the 2nd millennium BC. Ten years ago, this critical episode of food globalization was simply not on record. New evidence has come from archaeology, genetics and stable isotope studies. A series of large, current research projects are exploring the nature of this early episode of food globalization, how it happened, what resources and communities were involved, the challenges to movement, and how they were mitigated. Prehistoric antecedents have been discussed in the context of 2nd millennium BC metalworking technology and the development of horse-drawn transport. These episodes constitute over three millennia of trade and exchange, first over land and subsequently over sea, that put people in contact, as well as their foodstuffs, technologies, ideas and diseases. Prior to that exchange-driven history, the default model has been one of isolated farming communities, arising from a series of similarly isolated centers of domestication.

[346] Symposium - CRAFTING THE TENOCHCAN IMPERIAL IDENTITY AND STYLE

Recent researches have demonstrated that a large number of objects found in the offerings from the Sacred Precinct of Tenochtitlan are local products and not foreign artifacts obtained by tribute, exchange, war prizes, or looting. Based on their formal characteristics, an important group of them were exclusive to Tenochtitlan and even to its Great Temple in comparison with Tlatelolco, Texcoco, or other sites of Mesoamerica, because identical elements have not been found in other settlements. The papers of this symposium will present the detailed studies of the stylistic attributes and the manufacturing techniques of these objects in different raw materials that support and confirm this assumption for most of the Triple Alliance period (AD 1440-1520). Based on these results, it is even possible to propose the existence of the Tenochcan Technological Imperial Style to reinforce their identity since Moctezuma I until Moctezuma II. The high standardization observed in the morphology, iconography, and technology of these pieces, and its restricted distribution in the offerings of the main ceremonies at the heart of the Empire, suggest that its manufacturing took place in a dependent context, probably even in the palace of the Tenochcan rulers.

[347] Symposium - LIKE FREJILES IN A POD: EXAMINING THE CURRENT STATE OF PALEOETHNOBOTANY IN PERU

In the last decade or so, the field of paleoethnobotany has witnessed a rapid rise in the number of Peruvian and foreign researchers conducting archaeobotanical inquiry in the country of Peru. The primary goal of this symposium is to open lines of communication among these scholars, many of them recently trained, and solidify the network of researchers actively involved in the study of macro- and micro-botanical remains in the region. Through this symposium, we also aim to raise awareness about the need for sharing information such as project-specific methodologies and the rationales behind them, seed/phytolith/starch grain databases, and analytical protocols. The specific goals for this symposium include (1) disseminating the results of recent archaeobotanical analyses, (2) pushing theoretically engaged and question-driven research, (3) critically examining methodological issues specific to Andean archaeobotany, and (4) discussing joint efforts in developing databases and guides for Andean macro- and microremains. By taking these steps towards developing an active and collegial network of researchers interested in the complex entanglements between peoples and plants, we hope to advance the field of paleoethnobotany in Peru.

[348] Symposium - THE SHORT AND THE LONG OF IT: COMBINING TIMESCALES

Many prehistorians in Europe have used the long term as their default chronological perspective. A current ERC-funded project, 'The Times of Their Lives', is applying radiocarbon dating and a Bayesian framework for the interpretation of results to a series of case studies across the European Neolithic (sixth to third millennia cal BC) to push chronological precision to the scale of lifetimes and generations. The creation of much more precise timescales, however, still leaves the challenge of how to combine much more individual perspectives with the long term, in multi-scalar analysis. So this session seeks to explore, first, how far archaeology can go with refining its timescales, and secondly, how to combine multiple timescales. Papers will combine coverage of some key results from 'The Times of Their Lives' with comparative studies from North America.

[349] Symposium - RECENT ADVANCES IN THE SETTLEMENT AND LANDSCAPE ARCHAEOLOGY OF (SOUTH)WEST CHINA AND SOUTHEAST ASIA PART II: THE MICRO PERSPECTIVE OF INTERNAL SETTLEMENT ORGANIZATION AND OBJECT PRODUCTION

Since the beginnings of archaeological research in Southwest China and Southeast Asia, the focus has largely been on burial material. Whereas the burial customs, personal decoration, and weapon and tool assemblages that accompanied the deceased are by now fairly well known, the world of the living is far less well explored. During the last few years, however, there has been increasing interest in the settlement archaeology of the region, ranging from smaller-scale investigations of sites, to a broader landscape approach. A considerable number of field projects throughout Southwest China and Southeast Asia have greatly advanced our understanding of the daily lives of prehistoric and early historic inhabitants of the area. This session assembles papers that introduce some of the results of these research projects, providing an overview of our current knowledge in this field and pointing out new avenues of research. While the first part of the session takes on the macro perspective of large-scale spatial analysis and long-term developments,

this second part of the panel presents the micro perspective of settlement structure and object production.

[350] Symposium - ADVANCES IN WETLAND ARCHAEOLOGY IN THE AMERICAS

Over the last several decades, studies in Central and South America have demonstrated that numerous wetland areas were modified in the Pre-Columbian past, transforming marginal areas into highly productive agricultural land and profitable centers of aquaculture. Scholars emphasize the diversity of these complex hydrological features, which include raised, ditched, and drained fields, canals for transportation and drainage, as well as dams and pools for managing seasonal flooding and trapping fish. Scholars continue to debate the chronology and use of wetland features, the technology and organization of their production, the populations these environments were able to support, and the role(s) wetlands may have played in both local and regional economies in the past. In recent years, research has shown wetlands provide a rich repository of sediments, fauna, and plant remains that offer important proxies for gauging climate change, such as drought, and for understanding human-environment interactions and adaptive responses to stress in pre-Hispanic times. In addition, our understanding of the nature and aerial extent of these features has improved through more advanced aerial survey and mapping techniques, including satellite imagery, unmanned aerial vehicles, and other spatial technologies. These and other advances in wetland research in the Americas are presented here.

[351] Symposium - RESILIENCE, SUSTAINABILITY AND COLLAPSE IN THE NORTH ATLANTIC

The North Atlantic has become recognized as a key research area in the circumpolar north. Long term Human Ecodynamics in the North Atlantic islands affected by human settlement impact, climate change, and early globalization and culture contact have become classic cases of resilience and collapse in the archaeology of global change literature. International, interdisciplinary collaboration coordinated by the North Atlantic Biocultural Organization (NABO, www.nabohome.org) during the International Polar Year (2007-11) and the NSF funded Comparative Island Ecodynamics Project (2012-15) has supported extensive new fieldwork across the region and innovative combinations of archaeology, documentary sources, high resolution multi-proxy climate reconstruction, modeling and data management initiatives are producing new insights. This session presents this new research from the Faroes, Orkney, Iceland and Greenland that report on new understanding of processes of Viking Age settlement, cases of both sustainable and ultimately unsustainable management of natural resources, impacts of sudden climate change after the Lombok eruption of 1257 with onset of summer sea ice ca. 1275-1300, the effects of growing trade and proto-world system impacts on local communities, and the integration of archaeology with use of heritage for place based sustainability education.

[352] Symposium - ROCK ART RESEARCH: A REGIONAL ANALYSIS

(SPONSORED BY SAA ROCK ART INTEREST GROUP)

Rock art research in the Americas has a long history. Thousands of rock art sites have been discovered and formally recorded and within these sites are countless images. The purpose of this symposium is to place rock art within a geographic and cultural framework. Various kinds or related information may be employed to help differentiate the rock art of one region from another, including rock art character and structure, comparative and historic linguistics, ethnography, ethno-history, population genetics, prehistoric cultural materials, and traditional knowledge. A combination of such data sets may be used to posit ethnic identities, population movements and cultural patterns. Through such efforts, these studies can illuminate meaning and function that captures salient cognitive and ideological elements of Native cultures and furthers rock art research.

[353] Symposium - METHODOLOGY AND INTERPRETATION IN THE ARCHAEOLOGY OF ROCK ART:

(SPONSORED BY ROCK ART INTEREST GROUP)

In the pursuit of innovative instrumental technique, enhanced interpretive insight, and successful approaches to preservation, this Rock Art Interest Group sponsored symposium is intended to provide a context within which recent archaeologically informed rock art research can be shared. Additionally, RAIG has invited papers focusing on (1) methodologies for the long term (100 years plus) management and storage of the "big data" sets (>50 GB) now common to rock art research and (2) the unique problems attendant to conserving and accessing digital visual archives on a similar multigenerational basis.

[354] Symposium - ITS ABOUT TIME: CONTRIBUTIONS IN HONOR OF THOMAS C. WINDES

Thomas C. Windes has been a prominent archaeologist in the American Southwest for the past forty years. He has produced seminal works on the prehistory of Chaco Canyon and has devoted immense amounts of time and energy to dendrochronological research from northern Mexico to southern Utah. But perhaps most important, he has been a generous and influential mentor to young archaeologists. This symposium recognizes Tom's achievements and acknowledges the profound impact that he has had on the development of a generation of professional archaeologists.

[355] Symposium - CAVES, SINKHOLES AND CHULTUNS: NEW EVIDENCE FOR THE IMPORTANCE OF EARTH OPENINGS IN ANCIENT MESOAMERICA RELIGION

When Mesoamerican cave archaeology began to take shape in the 1980s and 1990s an early consensus formed around using the term "cave" in the sense of the Maya word *ch'e'en* which indicates not simply a cave but also a large number of other holes that penetrate the earth. Additionally, indigenous peoples show far less concern for whether the hole is of a natural or human origin. Recent research continues to demonstrate that traditional caves are important landmarks in the landscape but, additionally, archaeologists have begun to show that many more features were marked by ancient peoples as having sacred significance. This session brings together fresh perspectives on the subject.

[356] Symposium - BUILDING THE HUNTER-GATHERER'S PALEOSCAPE ON THE SOUTH AFRICAN COAST: THE ARCHAEOLOGICAL RECORD

In this symposium, we present archaeological research from the Cape Floral Region (CFR) and other localities relevant to assessing the strength of the paleoscape model and contributing to a record important to understanding modern human origins. Traditional paleoanthropological approaches to paleoenvironmental data seek to increase the resolution of both records in order to show meaningful correlations. Although heuristically useful, these strategies typically fail to illuminate causal relationships because they lack connective theory. To build that connective theory we need to 1) understand the links between our paleoenvironmental proxies and the distribution of resources relevant to foragers 2) construct "paleoscape" models of the distribution of those resources under different climate conditions, 3) simulate forager actions and decisions in those paleoscapes, and 4) compare the model output to empirical archaeological observations. The CFR, a floristically hyper-diverse ecosystem bordered by a super-rich coastal zone presents a useful laboratory for the development and testing of paleoscape models. Our project is a large international consortium exploring the co-evolution of people and ecosystems by creating paleoscape models of the CFR, simulating how hunter-gatherers utilized this changing ecosystem, and testing these models with high resolution paleoenvironmental and archaeological data. Here we focus on the archaeological evidence.

[357] Poster Session - PEOPLING OF THE NEW WORLD AND ARCHAEOLOGY OF PALEOINDIANS**[358] Poster Session - ARCHAEOOMETRY IN THE WESTERN AND SOUTHWESTERN UNITED STATES****[359] Poster Session - PREHISTORY OF THE MIDWESTERN UNITED STATES****[360] Poster Session - ARCHAEOLOGY OF THE NORTHWEST COAST, ALASKA, AND THE ARTIC****[361] Poster Session - PLAINS ARCHAEOLOGY****[362] Poster Session - PREHISTORIC ARCHAEOLOGY IN THE INTERMOUNTAIN WEST****[363] Poster Session - CULTURAL RESOURCE MANAGEMENT ON MILITARY LAND**

This poster symposium will highlight archaeological sites on military land and the fieldwork that has been conducted on these lands. The Department of Defense manages over 21 million acres of land and in turn, 110,000 formally recorded archaeological sites. These agencies and individual installations must comply with all federal regulations concerning our nation's heritage and resources. Archaeological sites located on military lands range from the precontact of 13,000 years ago to historic sites of 50 years, and they all have

significance in our nation's heritage and military history. These sites must be managed in accordance with federal regulations which are essential in the field of cultural resource management, while not hindering the mission and training of our United States soldiers. The posters in this session will seek to highlight the types of archaeological sites found on military lands, fieldwork that has been conducted, and the obstacles that cultural resource professionals face when managing our country's historic resources while maintaining the mission of the United States military.

[364] Poster Session - RECENT ARCHAEOLOGICAL RESEARCH IN PETRIFIED FOREST NATIONAL PARK

Petrified Forest National park has been the subject of archaeological research for well over 100 years. In 2004 Congress authorized a boundary expansion, effectively doubling the protected land in Petrified Forest National Park. As these lands are slowly being purchased and added to the park, a three year project began in 2013 to inventory cultural resources. The results of the first two seasons of survey and recording work have found a stunning density and diversity of archaeological remains. Archaeological sites spanning the last 10,000 years of human occupation have been identified and recorded, including most notably extensive preceramic sites and lithic landscapes, large Basketmaker villages, and a densely settled Puebloan landscape. The National Park Service has taken this opportunity to use the boundary expansion project as a teaching laboratory and platform for future investigation, incorporating student interns and researchers into the project. This session presents an update of the recent archaeology completed in Petrified Forest, and highlights some of the independent student research projects.

[365] Poster Session - NEGOTIATING MIGRATION AND VIOLENCE IN THE PRE-COLUMBIAN MID-CONTINENT

A remarkable level of indigenous violence consisting of prolonged, intermittent, small-scale warfare documented at the Norris Farms 36 cemetery in Fulton County, Illinois impacts perspectives on relative levels of violence in the Mid-continent of North America. Understanding the larger social context for violence in the Norris Farms Oneota skeletal population and the attributed social stress has been the over-arching goal guiding research and excavation at the associated Morton Village for the past seven years. Building on prior research in the cemetery and village, current work positions the issue of social context within a migration framework. At A.D. 1300 there is clear evidence that a small group of Oneota migrated into the Central Illinois River Valley encountering a resident Middle Mississippian population. It is also clear that the migrants were engaged in a significant level of conflict. What is not clear is how migrant and resident populations negotiated their new, post-migration situation. New evidence points to co-habitation of the village site and ensuing cultural changes for both groups. Posters in this symposium present different lines of evidence addressing the negotiation of space and material culture to assess post-migration interaction thereby informing the particular social context for violence.

[366] Symposium - COMMUNITY DIVERSITY IN THE ARCHAEOLOGICAL PAST AND THE COMPLICATED PRESENT: ONGOING FIELD RESEARCH AND CIVIC ENGAGEMENTS IN THE COPAN VALLEY, HONDURAS

From its earliest days, the archaeology of Copan demonstrated clear evidence for the diversity of its population, who immigrated to the Copan Valley from different regions. The record is further complicated by great variation in the locations and longevity of the different immigrants' habitation areas. Ongoing programs of archaeological field research and community engagement have embraced this diversity in the archaeological past, and the complexity and contested nature of identity, claims to heritage, and economic interests among the diverse contemporary communities and stakeholders in the Copan Valley, the country of Honduras, and the "Mundo Maya." This session will highlight the ancient communities presently under active investigation in the Valley, and the varying theoretical approaches and research priorities of these active programs of fieldwork. The variation in goals and engagement with different sectors of the living population will also be explored, through discussions of present practice. As a World Heritage Site, Copan is home to new and innovative approaches to heritage management, to address the challenges and controversies that this complex set of communities has generated in the past and the present in the Copan Valley, in Honduras, and in the professional archaeological community.

[367] Symposium - CURRENT PERSPECTIVES IN ECUADORIAN ARCHAEOLOGY

Ecuador is experiencing a period of growth and increasing professionalization in the field of archaeology. Government investments for archaeological surveys have led to the identification of new sites, and new training programs provide Ecuadorians with the necessary training for the profession. The papers in this session represent current work in Ecuador that are part of this burgeoning wave of research. The papers collectively transcend temporal and spatial boundaries. Research spans from the Formative through the Colonial Periods, and includes work from the coast and the highlands. Papers also address ethical issues and the cultural context of archaeological practice in Ecuador. By transcending these boundaries, this session builds on six decades of research into the cultures of Ecuador and provides new directions for future study.

[368] General Session - ARCHAEOLOGY OF THE MEDITERRANEAN REGION AND ROMAN WORLD**[369] Forum - A MODEL FOR SUCCESS IN REPATRIATION: A COLLABORATIVE PROCESS BETWEEN THE STATE OF COLORADO AND AMERICAN INDIAN TRIBES**

Since the 1970s, the State of Colorado has worked collaboratively with Native peoples toward the repatriation of their ancestors. The process has been refined over the decades in response to implementation and changes in State and federal laws. Many efforts have been tribally led with extensive consultation between the State and tribes with ancestral ties to Colorado. This forum will address the successes and challenges we have had. Participants from state agencies and tribes will share their perspectives and experiences which may help other states seeking resolution to similar issues.

[370] Symposium - THE HOYO NEGRO PROJECT: RECENT INVESTIGATIONS OF A SUBMERGED PALEOAMERICAN CAVE SITE IN QUINTANA ROO, MEXICO

The cenotes and underwater cave systems of the Yucatan Peninsula are emerging as one of the most promising frontiers for Paleoamerican studies. Following the end of the last glacial maximum, rising sea levels flooded the region's maze of underground passageways and preserved a diverse Late Pleistocene fossil assemblage. A relatively well preserved female human skeleton found in spatial association with the remains of now-extinct fauna in a submerged subterranean pit of Hoyo Negro presents a unique opportunity for interdisciplinary Paleoamerican and paleoenvironmental research in Quintana Roo, Mexico. The young woman's skeleton is the oldest, most complete yet found in the Americas. Investigations have thus far revealed a range of associated features and deposits, which make possible a multi-proxy approach to identifying and reconstructing the processes that have formed and transformed the site over millennia. Recent and ongoing studies involve osteological and taphonomic analyses; absolute dating of human, faunal, macrobotanical, and geological samples; human DNA analyses; and a consideration of site hydrogeology and sedimentological facies. Additionally, innovative recording and imaging techniques are enabling researchers to analyze deposits and their contexts with minimal impact to the site.

[371] General Session - CONTEXTS OF ARTIFACT PRODUCTION AND USE IN SOUTH AMERICAN ARCHAEOLOGY**[372] General Session - MORTUARY ARCHAEOLOGY****[373] General Session - DAILY LIFE, RITUAL, AND ETHNOBOTANY****[374] General Session - ORAL HISTORY AND ORAL TRADITION IN NATIVE NORTH AMERICA****[375] General Session - MAYA CERAMICS****[376] General Session - HOUSEHOLD ARCHAEOLOGY AND MULTISCALAR ANALYSIS IN MAYA REGION: ACTIVITY AREAS, RITUAL, PRODUCTION, AND DOMESTIC ECONOMIES**

[377] General Session · APPLICATIONS OF THEORY IN ARCHAEOLOGICAL ANALYSES**[378] General Session · ARCHAEOLOGIES OF SOCIAL IDENTITY AND SOCIAL INTERACTIONS IN SOUTH AMERICA****[379] General Session · CERAMIC ANALYSIS****[380] General Session · BIOARCHAEOLOGY OF THE ANCIENT NEAR EAST****[381] General Session · ARCHAEOLOGY OF HISTORIC INDUSTRIAL FEATURES, LABOR RELATIONS, AND MILITARY INSTALLATIONS****[382] General Session · CHACOAN ARCHAEOLOGY****[383] General Session · CALIFORNIA ARCHAEOLOGY - LITHIC STUDIES****[384] General Session · BIOARCHAEOLOGY IN SOUTH AMERICA****[385] General Session · EDUCATION AND PEDAGOGY IN THE CLASSROOM AND FIELD****[386] General Session · DESERT AND HIGH ELEVATION ADAPTATION IN THE AMERICAN WEST****[387] General Session · PREHISTORY OF THE CARIBBEAN****[388] Symposium · CEREMONIAL ARCHITECTURE IN EASTERN POLYNESIA: DEVELOPMENT & VARIABILITY**

Ancient monumental remains in Eastern Polynesia include many types of structures. Among the most visually impressive category is the so-called “marae complex”: the defining element of traditional ceremonial sites. Despite an apparent cultural homogeneity within the Polynesian area, archaeological studies—as well as ethnohistorical accounts—have demonstrated considerable regional and local variation in the architecture of marae. Patterns have emerged, including a recurrence of several fundamental features, but the marae monuments have evolved unique regional characteristics (marae in central East Polynesia and New Zealand, heiau in Hawaii, ahu on Easter Island). This differentiation has traditionally been attributed to both internal and external factors, but can also be explained through an adaptation to specific, localized ritual and socio-political functions. Sessions contributions will explore various topics, including the appearance and chronology of the sites, their architectural diversity and subsequent interpretations, the functions and specializations of their structures, their place within a larger settlement pattern, etc. Regional and archipelago scale syntheses are encouraged. We are also accepting contributions related to other components of ceremonial sites, such as stone sculptures, petroglyphs etc.

[389] General Session · LITHICS IN THE PALEOLITHIC**[390] Forum · SITE STEWARDSHIP ALLIANCE: BUILDING THE FUTURE OF ARCHAEOLOGICAL SITE STEWARDSHIP PROGRAMS**

Over the last fifteen years, many states have established archaeological site stewardship programs in response to the increasing damage or destruction of cultural resources. Across the states, these programs are often organized differently due to the needs of their managing agency, the local community, and the particular resources that they steward. However, they all face many of the same challenges. This forum will bring together program coordinators from five different western states to discuss topics that are important to the longevity of cultural site stewardship programs. These topics include funding, information management,

and organizational structure. A preliminary survey of these topics will be conducted and the results will provide the focus of this forum discussion. Overall this survey and forum discussion will assist in building the framework for a National Site Stewardship Alliance by identifying parts of the programs that could most benefit through collaboration.

[391] General Session - ARCHAEOLOGIES OF TRADE AND CULTURAL INTERACTIONS

[392] General Session - THE PRACTICES AND PRODUCTS OF CULTURAL RESOURCE MANAGEMENT IN CALIFORNIA

[393] General Session - CONQUEST AND COLONIALISM IN MESOAMERICA AND SOUTH AMERICA

[394] General Session - GLOBAL HISTORICAL AND CONTEMPORARY ARCHAEOLOGIES

[395] Symposium - MAGDALENIAN SOCIAL GEOGRAPHIES IN WESTERN EUROPE

Known for its widespread and impressive art, the Magdalenian had been studied for over a century and a half. Extensive research on the period has provided us with a very comprehensive archaeological record, which still provides information on prehistoric hunter-gatherers' lifestyle, set in different environments. The objective of this symposium is to present current research on hunter-gatherers' social behavior, and inter- and intra-regional interactions in the context of the late glacial Upper Paleolithic Europe, and thus, to summarize our current knowledge of this important archaeological period. The presentations, encompassing research done via computational modeling, GIS, empirical studies, and experimental archaeology, will combine multi-disciplinary viewpoints into one comprehensive overview of the Magdalenian.

[396] General Session - ARCHAEOLOGY OF THE PALEOLITHIC

[397] General Session - ZOOARCHAEOLOGY AND SITE INTERPRETATION

[398] Symposium - THE IMPERIAL CRAFT: COMPARATIVE PERSPECTIVES ON PRODUCTION AND SOCIETY IN EMPIRES

While craft production has always been part of the discussion about the nature of empires, recent work pushes the debate in new directions. Current research emphasizes the agency of craft producers as influential in the development of overarching systems. Such research identifies variation in production technologies and labor practices. In refocusing our attention on the dynamic role of producers, previously held beliefs about the relationship between craft production and the state have been overturned. The symposium aims to create a dialogue between scholars working in different parts of the world on the intersection between craft and empire. A comparative perspective will privilege different strategies, techniques, technologies, and social practices, while advancing new perspectives on the production of empires. The diversity of the scholars committed to giving papers that span disciplinary, theoretical, chronological, and geographical, divides, will generate unique combinations of data and lead to new lines of investigation. Although seemingly divergent, these perspectives draw attention to the critical role played by materials and by production processes in imperial contexts. The session engages the issues of craft production and its relationship with political authority, the economy of states, and the role of material culture in the negotiation of power relations.

[399] Symposium - THE EXPLOITATION OF LIMESTONE IN ANCIENT MESOAMERICA

Limestone was a key resource for daily life throughout much of ancient Mesoamerica where it was used for a variety of purposes including construction, hygiene, and diet among others. This session brings together archaeologists and archaeometrists investigating different aspects of ancient limestone exploitation throughout Mesoamerica to shed light on current research concerning: 1) limestone quarrying; 2) construction technology and methods; 3) the processing of limestone into lime powder (or cal); 4) the multiple uses and functions of lime powder; and 5) the social and economic implications of the ancient limestone exploitation industry. A combination of papers spanning a wide range of technical and theoretical backgrounds will foster conversation and debate concerning the study of this crucial material resource.

[400] Symposium · ANARCHY AND ARCHAEOLOGY: CONTESTING HIERARCHY, POWER, AND AUTHORITY IN THE PAST AND TODAY

Archaeological conceptions of power, authority, and inequality have been undergoing significant changes in the last few decades, both in terms of how the discipline conducts itself as well as in how archaeologists interpret their study matter. To the level that researchers strive to create more balanced relationships with collaborators, develop openness to alternative ontologies, and investigate the active nature of egalitarian social systems, many in the discipline are turning towards policies, methods, and interpretations that emphasize decentralized leadership and more balanced social relations. This session questions whether the application of Anarchist Theory, a growing field of inquiry with deep historical roots, can be beneficially applied to both the interpretation of past cultures and how archaeologists apply our research within a wider political world. In the past, archaeologists rarely engaged with Anarchist Theory, although aspects of anarchism, such as the concern over alienation from decision-making and the need to constantly combat incipient power centralization, permeate the archaeological literature. Papers within this session will explore the ways in which a more explicit engagement with Anarchist Theory can open new avenues of research, inform novel interpretations, or affect relations with collaborators and other invested parties.

[401] General Session · NEOLITHIC AND CHALCOLITHIC ARCHAEOLOGY IN THE ANCIENT NEAR EAST

[402] General Session · STUDIES OF TECHNOLOGY, ECOLOGY, AND CRAFT PRODUCTION IN SOUTH, CENTRAL, AND WESTERN ASIA.

[403] Symposium · DIETARY BIOGRAPHIES: CHRONICLING PAST HUSBANDRY, MOBILITY, AND EXCHANGE PRACTICES THROUGH ISOTOPIC ANALYSIS OF PLANT AND ANIMAL TISSUES

The tissues of animal and plant remains recovered from modern and archaeological contexts provide a deep record of detailed dietary and environmental information that can be unlocked with stable isotope analysis. This session brings together advances in our understanding of the properties of mineralized, proteinaceous, and carbonized tissues and the distribution of carbon, nitrogen, oxygen and strontium isotopes in natural biomes to reconstruct individual dietary and mobility histories of animals and humans. The ways in which humans intentionally manipulate their plant and animal resources through management and exchange, and establishing the isotopic outcomes of these activities, is integral to documenting social and economic dynamics in ancient societies.

[404] Symposium · RECENT RESEARCH AND A CHRONOLOGICAL REEVALUATION OF THE VIRU-MOCHE-CHICAMA VALLEYS

The Viru, Moche, and Chicama Valleys, on the north coast of Peru, are home to many pioneering studies of Andean prehistory and Peruvian archaeology, including the work of Rafael Larco, the Viru Valley Project and the Chan Chan/Moche Valley Project. As the focus of some of the most significant fieldwork to be carried out in the Andes, these three valleys remain the focus of many ongoing archaeological projects. This symposium is an opportunity to present recent research, contributing to a chronological reevaluation of the prehistory of the Viru, Moche, and Chicama valleys. Session participants will present data from their recent research from one or more of the three valleys and explain how this data impacts previous interpretations or ideas about culture periods and our understanding of the prehistory of the region. This session will enable presenters to introduce their new perspectives and research agendas for one of the most traditional areas of Andean

Archaeology.

[405] Symposium - MANAGING ARCHAEOLOGICAL HERITAGE IN THE 21ST CENTURY

Archaeology has long been an important component of heritage management throughout the world. Iconic as well as mundane heritage sites have employed archaeology to celebrate and honor the past. As community archaeology has expanded over the past decade to involve various stakeholders who have a vested interest in the material remains of the past, it has become incumbent upon archaeologists to partner with others to manage archaeological resources in the interests of broad and varied constituencies. There is a global challenge to archaeological heritage management as a top-down endeavor in which archaeologists are seen as the arbiters in deciding which sites matter and to whom, which sites to preserve, and why and how. This symposium will showcase effective ways to manage archaeological heritage in collaboration with public partners by showcasing best practices, successes, and challenges to guide the archaeological enterprise in the 21st century.

[406] Symposium - "BONES ARE NOT ENOUGH": RESEARCH IN HONOR OF DIANE GIFFORD-GONZALEZ

Diane Gifford-Gonzalez was one of a generation of scholars who transformed basic faunal identification into the modern sub-discipline of zooarchaeology. In so doing she helped revolutionize our understanding of past human diets, the origins and implications of food production, and historical human ecology. Her research has focused on a number of different critical times and places in the global human experience, from Holocene adaptations in Africa and the Pacific Rim to Native responses to colonialism in the American Southwest. Gifford-Gonzalez has also made significant contributions to studies of archaeological epistemology and the role of actualistic research in archaeological reasoning. While her work is always technically rigorous and she has enthusiastically embraced new techniques and methodologies, such as isotope analysis and DNA studies, Gifford-Gonzalez' research has also explored the cultural and ideological significance of human-animal interactions. Drawing on her experience as a poet and novelist, she has been able to bridge humanistic and scientific approaches in archaeology with skill and creativity. But most importantly, Gifford-Gonzalez is a beloved teacher and mentor. The papers presented in this symposium highlight the influence of Gifford-Gonzalez' scholarship on the on-going research of several generations of her students and colleagues.

[407] Symposium - ENVIRONMENTAL ARCHAEOLOGICAL APPROACHES IN SOUTHEAST ASIA

The aim of this session is to report on recent environmental archaeological approaches to understanding human behavioral adaptations in Southeast Asia (mainland and island). We aim to survey the various ways that environmental conditions affected hunter-gatherer and agricultural societies throughout the late-Pleistocene and Holocene. Paper topics of this session may include research of subsistence regimes, technological change and/or development, forager efficiency, paleoecology, transition into agriculture, or any relevant research involving these themes. We welcome novel research, papers involving meta-analysis, or historical reviews.

[408] Symposium - THE MIRADOR BASIN: NEW INVESTIGATIONS AND CONSERVATION PROGRAMS

(SPONSORED BY FOUNDATION FOR ANTHROPOLOGICAL RESEARCH & ENVIRONMENTAL STUDIES (FARES); UNIVERSITY OF UTAH)

Major research programs in the Mirador Basin of northern Guatemala and southern Campeche, Mexico, have provided new data relevant to the origins, dynamics, and collapse of complex societies in the Maya Lowlands. Data suggests that the origins of sedentary societies began earlier than previously thought, and that the dynamics of complexity included complex agricultural sophistication, elaborate communication and trade systems, logistics development, and vast political, economic, and social dominance within the circumscribed region primarily in the Middle and Late Preclassic periods of Maya civilization. Furthermore, the factors that gave rise to socio-political complexity were damaged by a multitude of issues, including

climate change, inept leadership, and a conspicuous consumption of resources resulting in the collapse of the major centers of the Basin near the end of the Late Preclassic period (ca. A.D. 150). Research has demonstrated the roles and activities of subsequent inhabitants in the monumental sites within the Basin and clarified the settlement distribution and formation of Maya societies living within the ruins of the ancient Kan kingdom. New conservation strategies for art and architecture at several major sites within the Basin have also provided protective measures and consolidation practices that have proven useful and productive.

[409] Symposium · ARCHAEOLOGICAL APPLICATIONS OF UNMANNED AERIAL SYSTEMS (DRONES)

An emergent technology rapidly finding a niche in the archaeological toolbox is the Unmanned Aerial System (UAS), used as a platform to record and manage archaeological excavations and surveys. The falling prices of commercial UAS with high resolution passive sensors have made this flexible and portable equipment accessible to many archaeological projects. Advances in software have also made it possible to run many complex photogrammetric processes on personal computers at low cost and high efficiency. Archaeological projects can now produce accurate Digital Terrain Models, Digital Surface Models, high resolution ortho-photos and 3D models of archaeological sites close to real time. This session offers examples of UAS in action in a variety of field projects worldwide, as well as reviews of technological and software capabilities, implementation strategies, and the current state of FAA regulations.

[410] Symposium · THE BIOARCHAEOLOGY OF OAXACA: TALKING WITH THE DEAD FROM SOUTHERN MEXICO

Bioarchaeological research has become one of the main subdisciplines in both archaeology or in biological anthropology that has contributed to the information of ancient society through the study of human remains. Bioarchaeological research has focused on both individuals (osteobiographies) and populations. From its origin, bioarchaeology has positioned itself in diverse topics such as gender, identity, violence, ethnicity in different geographic areas. The main aim of this symposium is to put together diverse topics from bioarchaeological specialists who have been working in the area of Oaxaca, Southern México, among groups such as the Zapotecs, Mixtecs and the Chontal people. This symposium is the first academic forum either in the US, Mexico, or in other countries to bring together a diverse array of Mexican and foreign researchers to present, share, discuss and enrich the bioarchaeology of Oaxaca.

[411] Symposium · ITINERANT MATTERS AND HYBRID OBJECTS: RESEARCH ON MATERIAL TRANSFERS AND CONTACT PRODUCTS

Anthropological archaeology has moved beyond defining cultural geographical boundaries. Instead we understand the fluidity of territories and identities within and between geographic regions. The crossing of boundaries is often documented first through evidence of foreign products, foreign raw materials and foreign styles or practices. Another line of evidence for tracing boundaries and boundary crossings is hybrid styles or technologies. This session aims to bring together scholars spanning geographic, material and methodological specialties to discuss research on tracking and understanding the effects of interactions between different cultural or environmental worlds. The session participants will discuss transfers of knowledge, styles, technology, raw materials or material culture with a particular focus on the evidence and methods for recovering and interpreting this evidence for transregional and interregional interaction and the broader socio-cultural effects. Topics to be presented include evidence of transfer of raw materials beyond the expected ethnohistorically documented range; emerging and growing evidence of itinerant craftspeople who cross borders; interregional contacts reflected in hybrid ceramic styles or technologies; evidence of different modes of trade and how these are documented in the archaeological record and the evidence of the effects and role such transfers of materials, styles and knowledge played in the past.

[412] Symposium - EXOTIC, LUSTROUS, AND COLORFUL: OBSIDIAN IN SYMBOL, SOCIETY, AND CEREMONY*(SPONSORED BY INTERNATIONAL ASSOCIATION FOR OBSIDIAN STUDIES)*

The long distance movement of obsidian in many parts of the world is well documented in the archaeological science literature, but few scholars have seriously considered why this particular raw material was so popular in the past. Although its physical properties, particularly excellent conchoidal fracturing and extremely sharp cutting edges, must have played a role, the widespread popularity and variety of uses for obsidian demand additional explanations. The papers in this session will explore a broad range of factors, such as performance, symbolism, ritual, and exchange value, that significantly extend our understanding of the role of this black, shiny rock within past societies.

[413] Symposium - PORTS, TRAILS, AND WATERWAYS: TRADE AND ECONOMY IN THE ANCIENT MAYA WORLD

The role and importance of ports in the ancient Maya world has long been an object of study. However, for decades the principal focus was the nature and role of Caribbean and Gulf ports, particularly during the Terminal Classic and Postclassic periods. Recent investigations indicate a critical role for inland river and lake ports in the integration of Maya economies as well. In addition, current evidence demonstrates the significance of ports in exchange systems in Preclassic and Classic period economies. The importance of river and sea ports and transport routes can be seen in the historical patterns of war and alliance – in which ports and their routes were principal targets for conquest and alliances. This session brings together researchers from North America and Latin America to share results of investigations of Maya ports from coasts and rivers, and from all periods. The participants explore and evaluate the nature and dynamics of ports as critical nodes in ancient Maya political economy. Those dynamics were central to the Classic period apogee, were critical in the “collapse” and/or Terminal Classic transition, and were a dominant characteristic of the Postclassic recovery and florescence.

[414] Symposium - NEW PERSPECTIVES ON AGRICULTURAL ORIGINS*(SPONSORED BY ARCHAEOLOGICAL SCIENCE PROGRAMS, THE AUSTRALIAN NATIONAL UNIVERSITY; COMPARATIVE PATHWAYS TO AGRICUL)*

The niche constructing activities of humans are revealed quintessentially in agricultural origins, in which numerous species of plants and animals evolved into a domesticated category while human societies and demographics adapted to these new domesticatory relationships. The expansion of archaeological evidence, from many more regions of the world and through improved methodologies of archaeobotanical and faunal investigation, now offer an enriched basis for comparing and contrasting the pathways towards domestication and the transition to agricultural economies. The diversity of regional datasets raises new questions of ‘how’ and ‘why’ agriculture emerged in certain places at certain times, as well as providing a basis for the interrogation of different explanatory frameworks proposed to address these questions. The present session brings together studies from across the globe drawing on new data, new approaches to analysis and new explanatory frameworks to assess how far we have come in understanding agricultural origins and the priorities for further research.

[415] Symposium - CELEBRATING THE 100TH ANNIVERSARY OF THE DEATH OF PRIMITIVE ECONOMIC MAN: NUTRITIONAL ARCHAEOLOGY FOR THE 21ST CENTURY

In 1915, E. V. McCollum and Marguerite Davis published a seminal paper on the nutritional requirements of mammals under the unassuming title “The Nature of the Dietary Deficiencies of Rice.” This paper marked a turning point in the study of nutrition and demography. McCollum and Davis demonstrated that proper mammalian development and growth was not based solely on the quantity and variety of macronutrients, particularly proteins. Instead, mammalian nutrition required non-energy producing micronutrients that McCollum and Davis called “accessory substances.” This marked the beginning of a scientific push to isolate and understand these nutrients that would later be called “vitamines” in the 1920’s. McCollum and Davis (1915) can also be seen as marking the death of Primitive Economic Man (PEM), a paradigm based on the

premise that energy (or wealth) alone determines the outcome of human demographic trends, whether through Darwinian selection or capitalist markets. Although PEM died a century ago, his ghost continues to haunt archaeology. This symposium brings together an eclectic group of papers that utilize modern principles of nutritional ecology to understand ancient human nutritional challenges, including the consequences of specific diets to the health of individuals and cultures, and how these diets may have influenced demographic trends.

[416] Symposium · SPANISH TO THE SILICON: THE DIVERSITY OF SAN FRANCISCO HISTORICAL ARCHAEOLOGY

San Francisco, as the one of the oldest cities on the West Coast, has a multifarious economic and cultural history that encompasses an array of eras from its origins as a Spanish outpost beginning in the 18th century, through Mexican rule in the early-19th century, and United States statehood in the mid-19th century. The papers in this session will focus on the geographical area of the San Francisco peninsula and will feature a variety of topics that touch upon the cultural and social history of the city. The papers will discuss how historic archaeology has contributed to a more complete understanding of the lives of the many people who contributed to the city's continuing culture of diversity and progress.

[417] General Session · ARCHAEOLOGY OF THE BRONZE AGE

[418] General Session · ISSUES OF HERITAGE, ETHICS, INFORMATION DISSEMINATION, AND ARCHAEOLOGICAL PRACTICE

THE ANNUAL MEETING of the Society for American Archaeology provides a forum for the dissemination of knowledge and discussion. The views expressed at the sessions are solely those of the speakers and the society does not endorse, organizers, not the society.

ABSTRACTS OF INDIVIDUAL PRESENTATIONS

Abatis, Stamos (Stamos Abatis Photography)

[14] *Perpetually on the Move from the Lowlands to the Highlands in Northern Greece*

"On the move" is a pan-Mediterranean project on transhumance implemented by the Mediterranean Consortium on Nature and Culture. As part of this project, I have produced a documentary that illustrates the life and experiences of transhumant pastoralists in Northern Pindos, Greece. The seasonal movement of these people with their flocks from the valleys to the alpine meadows of Pindos, although a practice currently in decline, has for centuries been the backbone of the economy of Greece and many other Balkan countries. Nomadic pastoralists not only provided the populations of Greece and the Balkans with milk, cheese, wool and textiles but also kept the mountainous areas alive both culturally and ecologically. Their routes have functioned as ecological and cultural corridors connecting the cities and towns of the lowlands with the most remote peaks of Pindos. This previously unscreened video seeks to shed light onto issues of connectivity and the complexities emerging from the cultural interactions of the people of the highlands with those in the lowlands. It also hopes to challenge long-held cultural and social prejudices about transhumant groups and individuals.

Abbott, David [123] see Judd, Veronica

Abbott, David (Arizona State University)

[304] *Discussant*

Abeyta, Armando [392] see Burnett, Katherine

Abraham, Shinu (St. Lawrence University), Praveena Gullapalli (Rhode Island College) and K.P. Rao (University of Hyderabad)

[101] *Beads, Bangles, and Glass: Historical and Ethnographic Insights into Glass Working in South India*

The contemporary glass bead making village of Papanaidupet in southern Andhra Pradesh has long served as the ethnographic model for understanding ancient South Indian glass working. Recent surveys, conducted as part of the project Production Landscapes of Southern Andhra Pradesh (PLoSAP), have yielded new data about contemporary and recent glass working in this region of south India. These data include a modern glass bangle making community with production links to Papanaidupet as well as an as-yet undocumented archaeological glass working site. A detailed exploration of the materials and processes at these sites will help archaeologists reconstruct early glass technologies in southern India.

Abraham, Shinu Anna [402] see Gullapalli, Praveena

Abramo, Heather

[363] *"Left Behind": The Transition of a Farming Community into Camp Atterbury*

On 6 January 1942, the United States Army announced that it would build a 40,000 acre training camp in rural central Indiana. The residents of the farming community were given less than six months before they were displaced from their ancestral land for the construction of the camp. Once gone, several hundred vacated farmsteads were left behind. These farmsteads were demolished and

would in 50 years become archaeological sites. This poster will highlight some of the historic archaeological sites found within the boundaries of Camp Atterbury, archaeological fieldwork conducted, and the best management and compliance practices of the cultural resource program in regards to the historic history of Camp Atterbury.

[363] *Chair*

Acabado, Stephen [119] see Sanders, Mariana

Acabado, Stephen (UCLA) and Marlon Martin (Save the Ifugao Terraces Movement, Inc.)

[180] *Post-A.D. 1600 Origins of the Ifugao Rice Terraces: Highland Responses to Spanish Colonial Aims in the Philippines*

Local wisdom and nationalist sentiments would have us uphold the long-held belief in the age of the Ifugao Rice Terraces, pegged at ca. 2,000 years old. Recent findings by the Ifugao Archaeological Project (IAP), however, indicate that landscape modification (terraced wet-rice cultivation) intensified between ca. A.D. 1600 and A.D. 1800, suggesting increased demand for food, which could indicate population growth, a period that coincided with the arrival and subsequent occupation of the Spanish of the northern Philippines. This period also shows increased social differentiation and apparent elite manipulation to maintain their position in the society. It is argued that, although the Spanish colonial government never controlled the interior of the Philippine Cordillera, the economic and political transformations in the region were drastic and this was likely due to the Spanish presence in the lowlands. This presentation focuses on the impacts of colonialism on the development of agricultural terraces in the northern highland Philippines.

[238] *Chair*

Acebo, Nathan (Stanford University)

[128] *Borderlands, Continuances and Violence: A Social Nexus at Black Star Canyon, San Juan Capistrano California*

Post European contact the historicity of the Santa Ana Mountain landscape of Orange County, California has been popularly constructed around the narratives of bucolic mission and ranch life, and that of the "wild frontier." The interplay between both histories has contributed to a memorialization of the Santa Ana Mountains as a borderland space during the Spanish, Mexican and American colonial eras that deemphasizes indigenous social life. This paper seeks to complicate the historical concept of a colonial borderland by exploring ways in which the mountain space enabled or disabled local and non-local indigenous practices of social and economic subversion. Lastly, this paper discusses the author's ongoing collaborative research on identifying multicomponent "runaway" sites, and indigenous movement through archaeological survey and the integration of oral history.

Aceituno, Javier [186] see Dickau, Ruth

Acevedo, Veronica (Licenciada Veronica J. Acevedo)

[411] *Alfarería en las fronteras de La Quebrada de Humahuaca, Jujuy, Argentina (Ceramics at the borders of the Humahuaca Quebrada, Jujuy Argentina)*

Los materiales cerámicos arqueológicos policromos denominados "vírgulas o comas" tienen una amplia pero desigual distribución espacial y son hallados en cantidades limitadas en sitios arqueológicos de las regiones de Puna central y Quebrada de Humahuaca, Jujuy, Noroeste de la República Argentina.

Estas regiones mantienen límites ambientales y geográficos fronterizos. En el pasado los habitantes de ambas zonas sostenían una fluida comunicación, manteniendo formas identitarias diferentes entre el "Ser Quebradeño" y el "Ser Puneño". Estas vasijas han transitado las dos regiones desde el 900 d.C hasta el postcontacto con el español. Lo que nos ha conducido a reflexionar sobre la circulación de piezas cerámicas entre fronteras con importante uso y consumo ritual y/o ceremonial.

En este trabajo se presentan los resultados del análisis sobre la caracterización de diseños y pastas de piezas y fragmentos de cerámica de sitios de la región de Puna y de Quebrada de Humahuaca,

Jujuy. La aplicación combinada de técnicas arqueométricas con las cuales se estudiaron los materiales permitió reconocer las dinámicas fronterizas dadas en el pasado entre poblaciones de la región del Noroeste de la Argentina. Las técnicas analíticas aplicadas fueron: microscopia óptica, espectroscopia Raman, DRX, análisis sobre cortes delgados, entre otras.

Acosta, Jocelyn [355] see Bueno, Marilyn

Acosta Ochoa, Guillermo (Instituto de Investigaciones Antropológicas)

[141] *Early Agrarian Societies in the Basin of Mexico: Challenges and Perspectives*

Over the past three decades, there have been very few studies of the earliest agrarian communities in the Basin of Mexico in comparison with other periods. In this paper, we introduce the symposium with an evaluation of the state of knowledge concerning preceramic, archaic communities up to the Formative period in the Basin of Mexico, with particular emphasis on the dearth of information available concerning paleoenvironment and subsistence. We review some of the recent investigations in the region, especially in the context of "The Development of Agrarian Communities in the Basin of Mexico," and discuss the challenges and future perspectives for studies concerned with this period.

[141] *Chair*

Acosta Ochoa, Guillermo [141] see García Gómez, Víctor Hugo

Acuña, Mary Jane (Washington University in St. Louis)

[244] *El Tintal in the Late Classic and Territorial Implications*

The archaeological site of El Tintal, known primarily as a large and important Late Preclassic ancient Maya city in northern Petén, Guatemala, also had a significant occupation during the Late Classic Period. Preliminary observations and an initial season of explorations at El Tintal indicate that this later occupation was quite substantial, yet unlike the southern lowland pattern of recording history on stone monuments, not a single carved stela that dates to the Classic Period has been identified at the site. In this presentation, I contextualize El Tintal in the Classic Period political geography and explore the reasons why a major center like El Tintal would deviate from what appears to be such a widespread and standard tradition among its regional neighbors. More importantly, what this means when we conceptualize ancient Maya territories and its implications for recognizing boundaries, political and otherwise, especially when considering its location between two competing polities, Tikal and Calakmul, that we know impacted so many other cities in the region of modern-day Petén.

Acuña, Mary Jane [413] see Freidel, David

Adams, Jenny (Desert Archaeology, Inc.)

[55] *Exploring Early Agricultural Technological Traditions at Las Capas with Experiments*

Experiments conducted in concert with the analysis of ground stone artifacts recovered from Las Capas, AZ AA:12:111, (ASM) explored important early agricultural activities including planting and harvesting maize, processing maize, and making stone and fired-clay pipes. Results from the experiments combined with models developed from ethnographic references created workable correlates for evaluating features and tools associated with these activities. Las Capas style fields were planted with two popcorn varieties, Chapalote and Reventador, and one flour variety of maize, Tohono O'odham 60-day. Maize ears were harvested when immature and mature, they were processed fresh, dried, and parched, and the stalks were juiced using replicas of the types of manos and metates recovered from Las Capas. Considering only the maize products, the Las Capas inhabitants had the necessary components for a varied and nutritious cuisine.

Descriptions of pipe manufacturing techniques in the archaeological and ethnographic literature of the U.S. Southwest are scarce. At Las Capas, pipes were made from stone and clay. Bifaces used to drill stone successfully replicated the marks on recovered whole and broken pipes. Clay was pressed

around wood molds in a successful attempt to replicate the types of fired-clay pipes recovered from Las Capas.

Adams, Karen [85] see Smith, Susan

Adams, Karen (Crow Canyon Archaeological Center)

[127] *Quids with Wild Tobacco (Nicotiana) Flowering Stems Inside*

Unburned yucca (*Yucca*) quids with wild tobacco (*Nicotiana*) contents have preserved within Antelope Cave in northwestern Arizona. Although the cave was visited during the Archaic, Southern Paiute, and Euro-American periods, material culture remains and radiocarbon dates indicate heaviest use by the Virgin Anasazi (A.D. 1–1000). Quids are wads of fiber twisted or knotted into a ball for insertion into the mouth. Ten of the quids examined were clearly made from the fibers of *Yucca* plants, based on molecular analysis and comparison to the DNA of *Yucca*, *Agave*, and *Nolina* plants known from the surrounding region. Twenty-eight of thirty quids examined were wrapped around a range of wild tobacco (*Nicotiana*) flowering stalk plant fragments (capsule, seed, calyx, pedicel, main stem, leaf). Quids have been interpreted as serving a range of needs (food, ceremonial/ritual, other). The inclusion of tobacco and the scattered contexts of recovery of quids within Antelope Cave suggest these provided occupants with a personal narcotic experience.

Adams, E (University of Arizona)

[343] *Back in Time: Research at Rock Art Ranch*

In 2011 the Homol'ovi Research Program (HRP) launched a fieldschool at Rock Art Ranch (RAR) 8 km south of Chevelon Pueblo and nearly 25 km from the Homol'ovi core (Homol'ovi I-IV) to investigate (1) the relationship of the many small pueblos in the area to those occupied at the same time in the core Homol'ovi area and ultimately to the large Pueblo IV villages; (2) the location and age of sites associated with the major petroglyph panels at The Steps in Chevelon Canyon generally dating Basketmaker II and earlier to get a sense of land use and duration of occupation; and (3) the scope, nature, and date of Hopi visitation to the area based on the presence of yellow ware pottery. The investigation of these three goals has been approached through survey and excavation. Survey has been used to locate, map and relatively date sites on the ranch; whereas excavation has focused on small Pueblo III hamlets of 5-20 rooms on the ranch and 10 km southeast at Multi-Kiva site (AZ P:3:112). This paper will use survey data collected on the ranch and adjacent land to address the central research questions.

[343] *Chair*

Adams, Jesse (Logan Simpson Design, Inc.), Michael Ligman (Logan Simpson Design, Inc.) and Zach Scribner (Logan Simpson Design, Inc.)

[362] *Paleoarchaic Occupations in the Eastern Great Basin: Results of GIS Predictive Modeling for Identifying Paleoarchaic Sites in Southern Nevada*

Within the Great Basin, site locations dating to the Pleistocene-Holocene Transition (PHT) are generally associated with specific geographical features. GIS is a useful tool for identifying geographical features likely to contain sites dating to the PHT period. Guided by previous Late Pleistocene/Early Holocene investigations in the Great Basin, a GIS predictive model combining topographical features likely to have been favorable for PHT period occupation was developed. Topographical features likely to have implications for PHT occupation included pluvial lake maximum extents and associated shore features, Holocene deposited alluvial sediments, drainages, predicted marsh zones, and current playa extents. These features were mapped and ranked; a sample of high-probability, medium-probability, and low-probability areas were then inventoried. Sample inventories were conducted within Delamar Lake, Dry Lake, and Kane Springs valleys, Lincoln County, Nevada, to identify cultural resources associated with the PHT period and test the accuracy of the GIS model. Here we present: 1) the methods used to develop the GIS model and sample inventory, and 2) the results of those inventories. Results indicate that model refinement based on additional environmental, topographical, and geologic inputs enables PHT site identification. Additionally,

results may provide more fine-grained information regarding PHT foraging behavior and occupation strategies.

Adler, Michael (Southern Methodist University)

[34] *Practicing Community Archaeology and Present Communities of Practice in Archaeology: A Southwestern Perspective*

Practicing archaeology as part of descendant community historical research necessarily addresses issues of cultural identity, concepts of historical continuity, political status and myriad other considerations. This case study focuses on the interplay of communities in the northern Rio Grande region of the American Southwest that are variously defined by Native American, Hispanic, and other identities, as they relate to ongoing negotiations over water rights and other natural resource uses. The study contrasts the dynamics of how communities are defined as political, geographic, historic and resource-using entities, with the realities of long-standing relationships between the various communities in the region.

Adler, Jon [121] see Brown, James

Adovasio, J. M. (Mercyhurst Archaeological Institute MAI) and J. S. Illingworth (Mercyhurst Archaeological Institute MAI)

[114] *Fremont Basketry: Redux!*

Decades of research have indicated that the basketry of the Fremont formative "culture(s?)" of the Eastern Great Basin is unique to and highly diagnostic of that (those?) prehistoric population(s?). Additionally, it has been repeatedly stated that the basketry of the Fremont exhibits few to no technical connections to that produced by neighboring Ancestral Pueblo groups. Recent reanalysis of literally all of the basketry recovered during the multi-year Glen Canyon Project corroborates the distinctive features of the Fremont basketry suite, but also suggests a very different relationship to, at least, some varieties of Ancestral Pueblo basketry than obtained previously. The results of this reanalysis are summarized and a revised perspective on Fremont-Ancestral Pueblo perishable relationships is offered.

Adovasio, J. M. [192] see Hemmings, C.

Adriano Morán, Carmen Cristina [141] see Martinez-Yrizar, Diana

Aebersold, Luisa (University of Texas at Austin)

[10] *Geoarchaeological Methods for Sediment Samples from Northwestern Belize*

The Rio Bravo Conservation and Management Area (RB.C.MA) is an area comprised of over 260,000 acres of protected land, which is owned and managed by Programme for Belize (PfB), an entirely Belizean conservation organization. This area is ideal for geoarchaeological research that encompasses human-environment relationships by analyzing sediments. This poster will present methods and results on preliminary geoarchaeological techniques completed on sediments at the University of Texas at Austin in the Sediment Lab, within the Department of Geography and Environment. Analysis includes identification of color using the Munsell Color Chart, loss on ignition, magnetic susceptibility, grain size, and sorting.

Agarwal, Sabrina [107] see Miller, Melanie

Agenten, Courtney (Project Archaeology)

[236] *National Network: The Strength of Project Archaeology*

We estimate that 275,000 students each year learn about archaeology and protecting the human past through Project Archaeology's high-quality educational materials. In 2009, I was lucky to attend a Project Archaeology workshop at the Little Bighorn Battlefield, living in a tipi for a week and

studying how to engage my students in discovering the culture and history of the Crow tribe. The workshop was taught by a passionate, knowledgeable archaeology educator and I was hooked! The next year, I guided my students through the investigation of a Crow tipi as they uncovered oral histories by living descendants, archaeological evidence, and the importance of preserving our shared heritage. My story is only one of 12,000. Teachers from across the nation have been inspired by passionate archaeology educators who are members of the National Project Archaeology Network in 36 states. This paper examines the strength of the Network, its impact on communities nationwide, and our plans to extend our network to all 50 states.

Aguilar, José [410] see Hepp, Guy

Aguilera, Patricio [318] see Ballester, Benjamín

Aguirre, Alberto (CEQ-COLMICH)

[129] *Transformaciones e historia entre Michoacán y Guanajuato a partir de las plantas hidroeléctricas en el siglo XX*

Se presenta una síntesis del uso del agua en la Cuenca del Lerma en su paso por el Bajío, en particular en donde se unen Michoacán y Guanajuato, así como su transformación en energía eléctrica. A partir de un repaso histórico, se toman en cuenta las obras realizadas para generar electricidad y sus transformaciones más significativas en relación con el paisaje que las alberga. Asimismo, se discute el cambio tecnológico implicado y el del paisaje que conllevó el uso social de la electricidad en la vida y el trabajo cotidianos. El periodo de estudio se centra hacia finales del siglo XIX y principios del XX, periodo en el que es posible encontrar diversas escalas en cuanto a la explotación del agua como fuerza motriz. Estas escalas se ven reflejadas en las transformaciones de la vida productiva ligada al entorno agroindustrial que imperó en la Cuenca. Entre las obras que se mencionan, se hallan aquellas para el desvío del curso del agua, por retención o desviación momentánea del cauce natural, y que transformaron también la manera de percibirlos en el paisaje por parte de la población.

Aguirre, Alejandra (Proyecto Templo Mayor/UNAM)

[298] *Images Represented in the Dressed Flint Knife Offerings from the Plaza West of Tenochtitlan's Great Temple*

During the seventh field season of the Templo Mayor Project directed by archaeologist Leonardo López Luján, twenty-two ritual deposits were found in the west plaza at the foot of the Great Temple of Tenochtitlan. Eight of the deposits (Offerings 123, 125, 126, 136, 137, 138, 141, and 163, dating to Ahuitzotl's reign, Stage VI, 1486–1502 CE) contained more than one hundred flint knives that were dressed with garments bearing the attributes of gods and deified warriors. Some of the knives were adorned with miniature artifacts related to warfare, such as darts, spear-throwers, and maces, while others were decorated with wooden masks, pectorals, marine shell and greenstone pendants, depictions of bloodletting implements, and round insignia made of gold. This paper will discuss the identification of the supernatural beings personified in the flint knives as images of deities or *ixiptlatin* (soul containers), as well as their symbolism in each offering, and thus contribute to our understanding of oblation rituals at Tenochtitlan.

Aguirre Molina, Alejandra [298] see Robles Cortés, Erika

Ahlman, Todd (Texas State University)

[44] *Costly Signaling, Risk Management, and Network Creation: Commodity Production and Exchange in the Historic Caribbean*

During slavery, enslaved and freed Africans throughout the Caribbean engaged in commodity production and exchange for many different but complementary reasons. Slaves and freedman raised crops and animals and produced crafts that they traded; they also engaged in rented labor. These practices allowed them to barter for other goods and earn cash. For some, this exchange allowed them to survive the hardships of enslavement and marginalization. Others were able to

accumulate goods and cash that allowed them to express their wealth within the confines of slavery and marginalization. Examples from slave contexts on the island of St. Kitts are examined and the different strategies used by enslaved Africans are discussed. The material remains suggest that enslaved Africans in the Caribbean employed multifaceted approaches to survive slavery, express their identity, and signal their wealth or some other attribute.

Ahlrichs, Robert [139] see Sterner-Miller, Katherine

Ahlrichs, Robert (UW-Milwaukee)

[359] *Viewsheds and Variability: The Red Ochre Burial Complex Revisited Geographically*

The Red Ochre Burial Complex, like it's later and more intensively studied Adena and Hopewell counterparts faces questions about its usefulness in understanding the cultural prehistory of the Western Great Lakes region. Over 50 years ago the complex was defined using a "trait list" approach. These traits are, for better or worse, still the clearest depiction of what is and is not a Red Ochre mortuary site. This study utilizes GIS to bring together disparate cultural data on a variety of Red Ochre sites in Wisconsin. This will facilitate examination of the "nuclear" Red Ochre traits including: hilltop site preference, presence of burials with caches of bifaces made from exotic raw material and several other more "peripheral" traits. It will also elucidate any spatial patterning evident in these mortuary behaviors. The Red Ochre Burial Complex represents an important transitional period in Eastern North American prehistory. It lies between the earlier, more egalitarian hunters and gatherers of the Archaic period, and the later more culturally stratified foragers and horticulturalists of the Woodland period. This poster seeks to gather, organize, and present some of the significant material remains from that transitional period in Wisconsin prehistory.

Aiello, Leslie

[71] *Discussant*

Aimers, Jim (SUNY Geneseo)

[295] *Peter Harrison: Remembering a Friend and Colleague*

Peter Harrison introduced himself to me immediately after I presented my first SAA paper in 1991. We shared an interest in architecture, and I was then attending Trent University where he had taught. From that moment until his death, Peter was extremely supportive personally and professionally. In this paper I introduce this session with reference to Peter's support for me and other (then) young archaeologists, both personally and through his Ahau Foundation. I will highlight his work related to Maya architecture and site planning and share some of my personal reminiscences of our friendship.

[295] *Chair*

Ainis, Amira [32] see Whistler, Emily

Ainis, Amira (University of Oregon), Kristina Gill (University of California, Santa Barbara), Jon Erlandson (Museum of Natural and Cultural History, University), René Vellanoweth (California State University, Los Angeles) and Kristin Hoppa (University of California, Santa Barbara)

[32] *Perishable but not Forgotten: The Potential Use of Seaweeds on California's Channel Islands*

California's Channel Islands are surrounded by some of the most extensive and productive kelp forests on the planet with nearshore environments containing more than 100 species of edible seaweeds. Archaeological deposits testify to the use of kelp forests by native islanders, but there has been little discussion of seaweeds as a food resource. Ethnohistoric evidence that Channel Islanders consumed seaweeds is limited, but accounts of islander foodways in general are minimal. Ethnographic and ethnohistoric accounts ranging from the Pacific Northwest to Baja California demonstrate considerable use of seaweeds by native coastal peoples. Archaeologically, the use of seaweeds is obscured by their perishable nature, but seaweed-associated mollusks can help infer

the extent to which they were used in the past and archaeobotanical identification may be an important avenue of future research. We summarize the biology, diversity, ecology, and productivity of seaweeds in the California Bight, highlighting ecological interactions with mollusks that can be used to infer kelp harvesting, and discuss nutritional data supporting the likely consumption of these resources in the past. As evidence for the use of endemic plants mounts on the Channel Islands, we provide suggestive evidence that “sea vegetables” were harvested as well.

Ainsworth, Caitlin (University of New Mexico)

[364] *13,000 Years of History in 990 Square Feet: Recent Undertakings in Public Archaeology at Petrified Forest National Park.*

Petrified Forest National Park boasts an archaeological record spanning 13,000 years of human history with occupations dating from the Paleoindian, Archaic, Basketmaker II and III, Pueblo I–IV, and Historic periods. This remarkable depth and diversity of archaeological sites has long drawn the interest and attention of researchers. Yet the public remains largely uninformed about many of the park’s unique cultural resources. Recent undertakings in public archaeology at the park are beginning to address this issue. A decommissioned former park entrance station dating to the 1930s has been selected and restored for the park’s first permanent archaeology exhibit in decades. Plans for the exhibit include highlighting the diverse implications and interpretations of the park’s cultural resources by incorporating modern Native American perspectives and both local and regional archaeological information. In addition, the exhibit will showcase the restored building, highlighting the long administrative history of the park. The opening of this exhibit marks a tremendous move forward at Petrified Forest towards better meeting obligations to the public which all archaeologists share; to inform and educate the public on the meaning and significance of the archaeological record and cultivate a desire to conserve archaeological resources.

Aiuvalasit, Michael [239] see Roos, Christopher

Aiuvalasit, Michael (Southern Methodist University)

[239] *Through Fire and Water: The Vulnerability and Resilience of Highland Ancestral Puebloan Communities to Prehistoric Droughts in the Jemez Mountains, New Mexico*

Establishing causality between climate change and cultural history is often fraught by mismatched temporal scales and weak archaeological correlates. In the Jemez Mountains of New Mexico the abandonment of large villages on the Pajarito Plateau in the early 16th century has largely been attributed to drought, however the persistence of large communities on the adjacent Jemez Plateau, which shares similar climate histories, ecological settings, and prehistoric adaptations, has not been considered. Water storage features were built adjacent to large villages in both regions. I argue that the use-life histories of these features serve as a proxy for communal management strategies to buffer the vulnerability of water scarcity. I will present the preliminary results of geoarchaeological investigations of six reservoirs on the Jemez Plateau and a regional paleohydrological reconstruction to evaluate whether prehistoric “mega-droughts” induced periods of water scarcity for Ancestral Puebloan communities, and assess if the construction and use of reservoirs enhanced the resilience of communities to droughts.

Aju, Gloria (Proyecto Kaminaljuyu), Barbara Arroyo (Direccion General del Patrimonio Cultural y Natura), Lorena Paiz (Universidad del Valle de Guatemala) and Andrea Rojas (Proyecto Arqueologico Kaminaljuyu)

[196] *The Chronological Ceramic Sequence of Naranjo, Guatemala: A Revision and Relationship to Kaminaljuyu*

Recent research at the site of Kaminaljuyu and the revision of the ceramic sequence has promoted a revision of Naranjo chronology and ceramics. The site of Naranjo is located 3 km north of Kaminaljuyu and has a significant occupation during the Middle Preclassic. An abandonment of the site has been dated to around 500-400 B.C., the moment when the first rise of Kaminaljuyu has been identified. The results of analysis presenting the relationships of various ceramic types from Naranjo connected to later Kaminaljuyu examples will be presented to link both sequences of occupations during the Preclassic. A large data set of radiocarbon dates will be presented supporting the revised

sequence for both sites.

Akai, Fumito [115] see Nakazawa, Yuichi

Akins, Nancy (Office of Archaeological Studies, Museum of NM) and John Schelberg (retired)

[354] *Chaco Legacy Studies: Archival Research, Archeomagnetic Dating, and the Role of Turkeys*

Part of the Chaco legacy includes early excavations that were under or unreported leaving large gaps in our knowledge of a considerable amount of work, especially during the University of New Mexico field school era. UNM constructed a research station with laboratory facilities and dormitories with the goal of training students and conducting long-term research on a concentration of small village sites opposite the great houses of Pueblo Bonito and Chetro Ketl. One of these excavations was at Bc 59, which was partially excavated in 1947 with additional excavations completed in conjunction with the National Park Service's ruins stabilization program. One of Tom Windes' legacies is his effort to refine dating throughout the canyon by collecting archeomagnetic and dendrochronological samples. Finally, 25 years of distance and research provides additional insights into the role of the turkey—the bird that inspired our Chaco Navajo crew's name for Tom—Tom Tazhii.

Akoshima, Kaoru (Tohoku University)

[389] *Evaluating Lithic Microwear Traces in Terms of Settlement Mobility Patterns and Raw Material Distributions*

The paper investigates concrete methods to evaluate lithic microwear data in conjunction with human mobility patterns and raw material distributions. The discovery of micro-polish variety reflects different worked materials, use-wear analysts have emphasized the reconstruction of individual behavioral episodes at the site location. However, actual wear traces reveal highly complex patterns, partially attributable to combined factors of mobility and raw material selection. Conventional methods of wear interpretation confront such problems as coarse-grained rocks, heavy surface patina, and superimposed traces. Therefore use-wear data tends to underestimate implements less suitable to high power analysis. Repeated use-wear on working edges of high quality rocks reflects gradient dichotomy between on-site consumption of local resources, and the technological strategy of retaining good quality materials of limited availability on the landscape. The proposed method would alleviate existent biases in traditional use-wear interpretations. Case studies in the Japanese Upper Paleolithic are discussed from the Tohoku University excavation projects of the Mogami River drainage, Shinjo Basin, where excellent quality materials of shale schist are locally abundant and utilized in blade based industries.

Al Kuntar, Salam (University of Pennsylvania)

[254] *Emergency Care Training Workshops for Syrian Museum Collections*

Amidst the atrocities of Syria's civil war, Syrian curators, heritage professionals, and activists courageously risk their lives to protect the country's cultural heritage. Working in areas outside of the Assad regime's control, these individuals have managed to safeguard collections salvaged from damaged museums, religious institutions, and looted sites. This paper discusses a workshop, held in Turkey, which brought together museum curators, heritage professionals, and other members of civil society from the Idlib and Aleppo provinces of northern Syria. The workshop offered training on how to secure museum collections safely during emergencies and provided participants with basic supplies for packing and securing museum collections. Furthermore, one of the outcomes of this workshop is an emergency plan to protect the Ma'arra Museum in the Idlib province. The museum holds a magnificent collection of well-preserved Roman and early Christian mosaics and has suffered collateral damage from aerial barrel bombings and repeated attacks from Jihadi militants. This presentation examines the steps required to undertake the workshop, its reception among the Syrian participants, and its subsequent outcomes.

Alaica, Aleksa (University of Toronto)

[60] *Companions or Counterparts: Considering the Role of Animal Depictions in Moche Ceramics from Northern Peru*

The Moche Period (1-850 A.D.) is well known for its iconography with naturalistic depictions of a variety of different figures and themes. One aspect of the corpus that has been under-analyzed is the common representation of plant and animal life. The ceramic assemblages of the Moche depict numerous animal species from coastal, highland and Amazonian locations. Recent work conducted at the Larco Herrera Museum reveals that various animal species may have been considered important symbols of group association and community identity. The patterns that can be ascertained from the vessels that have been analyzed reveal that dog and sea lions may have been key species used to aid in ritual and ceremonial practices. Furthermore, the representation of anthropomorphic figures with animal features suggests that Moche elites personified specific species as a means to heighten the effect and meaning of established ritual performances. This paper will also explore how animal imagery in Moche ceramics may have been expressive of totemistic and animistic ontologies. It will be argued humans and animals were not absolute categories in Moche worldviews and that the boundary separating humans from non-human entities often appears to have been blurred.

Aland, Amanda (Southern Methodist University) and R. Alan Covey (University of Texas at Austin)

[398] *Local Effects of Imperial Craft Production in Highland and Coastal Peru*

During the Late Intermediate period (LIP, ca. A.D. 1000-1400), longstanding traditions of specialized craft work and distribution of wealth goods on the north coast of Peru culminated under the rule of the Chimú Empire. In contrast, the same period in the highlands shows little evidence of specialization or large-scale access to wealth goods during the advent of the Inca Empire. This paper will compare the evidence for craft production and wealth consumption at sites located in valleys near the Chimú and Inca capitals. Using excavation data from Pukara Pantillijilla in the Cuzco region and Santa Rita B in the Chao Valley on the north coast of Peru, we examine craft production and consumption changes at the local level prior to imperial incorporation and how it changed under the rule of imperial states.

Al-Azm, Amr (SHTF Shawnee State University)

[254] *The Syrian Heritage Task Force and the Importance of Preserving Syria's Cultural Heritage*

Currently many of Syria's famous heritage sites are in territory outside of the control of the Assad regime and are at great risk from looting, damage as a result of conflict, or deliberate attack. This is not only causing irreparable damage to Syria's cultural heritage but also destroying the common history that provides Syrians with a shared sense of identity. In order to help protect this heritage and preserve it for the future, a Syrian Heritage Task Force (SHTF) was recently established. The SHTF provides an organizational framework for addressing emergency preservation concerns among heritage professionals and activists inside Syria, training, documenting and advocating for heritage protection among the international community. It is hoped that by working to protect and preserve Syria's threatened history and heritage we are safeguarding its future, too.

Albeck, María

[180] *Agricultural Landscapes in Northern Argentina*

Quebrada de Humahuaca is an important gorge in northwest Argentina, which lies between the altiplano-like puna to the west and the forested lowlands to the east. It has a long and interesting agricultural history spanning nearly three millennia from the settlement of the first farmers to the present. The prehispanic archaeological landscapes are best preserved in the northern part of Quebrada de Humahuaca, due to the strong erosional processes that cut deep into geological sediments. On the lower parts of the west facing slopes, ancient agricultural structures almost completely cover the surface, but belong to different moments of the prehispanic past. Three occupations are considered: the first farmers (pre-11th century), the societies that developed between the 11th and 15th century, and the Inca occupation (15th to 16th century). Different approaches were used to examine the construction, remodelling, and use of ancient agricultural

features in order to understand the nature of past agricultural landscapes. The most important include the type and placement of cultivation surfaces, the nature of the stone piles built when clearing the terrain, the irrigation systems, lichenometry, palynology, and others.

Albert, Rosa-Maria (ICREA/University of Barcelona), Irene Esteban (University of Barcelona) and Curtis Marean (Arizona State University)

[294] *Paleoenvironmental Reconstruction Using Fossil Phytolith Assemblages at Pinnacle Point Caves 13B and 5/6 during Middle Stone Age, Mossel Bay, South Africa*

Climatic conditions played a key role in the evolution of modern human lineage and South Africa has been considered, based on genetics and fossil evidence, a suitable area. South Africa hosts the smallest of all-known biomes (Fynbos), characterized by hyper diversity with high species richness and large presence of edible plants. We present the phytolith record from the archaeological sites Pinnacle Point caves 13B and 5/6 spanning from ~160 to ~50 ka. This study aims at reconstructing the past environmental and climatic conditions at the central South Africa coast during this crucial period in human evolution. We assess fossil phytolith assemblages and the occurrence of grass subfamilies (C3 – C4) in order to achieve this objective. The phytolith record indicates changes in vegetation composition along the sequence indicative of climate shifts. Phytoliths characteristic of the Restionaceae family, a typical component of Fynbos vegetation, are present during most of the occupation moments. Grass phytolith presence varies along the sequence suggesting grasslands movements. Among grasses, there is a general dominance of C3 grass phytoliths with sharp increases of C4 characteristic phytoliths at specific occupation moments. These results correlate well with previously published and new paleo-reconstructions based on isotopic analysis from speleothems

[309] *Chair*

Albert, Rosa Maria [309] see Clifton, Breanne

Alberto-Villavicencio, Angeles (Profesora-Investigadora)

[129] *Apropiación de recursos naturales, configuración territorial y paisajística en torno al río Lerma, Zona Metropolitana La Piedad-Pénjamo*

En este trabajo se analizan las formas de apropiación de los recursos naturales y el uso de los servicios ecosistémicos del río Lerma para las actividades cotidianas y económicas durante la época reciente, asimismo, se explican los procesos de configuración territorial y transformación paisajística en torno al río en la zona Metropolitana La Piedad-Pénjamo. Se analizan los procesos de degradación de la calidad ambiental del río que han alterado la provisión de servicios ecosistémicos, y se ponen en valor aquellos que se mantienen para algunos usuarios y actividades económicas. A partir de la explicación de los procesos se sugiere la interacción de múltiples actores y agentes para la gestión ambiental del río en la zona metropolitana.

Albore, Alex [73] see Frances, Guillem

Alcantara, Keitlyn (Vanderbilt University), Steven A. Wernke (Vanderbilt University) and Lane F. Fargher (Centro de Investigación y de Estudios Avanzados de)

[249] *A Spatial Analysis of Proposed Egalitarian Site Organization in Postclassic Tlaxcallan*

The Tlaxcaltecas are known as one of the few groups to maintain autonomy from the Late Postclassic expansion of the Aztec Triple Alliance in Central Mexico. This is particularly interesting given their location, surrounded by Aztec allies and tributaries. In their 2010 paper, Fargher et al. proposed that the success of the Tlaxcallan state was attributed to a political ideology that emphasized egalitarianism rather than imperialism. In a 2011 paper, Fargher et al. expanded upon this hypothesis following a full-coverage survey of the city of Tlaxcallan and the adjacent governmental complex of Tizatlan. The authors proposed that given its isolated nature, Tizatlan might have served as a neutral meeting place for government officials from the 20+ plaza groups of Tlaxcallan, as well as the rest of the state's territory. This poster presents a GIS cost-path analysis to explore the "neutral meeting place" hypothesis. Using a Digital Elevation Model of the site

topography and data for culturally constructed walking barriers (architecture, agricultural fields, etc.), this poster presents estimated walking distances and walking times from each plaza to and from Tizatlan. The results are compared between sites to understand how walking costs might define relationships between the city's plazas and Tizatlan.

Alconini, Sonia [184] see Friedel, Rebecca

Alconini, Sonia (University of Texas At San Antonio)

[398] *Frontier, Inka Craft Production and the Kallawayá Territory*

In this paper I will evaluate the nature of Inka specialized craft production in the province of Kallawayá, and the ways in which the manufacture and distribution of imperial pottery was an avenue to enhance status. I have two goals in this presentation. First, using archaeological and ethnohistoric data, I will assess the nature of production in the ceramic workshop of Milliraya and the role of specialized mitmaquna colonies in such processes. Second, I will illuminate the ways in which the highly valued Taraco Polychrome imperial style was distributed in the Inka imperial centers of the Kallawayá region. Such comparison will provide a window to understand the intersection between specialized craft production, imperialism and power, and the importance of such goods in the Inka imperial frontier economy.

Aldeias, Vera [35] see Goldberg, Paul

Aldeias, Vera (Max Planck Institute for Evolutionary Anthropology)

[190] *Sea Shells by the Sea Shore: microstratigraphic investigations of the Cabeço da Amoreira Mesolithic shell midden (Muge, Portugal)*

Cabeço da Amoreira is a long-known Mesolithic shell midden located in the shores of the Muge River in Portugal. Like in similar midden contexts, sedimentation is greatly influenced by anthropic inputs associated with an intensive exploitation of marine and estuarine resources. The abundance of shell-fish refuse favors an intricate and laterally variable stratigraphic succession of layers and lenses, which result in an extensive artificial mound. The complex stratigraphy of shell midden sites has been difficult to decipher and few studies have focused on the microstratigraphic record of midden formation. The present paper applies geoarchaeological and soil micromorphological techniques to investigate site formation and the nature of anthropogenic activities at Cabeço da Amoreira. Given the recurrent accumulation of similar types of components throughout the sequence (namely, shells, charcoal, bones and geogenic grains), we apply a microfacies analysis to distinguish between primary activities (such as discrete shell tossing events, trampled surfaces and combustion features), versus secondary position of the assemblages in dumped or reworked deposits. The complex superposition of events seen at Cabeço da Amoreira underlines the role of micromorphology for the identification of behavioral signatures and its relevance in understanding the formation of large shell midden sites.

Aldenderfer, Mark (University of California) and Laure Dussubieux (The Field Museum)

[140] *Regional Connections Identified through the Analysis of Glass Beads from Samdzong, Upper Mustang, Nepal, CE 500*

Samdzong is found in the Kali Gandaki drainage in Upper Mustang, Nepal, just to the south of Tibet. Known from historical sources that date to the 17th C., Samdzong was an important waypoint on the salt trade route between South India and the Tibetan Plateau. Aside from salt from the plateau, these documents say little about other materials that were exchanged, and virtually nothing about their places of origin. The antiquity of the salt route was simply assumed. Excavations at the site conducted over the past three years have added both a wider regional scope and a greater time depth to our understanding of trade in this region. Glass beads have contributed much to this improved understanding of regional trade and its local expression at Samdzong. Analyzed by LA-ICP-MS, the beads tell a story of far-flung ties: trade from the west with ancient Sassania (now in modern Iran), the Sindh to the south (now in modern Pakistan), and participation in the Asia-Pacific bead trade that may include production loci in far southern India or southeast Asia. We will describe

these results in greater detail and will compare them to the analyses of other artifacts that circulated in this region.

Aldenderfer, Mark [205] see Eng, Jacqueline

Alders, Wolfgang (University of California, Berkeley) and Jared Koller (Boston University)

[238] *Rice Terraces as Defensive Structures: Landscape Modeling in Hapao, Ifugao*

This paper investigates the potential defensive functions of rice terrace construction in Ifugao, Philippines, through an exploration of how landscape analysis and 3D modeling might contribute to established archaeological and ethnographic understandings of the region. While still under debate, a growing body of archaeological evidence suggests that the settlement of the Ifugao highlands and the development of intensive rice terrace farming may have been a strategy for avoiding political violence caused by Spanish colonial incursions on the island of Luzon beginning in the 16th century A.D. During the 2014 field season in Hapao, Ifugao, Philippines, we recorded over 150 rice terrace walls that form a single rice terrace system in order to gather a data set for our 3D model, which facilitates viewshed analysis and modeling of walking difficulty. We suggest that in addition to being part of subsistence management, a rice terrace construction could have played a secondary role as a defensive structure. This would have been difficult for large armies to effectively navigate, but would have still allowed for small-scale warfare practices to remain, such as the famed Ifugao head-hunters.

Alegria, Crystal [95] see Fulton, Marsha

Alegria, Crystal (Project Archaeology) and Shane Doyle (Montana State University/Project Archaeology)

[236] *Making History Relevant and Sustainable: Listening to Descendant Communities through Collaboration and Partnership*

Project Archaeology is a heritage education organization devoted to curriculum development that gives students the tools to better understand the cultural landscape of the world they live in. One of our main goals is to collaborate and partner with descendant communities in all that we do to research, develop, and implement our programs. In this paper we will outline our collaborative theory and practice, and our goals to encourage multiple ways of knowing, validate tribal history, and support community empowerment. Through education we can show students the importance of a socially useful heritage, and they can make informed judgments concerning their own history and the history of others, leading to a world where archaeology is relevant and sustained.

[390] *Discussant*

Aleshire, Rachael and Olivia Navarro-Farr (College of Wooster)

[95] *Building and Debating National Identity: Three Case Studies of the Ownership of Ancient Artifacts*

Artifacts are crucial to the understanding of past societies. Archaeologists are able to learn about the values and cultural practices through material remains left behind by ancient civilizations. Museums display artifacts not only to educate the general public, but to make modern nationalistic statements connecting the country in possession of material to the ancient civilization which created it. The critical point with most of these exhibitions is that many of the artifacts are not excavated from sites within the nation itself, but rather have been collected over the years from distant locations. The problem with this is that the removal of artifacts from their site has not always been done by legal means, and many of the more popularly known cases involve artifacts taken from their sites before laws were created to address the ownership of artifacts. In discussing the ownership of artifacts and the cultural heritage associated with them, it is important to know the story behind an artifact's excavation and acquisition, as well as have an understanding of how laws display its placement in museums. This project examines three case studies: the Elgin Marbles, the Rosetta Stone, and the Trojan Treasure.

Alex, Bridget (Harvard University), Omry Barzilai (Israel Antiquities Authority) and Elisabetta Boaretto (Weizmann Institute-Max Planck Center for Integrati)

[64] *Chronology of Ahmarian and Levantine Aurignacian Occupations of Manot Cave, Israel*
Recent excavations of Manot Cave, in the Western Galilee, Israel, have revealed abundant Upper Paleolithic finds, including modern human fossils, in situ hearths, shell beads, bone and stone tools, and faunal remains. The two major Early Upper Paleolithic traditions of the Levant—the Ahmarian and the Levantine Aurignacian—are well represented at Manot Cave. The Ahmarian is thought to have developed from local Initial Upper Paleolithic traditions, while the Levantine Aurignacian may represent a back migration of peoples and/or ideas from Europe. At Manot, a Levantine Aurignacian assemblage overlies an Ahmarian assemblage. Here we present the challenges, methodology, and results of radiocarbon dating at Manot Cave. The dating of over 40 identified charcoals suggests that the Levantine Aurignacian tradition was present between 39- 35 kcal B.P. and Ahmarian occupations occurred between 46- 42 kcal B.P.

Alex, Lynn and Elizabeth Reetz (University of Iowa Office of the State Archaeologi)

[98] *Enhancing Archaeology Education and Outreach in Iowa through Project Archaeology*
Iowa has been an active partner in Project Archaeology since 2002, joining at a time when the national program was redefining its mission, recreating its curriculum, and expanding its partnerships. This presented the opportunity to assist in determining the scope and direction of national Project Archaeology while remaining cognizant of the challenges Iowa would face as a state where curriculum decisions are locally determined. Thirteen years later, Iowa PA has a stable foothold with dedicated institutional resources, established statewide partnerships, and its own place-based curriculum. Promising new initiatives include environmental education and university-based partnerships.

Alexander, Rani (New Mexico State University)

[76] *The Gilded Age in Eastern Yucatán, Mexico: The Age of Betrayal or the Rise of the Middle Class?*

The social transformations produced by rapid industrialization and expansion of henequen production in the late nineteenth century in western Yucatan were not what happened in Maya-speaking communities further to the east. The Gilded Age in eastern Yucatan was attenuated because communities suffered the protracted aftershocks of the Caste War of Yucatan (1847-1901), which may have repressed wealth disparities instead of heightening them. In this paper, I examine the archaeology of haciendas and rural farming settlements situated southwest of Valladolid, Yucatan. Analysis of the distribution and architectural characteristics of haciendas and ranchos in this area reveals that small-scale cattle-raising was a key entrepreneurial strategy that enhanced social mobility and aided economic recovery in the region. Acasillamiento and debt peonage were practiced on only a few large haciendas, most dating to the early 20th century. Using documentary census data, I measure variation in inequality among households in rural settlements using GINI coefficients for the 1880s and 1900s. The trajectory of globalization in this region offers an important comparison to the pattern observed further west, near Mérida.

[76] *Chair*

Alexander, Karen [81] see Howey, Meghan

Alexandrino Ocaña, Grace (Pontificia Universidad Católica del Perú - PACO)

[134] *Wari funerary contexts: An Elite Funerary Chamber in Cerro de Oro, Cañete Valley*
Evidence of looted tombs from Conchopata and Huari—the capital of Wari—have allowed archaeologists to identify up to three formal types of funerary structures. Researchers also point out that variants of these types of funerary enclosures identified at both sites might have held local chiefs and provincial governors. Evidence of such elite Wari funerary contexts has also been found in Espítiru Pampa, in the high jungle of Vilcabamba, and Batan Urqo, in Cusco, among others. Although the information from looted funerary contexts is incomplete, there are grounds to believe

that these structures served as graves for local elites buried with luxury objects understood as symbols of Wari authority. However, Wari mortuary ritual is diverse in different regions and presents temporal variations.

A funerary enclosure was excavated at Cerro de Oro in the Cañete Valley containing a funerary bundle associated with over a hundred luxury objects, primarily textiles. Based on comparisons we can propose that this funerary context is analogous to the intrusive funerary contexts recorded at different archaeological sites belonging to the Middle Horizon along the southern and central coast.

Alexis, Marie [181] see Lejay, Mathieu

Alfaro, Martha (Centro INAH Baja California), Dr. Andrea L. Waters-Rist; (Human Osteoarchaeology and Funerary Archaeology Pr) and Danny Zborover (Center for US-Mexican Studies, UCSD)

[410] *An Osteobiography of a Oaxacan Chontal Young Adult Female*

Skeleton Sk-CV-01 is a female around 18 years of age, carefully buried in a stone cist in the Chontal Highlands of southern Oaxaca during the Late Postclassic or Early Colonial period. She is the first and only human skeleton known from controlled excavations in the area, and the archaeological context and historical documentation associate her with the Chontal people who still inhabit the region. In this presentation the results of the archaeological, osteological, and stable isotope analyses of this unique skeleton are presented. The skeletal and dental analysis revealed many pathological conditions, including porotic hyperostosis, cribra orbitalia, periostitis, a healed fracture, dental caries and abscesses, periodontitis, and possibly tuberculosis. Musculoskeletal markers indicate differential use of the arms, possibly related to activities such as grinding corn. The cranium shows evidence of modification, which we suggest occurred from the carrying of heavy loads via a tumpline from a young age. The stable carbon and nitrogen isotope data suggest that her diet was high in maize, and low in animal protein which came from terrestrial herbivores low on the trophic chain. These results provide us with a first glimpse into the health conditions, daily activities, and diet of this little known ethnic group.

Alfonso-Durruty, Marta [251] see Morello Repetto, Flavia

Aliphat, Mario (Colegio de Postgraduados Campus-Puebla. México)

[86] *El paisaje natural de la Cuenca del Alto Usumacinta*

Los estudios de las relaciones entre la Cultura y la Naturaleza son un aspecto importante en las relaciones espaciales entre recursos naturales y asentamientos humanos. En investigaciones sobre la distribución espacial de recursos y sitios arqueológicos es primordial definir los parámetros del mundo natural que establecen el potencial para que las comunidades humanas logren florecer. Esto se alcanza mediante la construcción, al nivel del paisaje natural, de unidades espaciales básicas de recursos. Las unidades básicas del paisaje se establecen primordialmente mediante estudios de la geología estructural de una región que incluye aspectos como topografía, pendientes, geomorfología, tipos de suelos, hidrología, así como distribución y tipos de vegetación y vida silvestre. La idea es establecer la distribución de aquellos rasgos que determinan patrones y sistemas del uso de la tierra. En este trabajo presentamos estudios básicos de la arqueología del paisaje en el Alto Usumacinta, con la intención de establecer el potencial económico de áreas y localidades. Se espera poder definir y establecer aspectos significantes entre las unidades básicas del paisaje y los asentamientos humanos como Piedras Negras y Yaxchilán.

Alix, Claire [302] see Mason, Owen

Alizadeh, Karim [402] see Samei, Siavash

Allan, James

[416] *They Build Ships There: Gold-Rush San Francisco's Maritime Industries*

The unprecedented growth of San Francisco during the California Gold-rush was fueled in part by the ingenuity and ambitions of entrepreneurs who recognized and exploited economic opportunities unrelated to the activities in the gold fields. This paper will discuss several maritime enterprises whose remains have been discovered and documented during archaeological investigations William Self Associates has conducted along and within the former confines of early San Francisco's Yerba Buena Cove.

[62] *Chair*

Allard, Francis (Indiana University of Pennsylvania)**[349] *Settlement Archaeology in Southeast China during the Han Dynasty: Limitations and Approaches***

As with other regions of China with limited settlement evidence, our understanding of life and developments in Lingnan (present-day Guangdong and Guangxi) during the Han dynasty relies in large part on contemporary texts and burial evidence – over 3000 Han dynasty graves have been identified to date in Lingnan. Although a number of non-funerary sites are now known, they offer only limited information about internal organization and function, the exception being the impressive Nanyue palace in Guangzhou. Along with reviewing the available information about such sites, this presentation considers different approaches to the study of Han dynasty settlement patterns in the absence of sufficient numbers of non-funerary sites. Relevant sources of information include: 1. The spatial distribution Han period burials; 2. Environmental considerations; and 3. Later texts with references to the region's settlements and interaction with native populations. Together, these sources provide useful insights into a number of issues pertaining to the Chinese presence in Lingnan during the Han dynasty, including the extent of administrative and military control, and the nature of interaction with the many local groups that inhabited the region's mountainous landscape.

Allcock, Samantha [210] see Jenkins, Emma

Allen, Melinda (University of Auckland), Alex E. Morrison (University of Auckland, New Zealand), Andrew M. Lorrey (National Institute of Water and Atmospheric Research) and Geraldine Jacobsen (Australian Nuclear Science and Technology Organisation)**[77] *Assessing Island Habitability and Land Use on Polynesia's Smallest Islands***

In a series of papers, Bill Dickinson has outlined the timing of late Holocene sea level fall across the Pacific and its effects on island habitability and human settlement. He proposed that island settlement, particularly in East Polynesia, was constrained, or in some cases impossible, during the mid-Holocene sea level highstand, when low-lying islands (e.g., atolls) were awash and shallow near-shore environments restricted. Stable islets of modern configuration only developed after declining high tide levels fell below mid-Holocene low tide levels (i.e., the crossover date), a process that was regionally variable. We examine his model, and build on his research on the near-atoll of Aitutaki, southern Cook Islands. Specifically we consider: 1) the timing of human settlement both on the Aitutaki mainland and at recently dated islet localities, 2) the elevation of dated cultural deposits across Aitutaki in relation to current shorelines; 3) the age of emerged microatolls that mark former sea level high stands; and 4) land availability at key points in time. The analysis gives insights into the timing and distribution of human activities in relation to the evolving land and seascape.

Allen, Kathleen [109] see Katz, Sandra

Allen, Mark (California State Polytechnic University, Pomona)**[138] *Pay Dirt in the Mojave Desert: An Assistance Agreement between Cal Poly Pomona and the California Bureau of Land Management***

This paper reports on more than a decade of archaeological fieldwork conducted at two archaeological landscapes in the western Mojave Desert by Cal Poly Pomona undergraduate students on lands managed by the Bureau of Land Management (BLM) Ridgecrest Field Office. The majority of funding for the project was provided by a multi-year BLM Assistance Agreement. It

represents an outstanding example of a “win-win” partnership between a university and government agencies. Students received training in archaeology and were provided with research opportunities in the “real world” of public lands stewardship. In turn, the BLM obtained archaeological data, analysis, and interpretation that will assist their mission of protecting cultural resources and educating the public. The third benefit is the detailed archaeological investigation and publication of two quite different archaeological landscapes that address important research questions in the western Mojave and southern Sierra Nevada. This partnership thus provides new insights on the most well-known archaeological resources of the region such as the Coso obsidian quarries, which supplied much of California and the Great Basin with volcanic glass for millennia, or the multitude of world-class petroglyphs in the Coso Mountains that still capture the imaginations of visitors.

Allen, Megan (The Catholic University of America)

[208] *Spinning in the Middle Horizon: Spindle Whorls from the Site of Uraca in the Majas Valley*

Textiles were a major economic component in the prehistoric Andes. Mortuary evidence indicates an association between women and textile production. While spinning may have been an activity undertaken by both men and women, women dominated the produced domestic textiles and therefore were often buried with textile related tools. Spindle whorls from mortuary contexts can be used to determine the quality of the final cloth. Smaller spindle whorls produce a finer quality of yarn for elite products while larger whorls produce yarn more suited for domestic use. This project will focus on the production of domestic and elite status textiles. From the Middle Horizon cemetery site of Uraca in southern Peru 87 spindle whorls have been recovered. Many of the whorls are associated with yarns either wrapped around the shaft or extending from the interior of the whorl. All of the yarns are single plied and Z spun, suggesting a non-specialized function. Using ethnographic and ethnohistoric accounts along with archaeological evidence I will seek connect the spindle whorls to domestic yarn production.

Allen, Susan (University of Cincinnati) and Kathleen Forste (Boston University)

[291] *On the Periphery of Collapse: An Archaeobotanical View from the Mycenaean Hinterland at Tsoungiza*

The site of Tsoungiza, situated in the Nemea Valley of southern Greece, offers a glimpse into processes of agricultural and land-use practices in the Mycenaean hinterland and their intersection with the waxing and waning of Mycenaean political, economic, and social control. After abandonment in the Early Helladic III period (ca. 2,000 B.C.), the site was re-occupied during the late Middle Helladic III (ca. 1,650 B.C.), at a time of regional population expansion associated with the rise of the palace center at nearby Mycenae. Similarly, this brief florescence of Tsoungiza ended with its re-abandonment at the end of Late Helladic IIIB/early Late Helladic IIIC (ca. 1,200 B.C.), coincident with the collapse of Mycenae. Although rarely considered in narratives of political emergence or collapse, archaeobotanical remains provide a unique view of the role of economic reorganization that accompanies these major cultural transformations. The view from Tsoungiza – the only peripheral village where systematic recovery of plant remains has been undertaken – illuminates diachronic shifts in land-use practices and economic organization at Tsoungiza over the course of the Middle and Late Bronze Age that are entangled with significant environmental and sociopolitical changes that accompanied the rise and collapse of Mycenae.

Allen, Jim

[296] *Overpaid, Over-Sexed, and Over Here: O'Connell in Australia*

Jim O'Connell arrived in Australia in 1973 to take up a five-year research fellowship at the Australian National University in Canberra. Although he returned to the US in 1978, O'Connell has not only maintained diverse interests in Australia and its archaeological record but has also returned there perhaps 25 times to carry out fieldwork, present papers at conferences and to interact with colleagues. It is clear that some of O'Connell's major contributions to world anthropology have been directly informed by his Australian experiences, but that equally he has remained a serious player in the development of Australian archaeology for the last 40 years. This paper reviews some of the major themes of O'Connell's interaction with Australia, Australians, and Australian archaeology,

including his early influence in a Cambridge (UK) dominated archaeology department, his promotion of the discipline and his practical and intellectual contributions to it. In parts irreverent, the paper acknowledges the unique role O'Connell continues to play in Australian archaeology.

Allen, Josh (PAR Environmental Services Inc.)

[392] *Settlement Patterns in Southeastern Sacramento County*

Twenty years of cultural resource management efforts have culminated in over four thousand acres of inventoried land in southeastern Sacramento County. With nearly one hundred recorded lithic scatters, middens, bedrock mortars, rock art, and rock shelter sites, this archaeological evidence offers the chance to better understand prehistoric settlement patterns along the Cosumnes River and Deer Creek drainages. The data, normally contained in fragmented surveys and limited testing, is an initial look at the potential offered by these studies with future hopes to expand research opportunities and knowledge in the area.

Allison, James [6] see Ferguson, Jeffrey

Allison, James (Brigham Young University)

[274] *Neutron Activation Analysis of San Juan Red Ware Pottery*

San Juan Red Ware pottery is most common in southeastern Utah, where most of it appears to have been made, but is widely distributed throughout the Four Corners region from about A.D. 750 to 1100. Neutron Activation Analysis of San Juan Red Ware potsherds shows that there were numerous production locales, and red ware pottery from southeast Utah falls into several distinguishable chemical groups. These chemical groups have distributions that suggest relatively little exchange among the production area sites. Despite differing from red ware producers in styles of material culture (ceramics, architecture, and settlement patterns), and probably social identity, Pueblo I people living to the east of the red ware production zone also obtained San Juan Red Ware. Most of the red ware on southwest Colorado Pueblo I sites appears to come from the eastern part of the production zone, but the distribution of the chemical groups varies from site to site. Red ware exchange thus appears to have linked Pueblo I people across the Mesa Verde region through complex networks of interaction that cross-cut apparent differences among social groups.

[127] *Discussant*

Almansa-Sanchez, Jaime (JAS Arqueología)

[72] *Ghost Tourists in Gondar: Sustainable Tourism and Archaeological Heritage*

Literature in heritage and tourism usually addresses the multiple benefits of visitors, their threats and the controversial concept of 'return'. As heritage managers we usually focus our efforts on these visitors, as the panacea for everything. In the context of postcolonial theory and public archaeology, there are two factors of this equation that we usually forget: local communities and the real recipients of the money. Working in Gondar (Ethiopia) I have come to define the concept of the 'ghost tourist' in the context of a World Heritage Site and a great affluence. The concept of tourism in local education is far from being sustainable and, therefore, the alleged benefits of this tourism are questionable. Trying to change the model is a challenge, but it can address the problems the current situation and help building new capacities and real benefits in the way other projects are already working. This paper will address the phenomenon of the 'ghost tourist' in Gondar and the solutions are being proposed to engage a sustainable model of tourism where archaeological heritage has a lot to say.

al-Nahar, Maysoon [64] see Olszewski, Deborah

Alonso, Christina (William Self Associates)

[62] *Health and Mortuary Analysis of the Transbay Skeleton*

During the 2014 geothermal trenching for the Transbay Transit Center Project, a single burial was

uncovered at approximately 1.8 meters below existing sea level, encased in estuarine clay. This anaerobic clay preserved the bone and associated artifacts almost perfectly. Radiocarbon dating placed this burial at ~7590 years B.P., making it one of the oldest burials within the region. The young adult male was wrapped in a woven fibrous mat with numerous wood artifacts surrounding the legs and torso. Patterns of mortuary practices, general health, and wellness during this temporal period are not well known due to the lack of available data. Very few burials dating to this time have been found, even fewer have been found with such a high level of preservation. This skeleton allows a unique perspective into life on the San Francisco Bay at a time before the large scale shell mounds were created. CA-CCO-637, CA-CCO-696, CA-SCL-065, CA-CCO-548, and CA-MRN-17 were all dated to a similar chronological time predating many sites within the greater San Francisco Bay area. The burials from these sites will be compared in order to try and glean information or distinguish patterns regarding styles of mortuary treatment, and overall health and wellness.

Alonso, Isuara Nereyda (PARACOPAN), Antonia Martínez (PARACOPAN) and César Antonio Martínez (PARACOPAN)

[366] *Retos de la conservación arqueológica: Una vista desde Copan*

Varios proyectos en marcha de capacitación e intervención están contribuyendo a la creación de un programa de conservación de campo sostenible para la arqueología de Copan. La construcción de un nuevo laboratorio para la conservación de la escultura y oportunidades para participar en talleres para personal local están ayudando a reforzar la misión del Instituto Hondureño de Antropología e Historia y las ONG en el resguardo y conservación de este Sitio de Patrimonio Mundial. En esta presentación hacemos hincapié en varios proyectos recientes en que los autores están involucrados activamente, y examinamos los retos de conservación sostenible del patrimonio mundial de Copán.

Alonso-Olvera, Alejandra, Nora Ariadna Perez (Instituto de Fisica UNAM), Jose Luis Ruvalcaba (Instituto de Fisica UNAM) and Jaime Torres (Escuela Nacional de Conservacion, Restauracion y M)

[399] *Selective Use and Technology of Limestone and Lime Products Employed in Mosaic and Stucco Decorations in Ek' Balam*

This study comprises preliminary results of analyses made on different type of limestones employed in models and stucco supports, and other stone products used by the ancient Maya of Ek' Balam. The ancient Maya technology results in high efficiency and durable materials appropriate for the architectural and decorative program at the site, which has positively influenced the preservation of this heritage. The study of mineral elements from various limestone, and lime products (sascab and kut) using petrographic analysis and x-ray diffraction and fluorescence, allows for a general chemical characterization and evaluation of their physical properties that made up the technology of the Late Classic architecture. These examinations are convenient to recreate methods and techniques replicating the technology of ancient materials for in situ preservation of this heritage

Alonzi, Elise [315] see Lash, Ryan

Alonzi, Elise (Arizona State University), Ryan Lash (Northwestern University), Terry O'Hagan (University College Dublin), Anne Wildenhain (University of Notre Dame) and Ian Kuijt (University of Notre Dame)

[315] *The Salmon of Knowledge: Determining the Influence of Marine-Derived Isotopes on the Diets of Medieval and Early Modern Irish Populations*

Many medieval and early modern villages and abbeys in County Galway, Ireland are situated directly on the coast. This study seeks to understand the pathways that marine resources follow as they enter diets of religious and lay Irish populations by using isotopic, ethnographic, and historical evidence. The isotopic portion of this study elucidates how marine-derived isotopes cycle through the coastal Irish landscape and are included in the diet. Ecological sampling on the Atlantic island, Inishark, addresses the impact of the little-understood Seaspray Effect on terrestrial resources. Because strontium isotopic ratios are theoretically constant throughout the world's oceans, sprayed ocean water coating plants and soil may mask terrestrial bedrock-based strontium isotopic ratios that are used to determine human diet and mobility. As one of the most westerly points of Europe,

Inishark experiences strong seaspray and is a prime location to evaluate the impact of ocean water on crops grown in coastal fields. A chemical mixing equation calculates the proportion of marine and terrestrial isotopic contributions to coastal Irish diets. This study provides a basis for interpreting strontium isotopes in other coastal regions, as well as a contextualized understanding of the marine component of early modern and medieval Irish diets.

Alonzo, Patricia

[249] *Disruption or Continuity?: Iconography on Portable Objects in Classic to Epiclassic Jalisco and Zacatecas*

This study investigates the rarely studied iconography of Pseudo-Cloisonné vessels from Jalisco and Zacatecas through a comparison with earlier portable imagery. Recent interpretations of the shaft tomb figures of the Formative/Classic periods have begun to interpret their religious and political content and contextualize them archaeologically. But imagery in western Mexico takes a radical new turn in the Epiclassic period (A.D. 500-900), when the most elaborate iconography is found on the complex Pseudo-Cloisonné ceramics. The manufacture of Pseudo-Cloisonné begins with a pre-existing vessel, to which is applied a thick gray slip. Cells are next cut through this new surface to create an image, and lastly brightly colored pigments are applied to fill each of the cells using an adhesive. The vessel is not fired once the decoration is complete and is very fragile, and few vessels have ever been published in their entirety. The complex iconography on these vessels includes depictions of people, eagles, serpents, and abstract symbols. This study compares the themes present in these two forms of portable imagery, to help understand the changes that took place in the transition to the Epiclassic in Jalisco and Zacatecas.

Alram-Stern, Eva [79] see Burke, Clare

Alrawi, Zaid (Penn. State)

[254] *New Observations of Looting at Archaeological Sites in Southern Mesopotamia*

Archaeological sites in Iraq have suffered the consequences of unstable political conditions. Due to this volatile situation law enforcement has been inconsistent and allowed antiquities looters to vandalize southern Mesopotamian sites. This resulted in differential rates of damage among the country's cultural heritage sites. By focusing on the ancient archaeological site of Girsu (modern-day Telloh) and its hinterland, I used Digital Globe imagery, remote sensing techniques and recent ethnographic information to show that the social aspects in people's lives have effects on antiquities looting in southern Iraq.

Alsgaard, Asia

[193] *The Role of Offerings in Interpreting Architecture: Evaluating Human Remains at Xultun, Peten, Guatemala*

During the 2014 field season at Xultun, Peten, Guatemala, two sets of human offerings and a tomb were identified in the center of "Los Arboles" (XUL12F19); however, the relationship between the different sets of remains and the structure is unclear. While the Maya are known for placing offerings around tombs and in entryways as closing ceremonies, human offerings are a less-common subset. To date, their role in Maya society is not entirely understood although their presence has been claimed at numerous sites. The goal is to evaluate whether the human remains found at "Los Arboles" can properly be described as offerings through an examination of similar deposits in the Maya Lowlands. The following research will discuss the distinction between ancestral remains and sacrifices, the role of children in ancient Maya society, and mortuary practices at "Los Arboles." This evaluation of the human remains interred within the site aims to further the understanding of "Los Arboles" as a possible ancestral shrine.

Alt, Kurt W. [16] see Benz, Marion

Alvarado, Jennifer and Amber VanDerwarker (University of California Santa Barbara)

[172] *Patterns of Plant Use at Los Soldados and Beyond*

There has been much speculation regarding the nature of agriculture and subsistence among the Formative Gulf Coastal Olmec, and regional subsistence reconstructions based on primary plant data are now beginning to bear fruit. Recent excavations in the rural Olmec heartland and the neighboring Sierra de los Tuxtlas have yielded pertinent archaeobotanical data that have revealed considerable local variation in plant foodways. We build on these studies by presenting archaeobotanical data from Los Soldados, a Middle Formative habitation site along the Río Pesquero, and present a comparative analysis with extant data. Results from Los Soldados reveal that local variation in daily foodways is the regional norm, rather than the exception.

Alvarez, Myrian [176] see Zurro, Debora

Álvarez, Myrian [73] see Caro, Jorge

Álvarez-Fernández, Esteban [74] see Arias, Pablo

Álvarez-Sandoval, Brenda [231] see Vallebuena, Miguel

Alvey, Heather [3] see Thomas, Jayne-Leigh

Alvitre, Cindi [95] see Brennan, Candice

Amador, Julio (UNAM)**[352]** *Animal Symbolism in the Rock Art of the Sonoran Desert*

In this paper we propose a line of interpretation referred to the symbolism attributed to the zoomorphic figures, present in the rock art of the Sonoran Desert. We confront the results of rock art analysis and classification with a systematic study of the myths and legends of the Uto-aztecan cultural groups that lived in the region, when Europeans arrived. We pay special attention to the traditions of the O'odham, who inhabited the Sonoran Desert where we can find the rock art that belongs to the Trincheras Culture of northwestern Sonora. Though, as several ethnographers that have studied the traditions of the Uto-aztecan groups of western and northwestern Mexico and of the Southwest have pointed out, we can find very important coincidences in all of them, as well as in the rock art figures of northwestern Mexico and the American Southwest. By these means we can begin to build a regional and cultural perspective of rock art analysis and interpretation.

Amador, Fabio Esteban [355] see Hoff, Aliya

Ambrose, Stanley H. [174] see Slater, Philip

Ambrose, Stanley (U. Illinois, Urbana-Champaign), Fiona Marshall (Washington University, St. Louis) and Steven Goldstein (Washington University, St Louis)**[406]** *Nutrient Hotspots and Pastoral Legacies in East African Savannas*

Negative impacts of pastoralists on African savannas have been largely debated, but the creation of nutrient hotspots may also have significant positive effects. African savanna productivity is largely nutrient limited, however, ecologists show corrals in abandoned Maasai pastoral settlements have high nitrogen and phosphate levels, and distinctive vegetation and grazing successions. Such hotspots may drive ecosystem structure and function, but little is known about how long-term or how widespread they may be. Two newly discovered Elmenteitan sites, Oloika 1, Oloika 2 and the Savanna Pastoral Neolithic sites of Indapi Dapo in SW Kenya and GvJm 44 at Lukenya Hill, revealed distinctive archaeological sequences, dung and offsite profiles. Nitrogen and carbon isotopic analyses are still ongoing but suggest long term nutrient enrichment. Repeated visits of herders and wildlife to ancient pastoral camps results the creation of distinctive anthropogenic landscapes in the

Serengeti-Mara ecosystem and other African savannas.

Ames, Kenneth (Portland State University)

[80] *Dating Pacific Period Settlement Pattern Dynamics in the Prince Rupert Harbor Region of Northern British Columbia*

In this paper, a large regional suite of radiocarbon dates are used to document changing Pacific Period settlement patterns in the Prince Rupert Harbor region of northern British Columbia. Late Pleistocene/Holocene sea level changes focus discussion on the last 5000 years. At that time, the settlement pattern appears to be one of small, one to four house communities, dispersed across the seascape. Non-residential middens are present throughout the Holocene with larger linear villages appear after 5000 cal B.P. and larger multi-rowed linear and curvilinear villages with marked variation in house form appear by 2500 cal B.P. While villages are still widely dispersed regionally, populations and villages were also concentrated in the Harbor after ca. 3800 cal B.P. This well-established pattern is disrupted ca. 1700 cal B.P. when the harbor and environs were abruptly abandoned. Upon reoccupation land use was significantly reorganized with populations aggregated in several large villages in the harbor and areas formerly occupied residentially exploited logistically by boat-borne task groups.

[1] *Discussant*

Ames, Christopher (University of California, Berkeley) and Benjamin Collins (University of Toronto - Scarborough)

[35] *Revisiting Grassridge Rockshelter in the Eastern Cape Province of South Africa: Results of the 2014 Field Season*

Grassridge rockshelter is located at the base of the Stormberg Mountains approximately 200 km inland in the Eastern Cape of South Africa. Previous excavation by Dr. Hermanus Opperman in 1979 focused primarily on the Later Stone Age (LSA) and Holocene occupations at Grassridge, but he also identified an underlying Middle Stone Age (MSA, ~300-30 ka) sequence containing abundant typologically MSA lithic material, well-preserved faunal remains, and charcoal. With particular interest in the MSA deposits, we revisited the rockshelter in the fall of 2014 to relocate the 1979 excavation trench and re-evaluate the stratigraphy using modern geochronological and geochronological techniques. We also opened a new 2 x 1 m excavation adjacent to Opperman's trench, and conducted preliminary survey in the surrounding landscape to identify additional caves and rockshelters that contain MSA and/or LSA deposits, which is the first step toward building a regional record of Late Pleistocene occupation. In this presentation, we will discuss the results of our 2014 fieldwork, which was the first season of the Grassridge Archaeological and Paleoenvironmental Project (GAPP). Results of preliminary stratigraphic, sedimentological, site formation, and artifact analyses from the renewed excavation will be presented, as well as the paleoenvironmental and archaeological significance of our findings.

Ames, Kenneth [80] see Brown, Thomas

Ames, Nicholas (University of California, Berkeley)

[402] *In Smaller Things Forgotten: Using Microdebris to Enhance our Understanding of Middle Islamic Dhiban (Jordan)*

This paper presents heavy fraction data from the archaeological site of Dhiban, Jordan, dating to the Middle Islamic period of occupation (late 12th to late 15th centuries CE). Based on a comparative study between larger heavy fraction materials and microartifacts I argue for the importance of smaller material residues in interpreting specific use-space as well as understanding Dhiban in relation to larger regional trends. Using a systematic flotation sampling strategy that recorded volume and provenience, the material was collected from a barrel-vaulted room enclosing a "domestic" space that encompassed a series of successive layered floors. Analysis of the material revealed that smaller residue sizes often do not correlate with larger residue sizes in either abundance or presence of different materials. Ceramics are abundant in larger fraction sizes but relatively infrequently in smaller sizes. Faunal remains of marine vertebrates and invertebrates that provide

evidence for long-distance trade and water-resource use are rarely found in larger fraction sizes yet are ubiquitous in even the smallest fraction sizes. This research suggests that smaller fraction sizes are valuable sources of data to supplement archaeological interpretation concerning the material life-ways of past inhabitants.

Amicone, Silvia (Institute of Archaeology, University College London), Patrick Quinn (Institute of Archaeology, University College London), Miljana Radivojevic (Institute of Archaeology, University College London) and Thilo Rehren (UCL Qatar, Hamad bin Khalifa University, Doha, Qat)

[89] *On the Transmission of Pottery Recipes at the Dawn of the Metal Age: A Case Study from Pločnik and Belovode*

This paper focuses on the reconstruction of pottery recipes and their transmission in the Neolithic/Chalcolithic sites of Belovode and Pločnik (c. 5350-4650 B.C.; c. 5200-4650 B.C.). These two Vinča culture sites, located respectively in north-east and south Serbia, have recently yielded some of the earliest known copper artifacts in Eurasia. The rich material culture of these two sites, therefore, offers a unique opportunity for the study of the evolution of pottery craft technology during the transition from the Stone into the Metal Age. An interdisciplinary approach employing macro observation and analytical methods including thin section petrography XRF, XRPD and SEM was applied to a wide selection of ceramic samples representing the full spectrum pottery at Pločnik and Belovode. The application of material science methods in particular has allowed us to reconstruct different technological choices and shed new light on traditional argument about the relation between pottery and metal pyrotechnologies. A diachronic analysis of the data allowed us to trace and compare the evolution of pottery recipes in the two sites, as well as to elucidate different mechanisms of cultural transmission within two early Chalcolithic communities in the Balkans at a time of major technological change in this area.

Ammerman, Albert J. [25] see Iliopoulos, Ioannis

An, Ting (University of Cambridge)

[102] *Considering a 'Chinese Element' in Southeast Europe before the 2nd Millennium B.C.*

Evidence of millet in Europe before 2000 B.C. has invited questions about its material culture context, possibly related with external regions such as China. This study compares the material assemblages of distinctively painted pottery vessels associated with findings of millet in different regions, such as the Cucuteni-Tripolye Culture of Southeast Europe, the Anau Culture of Central Asia, and the Majiayao Culture of China. These painted pottery vessels have been argued to be similar to each other, resonant with the geographical distribution of millet across Eurasia. This paper looks at the millet evidence in relation to the technologies and artistic styles of painted pottery traditions, clarifies their chronological relationships, and considers if the geographic spreads of millet and specific painted pottery traditions were indeed correlated. I will discuss to what extent the pottery types are similar or different, homologous or analogous, and chronologically congruent or incompatible. I additionally will present findings of millet impressions on the Cucuteni pottery that contributed significant new information.

Anamthawat-Jónsson, Kesara [288] see Hicks, Megan

Anaya Hernandez, Armando (Universidad Autonoma De Campeche) and Pascual Izquierdo Egea (Laboratorio de Arqueología Teórica, Graus, España)

[86] *Show Me What You Have and I'll Tell You Who You Stick Around With: A Model of Economical-Political Interaction in the Upper Usumacinta*

Walking, although commonly seen as a simple activity, represents in fact, a very important aspect of the relationship that develops between human groups and the physical environment on which they live. In this way, the nature of this environment will bestow the singularities of the political, social and economic organization of societies. We can approach human mobility through the application of GIS in terms of the estimation of cost of movement. Various algorithms have been developed that allow

us to estimate cost in terms of time, distance, or calories consumed during the stride. In this context, the upper Usumacinta region constitutes an ideal scenario to model human movement over a rugged landscape, and, thus, estimating the territorial extent of its different regional capitals. In this paper we intend to delve deeper in the definition of the territorial limits of these centers by approaching, along with the characteristics of the terrain, the fluctuations in time to access of certain prestige goods. To this end it becomes necessary to quantify objectively the economic fluctuations in relation to the geopolitical adjustments throughout time, through the application of the contextual valuation methodology developed by Izquierdo.

Anaya-Hernández, Armando [103] see Zetina-Gutiérrez, Guadalupe

Anderson, Patricia (CNRS, Nice, France)

[17] *Interpreting Uses of Cereal Threshing Tools and Straw Storage Structures from Neolithic, Chalcolithic and Bronze Age Sites in the Near East*

Optical reflected light and transmitted light microscopy, laser confocal analysis, SEM and EDX analyses, accompanied by field and laboratory experiments, were used to study surfaces and residues for stone and bone tools, soil deposits and mudbrick. Case studies presented here suggest two types of intensive threshing practices were occurring from the beginnings of agriculture. Bone tools from the early Neolithic in Iran show large amounts of cereals were threshed so as to leave long stems, perhaps for craft uses. In other instances, microwear of stone tools showed cereal crops were being threshed and stems cut using the threshing sledge, beginning in the late Neolithic in Syria and continuing in the Chalcolithic and Bronze Age of Syria, Iraq, and Israel, a practice that seems to diffuse initially as part of the "Neolithic package". Several sites had storage structures containing cereal straw cut by this instrument. Tools and remains of cereal threshing shed light on human cultural practices, as well as on site economy, showing intensive use of cereal straw treated with efficient instruments beginning with early agriculture, seemingly corresponding to feeding of domestic animals but also to crafts, particularly for building materials for ever larger villages.

Anderson, Emily (Johns Hopkins University)

[20] *In the Trail of Dancing Lions: Iconography and Community on Early Crete*

This paper examines the formulation of an early iconographic tradition on late third-early second millennium B.C.E. Crete as a means of gaining insight on the development of a novel scale and variety of community ideology. During this period stamp seals began to be crafted from imported ivory and engraved with figural motifs involving lions, each belonging to a highly distinctive iconography reproduced across the island. These changes coincide with evidence of other social developments, including establishment of new types of ritual site where people from numerous communities gathered. We thus have evidence of a new scale of social life taking form but its character remains difficult to ascertain. Moving beyond examination of symbolism alone, I investigate the innovative practices underlying and supported by the iconographic seals, from their crafting to use/performance. These indicate how people were actively establishing a point of social similarity that transcended the boundaries of local interaction by forging a common signifier of social identity. Moreover, analysis suggests that the seals were produced by itinerant craftspersons, whose travels wore in physical paths between communities that paralleled those established symbolically by the iconography. Through this multi-faceted lens, an ethos of social incorporation and connective distance begins to emerge.

Anderson, Lars [35] see Jarry, Marc

Anderson, J. Heath (Minnesota State University)

[88] *Cerro Magoni: A Link Between Epiclassic Tula and the Bajío?*

In recent years, scholars interested in the processes and events involved in the formation of the Toltec state have turned their interest toward links that might have existed between the area immediately surrounding Tula Grande, the civic-ceremonial center of the Toltec state, and sites in the Bajío region to the northwest. Although several material culture affinities have been proposed to

demonstrate possible ethnic and economic ties between these areas, investigators have not arrived at a general consensus regarding the chronology and significance of these links. Recent work at Cerro Magoni, a hilltop Epiclassic site near Tula Grande, can provide a fresh perspective on these questions with new information on the timing of Epiclassic settlement near Tula Grande. Additionally, Magoni demonstrates unambiguous material culture similarities with sites to the northwest that will enable researchers to ask more sophisticated questions of the economic, political, and ideological factors involved in the movement of population and consolidation of power that led to the foundation of the Toltec state. In this paper, I review the newly available data from Magoni and discuss its implications for the regeneration of complex society in the Tula region after the decline of Teotihuacan.

Anderson, David (University of Tennessee), Stephen Yerka (University of Tennessee), Eric Kansa (Open Context & UC, Berkeley), Joshua Wells (Indiana University, South Bend) and Thaddeus Bissett (University of Tennessee)

[125] *Big Data/Big Picture Research: DINAA (The Digital Index of North American Archaeology) and the Things Half a Million Sites Can Tell Us*

The DINAA project allows archaeologists to explore archaeological questions at a large scale, facilitating big picture research. Information from >500,000 archaeological sites in 15 states in Eastern North America is used to examine the effects of climate and vegetation change on human existence, in the past as well as in the future. Distribution maps illustrate where people were concentrated on the landscape at various times in the past, as well as areas they avoided, and environmental factors that helped shape those patterns. The total dataset additionally highlights variation in archaeological survey coverage at a regional scale. How changes in sea level affected settlement in the past are examined, and the same data also document how even modest rises of from 1 to 3 m in the near future will affect tens of thousands of known sites, including thousands considered eligible for the NRHP. A multi-institutional collaborative effort, DINAA provides a framework for distributed linked open data initiatives in North American archaeology; promotes greater interaction between data generators, managers, and users; and helps promote a greater appreciation for archaeology among researchers, resource managers, and the general public.

[161] *Discussant*

Anderson, Shelby (Portland State University)

[302] *Maritime Adaptations and Arctic Ceramic Technology: Results of Residue Analysis*

Archaeologists have put forth various hypotheses to explain the adoption of pottery technology by hunter-gatherer groups. These include the efficiency of ceramics over other container technology, rising population pressure and related increased need for storage, and a change in food processing practices. Food processing shifts could include diet breadth expansion, particularly increased use of aquatic resources. The late adoption of pottery technology in the North American Arctic between 2500 and 2800 years ago coincides with the development and spread of an increasingly specialized maritime economy. As such, arctic ceramic technologies present an excellent case study for further examining the correlation between hunter-gatherer adoption of pottery technology and aquatic resource use. In this paper we review the timing and distribution of early pottery in Alaska and explore the link between changing diet and culinary practices through residue analysis of pottery vessels from northwest Alaska. The results of this study suggest changes in diet over time, and identify a direct link between pottery use and processing of marine resources. Although the sample size is small, this analysis further suggests a diversification in marine resource use between 1000 and 500 cal BP.

[159] *Discussant*

Anderson, Lars (Université de Toulouse II - Jean Jaurès/UMR 5608 TRACES)

[181] *Towards a Synchronic View of Aurignacian Lithic Economy*

The Aurignacian is considered a product of the first modern human groups in Western Europe. Nevertheless, we have approached this important moment in Prehistory with a diachronic vision, ultimately inhibiting us from investigating the synchronic organization of this archaeological culture.

By enlarging our field of vision to several sites in southwestern France we hope to characterize the variability of Aurignacian lithic industries on two scales: the inter- and the intra-site. At the intra-site level, through spatial analysis of refits and the evaluation of variability in lithic knowledge and know-how, we will go further in the interpretation of site function by identifying different skill levels of flint-knappers. The comparison of these results at the inter-site level, while taking into account their location relative to raw-material sources, will ultimately allow us to refine our understanding of variability, function, and respective roles in mobility patterns of Aurignacian sites. Here we present preliminary results contrasting four sites with presumed differing functions: the Bergerac flint workshops of Champ-Parel 3 and Corbiac-Vignoble 2, the open-air campsite of Régismont-le-Haut, and the cave occupation of La Tuto de Camalhot. This nuanced approach will help us determine whether variability in Aurignacian lithic-economy was, in reality, structural, or simply circumstantial.

[181] *Chair*

Anderson, David S. (Radford University) and Marijke Stoll (University of Arizona)

[182] *Sport and Ritual as Social Bonding: The Communal Nature of Mesoamerican Ballgames*

For over a century, the Mesoamerican ballgame has received copious attention in the academic literature. Much of this attention, however, has focused on either the control and promulgation of the game by elite actors, or the game's interconnections with indigenous cosmogonies. Because of this intense focus on the game as elite and/or ritual practice, we often lose sight of the communal role it may have held. Anthropological research into the cultural role of sport suggests that while sport can create inequalities through the nature of competition, it can also serve as an integrative force within a community through team bonding. In this paper, we argue that archaeological evidence from our research in the Mexican states of Oaxaca and Yucatan, as well as data from additional sites throughout Mesoamerica, suggests that ballgames primarily served a community-building role and were not solely a function of elite political theater. This interpretation is further supported through both ethnohistoric and ethnographic evidence, ultimately bringing us to a new understanding of Mesoamerican ballgames as not simply a spectacle of elite ritual, but instead as an integrative communal tradition.

Anderson, Karen

[184] *Transformation and Continuity: Late Tiwanaku to Post Tiwanaku Traditions in the Central Valley of Cochabamba*

This paper presents evidence from the Central Valley of Cochabamba, a key peripheral region of the Tiwanaku state. It addresses Tiwanaku expansion, state collapse and post-Tiwanaku transformation and continuity using data from ceramic styles and other material culture traditions. Also presented are new radio-carbon dates from the Central Valley site of Piñami covering Tiwanaku expansion and collapse and how these dates fit into the larger regional context and suggest that Tiwanaku influence continued longer in Cochabamba than in other areas. I then discuss the implications of this data for understanding how state collapse impacted local and regional social identities, political economy and interaction networks.

Anderson, Mark

[185] *Rock, Paper,.....XRF.....: Continuing Improvements to the UI-OSA Lithic Raw Material Assemblage*

The University of Iowa Office of the State Archaeologist (OSA) has an expansive lithic raw material assemblage with a 30 year compilation history. The largest portion contains multiple samples of 75 in-state lithic types while the second portion contains multiple samples from the seven surrounding and 16 additional states. A revision and reorganization of the OSA collection was completed in 2006 to provide a more systematic and consistent approach to lithic identification and sourcing. This includes a web-based version affording access to our entire assemblage from anywhere. Originally a macroscopic identification system, we soon realized the need for expansion. We have recently posted multiple, 20x microscopic images for all in-state samples. Geologic thin sections of numerous samples are currently in production through collaborative research with anticipated application to the entire in-state assemblage. Using a portable XRF, we are building a chemical and elemental

database for all in-state samples. These expanded analytical tools will afford us the opportunity to investigate several geographically and stratigraphically problematic types within the in-state assemblage. Since lithic materials so often dominate prehistoric artifact assemblages, a well-developed comparative assemblage offering more than macroscopic analysis, could afford researchers the opportunity to address a myriad of anthropological questions.

Anderson, E. (UC Riverside)

[291] *Medieval Warmth: Did the Medieval Warm Period Sink the Maya but Make the Mongols?*

World temperatures are now back up to the range last seen in the Medieval Warm Period (MWP), a time known to have caused droughts in many areas, warmer moister weather in others. The droughts may have destroyed lowland Maya civilization, as well as Pueblo III culture, and may also have impacted Khmer civilization in Cambodia, and other tropical cultures. Recently, Mongolia has been shown to have had warmer weather, which would have made life easier for forest and grassland Mongols, though harder in the drought-stricken Gobi. Perhaps Genghis Khan could ride out with his hordes because of better horse-rearing conditions. On the other hand, not all of Mayaland fell, and not all Mongols rose. Social and human-ecological factors must have made some differences. The central Maya Lowlands were very fine-tuned, relying on delicate balance. Genghis Khan's eastern Mongol world was especially favored by both climatic improvement and proximity to north China (then controlled by nomadic states). These and other factors evidently mattered along with climate.

[291] *Discussant*

Anderson, Richard

[357] *Paleoindian Archaeology in the Little Missouri Badlands: An Update on Research in the Dakota Prairie Grasslands, North Dakota*

In 2012 the Dakota Prairie Grasslands, Southern Methodist University, and the State Historical Society of North Dakota began a multi-year research project investigating Paleoindian land use, Late Pleistocene-Early Holocene environments, and archaeological preservation potential in the Little Missouri National Grasslands (LMNG) and surrounding areas. Field research in 2013 and 2014 included resurvey and test excavation at known or suspected Paleoindian localities to determine the nature and condition of potential Paleoindian sites and test for the preservation of subsurface archaeological deposits. This poster summarizes the currently known Paleoindian archaeological record of the badlands and presents new data from field work during the summer of 2014.

Anderson, Derek (Mississippi State University), Nicholas Herrmann (Mississippi State University), Molly Zuckerman (Mississippi State University), Felicia Pena (Mississippi State University) and D. Shane Miller (Mississippi State University)

[387] *Recent Archaeological Excavations at the Aklis Site, St. Croix, U.S. Virgin Islands*

The Aklis site (12VAm1-42) is a multicomponent prehistoric conch shell midden containing cemetery and habitation components. Large portions of the site are currently subject to damage from rising sea levels and modern disturbances, including looting. Salvage excavations of two sets of human remains in 2012 led to the development of an archaeological field school in 2014, offered by Mississippi State University and in conjunction with the U.S. Fish & Wildlife Service. Survey and excavation focused on mapping the site, documenting, mitigating, and stabilizing the midden deposits, and recovering exposed features, including burials. This paper presents the preliminary results of human skeletal, zooarchaeological, lithic, and ceramic analyses, spatial and geochronological data, and discusses Aklis in a regional cultural context.

Anderson, Lysanna (U.S. Geological Survey) and David Wahl (U.S. Geological Survey)

[408] *Records of Holocene Biomass Burning, Environmental Change, and Human Occupation in the Southern Maya Lowlands*

Fire was arguably the primary tool used by the Maya to alter the landscape and extract resources. Opening of forest for agriculture, building, and extraction/production of construction material necessitated burning. While we understand the fundamental role of fire in Maya land use, there are

very few records of prehispanic biomass burning from the Maya lowlands. Consequently, a limited understanding exists of natural fire regimes and patterns of anthropogenic burning in the tropical seasonally dry forests of Central America. Here we report two new well-dated, high-resolution Holocene records of biomass burning based on fossil charcoal recovered from wetland and lacustrine sediment cores from northern Peten, Guatemala. These macroscopic charcoal data, coupled with previously published environmental proxy data from the cores, are interpreted in the context of regional archaeological records. Results show frequent fires occurred in the closed canopy forests of the region prior to occupation by sedentary agriculturalists. Following the arrival of agriculture around 4600 BP, the ecosystem transitioned from climate to anthropogenic control. Low fire frequency in the Early Preclassic period suggests that intensive agricultural strategies may have been employed earlier than previously thought.

Anderson, Amber (RIT, Medaille College), Samuel Connell (Foothill College), Chad Gifford (Columbia University) and Siobhan Boyd (Gardiner Museum)

[411] *Local and Inca Cross Regional Interactions: Studies from the Northern Ecuador frontier.*

This paper focuses on the importance of interregional contact along border zones as we seek to understand the nature and impacts of interactions between cultural worlds. We are particularly concerned with how archaeologists construct and methodologically recover evidence of these interactions. Ultimately, and not surprisingly, people within these zones show innovative ways of expanding, exploiting or resisting transfers of knowledge, styles, technologies, raw materials and material culture. Our case study involves the Pais Caranqui of Northern Ecuador during the Late and Inca Periods. XRF studies of obsidian and ceramics display the varied networks were created during these periods to obtain and exchange goods, while ceramic analysis shows the incorporation of non-local "thinware" from the oriente. While these trade networks were established primarily by the indigenous polities before the arrival of the Inca, some networks and products were heavily utilized by the Inca after their arrival in the Northern Highlands, while still others were dismantled or blocked entirely. We see these dynamics play out in particular at the important border zone site of Pukarito. Our paper will thus show the varied nature of these interactions along the frontier and their effect on the social, political and economic realms of Northern Ecuador.

Anderson, Eugene [291] see Inoue, Hiroko

Andrade, Israel (Arqueólogo), José Luis Punzo and Héctor Cabadas

[231] *spike scraper an approach to lithics from Durango*

In this paper, we present a study of one of the most important lithic artifacts used by the chalchihuiteños in Guadiana valley, the spike scraper, which might be the only representative lithic piece for this cultural group in the area. We describe our analytical methods and our typology for these tools and discuss the source of the materials used to its elaboration. Finally, we discuss the possible uses of this tool for the prehispanic inhabitants of Durango.

Andrade Cuautle, Agustin [410] see Cervantes Perez, Jose

Andrén, Anders

[36] *The Otherness of Objects? The Material Turn and Historical Archaeology*

The material turn in archaeology – and in humanities in general – has led to a new interest in the non-verbal and non-signifying aspects of the material world. Instead of discussing meaning of objects, issues such as longterm duration and agency of objects have come into focus.

Consequently, many archaeologists have turned away from the textual metaphor to a recognition of the otherness of materiality. However, this material turn has above all taken place in a dialogue with modern ruins and remains, and not in relation to historical archaeology in a broader sense. The aim of this paper, therefore, is to critically discuss some challenges of the material turn for historical archaeology in general.

Andrew, Holly L. [98] see Howell, Ryan

Andrew, Holly (University of Oklahoma)

[188] *The Countless Perceptions of Archaeology in Archaeological Societies: A Case Study Involving the Oklahoma Anthropological Society*

The public has a genuine interest in archaeology of which avocational and amateur archaeological groups are among the most vocal. The greatest area of interest among avocationalists is in participating in archaeological research, which has led eight states to develop and implement archaeology certification programs. These programs are designed to train avocationalists on how to contribute to the professional field and laboratory projects. However, while these state certification programs seek to provide avocationalists with increased archaeological expertise, some states, such as Oklahoma, are struggling to make it beneficial for both avocational and professional archaeologists. In this paper, I use the Oklahoma Anthropological Society's (OAS) recent shelving of and subsequent effort to revitalize its archaeological certification program as a case study. I explore how OAS's professional and avocational perceptions of archaeology have shaped the needs and interests in a collaborative program, such as certification. I also explore how these programs are innovative approaches to sharing information, while promoting public awareness on archaeological stewardship and literacy. This is because these programs demonstrate how, we, as archaeologists are willing to fulfill both our legal and ethical obligations to sharing information, while gaining an understanding and appreciation of our shared heritage.

[188] *Chair*

Andrews, Brian (Rogers State University), Metin Eren (University of Missouri), Susan Mentzer (University of Tübingen) and David Meltzer (Southern Methodist University)

[35] *Goodson Shelter: Recent Excavations at a Newly Discovered Deeply Stratified Rockshelter in Northeastern Oklahoma.*

Goodson Shelter was discovered by an amateur artifact collector and was first brought to our attention in 2012. The site is an approximately 20-x-7-m eroded sandstone rockshelter situated about 5 meters above a small tributary. Work in 2013 and 2014 consisted of excavation of a 1-x-7-m trench running from outside the dripline to the back wall of the shelter. Deposits are approximately 2 meters deep, and appear to be largely stratigraphically intact. Over 300 projectile points/preforms and tools were recovered from the test trench, and include fluted, Clovis-like bifaces, conical blade core fragments, and large blades from the lowest stratigraphic level. Overlying and stratigraphically distinct from this lower level are points ranging from late Paleoindian, Early-Middle- and Late Archaic, and Woodland time periods. Numerous bone, shell, and antler artifacts and tools were also recovered. Ongoing work at the site focuses on geoarchaeological analysis to resolve formation and chronological issues, analysis of stone tool technology and point morphology (with the immediate goal of determining the cultural affiliation of the fluted biface assemblage from the basal stratigraphic unit), and continued excavation.

Andrews, Anthony (New College of Florida)

[413] *An Intracoastal Waterway and Port System in Classic Period Northwest Yucatán, Mexico*

Archaeological and historical research along the northwest coast of the Yucatán peninsula during the last half century have led to a preliminary reconstruction of a 200 km-long navigable intracoastal waterway between the Celestun estuary and Dzilám de Bravo during the Classic period. Along this waterway are remains of settlements, ports, and port complexes that supported an extensive trade network that connected northern Yucatan to more distant trade networks to the south, via the coast of Campeche and rivers leading into the southern Maya lowlands and beyond.

[76] *Discussant*

Andrews, Brian [148] see Morgan, Brooke

Andrews, E. Wyllys (Tulane University)

[295] Discussant

Andrieu, Chloe [413] see Demarest, Arthur

Andrus, C. Frederick T. [152] see Hadden, Carla

Angel Mamani, Manuel [208] see Archebelle-Smith, Aric

Angelbeck, Bill (Douglas College)**[400] *Questioning the Capitalist Lens: Anarchism as a Critical Theory for Assessing Sociopolitical Dynamics in the Past***

Archaeologists can view the societies of the archaeological record through the lens of their contemporary experience. I will explore how archaeologists have viewed past societies in terms of their experience within states based in capitalism. Some identify “rational economic actors” primarily as pursuing individual gain, or others find “aggrandizers” as the active, entrepreneurial agents of change in past societies. These arguments propound the socioeconomic dynamics of capitalist societies as if state-market actions were cultural “laws” applicable to most societies, rather than reflections of their own socioeconomy. It’s worth questioning the applicability of Western modes of interaction to non-state societies. I will explore examples with cases from the Northwest past, wherein the capitalist-influenced arguments offered are often in marked contrast with indigenous descriptions and oral histories about their own modes of interaction politically and economically. Anarchism, with its theories explicitly concerning modes of interaction in small-scale or non-state societies, can provide a critical perspective for archaeologists, presenting analytical tools to think about the dynamics of anarchic societies in the archaeological record. For one, it can help us shift from considering historical processes that are individually pushed (centralized and capitalist) to those that are collectively driven (decentralized and communitarian).

Angelo, Dante**[261] *Not All Archaeology for the Public is Public Archaeology***

The concept of public archaeology has become ubiquitous since the last decade and, gradually, it seems to have been accepted as an important component of archaeological research. However, despite the wider popularization of the concept, its operationalization still poses challenges to archaeologists interested in surpassing the academic and professional sphere. Here, I reflect on the procedural guidelines and implications that public archaeology has recently attained and some of the challenges they raise considering study cases in northern Chile. My aims in this presentation are twofold: first, to briefly sketch some of the scenarios in which this concept is commonly thought of or applied to in northern Chile; and, second, to explore the use of public archaeology as a tool to approach the dynamics embedded in the relationships between past and present.

Angourakis, Andreas (University of Barcelona), Matthieu Salpeteur (University of Barcelona), Xavier Rubio-Campillo (Barcelona Supercomputing Center (BSC)), Bernardo Rondelli (SIRIS Academic S.L.) and Sebastian Stride (SIRIS Academic S.L., University of Barcelona)**[73] *Land Use Patterns in the Arid Eurasia: Models and Historical Examples***

The relation between the main variants of pre-industrial economic production in arid Eurasia, from nomadic pastoralism to irrigated agriculture, is known to have been unstable, with abundant examples of conflict and shifting patterns of land use right up to contemporary times. We present a brief review of our experience using Agent-Based models to identify mechanisms and system dynamics that could help explain the different land use configurations, which have been recorded archaeologically for all periods from the Bronze Age up until the contemporary period. Our models helped us to explore the conditions for the stabilization of land use, simplified as discrete portions of land reserved to either mobile livestock breeding and sedentary agriculture. Assuming there is a general economic growth, we experiment with different theoretical solutions to how local stakeholders may respond to a basic economic conflict: matching an ever pushing demand with a

limited resource. By simulating these mechanisms, we achieved insights on the role of environmental, technological and social constraints in land use dynamics.

Angourakis, Andreas [402] see Torrano, Alexis

Ankele, William (University of Oklahoma), Bonnie L. Pitblado (University of Oklahoma), Meghan J. Forney (University of Oklahoma) and Christopher W. Merriman (University of New Mexico)

[300] *Paleoindian Use of the Lake Fork Valley, Southwest Colorado*

For more than a decade, University of Oklahoma archaeologists have teamed with avocational archaeologist Mike Pearce to document Paleoindian use of the Lake Fork Valley (LFV), southwest Colorado. The Lake Fork of the Gunnison River flows from the town of Lake City approximately 50 km north to the Gunnison River in the Upper Gunnison Basin (UGB). Interestingly, however, the Paleoindian record of the LFV differs markedly from that of the better-known UGB. We hypothesize that treating the LFV as simply an extension of UGB Paleoindian occupation may be ill-advised. In this paper, we summarize the early archaeological record of the LFV, focusing on its suite of Paleoindian site types, projectile point technologies, and most importantly, chipped stone raw materials. We contextualize the Lake Fork of the Gunnison geographically and explore whether the proximity of its headwaters to those of the Rio Grande River—just 40 km to the southwest—could hold the key to understanding the role of the LFV in Rocky Mountain Paleoindian lifeways. The Rio Grande is a direct conduit to the San Luis Valley, which has a well-documented Paleoindian record that may share more in common with the LFV signature than does the UGB.

Ann, Peters [31] see Tomasto-Cagigao, Elsa

Anthony, Dana [46] see Pratt, William

Anthony, David (Hartwick College) and Dorcas Brown (Hartwick College)

[241] *Horseback Riding and the Unintended Consequences of Innovation*

Every technological innovation carries a social agenda, usually one that was not intended or even foreseen by its inventors. The domestication of the horse in the Eurasian steppes probably was initially an attempt to secure winter-adapted meat animals, but horseback riding transformed the initial innovation into a revolution in transport. Riding made steppe herding more efficient, transformed tribal raiding, and eventually was combined with wagon transport to create a new way of life based on mobility that domesticated the steppe environment and transformed European populations.

Anthony, Alexander

[301] *The 1912 Grave Desecration of the Milwaukee County Institution Grounds Poor Farm's Cemetery*

This research looks at the institutional desecration of graves at the Milwaukee County Institution Grounds as overseen by Superintendent Ferdinand Bark, the reaction of the surrounding community to that disturbance, and the ensuing investigation. The paper also explores the relationship of this historical event to the evidence from the 1990s and 2013 archaeological excavations conducted at the location of the cemetery. The event will be viewed within the historical context in which it happened including a basic background of Ferdinand Bark and the circumstances of the Milwaukee County Grounds when he assumed control in 1904. The increasing need to find space in which to inter a growing number of deceased individuals from on the County Institution Grounds as well as the surrounding community within very limited cemetery bounds posed a significant problem for Bark. The paper also explores the community reaction to this desecration as related through local newspapers of varying readerships. Finally, the archaeological correlates of this event are examined, as are the difficulties in interpreting the archaeological record of expected mortuary behavior on the Milwaukee County Institution Grounds.

Antonellis, April [103] see Ervin, Kelly

Antorcha Pedemonte, Ricardo, Lane F. Fargher (Cinvestav del IPN - Unidad Mérida) and Richard E. Blanton (Purdue University)

[237] *Intermediate Scale Socio-Spatial Units, Collective Action, and the State in Cross-Cultural Perspective*

Collective Action Theory posits that states are the outcome of bargaining among the individuals, groups, and factions that make up the political community. Thus, the nature of intermediate scale socio-spatial units or social organizations that exist hierarchically between individual households and the state (e.g., corporate groups, clans, neighborhoods, communities, patron-client networks, etc.) plays a key role in determining the political-economic strategies employed by the architects of the state. Because the social construction of and the relationship between these units and states take myriad forms across space and through time, we draw on systematic cross-cultural research based on archaeology, history, and ethnography from around the world to elucidate the forms that these units take and the ways that they pressure, resist, work with, or ignore the political agents of the state. We place special emphasis on illustrating how these units are physical materialized on the landscapes of states and cities and how these structures or spatial organizations shape larger patterns in settlements, production strategies, and monumental construction, and, thus, the materialization of power in premodern states.

Anzellini, Armando (University of Central Florida) and J. Marla Toyne (University of Central Florida)

[78] *Mortuary Variability and Chronology of the Cliff Tombs of La Petaca*

The Chachapoya of the eastern Peruvian highlands utilized various methods for disposing of their dead, but almost all involve highly visible spaces. While some regional variation is found among what are typically considered Chachapoya mortuary spaces, there is evidence for social cohesion within each site. While few mortuary complexes of the Chachapoya have been excavated, La Petaca provides the opportunity to scientifically study intrasite variation. On only half of the mortuary complex's massive vertical wall we documented 112 constructions including tombs, platforms and walkways, as well as several caves, niches and rock shelters, all of which contained mortuary remains. By using techniques of vertical archaeology, we collected cultural, skeletal and organic samples for analysis and radiocarbon dating. Unfortunately, many of the contexts had been damaged by looting and natural taphonomic processes. There was some variability in construction methods, materials, architectural design, and location across the site, yet generally common features suggest 1) mortuary style was adapted to the precarious location, 2) there was little change over time, 3) few builders were involved, or 4) they reflect a single cultural tradition. Overall, these new, firsthand data yield valuable information on the importance of mortuary spaces and the regional complexity of the Chachapoya.

Appleby, Jo [116] see Santana Cabrera, Jonathan

Aragon, Leslie [278] see Covert, Alexandra

Aragon, Leslie (Desert Archaeology, Inc./University of Arizona)

[304] *We've Gotta Get Out of this Place: Formation and Resettlement of a Pre-Classic Hohokam Village*

It has long been thought that large Hohokam villages, once established, were long-lived and fixed in a single location. La Villa, a pre-Classic Hohokam village on Canal System 2, was one of the largest in the area. It has roots that stretch as far back as the Red Mountain phase and had achieved village status by Vahki times. The village continued to grow through the Pioneer Period, and much of the Colonial Period. Toward the end of the Colonial however, we see a sharp drop-off in both ceramics and residential structures. It is clear that residents were moving away from this long-standing settlement and few were still living there by the beginning of the Sedentary Period. When did La Villa

begin to shift from a village in florescence to one of diminishing importance, and where did its inhabitants go? One thought is that they moved downstream along the same main canal to Las Colinas, a Hohokam village thought to be established during the late Colonial Period – the same time that La Villa began to decline. Recent excavations by Desert Archaeology, Inc. provide data that can be used to address these important questions.

Arakawa, Fumiyasu (New Mexico State University)

[292] *Unraveling Sociopolitical Organization using Lithic Data: a Case Study from an Agricultural Society in the American Southwest*

Archaeologists that conduct research in agricultural societies of the American Southwest have contributed little discussions and interpretation regarding sociopolitical organization using lithic data; several negative factors may be at the root of the problem. These factors include (1) archaeologists in the American Southwest have developed a remarkable level of pottery analysis that allows for the reconstruction of some aspects of sociopolitical organization, (2) none has developed a comprehensive debitage analysis technique that allows for the understanding of sociopolitical organization using lithic data, and (3) archaeologists have not fruitfully developed research questions regarding sociopolitical organization using lithic data. In this paper, I demonstrate that the study of tool-stone procurement in agricultural societies has tremendous opportunities for archaeologists to understand and reconstruct sociopolitical organization. To support my points, I discuss the results from a lithic analysis conducted in the central Mesa Verde region of the American Southwest.

Arano, Diana [370] see Quintana, Patricia

Araujo, Adauto (organized session) and Karl Reinhard (University of Nebraska, Lincoln)

[127] *Parasites in Antelope Cave*

Human and animal coprolites revealed an interesting group of parasites, some of which have never been found before in archaeological context. The Rocky Mountain Wood Tick, *Dermacentor andersoni*, was found in two human coprolites. These were probably crushed and ingested. Acanthocephalan eggs found in the human coprolites were consistent with *Macracanthorhynchus ingens*. This is the first well-documented infection among Ancestral Puebloans and suggests that people at Antelope Cave had different preferences in insect foods than at other sites in the Pueblo region. Eggs of the intestinal pinworm (*Enterobius vermicularis*) were found in the coprolites. This was the only species specific to humans found. Pinworm reached remarkably high levels at some Ancestral Pueblo sites. At Antelope Cave, 23 percent of the coprolites were positive for this species. This indicates that the people who used the cave lived in crowded conditions at least temporarily during parts of the year. Two of four dog coprolites were positive for the canid whipworm, *Trichuris vulpis*. This was the first find of this parasite in the archaeological record. In conclusion, the people who used the site show a unique mixture of the Great Basin paleoepidemiology dominated by acanthocephalans and that of the Ancestral Puebloans dominated by pinworm.

Araújo, Adauto [415] see Dos Santos, Isabel

Arbuthnot, Michael [243] see Faught, Michael

Arce, Susana [31] see Lane, Kevin

Arcega-Cabrera, Flor [25] see Fargher, Lane

Archebelle-Smith, Aric (New College of Florida), Cassandra S. Koontz (Vanderbilt University), Lisseth Rojas Pelayo and Manuel Angel Mamani

[208] *Variations in Cranial Vault Modification at Uraca, Majes Valley, Peru*

Cranial vault modification was a prevalent type of body modification practiced throughout the ancient Andes. It was achieved by binding the head during childhood, which left the crania permanently

altered into adulthood. Different methods of binding led to visually different forms of modification, which likely marked membership in different ethnic groups. Researchers have documented three major modification styles in the Andes: tabular oblique, tabular erect, and circumferential. Recent excavations at Uraca, a Middle Horizon (600-1000 A.D.) cemetery associated with the petroglyph site Toro Muerto exhibit a divergent, local style where only the occipital bone is modified. This project describes the range of modification forms encountered at Uraca as compared to other regions of the Andes. This project examines the level of diversity of cranial vault modification forms between Sector I, which is closer in proximity to Toro Muerto, and Sector II, which is further away. If modification styles are highly diverse in individuals buried near Toro Muerto, this would show that people from throughout southern Peru had access to the petroglyphs at Toro Muerto. If individuals consistently display the local style, this could reflect low migration rates, or that interment at Uraca was restricted to local Majes residents.

Ardelean, Ciprian (University of Zacatecas, Mexico) and Juan Ignacio Macías-Quintero (Universidad de Ciencias y Artes de Chiapas, Mexico)

[317] *Rockshelters and Caves of Central-Northern Mexico: Archaeological Potential and Limitations, Sources for Paradigms and Landscape Markers*

Caves and rockshelters throughout the highlands and sierras of Central-Northern Mexico have always represented an important point of reference for prehistoric archaeology and were traditionally targeted as the most reliable contexts for the understanding of hunter-gatherer societies and the establishment of cultural-historical models. However, the paradigms created on basis of the excavation of such sites affected rather negatively archaeological thinking in Mexican archaeology. Caves and rockshelters are unevenly distributed and poorly investigated. Modern re-occupations and disturbance are high and depositional processes are diverse and far from properly approached. A reconsideration of their potential and the acknowledgement of their particularistic cultural dimension is required. The use of such landscape features for funerary purposes is perhaps the better known and most expected function among local scholars. However, the actual use of caves among prehistoric societies of ancient Mexico is still far from being clear. Several caves and rockshelters in Zacatecas and Aguascalientes are presented in order to analyze their cultural importance and their paper as landscape markers, since the times of the first inhabitants until today.

Ardren, Traci (University of Miami)

[344] *Don Pablo, Cha Chaak Ceremonies, and Archaeological Interpretation*

Don Pablo Canul, a Yucatec Maya h'men living in the village of Yaxunah, appears in vignettes throughout *A Forest of Kings*. Participation in ceremonies led by Don Pablo was a regular component of the Yaxuna Archaeological Research Project under the direction of David Freidel, and these experiences provided a strong and vibrant example of 20th century Maya culture in Forest of Kings. Many archaeological projects in Yucatan have collaborated with or employed the services of Maya h'men since the earliest research projects of the 1940's. This paper will explore Don Pablo's biography within the context of the history of collaboration between archaeologists and Yucatec h'men with the objective of exploring how such partnerships have shaped the interpretation of ancient Maya archaeological materials. While such partnerships have a long history in Yucatan, few archaeologists included the voice of Maya people in their written interpretations prior to this landmark volume by Schele and Freidel.

[24] *Discussant*

Ardren, Traci [152] see Sierra, Roger

Areche, Rodrigo [134] see Marcone, Giancarlo

Arendt, Nicole (National Park Service)

[95] *Learning from the Past: Cinder Mulch Agriculture Past and Present*

Cinder mulch agriculture has been studied in relation to the archaeology of the Flagstaff, Arizona, area since Colton in the 1930s; with several experimental studies assessing the agricultural benefits

of this method. Recently, local gardeners in the Flagstaff area have begun experimenting with using cinder mulch on their own gardens. This provides an opportunity for public outreach and for archaeologists and the local gardening community to learn from each other. Gardeners gain the benefits of the archaeological studies of this and other agricultural methods. Archaeologists potentially reach a new and very engaged audience interested in understanding agricultural techniques adapted to the local environment, as well as gaining some qualitative information on the opinions of experienced gardeners. Cinder mulching has recently been implemented as a water conservation method at the Bonito Street Community Garden in Flagstaff, which has provided an opportunity to educate the public on the archaeology of their local area, as well as illustrating its relevance to the present.

Arguelles, Amaranta (Proyecto Templo Mayor)

[298] *A Model of the Universe at the Foot of the Templo Mayor of Tenochtitlan. An Approach to Its Meaning.*

In this paper I will present the study of five offering containers found during the seventh field season of Templo Mayor Project in Downtown Mexico City. The shape of these stone boxes buried in foundation of the main plaza of Tenochtitlan (around 1486 C.E.), is one of the most important aspects of this ritual complex. They were deposited in the shape of a cross: one was placed in the center, while the others were buried in the cardinal points, representing a Quincunx, a model of the universe. The central offering contained thousands of ritual goods and their distribution was also a schematic recreation of the shape of the world. Symbols of water, fertility, war and sacrifice were buried in this cosmic model. In this deposit the Mexica recreated their cosmology of the world and its future. In contemporary Mexico, it is possible to find memories of these type of rituals in some indigenous communities. Through the study of these practices I hope to contribute to the understanding of these cosmogonic performances in the past.

Arias, Pablo (Universidad de Cantabria) and Esteban Álvarez-Fernández (Universidad de Salamanca)

[74] *By the Seaside: The Role of Marine Resources in Northern Spain from the Late Paleolithic to the Neolithic*

Cantabrian Spain is a privileged area for a diachronic study of the relationship between human societies and marine resources. The region boasts one of the highest densities of Upper Paleolithic and Mesolithic sites in Europe, and a long and dense tradition of archaeological research, especially in the coastal areas. Moreover, its continental shelf is very narrow, so the preserved sites are closer to the late Pleistocene shoreline than in other parts of the Continent. This paper presents a summary of current research on the use of marine resources during the late Paleolithic, the Mesolithic and the Neolithic in northern Spain. Information on settlement patterns and on the exploitation of fish and marine invertebrates is summarized, and indirect evidence of other types of activity is discussed. Finally, the evolution of the economic relevance of the marine environment and its relationship with the rising of the sea level and the climatic change are assessed. Information on social and symbolic aspects of the relationship between the human groups and the sea are also discussed.

[395] *Discussant*

Aristizabal Losada, Lucero

[107] *Alimentación y Sociedad. Paleodieta de una Población Muisca de la Sabana de Bogotá, el caso de Tibanica-Soacha*

El presente estudio fue llevado a cabo combinando información arqueológica, bioantropológica y análisis químico de hueso, específicamente de isótopos estables en una muestra muisca del sur de la sabana de Bogotá. Como objetivo principal se buscó la reconstrucción de la dieta antigua de la sociedad muisca tardía asentada en Tibanica y su relación con aspectos sociales. Específicamente, la investigación estuvo orientada a comparar la relación isotópica de una muestra de 200 individuos con el fin de buscar si existió alguna diferencia dietaria entre los individuos de élite y no élite. A su vez establecer semejanzas y diferencias en el acceso a los recursos de acuerdo a la edad, sexo y pertenencia a los diferentes grupos de distribución del sitio arqueológico. Los resultados de los

análisis isotópicos indican el consumo de dieta mixta por parte de todos los pobladores muiscas asentados en Tibanica. Adicionalmente, se puede decir que tanto los grupos de élite como los de no élite consumieron los mismos productos, pero en cantidades diferentes. La diferencia mas evidente se encuentra en relación al género. Esta información permite pensar acerca del modelo económico muisca que ha sido discutido ampliamente en el contexto colombiano.

[107] *Chair*

Arjona, Jamie

[108] *Things that Queer: Disorienting Intimacies in Late Nineteenth Century Jooks*

This paper examines late nineteenth and early twentieth century jook joints as sites that generated queer African-American intimacies and animacies. Emerging in the 1880s throughout much of the rural United States, jook joints crafted a performatively queer medium within African-American communities. Particularly in the rural south, these jooks offered a haven for black music, dance, gambling, prostitution, and alcohol consumption that disoriented expectations of temperance and frugality. Drawing from affect theory, queer theory and ontological approaches to materiality, I attempt to understand how jook atmospheres generated intimate connections between people and things that were, in turn, condemned by a host of black leaders. The animate assemblage of performers and materials that once resided in these rural spaces contested models of reproductive futurity and craft a focal point for understanding affective disillusionment captured in material attachments.

Arjona, Jamie [269] see Lennen, Joel

Arksey, Marieka (University of California, Merced) and Holley Moyes (University of California, Merced)

[193] *Keeping it Natural: Ancient Maya Modifications of the Ritual Landscape Outside of Caves*

From as early as 1000 B.C., the Maya considered caves to be sacred features of the landscape and used them as ritual spaces. Performances associated with caves served not only the ruling elite in reaffirming their right to rule, but the entire community's confidence in their rulers. These performances became increasingly important in times of crisis, such as during the Late Classic Maya 'collapse' when a series of droughts aggravated the overcrowded, over-farmed, and deforested localities which grew increasingly dissatisfied with their rulers. While we know that modern Maya use the spaces outside of caves for rituals, no one has yet investigated how these spaces functioned for ancient people. Using a combination of both cognitive methods and traditional excavation techniques, I compare the modifications to the landscape outside of several different caves in Belize. These investigations have revealed that the spaces outside cave entrances were modified for the first time during the Late Classic period, providing an ideal paradigm to begin to address how these ritual spaces were used to reinforce social rules and norms during a time period associated with the rising political complexity and the subsequent failure of Maya kingship and social hierarchy in the Maya Lowlands.

Arkush, Elizabeth [14] see Plourde, Aimee

Arkush, Brooke and Richard Hughes (Geochemical Research Laboratory)

[171] *Investigating Prehistoric Obsidian Source Utilization in Birch Creek Valley, Eastern Idaho*

The Birch Creek Valley of eastern Idaho lies just west of the Continental Divide in a region containing numerous obsidian sources. Although the rich archaeological deposits contained within this high desert area were first investigated more than fifty years ago, relatively little excavation-based research has occurred there since the late 1960s and our understanding of ancient lifeways within the Birch Creek drainage remains superficial. This paper presents the results of recently conducted obsidian provenance analysis from four sites that occur in three different ecozones (valley margin, foothills, and uplands) with emphasis on broad patterning in obsidian source use and settlement practices of Native peoples who occupied the area. We also address the challenge of determining

the most proximate procurement locations for obsidian from the Walcott Tuff, which yields artifact-quality volcanic glass of ash-flow origin exposed in numerous geological contexts across a broad swath (~ 35,000 km²) of the adjacent eastern Snake River Plain. Obsidian of this chemical type was commonly used by prehistoric Birch Creek residents, and may have been obtained from a number of highly dispersed deposits in eastern Idaho.

Arkush, Elizabeth (University of Pittsburgh)

[285] *Coalescence and Conformity at the Ayawiri Hillfort, Peru: A Social Experiment under Duress*

Defensive settlements are often places of relatively rapid, dense nucleation by people with few viable alternatives, resulting in the imperative need to establish new consensual rules for living together. In the Titicaca Basin of Peru, after the collapse of the Tiwanaku state, old political relationships were abandoned and defensive security became essential. In the post-collapse period, large hillfort towns formed by the aggregation of multiple families. What behaviors and attitudes were adopted in these forcibly nucleated places, and how did they mitigate scalar stress (or not)? I draw on Kowalewski's concept of coalescence, the aggregation of threatened populations into large new communities, a concept initially developed for historic Native American societies of the southeastern US. Coalescence creates the pressing, conscious need to rapidly reformulate the most basic, intimate logics of sociality and the material and spatial realm through which they work. Notably, it typically involves corporate leadership or collective decision-making rather than centralized political hierarchies. Recent investigations at Ayawiri (Machu Llaqta), a densely settled hillfort of the western Titicaca Basin, shed light on the process of coalescence, the nature of social life within the defensive community, and the workings of conformity, publicity, and social distinction.

[285] *Chair*

Armijo, Ricardo [24] see Gallegos Gomora, Miriam

Armit, Ian (University of Bradford)

[177] *Biographies of Enclosure: An Introduction*

The papers in this session explore the extended biographies of prehistoric enclosures, bringing together researchers from several geographical areas and periods. Although archaeologists have been drawn by the often monumental qualities of prehistoric enclosures, the act of enclosure was frequently just one episode in long-lived and/or recurrent patterns of human activity at significant places in the landscape. The European focus on the concept of the 'hillfort', for example, has tended to abstract many later prehistoric enclosures from their longer-term histories as special places whose meanings altered markedly through time. This presentation introduces these issues, drawing on evidence from the SE Scottish hillfort of Traprain Law. From the Late Neolithic onwards, Traprain Law was a place of primarily religious, funerary and cosmological significance. Archaeological evidence includes the creation of rock art panels in the Late Neolithic and Early Bronze Age, the presence of Early Bronze Age burials, and the deposition of fine metalwork in the Later Bronze Age. During two brief episodes, however, in the 9th century B.C. and 1st-4th centuries A.D., the hill became a focus of dense, high-status occupation. This paper examines how far each episode of human engagement with the hill drew upon earlier accretions of meaning.

[177] *Chair*

Armstrong, Aaron

[356] *Taphonomic Evidence for Human Accumulation of Small Mammals from Pinnacle Point Site 5-6 and Other MSA Sites in South Africa*

Our capacity to detect the utilization of small prey resources by MSA humans can help shed light on subsistence strategies, cognition, and social organization during this critical period in human evolution. Recent analyses of South African MSA faunas suggest an expansion of dietary breadth after ~100 ka with the increase in the exploitation of small mammals (<5 kg) during MIS 4, but until now there has been little taphonomic evidence to support these conclusions. I present the results of

a taphonomic study of 6,051 faunal specimens sampled from throughout the 91-50 ka late Pleistocene occupation at Pinnacle Point Site 5-6. Small mammals account for just 3% of the sample and specimens are only moderately preserved; despite these limitations, there is some evidence of cutmarked and calcined bone suggesting human contribution. These results, which consider the origin, abundance, and preservation conditions of small mammals at PP5-6 support my dissertation work at Die Kelders where I have shown the MSA humans were recurrently exploiting small mammals. With rigorous taphonomic documentation of South African MSA small prey accumulations, causal factors such as environmental change, population pressure, and advanced technologies can be more thoroughly addressed.

Arneborg, Jette (The National Museum of Denmark)

[351] *Vulnerabilities and Failure of Building Resilience in Norse Greenland*

The Norse colonies in SW Greenland were established in the late 900s and depopulated in the middle of the second half of the 1400's. In the Nordic Temperate Zone, pastoralism clearly was at its environmental limits in Sub Arctic SW Greenland. Still, adaptation to the new environment has been described as successful, and depopulation in the late Middle Ages is considered a consequence of economic specialization. This adaptation left the Norse Greenlandic society less resilient and more vulnerable to cope with climate change and a changing world system (Dugmore et al. 2012). In my paper I will explore further the vulnerabilities of the Norse society and the failure of building resilience at a community level with particular respect towards different groups of the society.

Dugmore, A.D., T.H. McGovern, O. Vésteinsson, J. Arneborg, R. Streeter and C. Keller: Cultural adaptation, compounding vulnerabilities and conjunctures in Norse Greenland. PNAS 109(10)3657-3663.

[351] *Discussant*

Arnett, Abraham (Northern Arizona University)

[382] *The Group Within the Group: Carter Ranch Pueblo and the Chaco Regional System*

Fifty years ago Paul Martin and John Renaldo of the Field Museum of Natural History directed the excavation of Carter Ranch Pueblo in the Hay Hollow Valley of east central Arizona. Decades later, archaeologists recognized a regional system of settlements in and around the San Juan Basin linked to great houses in Chaco Canyon via roads and highly visible material cultural characteristics. Although Carter Ranch Pueblo displays typical Chacoan attributes, its inclusion within the Chaco regional system has not been widely accepted. I compare the architectural, material cultural and chronometric characteristics of Carter Ranch Pueblo to sites more commonly accepted as Chacoan outliers within a framework of historical processualism to infer the relationship of Carter Ranch Pueblo to the Chaco regional system. I conclude that, rather than a product of migration from areas closer to Chaco Canyon or emulation by outsiders, Carter Ranch Pueblo represents willing participation in the Chaco regional system by local populations.

Arnold, Jeanne (UCLA, Department of Anthropology)

[32] *It Takes a Village: Mainland and Channel Islands Population (Labor) Resources through Time*

This presentation traces population estimates of the Chumash peoples on both sides of the Santa Barbara Channel through several thousand years, examining how researchers have arrived at those estimates and where possible suggesting how we might need to adjust both some of our assumptions and some of the outcomes. This review should be useful in further examining other phenomena such as sizes of labor forces available for the intensive Channel Islands specialized craft production industries (microliths, shell beads) or dietary requirements for subregions experiencing stressors such as drought. Comparatively robust community sizes on both the south coast mainland and the larger islands, particularly during the late Holocene, make clear that labor pools and leadership were well-established but may have responded differently to ecological instabilities. In no phase is a characterization of the islands as 'marginal' in human resources appropriate.

Arnold, Bettina (U. of Wisconsin-Milwaukee) and Manuel Fernandez Goetz (University of

Edinburgh)**[285] *Building Community: The Heuneburg Hillfort as Monument and Metaphor***

Walls are assumed to serve as systems of containment and protection in response to social divisiveness, but they may also serve to reduce or mask conflict within a society. Their physical form may be entirely expedient, largely symbolic, or some combination of the two. Early Iron Age settlements in west-central Europe were often situated on promontories with wall and ditch systems encircling portions of the occupied terrain, but because of the daunting task of excavating such hillfort sites, which can have deposits of many meters, relatively few sites have been extensively documented and our picture of the significance, both functional and symbolic, of these sites remains incomplete. The Heuneburg hillfort on the upper Danube River in southwest Germany is one of the few such sites to have yielded decades of data and the most recent excavations there, together with the application of new technologies, including LIDAR and various forms of remote sensing, have produced intriguing new evidence for the complexity of the hillfort phenomenon in this region.

Arnold, Jeanne [310] see Sunell, Scott

Arnold III, Philip J. [144] see Rosiles Hernandez, Sara

Arpaia, Angela (Far Western Anthropological Group)**[41] *Plant Remains Assemblage in Santa Clara Valley***

The Santa Clara Valley has an archaeobotanical record that spans from the central California Early, Middle, and Late periods. Sites CA-SCL-12, -478, -674, and -919 have robust plant remains assemblages from distinct periods that can be used to evaluate change in plant use and land-management practices. Temporal context and habitat will be compared for each site to understand variation in plant diversity and intensification.

Arpin, Trina (Independent) and Harris Greenberg (Boston University)**[190] *Where's the Beef? The Value of an Interdisciplinary Approach to PPN Features***

The anthropogenic landscape of a prehistoric site is made up of artifacts, structures, and features. However, the three do not receive equal attention. Features--by which we mean stationary but non-structural evidence of human activity--are usually the least analyzed. Inspired by Paul Goldberg's work on Paleolithic hearths, we hope to bring a new, more inter-disciplinary look at some of these less-studied elements of the anthropogenic landscape. To do so, we will expand the study to a later time period, the PPN of the Levant, with a special emphasis on the southern Levant. This paper accomplishes three goals: first, a summary and characterization of the types of features commonly found within the PPN of the Levant and a discussion of what they are, what information they contain, and how they are treated in the literature. Second, drawing on our own research, as well as already published results, we provide examples of the microstratigraphic study of selected features from PPN sites. These data will demonstrate the value these studies in expanding upon the interpretations made in the field. Third, we will use our results to suggest new protocol for documenting and sampling such features in the future.

Arrigoni, Aimee (William Self Associates)**[62] *Chair***

Arrington, Nathan [154] see White, Chantel

Arroyo, Barbara [196] see Aju, Gloria

Arroyo, Barbara (Museo Popol Vuh UFM Guatemala)**[242] *Ritual Practices at the Middle Preclassic Site of Naranjo, Guatemala***

The site of Naranjo, located in the Central Maya highlands of Guatemala has an important occupation that begins around 800 B.C. Here, many important rituals took place, some of them connected to the calendar and others as part of pilgrimage activities. Naranjo was part of a wider network of interaction as documented in the ceramics, site layout, sculptural practices, and figurine inventory. By 400 B.C.E., the site was abandoned and continued like that until the Late Classic when a specific ritual activity was documented. This paper will present evidence of ritual activities from the Middle Preclassic and Late Classic at Naranjo and the relationship of these activities with neighboring sites and others beyond its borders.

Arroyo-Cabres, Joaquín [141] see Ulloa-Montemayor, Ximena

Arroyo-Cabres, Joaquín, James C. Chatters (Applied Paleoscience and DirectAMS), Blaine W. Schubert (Center of Excellence in Paleontology, Tennessee St), H. Gregory McDonald (National Park Service) and Pilar Luna (Subdirección de Arqueología Subacuática, INAH)
[370] *The Late Pleistocene Fauna of Hoyo Negro*

The fauna from Hoyo Negro Cenote preserves a diverse fauna represented by a large amount of bones from both human and animals. To date eleven species of extinct and extant animals have been identified. Extinct animals include the highland gomphothere (*Cuvieronius tropicalis*), two species of giant ground sloth (the Shasta ground sloth *Nothrotheriops shastensis* and a previously unknown member of the *Megalonychidae*), and the sabertooth cat (*Smilodon fatalis*). Modern species, include taxa that are now extralimital such as bobcat, (*Lynx rufus*) and coyote, (*Canis latrans*), as well as Baird's tapir (*Tapirus bairdii*) and the collared peccary (*Tayassu peccari*). Short-faced bears (*Tremarctinae*) also occur in the assemblage and may represent a new variation of this South American lineage. Based on the faunal composition there are elements representing both the Neotropical (large "Xenarthrans" and gomphotheres) and Nearctic (carnivores, perisodactyls, artiodactyls, lagomorphs) affinities, and probably some endemic animals, like the magalonychid ground sloth and the tremarctine bear, which warrant further studies. The presence of bobcat and coyote, as well as the easternmost occurrence of the Shasta ground sloth indicate a drier, cooler habitat during the terminal Pleistocene, which is supported by findings in dry caves in the Yucatan Peninsula.

Arsuaga, Juan Luis [87] see Sala, Nohemi

Arthur, John (University of South Florida St. Petersburg), Matthew Curtis (University of California Los Angeles Extension), Kathryn Arthur (University of South Florida St. Petersburg), Joséphine Lesur (Muséum national d'Histoire naturelle) and Dorian Fuller (University College London)

[174] *Looking into the Dark: Investigating Four Holocene Shelter Sites in Southwest Ethiopia*

Preliminary excavations from the Gamo Ethnoarchaeological and Archaeological Research project in southwest Ethiopia include three caves and one rockshelter, located on the western escarpment of the Great Rift Valley. The analyses of these four mid-altitude (average 2135 m) sites will add to our understanding of the cultural, ecological, and technological transitions occurring within the last 6000 years. The cave and rockshelter sites indicate the use of a classic Later Stone Age lithic assemblage, the onset of pottery use, as well as changes in subsistence from a wild to domesticated fauna and flora. We hope to better discern how Holocene people constructed new landscapes and technologies utilizing lowland and highland resources such as stone, fauna and flora in their transition from foraging to a pastoral/agricultural way of life. Furthermore, we compare and contrast our preliminary research results from the Gamo region with extant published information from other shelter and cave sites within Ethiopia.

Arthur, Kathryn [174] see Arthur, John

Arthur, Dr. Kathryn (USF St. Petersburg)

[340] *Instigating Technological Knowledge through an African Ontology*

This paper focuses on the relationship between material culture and living peoples as constructed through an African perspective of what it means to be in existence--ontology. It is critical that we precedent descendant theories of the human and nonhuman world to produce meaningful narratives of the past, to avoid alienation and ethnocentrism. The Borada-Gamo of southern Ethiopia offers that their worldview enlightens their knowledge of technology. Material culture as spiritually animated has the potential to earn status and worth through gestation in rites of passage. Ironworks, ceramics, stone tools, houses, and food transform through four ritual stages that include birth, maturation in seclusion, adulthood in private households, and elderhood in public marketplaces. These life cycle stages, reproduction, serve as the process for being and as the mnemonic structure for organizing complex farmer and artisan technological knowledge surrounding the production of resources critical for human welfare. Importantly, the life cycle structure births a dialogue between people and materials, such that each instigates metamorphism in the other.

Artz, Joe (EarthView Environmental, Inc.), William Whittaker (University of Iowa Office of the State Archaeologist) and Emilia Bristow (Department of Earth and Environmental Sciences, Un)

[284] *Detecting Mounds Using Airborne LiDAR: Case Studies from Iowa and Minnesota*

Between 2009 and 2012, researchers at the the University of Iowa Office of the State Archaeologist (OSA) conducted a number of pilot studies in the application of airborne Light Detection and Ranging (LiDAR) to find and map prehistoric burial mounds. Studies were conducted in Iowa and Minnesota, two states that have invested in high quality, statewide LiDAR data. These studies began with the master's thesis research of OSA GIS specialist, Melanie Riley, and included the NCPTT-funded development of LiDAR Surveyor, a GIS-based model that processed LiDAR data looking for the characteristic conical topography of mounds. The studies have demonstrated that publicly-available LiDAR data from Iowa and Minnesota are capable of detecting mounds only 30 cm in height. We have found that LiDAR successfully detects a relatively high percentage of mounds known to exist at previously recorded sites. LiDAR Surveyor has proven successful at identifying previously unknown mounds, and is able to weed out "false positives," although we have found that field confirmation of results, no matter the method used, is absolutely essential.

Asaua, Tautala [77] see Sand, Christophe

Ashby, Steven (University of York)

[18] *Craft and Identity in the Viking World*

When considered at all, objects of bone and antler tend to be discussed in functional terms. Occasionally, ornate objects such as hair combs may be seen as communicators of information. In this paper I will argue that if such objects tell us anything about identity, it is not through their form or ornament, but through the tradition in which they were made. Crafts are grown out of tradition, which means that objects are reservoirs of important cultural and social information. For the early-medieval period, this potential remains largely untapped. I will focus on combmaking as an important community practice in Viking-Age Britain, Ireland, and Scandinavia, and will explore the ways in which novel approaches to technology, alongside leading-edge analytical processes that may illuminate questions of raw material supply and provenance, can help us to learn about the people who made and used these objects.

Ashcroft, Eric [254] see Wolfenbarger, Susan

Asher, Brendon (University of Kansas)

[148] *Folsom from the Continental Divide to the Plains-Woodland Border: Examining patterns in artifact distribution and lithic procurement*

Folsom artifact distributions from the Rocky Mountains to the Plains-Woodland border are not ubiquitous. This study documents Folsom projectile point occurrences across seven different physiographic regions, from the Rocky Mountains of Colorado to the Central Lowlands and Glaciated Region of eastern Kansas, and argues for diverse resource availability and lithic procurement

strategies in separate regions. Particular attention is given to artifacts from private collections and surface context. A variety of factors likely contribute to uneven distributions, including collector intensity, site visibility and geomorphic filtering. Observed artifact patterning is explored in terms of potential bias as well as prehistoric behavior.

Ashley, Michael (Center for Digital Archaeology)

[297] *Remediated Roads and Flights of Fancy: Travels with Ruth from Past to Present*

Twenty-five years ago, an undergraduate in philosophy at UC Berkeley took a course on the archaeology of architecture from Ruth Tringham and then dropped out of school, only to return a few years later to pursue a career in archaeology and digital remediation. In this performance, we will co-experience moments of inspiration, perspiration, risk and reflection on a journey with the best travel companion one could ever have. Prepare to be challenged, made slightly uncomfortable, to laugh, and cry and sing as we explore a more personal side to the woman who has never had a boss.

[5] *Discussant*

Ashmore, Wendy (University of California, Riverside)

[344] *Macaw Mountain and Ancient Peoples of Southeast Mesoamerica*

In *A Forest of Kings*, Linda Schele and David Freidel captivated readers with substance and inference about multiple Maya cities and their inhabitants. For Copan, they focused on long- and short-term developments culminating in the death of its last effective king, Yax Pasaj Chan Yopaat, whose death effectively coincided with the end of both dynastic rule and social cohesion at Macaw Mountain, Copan. Extraordinary finds and ideas have come to light since that 1990 publication, things those authors couldn't have known when they wrote. The time is right to explore briefly some theoretical, substantive, and methodological advances for interpreting people's lives and practices in culturally diverse societies of what are now parts of Guatemala, Honduras, and El Salvador. Freshly discriminating models and innovative analytic methods continue to enrich greatly our understanding of people, politics, and lived experience at Classic Maya Copan and its vexing subordinate Quirigua, as well as a growing range of their neighbors, whether allies, foes, subordinates, or other. Much remains as told in *A Forest of Kings*, and as its authors foresaw in their prologue, at least as much has augmented the narrative in the subsequent 25 years.

Asouti, Eleni

[414] *Climate Instability and the Origin of Farming in Southwest Asia*

Prevailing theories concerning the role of climate change in the transition from foraging to farming in SW Asia view socioeconomic change as a response to climate deterioration (push theories) or improvement (pull theories) which caused resource depression or abundance respectively. With this paper I propose that periods of socioeconomic and cultural innovation correlate with periods of climatic instability, which occurred at the timescales of direct human experience of the landscape (i.e., at the individual, generational and inter-generational scale). Climate instability generated suitable contexts for the development of inter- and intra-group information exchange and community interaction networks coinciding with the development of elaborate symbolism, laden with landscape themes and motifs that were widespread across the geographical and socio-cultural divides of early Holocene Southwest Asia.

Astrom, Courtney (College of Wooster) and Olivia Navarro-Farr (College of Wooster)

[249] *A Study of the Role of Cannibalism in Aztec Culture*

It is generally agreed upon that the Aztec practiced cannibalism, but scholars have proposed various hypotheses explaining what function this practice had in the Aztec culture. This study focuses on the nature and ritualistic function of Aztec cannibalism. The Aztec would only consume the flesh of outsiders, mostly war captives, as part of religious rituals which provided a foundation for their culture. A detailed examination of the ethnohistoric and archaeological evidence for cannibalism among the Aztec considers the work of Bernadino de Sahagún and other contemporary authors, compares it to the archaeological record, and evaluates some of the theories that have been

provided by scholars in light of these data. The views of Marvin Harris, Michael Harner, and others are evaluated. The social unity provided by public ceremonies may provide a better explanation for cannibalism than does the argument for nutritional needs.

Astudillo, Fernando [119] see Stahl, Peter

Atalay, Sonya (University of Massachusetts Amherst)

[308] *Moderator*

[34] *Discussant*

Athenstädt, Jan [229] see Habiba, Habiba

Atherton, Heather [34] see Sunseri, Charlotte

Atherton, Heather (Columbia University)

[34] *Chair*

Atkinson, Lesley-Gail [153] see Mol, Angus

Attolini, Franco [370] see Nava, Alberto

Atwater, Chloe (UC Davis), Jan de Vynck, Alastair Potts, Jayne Wilkins and Kim Hill

[294] *Wood Foraging in the Tree-Limited Environment of the Cape Floral Region of South Africa*

Wood is an essential resource for hunter-gatherers. It is necessary for cooking fuel, heat, and potentially safety, and hence influences site location choice and group size. Due to a low diversity and abundance of trees, wood may have been a limited resource for early humans in the Cape Floral Region (CFR) of South Africa. Drawing from behavior ecology foraging models, experiments with modern wood foragers were conducted to test this hypothesis. Foragers were observed collecting indigenous wood fuel species in the seven biomes present in the CFR and central place foraging models were applied. Experimental fires were also performed to assess the quality of the wood fuels. Preliminary results indicate that woody fynbos species provide sufficient fuel for human needs in a stable environment, despite the low abundance of tree wood. Future experiments will investigate how fire events and depletion due to human exploitation affect wood availability. Results will be built into an agent-based model of the paleoscape of the CFR.

Auer, Michael [100] see Richards-Rissetto, Heather

Auger, Reginald (CELAT - Université Laval)

[405] *Slavery and Memory in French Guiana: Designing the Commemoration of Memory at the Loyola Cemetery while Respecting Sensibilities of History*

Our paper reflects on the development of a commemoration concept which takes into account the sensibilities of descendants from the slave trade period in French Guiana. Memory of the trade period is indeed a very sensitive issue among residents of most Caribbean Islands, and we use sixteen years of research at one site to present the various questions with which we are confronted in order for the local population to appropriate the spirit of place. The Loyola Habitation was located at 10 km from Cayenne, and under Jesuit rule it comprised an area making slightly over 1000 hectares; at one point, there were nearly 500 slaves whom toiled at the production of a number of cash crops such as sugar, coffee, indigo, rum, etc. under the supervision of a handful of missionaries. From the remains of the cemetery where approximately 1000 people (Slaves, Amerindian and White land owners) have been interred, our motivation is to draw the fine line between commemoration of memory and glorification of history.

Aura Tortosa, J. Emili (Universitat de València), Oreto García Puchol (Universitat de Valencia, Spain), Jesus F. Jorda Pardo (UNED, Madrid (Spain)), Yolanda Carrion (Universitat de Valencia) and Margarita Vadillo (Universitat de Valencia)

[155] *Geoarchaeology, Paleobiology, and Archaeology of Rockshelters and Caves from Valencia (Spain)*

Cave and rockshelter stratified sites from Mediterranean Spain are the result of the accumulation of time-averaged palimpsests that probably do not represent the normal range of human activities on the landscape. We focus the discussion on understanding the nature of human responses to climate changes, and we argue that different erosive and removal events in several Mediterranean sites had been decisive in our vision of the end of the Paleolithic-Epipaleolithic and the beginning of the Neolithic. Nevertheless, caves and rockshelters have produced geoarchaeological, radiometric, paleobiological, archaeological and ethnographical data that could be used as proxies for systematic recovery of materials needed for eco-dynamics research. The goal of this contribution is to present long-term trends concerning the human populations in Valencia (Spain), a micro-region of Mediterranean Iberia, between the late Upper Paleolithic and the beginning of the Neolithic (ca. 20–6 ky calBP). Data about the use of the caves by shepherds in the twentieth century, which has affected the preservation of archaeological sites, are also included.

Ausec, Marne, Patricia Urban (Kenyon College), Jacob Griffith-Rosenberg (Kenyon College), Reagan Neviska (Kenyon College) and Chelsea Katzeman (Kenyon College)

[314] *Birds, Monkeys, and Shapes, Oh My! Investigating Intersecting Motifs on Ceramic Vessels, Stamps, and Candeleros*

Ongoing design description and analysis have revealed commonalities in the decoration of diverse ceramic artifact classes. Here we outline the specifics of these design features, focusing on depictions of monkeys and birds, geometric designs such as crosshatching and dots, and how these are used individually and in combinations. The use of similar designs on diverse pottery artifact classes suggests a commonality of accepted design elements, although there are differences between classes in design grammar. Thus, in addition to discussing the motifs themselves, we summarize our work to date on design grammar, with particular attention to the Late and Terminal Classic periods in the Middle Chamelecon area of SE Mesoamerica.

Austin, Anne (Stanford)

[240] *Fragmented Bodies and Splintered Coffins: What Can They Tell Us about Ancient Egyptian Mortuary Practices?*

Intrusions into the burial chamber directly impact the mortuary assemblage, often erasing the purposeful placement of grave goods and destroying the peaceful preservation of the body. So what can these palimpsests of havoc actually tell us about original mortuary practices? In this talk, I answer this question through analysis of Theban Tomb 290, the ancient Egyptian tomb of Iry-Nefer. This tomb, studied in 2013-14 as part of the French Institute mission at Deir el-Medina, contains up to 70 individuals from the 19th through 21st dynasties. Through a qualitative analysis of the state of preservation of the bodies in combination with a quantitative analysis of the minimum number of elements, I determine the primary ways bodies in this Egyptian tomb were fragmented after burial. I then use Egyptological research into post-depositional looting in antiquity and modernity to determine how the reuse of grave goods impacts fragmentation of the body in Egyptian tombs. While post-depositional processes can fracture evidence for ancient Egyptian mortuary practices by damaging key areas such as the head and pelvis, they also offer unusual access to the innermost layers of mummification, allowing insight into daily life practices such as tattooing and preparation of the body during embalming.

Austin, Don [352] see Garfinkel Gold, Alan

AVCI, Mert Bertan [218] see Karul, Necmi

Avila, Jairo (CSU, Northridge)**[391]** *Local or Non-local: Reassessing Material Exchange in Southern California*

Previous studies on material exchange have provided valuable insights about the complexity of long-distance networks once established by prehistoric cultures. Fueled by the presence of middlemen throughout the region, these elaborate and intricate networks of interaction and trade allowed easier acquisition and exchange of materials (local and non-local) over the years. Given the extensiveness of materials (i.e. lithics, beads, ochre) repeatedly entering and exiting Southern California by land or sea, how and when do materials no longer become non-local or exotic? When are remote cultures and materials sources no longer remote or unobtainable? Focusing on Southern California, this paper looks at both reassessing the role material exchange played in uniting people and landscapes, and how constant social, political, and economic relations affected material value.

Avila-Ortiz, Alan (ESCUELA NACIONAL DE ANTROPOLOGIA E HISTORIA), Patricia Fournier (INSTITUTO NACIONAL DE ANTROPOLOGIA E HISTORIA) and Patricia Kouvatso (ESCUELA NACIONAL DE ANTROPOLOGIA E HISTORIA)
[81] *Symbols of the Spanish Conquest: Early Colonial Period Figurines from the Basin of Mexico and the Michoacán*

The Spanish intrusion in Mexico brought indigenous peoples into contact with a Hispanic cultural system, creating a fusion of multiethnic societies each with its own religious, social, and economic values. Our research considers how material culture is formed and transformed through a variety of processes involving structure and practice in specific contexts, which we glean through archaeological collections and documentary records. We focus on the materiality of ceramic figurines made by the Nahua and Purepecha during the 16th and early 17th centuries, to study modes of manufacture, form, decoration, and particularly continuity and change in imagery. The Spanish conquest and the subsequent Christian indoctrination process resulted in the disappearance of material culture symbols associated with indigenous religion, including idolatrous representations prevalent in precolumbian ceramic figurines. Post-Conquest figurines portrayed different ethnic and social groups, and the sacred became the secular. These hybrid artifacts have a symbolic foundation in ideology and world view, for the construction of political organization and other expressions of structural components of society. Their symbols tended to solidify within the indigenous population the imposed way of life, economic and political order, and social organization.

Awe, Jaime [24] see Peniche May, Nancy

Awe, Jaime**[306]** *The Evolution of Anthropomorphic Imagery at Cahal Pech, Belize and Its Implications for the Rise of Kingship in the Middle Preclassic Maya Lowlands.*

In a series of articles published in the 1980s, and in the subsequent volume "A Forest of Kings", Linda Schele and David Freidel demonstrated that the institution of kingship had been firmly established in the Maya lowlands by the Late Preclassic period. Twenty five years later, ongoing research in Belize and the Peten now suggests that this level of cultural complexity may have actually arisen by the Middle Preclassic period. One line of evidence that strongly supports this argument is the evolutionary change in anthropomorphic imagery. In this paper, I present evidence from the Belize River valley which suggests that the replacement of figurines by other forms of anthropomorphic imagery was closely associated with changes in the socio-political structure of Middle Preclassic Maya society.

Ayres, William [52] see Thompson, Adam

Azéma, Marc (CREAP/TRACES UMR 5608 CNRS TOULOUSE)**[181]** *Graphic Narration and Spatial Organization in the Grotte Chauvet-Pont d'Arc*

The Aurignacian site of Grotte Chauvet-Pont d'Arc (Ardèche, ca. 37,000 calBP) signals the origin of figurative art, with nearly 500 stylistically uniform parietal decorations. Images of animals are composed in a spectacular fashion, especially in the Secteur des Chevaux and the Salle du Fond.

The latter, the end of the cave's passages, is the clearest example of the management of subterranean space by Paleolithic artists in the interest of achieving their ultimate intention: to narrate by image. The animated representations relate to each other in a narrative system whose meaning is lost to us. Multiple levels of graphic themes can be identified, the most evident being the major role of the "lead actor" in the cave: the cave lion. This narrative illustration develops at the level of the simple illustrated panel to that of complex frieze and to the level of the ensemble of the Salle du Fond. The cave itself directs the order in which the visitor perceives the images, thereby structuring the narrative constructed by the representational associations of unknown significance (symbolic? mythological?). Comparison of the Salle with other chambers of the cave confirms the likely extension of this narrative system to the scale of the entire cave

Azevedo, Diana (Utah State University) and David Byers (Utah State University)

[164] *Zooarchaeological Fish Remains and Signals of Resource Depression from Jamaica and Beyond*

This poster presents an analysis of archaeofaunal fish remains from Bluefields Bay, Jamaica and findings of prehistoric marine resource depression from the Caribbean area. The Jamaican collection derives from recent excavations of a shell midden in Belmont, encompassed by the Bluefields Bay marine sanctuary. Preliminary radiocarbon results suggest the site dates to Jamaica's Meillacan Ostionoid (900-1500 A.D.) occupation. The collection contains over 17,000 bones, with 8,961 specimens identified to Actinopterygii (ray-finned fishes) representing 50.45% of the collection. Zooarchaeologists have documented the effects of resource depression by measuring changes in prey choice and prey size. We use a combination of average adult body size and habitat zone to determine rank order of Caribbean fishes. The Jamaican collection suggests a reliance on high-ranked reef fishes as opposed to lower-ranked pelagic fishes. We use published data to identify signals of resource depression on Tobago, St John, and other islands. Based on these data and those we observed in our Jamaican study, we suggest human impacts to fish populations are idiosyncratic, not inevitable, and require particular attention to specific reef ecosystems to understand the impacts of human predation on each.

Babalola, Abidemi (Rice University), Laure Dussubieux (Field Museum, Chicago) and Susan McIntosh (Rice University)

[140] *Glass Beads from Igbo Olokun, Ile-Ife: Chemical Composition, Production, and Regional Interaction*

The site of Igbo Olokun in the city of Ife, in southwestern Nigeria has been identified as a primary glass and glass beads production center dating to the "Classic" period (12th-15th c.), but glass from well-recorded contexts has been rare. Excavations in 2011-2012 produced over twelve thousand drawn glass beads. LA-ICP-MS analysis of 49 glass bead samples revealed two main compositional groups: High Lime, High Alumina (HLHA); and Low Lime, High Alumina (LLHA). While the occurrence of HLHA corresponds with other compositional analysis previously carried out on Ile-Ife glasses, the LLHA represents a new group that had not earlier been reported for Ile-Ife glass beads. This paper contributes to the argument for local manufacture of bead in Ile-Ife. It also examines the regional and trans-regional spread of Ile-Ife glass beads from the 12th through 17th century A.D.

Bachelier, François [190] see Mallol, Carolina

Badilla-Cambronero, Adrián [170] see Corrales-Ulloa, Francisco

Badillo, Alex (Indiana University)

[120] *Full-Coverage Survey Techniques in the Mountains of the Sierra Sur, Oaxaca, Mexico*

This poster presents full-coverage mountain survey methodologies in light of the development of GPS technologies and GIS software and data during the last decade. Oaxaca, Mexico is a well-known area for settlement pattern research, as various projects have successfully implemented full-coverage regional surveys there. These efforts have produced large continuous datasets of the

spatial distribution of archaeological remains throughout Oaxaca. Improvements in GPS equipment and GIS software give us the ability to adapt full-coverage survey methods to local environments producing rich datasets. With the use of GIS it is possible to combine data layers, local knowledge, and judgmental sample strategies to develop a survey strategy tailored to the local region. High accuracy GPS and its ability to customize the kinds of descriptive and metric data offer the ability to expedite work in the field and shorten time spent post-processing geospatial datasets. The Nejapa Valley region and the Quiechapa frontier region will be used as case studies to illustrate the usefulness of GPS technology and GIS software to setup and execute a regional survey project.

Baer, Sarah [98] see Simon, Rebecca

Baer, Sarah (SWCA Environmental Consultants)

[352] *Managing Meaning: Mitigation, Monitoring, and Mentoring at a Rock Art Site in the Uinta Basin, Utah*

In 2014, SWCA, in collaboration with Crescent Point Energy U.S. Corp and Sunrise Engineering, completed detailed analysis, laser 3D scanning, mapping, monitoring, and dust mitigation of a rock art site in the Uinta Basin, Utah. Detailed analysis of the rock art figures—characteristic of the Archaic, Fremont, Ute, and Historic periods—gives us insight into possible movement of peoples between the Tavaputs Plateau and Uinta Basin. Importantly, the interest in the project lies not only with interpretation of the rock art itself, but also on positive collaboration between energy industry professionals, archaeologists, construction personnel, Native American tribal members, and local peoples during mitigation activities and subsequent monitoring of road construction near the site. Engagement in rock art by diverse groups demonstrates that interpreting the past provides an opportunity for open dialogue and provides mentoring on the importance of preserving historic places.

Baer, Alexander

[388] *Monumentality and the Archaic State: Heiau Distribution in Kaupo, Maui*

In the early 18th century, competing archaic states on the islands of Maui and Hawai'i were engaged in a long-standing conflict to establish primacy over the Hawaiian Archipelago. To better oversee preparations for war, Maui's King Kekaulike moved his entire royal court to the fertile, but politically peripheral district of Kaupo. Oral traditions speak of Kekaulike expanding a network of ritual structures throughout the region, resulting today in a landscape covered with some the largest heiau in the archipelago. In this paper I discuss the monumental structures of Kaupo and their distributions both across the region and through time. Combining extensive AMS dating of these, and residential structures, with GIS analyses I demonstrate that virtually all of the heiau in the district were in fact constructed well before the arrival of King Kekaulike. This indicates that despite its position on the fringes of the Maui polity, Kaupo's sociopolitical infrastructure was established without the direct oversight of the central regime. The network of temples therefore represents a local expression of increasing sociopolitical complexity, mimicking, at a smaller scale, the developments ongoing in the larger rise of Hawaiian states.

Bagwell, Elizabeth (Aspen Environmental Group)

[354] *Methods for the Analysis of Structural Wood and Some Examples from NW Mexico – A Paper in Honor of Tomas C. Windes*

The wooden portions of prehistoric and historic architecture are not always well preserved. However, when they are present they provide a wealth of information about construction techniques, labor effort, and other aspects of the lives of the people related to building construction. Some key attributes of analysis include: tree species, when the tree died, felling methods, branch and bark removal methods, and surface treatment. This paper summarizes some of Windes' contributions to this area of study, identifies some of the questions that these data might answer, and presents a case study of Medio Period (1200-1450 A.D.) adobe architecture from the Casas Grandes region of NW Mexico.

Baichtal, James [320] see Carlson, Risa

Bailey, David [10] see Rubinstein, Emily

Bailey, Kassi (University of Arizona)

[166] *Investigations of a Microfaunal Assemblage: Emergence of Pest-Host Relationships at Aşıklı Höyük, Turkey*

Small vertebrate remains are often ubiquitous in archaeological contexts, with rodent and microvertebrate activity recognized as a common source of disturbance. On the other hand, small vertebrates can have great significance for archaeological interpretation because they provide key evidence, directly or indirectly, on human subsistence and settlement behaviors, such as food storage, sedentism, seasonality, and site abandonment. This poster presents the results of a preliminary analysis of the microfaunal assemblage at Aşıklı Höyük, an early Aceramic Neolithic settlement in the Aksaray province of Turkey. The primary focus of this analysis is on the earliest levels of the site (Layers 4 and 5 in trench 4GH), which contain semi-isolated roundhouse structures, diverse outdoor features, and middens. Considerations of the architectural features of the site are important for understanding the potential factors that attracted small vertebrates to these human-altered environments, such as concentrations of food resources and the presence of safe places for these animals to reproduce or hibernate.

Bailey, Doug (San Francisco State)

[297] *Who Invited the Secret Police?*

In the summer of 1995, a team of British, Bulgarian and American archaeologists, students, helpers and local villagers made preliminary CENSORED at the late Neolithic settlement tell at CENSORED. After a CENSORED field season, during which CENSORED, CENSORED, and CENSORED were regularly engaged in CENSORED by CENSORED, several of the team were CENSORED. In the months that followed, CENSORED CENSORED CENSORED CENSORED and CENSORED CENSORED. National press coverage in CENSORED as well as a formal debate in CENSORED CENSORED CENSORED focused debate as much on archaeology as it did CENSORED and CENSORED. In this context, the first (and final) season of the Podgoritsa Archaeological Project provides an excellent, still ambiguous example of the CENSORED or CENSORED in archaeological traditions where CENSORED is openly accepted, even CENSORED. CENSORED CENSORED CENSORED CENSORED CENSORED. Professor Tringham CENSORED CENSORED CENSORED CENSORED while the recently exposed agent CENSORED were CENSORED and thus CENSORED. CENSORED CENSORED CENSORED CENSORED and CENSORED CENSORED CENSORED while only CENSORED. CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED. CENSORED CENSORED CENSORED CENSORED CENSORED.

Bailey , David [56] see Gunter, Madeleine

Baines, Jonathan (Institut für Naturwissenschaftliche Archäologie)

[402] *Plant Niche Construction: From Forager to Planter in the Zagros Mountains, Iran*

In terms of niche construction, the development of agriculture at the end of the Palaeolithic was a realignment and expansion of existing hunter-gatherer plant ecology modifications to a transforming human and natural setting. This paper suggests that people's engagement with their surroundings altered under pressure of changes in the environment and their subsistence, residence and mobility strategies. Increased foraging efficiency and stability were sought. These relied on a suite of actions and responses to ecological conditions, passed down the generations since the emergence of active modification and control of plants, and animals, during our primate evolution. To reduce logistic costs, improve the ability for longer-term storage and increase yields per hour of invested labor, plant niche modifications were developed on earlier Palaeolithic plant exploitation. Between the Upper Palaeolithic and the PPNA, plant niche construction efforts targeted economising on the expended

energy versus yield and broadened the variety of exploited plants and their calorific worth as is most clear with food plants in the Fabaceae and Poaceae families. In sum, people's niche construction activities developed dependent on their local environment and lifestyle and the ecological conditions of the targeted plants.

Baird, Douglas (University of Liverpool) and Andrew Fairbairn (University of Queensland)

[161] *The Ordering of Space at Boncuklu, Central Anatolia (8500-7500 cal B.C.): Household and Community*

This paper explores the degree to which the spatial ordering of Neolithic settlements may be related to the nature of households and their inter-relationships and where symbolic and cosmological factors may have had a role, using evidence from central Anatolia, notably from Boncuklu, where practices antecedent to those at Çatalhöyük are well attested. Still influential is a 'Domestic Mode of Production' model in which it is proposed that increasing household autonomy in the Neolithic reflects the dominance of the household in production and consumption, the Byrd and Banning model. Increasing house size and spatial division is often seen as related to this. In this context the emergence of corporate institutions at the supra-household level can be construed as the counter balance to the increasing economic autonomy of households, performing key integrative functions that allow the development of stable long term communities in the face of the autonomous tendencies of the household. We examine the Boncuklu evidence with reference to these paradigms and suggest alternative ways of envisaging relationships between households and community and consequent spatial ordering of various practices. This also allows us to consider the possible role of cosmologies in spatial arrangements and installations at the site.

Baires, Sarah [305] see Baltus, Melissa

Baisan, Christopher [110] see Guiterman, Christopher

Baitzel, Sarah [184] see Sitek, Matthew

Baitzel, Sarah (UC San Diego, Dumbarton Oaks)

[203] *What Once Was... Taphonomical Processes and Their Implications for Understanding Tiwanaku Funerary Practices and Social Identities*

Archaeological investigations into group affiliation and status, gender and other social identities are often based on human burials and their grave goods. Once deposited burials become subject to a series of cultural and natural taphonomic processes that alter the material record. The systematic recovery of over 200 provincial Tiwanaku burials from the Middle Horizon Period (A.D. 500-1000) settlement of Omo M10 in the arid Moquegua valley (southern Peru) presents a compelling case study for observing stages of looting and decomposition. The rich material record of the Omo M10 burials offers insights into the diverse uses of perishable and non-organic materials to express social constructs of status, gender, and group identity. Taking into consideration how distinct taphonomical processes impacted Tiwanaku funerary spaces and offerings both locally and regionally, I demonstrate the utility of a graded taphonomic scale in order to critically evaluate the material basis of the archaeological interpretations. Such an approach precludes the potential fallacy of directly comparing contexts site-wide or regionally that have been exposed to variable taphonomic processes, and arrives at a more cautious - albeit perhaps less wide ranging - view of Tiwanaku social identities and burial practices.

Baker, Kristen [132] see Pantel, Agamemnon

Baker, Brenda (Arizona State University)

[240] *Death on the Middle Nile: Mortuary Traditions and Identity at the Top of the Great Bend*

Our understanding of ancient Nubian mortuary traditions principally derives from monumental elite cemeteries such as Kerma, El-Kurru, and Meroe and the 1960s salvage excavations in Lower Nubia.

More recent work in Upper Nubia, in northern Sudan, however, has revealed substantial regional variation. Assessment of habitation, rock art, and cemetery sites from the Mesolithic through Christian periods in the Bioarchaeology of Nubia Expedition (BONE) project area on the right (north) bank of the Nile River in the region of el-Ginefab illuminates the rich archaeological record of a previously uninvestigated landscape. Mortuary practices in this “hinterland” at the top of the Great Bend show similarities to “core” sites, but local practices suggest that temporal differences in grave architecture and treatment of the dead are not always as distinct over time. Grave goods, however, indicate integration into far-flung exchange networks rather than isolation. Persistence of local traditions, spatial and social organization within and among cemeteries, and distinct identities marked in life (e.g., dental ablation) or death (e.g., burial with archery equipment) from the Kerma period (c. 2500-1500 B.C.) through Christian periods (c. A.D. 550-1400) are discussed to highlight new perspectives on ancient Nubian identity and mortuary behavior.

Baker, Jeffrey

[333] *Population, Climate Change, and Agriculture in the Late First Millennium C.E. Maya Lowlands*

Over the last 20 years, a number of studies have provided evidence for a “drought” in the Maya Lowlands between the 8th and 10th centuries. Researchers have argued that a higher water table in the northern lowlands allowed agricultural practices to continue in the north, while sites in the south suffered from the drought. This paper will examine the relationship between population changes and climatic changes in the Maya Lowlands. The nature of the water table and the agricultural practices of the Prehispanic Maya will be examined in light of how they might have helped or hindered the response to a drought.

Balanzario, Sandra [399] see Straulino, Luisa

Balasalle, Aileen (University of Massachusetts Boston) and Judith Zeitlin (University of Massachusetts Boston)

[76] *Landscape and the Impact of Late Colonial Industrial Agriculture on Indigenous Communities in the Tehuantepec Region of Mexico*

During the late colonial period, the political economy of the Oaxaca Isthmus of Tehuantepec, like many areas of rural New Spain, witnessed dramatic changes in response to Bourbon political reforms and as a consequence of increased engagement with global capitalism. These changes are particularly apparent in the sheltered piedmont zone of the Rio de los Perros, where Zapotec elites had managed to control productive agricultural lands into the early 18th century. New creole landowners emerge in the documentary record through their multiple petitions to engage in sugar cane production and to establish sugar refineries. In this paper we examine the archaeological footprint of these endeavors and explore changes in the landscape of power and the impact these changes had on indigenous communities.

Balasescu, Adrian [401] see Herrscher, Estelle

Balasse, Marie [406] see Janzen, Anneke

Balbo, Andrea (CaSEs IMF-CSIC), Jasmin Link (CLISEC-CLISAP University of Hamburg) and Jürgen Scheffran (CLISEC-CLISAP University of Hamburg)

[73] *You Go First: An Agent-Based Model of Mating-Migration between Early Farming and Foraging Societies*

Following the introduction of agriculture, domestication and permanent settlement in the early Holocene, patrilineal and patrilocal models have become more common than matrilineal and matrilocal ones. While patrilocality is observed at the worldwide level, matrilocality has been associated to specific areas, e.g. sub-Saharan Africa.

Matrilocal and patrilocal residence patterns indicate whether as a rule, a newly formed couple settles

with or near the female's or male's parents respectively. In this context, mating can be seen as a sub-category of the migration process, where one of the two components of the newly formed couple moves into the household/village/city/country of the other. Where patrilocality is widespread greater female mobility is observed. The opposite is true for matrilocality.

Using available ethnological data, our agent-based model (ABM) focuses on mating-migration dynamics between hunter-gatherer populations (HGP) and food-producing populations (FPP). We explore within and between population mating-migration behavior, highlighting possible tendencies for gendered 'marriage' migration among traditional HG and AP societies.

Balcarcel, Beatriz [408] see Johnston, Kevin

Balcarcel, AnaBeatriz

[408] *Arquitectura Preclásica en el Grupo Balam Acrópolis Central de El Mirador, Peten*

La Gran Acrópolis Central es el corazón del sitio arqueológico El Mirador, el cual presenta diferentes grupos de edificaciones de variada complejidad. Uno de ellos es el Grupo Balam con arquitectura del Preclásico Tardío. Se investigó los aspectos físicos, espaciales, funcionales, sociales e ideológicos a través de una secuencia arquitectónica minuciosa. El estudio permitió conocer no solamente los materiales y sistemas constructivos, las remodelaciones arquitectónicas, el arte en estuco adosado, como también los objetos asociados a esos espacios que permitieron acercarnos y explicar la sociedad que los construyó y ocupó.

Balco, William (Northern Illinois University) and Michael Kolb (Northern Illinois University)

[368] *Exploring the Roman Occupation and Abandonment of Salemi, Sicily: The Cistern at Largo Cosenza*

Excavations in Salemi, Sicily, have discovered a large, bell-shaped cistern dating from the 1st century B.C. to the 1st century A.D. This feature appears to be contemporaneous with a large mosaic floor identified nearby in 1893. The Roman cistern contained a wide variety of domestic debris attesting both the economic interconnectivity and independence of this site. This paper discusses the use and abandonment of the cistern, contextualizing the site within the broader, western Sicilian region. Initial results of the materials analysis suggest that Roman Salemi participated in several overlapping networks of pottery exchange while also maintaining material independence through the possible manufacture of glass artifacts. Furthermore, the high frequency of tablewares at this site contrasts with the high frequency of processing wares from other sites located in the nearby valleys, suggesting different occupation strategies employed at contemporary sites in the Sicilian hinterland.

Baldwin, Anne [34] see Bremer, J

Balinger, Duncan [24] see Skaggs, Sheldon

Ball, Terry, Luc Vrydaghs (Universite Libre de Bruxelles), Akos Peto (Hungarian National Museum), Madison Pierce (Brigham Young University) and AnnaLisa Davis (Brigham Young University)

[309] *Identifying Triticeae Taxa in Soil and Ceramic Thin Sections through Morphometric Analysis of Articulated Dendritic Phytolith Wave Patterns*

Morphometric analysis has proven to be an effective tool for identifying phytolith assemblages produced by various plant taxa. Dendritic phytoliths are produced in the inflorescence bracts of Triticeae. Articulated dendritic phytoliths produce a wave pattern along the margins of the cells. In this study we explore the use of morphometric data from our reference collection of articulated dendritic phytoliths to identify Triticeae taxa in soil and ceramic thin sections.

Balladares, Sagrario (Sagrario), Donald Byers and Leonardo Lechado

[313] *Proyecto Gran Canal: El patrimonio caribeño nicaraguense (cultural y arqueológico) en peligro*

Este tema estará referido a la preocupación de algunos investigadores, arqueólogos y antropólogos, nacionales y extranjeros, que trabajamos en la región caribeña de Nicaragua por las implicancias que tendrá la construcción del canal interoceánico en el caribe. Siendo que el área geográfica que se verá afectada posee en la actualidad un patrimonio vivo (comunidades originarias y étnicas) asentado en Punta de Aguila, lugar donde se pretende la construcción del principal puerto que dará inicio al canal por el caribe, produciéndose quizás la desaparición de dicho poblado. Se encuentra además, gran variedad de patrimonio arqueológico, evidencia material distribuida en éste y otros poblados cercanos, por ejemplo, en el poblado de Monkey Point, lugar de un asentamiento creole, donde aún se encuentran muchos concheros antiguos y las evidencias mas antiguas sobre el poblamiento en Nicaragua. Los habitantes actuales se encuentran alarmados por la desinformación de los pormenores en cuanto a los procesos que se avecinan. Los pobladores actuales quieren encontrar una salida para mitigar las consecuencias de dicho proyecto, ya que no se oponen al mismo.

Balladares, Sagrario [313] see Lechado, Leonardo

Balladares, Sagrario [313] see Roksandic, Mirjana

Ballantyne, Rachel (University of Cambridge)

[176] *Where Are the Lives? Characterizing Settlements from Small Artifactual Debris*

This paper is inspired by consideration of how charred plant macrofossil assemblages relate to past human lives, as one component of the small artifactual debris on settlements. Cultural decisions regarding activity location, rhythm and 'waste' deposition mean there can be wide variation in the archaeological remains of an otherwise identical plant processing activity; this issue is common in archaeology as many classes of material, including plant assemblages, are understood with models from actualistic studies. Our understanding of the past also pivots on the inherent temporality of all archaeological contexts, which embody many scales of process compared to present-day observed events (a duality much-debated from Schiffer and Binford onwards).

I thus present a strategy to identify patterning in small artifactual debris across excavated settlements by comparing multiple classes of materials from bulk sediment samples; and the implications of the results for understanding associated charred plant assemblages and lifeways. As daily life is the very basis of social meaning and identity, identifying and understanding small artifactual debris is vital since it is imbued with conscious and unconscious cultural decisions regarding the juxtaposition of materials. The case studies are all from rural Roman Britain, however the concepts and methods are widely applicable.

Ballard, Hannah and Elena Reese (Pacific Legacy, Inc.)

[416] *Life on Grove Street: Victorian Households in Hayes Valley, San Francisco*

During the mid to late 19th Century, Hayes Valley was a San Francisco neighborhood transitioning from working to middle class. Residents included European immigrants and transplants from other parts of the US. Many families rented the single and multifamily residences that lined the streets. In 2013, Pacific Legacy, Inc. conducted testing and archaeological monitoring excavations for the construction of a multistory building on Grove Street in the Hayes Valley. These investigations unearthed two privies associated with 19th century residences. The privies, which date from the 1860s-1890s, contained a diverse array of artifacts including those associated with Catholic religious practice, women, and children. The privy contents as well as the documentary record demonstrate the transitional nature of this San Francisco neighborhood, the efforts of families to conform to the middle class Victorian norms, and their various economic strategies.

Ballenger, Jesse [92] see Daughtrey, Cannon

Ballenger, Jesse (Statistical Research), Brandi Bethke (University of Arizona) and Maria Zedeno (University of Arizona)

[300] *The Landscape Archaeology of the Northwestern Plains: Problems and Potential*

The Plains of Northern Montana contain a uniquely preserved record of rock circles (tipi rings), rock piles (cairns), and other rock configurations that communicate resident, transient, and permanent aspects of prehistoric Native American life in the modern Blackfeet Indian Reservation. This paper relies on the long-term recordation of several thousand of such features to articulate a continuous architectural landscape that represents leadership, planning, seasonality, demography, and the passage of time. We seek to explain this record in the context of minimal and monumental human endeavors to conceive a better understanding of the ethnographic and archaeological pasts.

Ballester, Benjamín, Estefanía Vidal, Elisa Calás, Constanza Pelegrino and Patricio Aguilera

[318] *La materialización de la vida en comunidad entre los cazadores, pescadores y recolectores marinos que habitaron el litoral del Desierto de Atacama durante los 6000-4000 Cal AP (Norte de Chile)*

Los cazadores-recolectores han sido tradicionalmente entendidos como formas sociales caracterizadas por sistemas simples de organización, estructuras políticas levemente jerarquizadas, bajo desarrollo económico y tecnologías primitivas. Esta imagen trazada a partir de generalizaciones desmedidas se encuentra hoy muy lejos de representar la enorme diversidad de soluciones sociales y modos de vida de las poblaciones que han basado su subsistencia en la caza-recolección. Dentro de esta heterogénea categoría los cazadores-recolectores marinos han tomado cierta distancia y unicidad por vivir de un medio ambiente caracterizado por la riqueza de sus ecosistemas naturales, permitiéndoles en algunos casos alcanzar desarrollos complejos en su organización social, política y económica.

En la costa arreica del Desierto de Atacama (Norte de Chile) se asentaron desde los 13000 Cal-AP grupos humanos dedicados a la explotación del medio marino sin abandonar en ningún momento de su historia la caza-recolección, aun cuando en su devenir experimentaron cambios bastante profundos en sus formas de organización social, relaciones de producción y vínculos con otras sociedades. En esta ponencia buscaremos esclarecer estas transformaciones a partir de su arquitectura, la funebria, los medios para explotar el ambiente marino, los restos de los animales que consumieron, las cadenas operativas líticas y su patrón de asentamiento.

Baltus, Melissa (University of Toledo), Sarah Baires (Eastern Connecticut State University) and Timothy Pauketat (University of Illinois at Urbana-Champaign)

[305] *Religious Subjects and Gendered Transformations at the Native American City of Cahokia*

Though processes of subjectification are continuously ongoing, there are moments when powers coalesce in particular persons, places, or objects and bring about pervasive transformations. We explore these moments through gendered divisions of key religious spaces, objects, and practices at the Native American city of Cahokia and other early Mississippian places. Through cosmological oppositions, these spaces, objects and practices both created balance and fomented politico-religious transformation. In particular, we locate subjectification in practices of smoking tobacco with flint-clay pipes, sweating in circular lodges, corn ceremonialism, and the gathering of human and other-than-human persons in the specific ritual contexts of the eleventh and twelfth centuries CE. We recognize a continuum of power relationships and argue that religious subjects (people, spirits, and ancestors) were created through relationships mediated in particular places and can transcend, change or reify gender divisions. Subjectification at Cahokia was contingent upon accessibility and experiences where gendered persons came to embody place and ceremony in particular moments. Through deeply involved relationships with the dead, naturally powerful elements/forces, and divinely inspired designs, certain Cahokians may have been transformed along this shifting continuum of power relationships, from religious subjects to authorities.

Bamforth, Douglas

[17] Discussant

Banas, Jozie [52] see Takaoka, Ian

Banerjea, Rowena [288] see Pluskowski, Aleksander

Banffy, Eszter [348] see Whittle, Alasdair

Banffy, Eszter (Archaeological Institute HAS, BUDAPEST, HUNGARY), Anett Osztás (Arch. Institute RCH HAS Budapest, Hungary), Alex Bayliss (English Heritage, UK) and Alasdair Whittle (Cardiff University, UK)

[348] *A Chronology of Generations? A Site-Based Study from the 6-5th Mill. Settlement and Cemetery of Alsónyék, South Western Hungary*

The Neolithic site of Alsónyék was found in the course of the construction of a motorway. The earliest occupants were the first farmers arriving from the North Balkans. After a short gap, two later Neolithic occupations were followed by an immense settlement and cemetery of the Lengyel culture: 120 robust houses and in sum 2400 burials were excavated. Geomagnetic surveys revealed the remains of a large site lacking parallels in the Central European Neolithic. Dating has been completed with the help more than 200 radiocarbon samples, evaluated with the Bayesian statistical method. This study allows us to define a series of micro-narratives about the lives of the sixth and fifth millennium occupants, yielding a long-term history of Neolithic at the southern margins of Central Europe.

Banikazemi, Cyrus [11] see Longo, Julia

Banks, William (CNRS) (CNRS)

[40] *Culture-Environment Relationships and Heinrich Stadial 1 in Western Europe: Are Ecological Niche Shifts Implicated?*

A common theme among Upper Paleolithic studies is how hunter-gatherer adaptations may be related to environmental variability, with some focusing on how culture-environment relationships during the Paleolithic are intertwined with ecological niche dynamics. The reason being that when faced with the rapid-scale climatic fluctuations and environmental reorganizations characteristic of MIS 3 and 2, Paleolithic populations could have responded in a variety of ways. Ecological niche modeling methods applied to the archaeological record (Eco-cultural niche modeling: ECNM) have aimed to better understand how specific populations responded to Dansgaard-Oeschger climatic variability and identify those instances for which technological or adaptive shifts correspond to shifts in the ecological niches exploited by archaeological populations. For example, the technological changes between the Proto-Aurignacian and the Early Aurignacian were roughly coincident with Heinrich Stadial 4 and an expansion of the exploited ecological niche. This study shifts focus to the latter Upper Paleolithic and targets the Early and Middle Magdalenian archaeological cultures, the latter corresponding to Heinrich Stadial 1. ECNM is used to evaluate whether adaptive shifts observed between these cultures are associated with a niche shift and results are evaluated against a larger framework of culture-environment interactions that considers pre-LGM and LGM contexts as well.

Banks, Kimball (Metcalf Archaeological Consultants Inc. & Combined Prehistoric Expedition Fdtn)

[136] *Nanu, Nanu: Nabta and New Agers*

Over a span of some 30 years, the Combined Prehistoric Expedition conducted investigations of Neolithic occupations at Nabta Playa in Egypt's Western Desert. The most startling discovery was an elaborate expression of Late and Final Neolithic ceremonialism unprecedented in Africa. The expression included a "sacred mountain", tumuli burials, ceremonial burials, stellae and megaliths, and an astronomical calendar circle. The publication of the results has had unintended

consequences: it attracted the attention of not only the archaeological community but also New Agers. New Agers began to pilgrimage to the site and disturb some of the features, especially the calendar circle. The result was to move the circle along with several other structures to the Nubian Museum in Aswan to prevent their destruction. Others have advanced theories to explain the function of the circle and megaliths, including a "star map" that indicates an astronomical knowledge at least as sophisticated as ours. This knowledge included the distance to the stars to which the megaliths were aligned and an intimate knowledge of the Milky Way, including the relative position, scale, and orientation of our sun, and placements of the spiral arms and the galactic center.

Banks, Kimball [230] see Green, Debra

Banning, Edward (University of Toronto), Sarah T Stewart (Trent University), Philip Hitchings (University of Toronto) and Steven Edwards (University of Toronto)

[47] *Sweep Widths in the Evaluation of Coverage by Archaeological Surveys in Jordan and Cyprus*

The Wadi Quseiba Survey in northern Jordan and Tremethos Valley Survey in Cyprus recently employed "calibration runs" by survey crews to calculate sweep widths in a variety of visibility contexts. The resulting sweep widths were a critical element in evaluating the coverage of spaces previously surveyed, and these coverages were integral to the planning of additional survey according to a Bayesian allocation algorithm.

Banning, Edward [401] see Hitchings, Philip

Baram, Uzi (New College of Florida)

[405] *Local Politics and Site Ownership: Archaeology in the Age of Lawfare*

Heritage management encompasses a tremendous range of activities and concerns, including stewardship of the archaeological record. The ethical responsibilities of conservation and protection require recognition of the competing interests involved in the property ownership. This paper reflects on the implications of the dynamics involved in a recent case in Florida. A location containing a significant early 19th century archaeological record became caught up in legal battles. The dynamic is part of a larger trend that some anthropologists have labeled as lawfare, a double-edged sword used by the traditionally oppressed but also by the powerful.

Barba, Luis (Universidad Nacional Autonoma de Mexico)

[26] *Archaeological Prospection In Coixtlahuaca, Oaxaca*

During field seasons 2008 – 2011 a large set of archaeological prospection techniques were applied in large areas surrounding present town of Coixtlahuaca, Oaxaca in a joint project carried on by University of Georgia and the National University of Mexico. This project attempted to put together the large experience of Kowalewski in archaeological survey in Oaxaca's valleys and the experience of the Archaeological Prospection Laboratory using geophysical techniques in Mexico. These approaches are complementary because the scale of archaeological survey is in the order of 106 m², the archaeological prospection is closer to 104 m², building in this way, a bridge to connect the archaeological excavation that covers areas around 102 m². It was possible to take advantage of the data obtained during the 50 km² survey carried on by Kowalewski's team, selecting some specific areas to perform geophysical studies that at the end of the process allowed archaeologists to select areas for excavation. It was a unique project since there is no other example of such a combination of scales and techniques in an extensive archaeological site like Coixtlahuaca to detect not only the presence of buried structures but more importantly, occupation density in the area.

[176] *Discussant*

Barba, Luis Alberto [176] see Pecci, Alessandra

Barber, Sarah [249] see Brzezinski, Jeffrey

Barber, Sarah (University of Central Florida), Arion Mayes (San Diego State University) and Arthur Joyce (University of Colorado at Boulder)

[410] *The Río Viejo Weaver: Burial Practices, Osteobiography, and the Early Classic Collapse*

The Early Classic (A.D. 250–500) in the lower Río Verde valley was marked by political fragmentation and significant transformations in social, political and economic relations following the collapse of a regional polity centered at Río Viejo. How the region's inhabitants navigated these transformations remains poorly understood, although regional-scale evidence from settlement patterns and excavation indicates the abandonment of many communities and major changes in the way people engaged with uninhabited monumental spaces like the acropolis at Río Viejo. This paper provides a micro-scale consideration of the broader social processes under way during the Early Classic in the lower Verde. Combining osteobiography with a detailed analysis of burial context and grave contents, we examine lived experience from the perspective of a single individual from the post-collapse era. This individual was an adult female who showed signs throughout her skeleton of occupational stress possibly related to weaving. She was also buried in the fill of an abandoned ritual structure with a number of grave offerings including ceramic vessels and a ceramic pendant. The juxtaposition of her physical health, burial location, and grave contents reveal the complex interplay of economic, religious, and political tensions during an era of significant social change.

Barbi, Nicholas [101] see Ganio, Monica

Barbier, Brian [32] see Gamble, Lynn

Bardolph, Dana [187] see Bardolph, Paige

Bardolph, Paige (Autry National Center) and Dana Bardolph (University of California, Santa Barbara)

[187] *Visual Representations and Entanglements: Photography and Native Identity-Making in the Classroom and Museum*

This paper examines politics of representation of Native North American communities, past and present, through the use of photographs in academic and museum settings. We consider how photographs of people and objects have been used to naturalize precepts of colonialism, as well as how they have been used to empower indigenous subjects. The implementation of NAGPRA has provided a framework for museums to determine if they should display certain objects deemed culturally sensitive; however, there are no formal procedures in place for historic photographs and images, whether used in museum exhibitions or education venues such as classroom lectures, publications, and media. We critically examine the roles of photographs in popular and academic imaginations as a means to explore improved methods of teaching anthropology in the 21st century. Through interviews with Native consultants, we aim to explore "best practice" approaches for representing Native identities in the classroom and in museum exhibits, in order to move away from outdated representations and stereotypes.

Bardolph, Dana (University of California Santa Barbara)

[347] *Paleoethnobotany at Cerro la Virgen: Exploring the Lives of People and Plants at a Chimú Town in the Hinterland of Chan Chan*

This paper explores the roles of plant foodways in the social, political, and economic organization of Cerro la Virgen, a Late Chimú site in the Moche Valley of North Coastal Peru. Located in the hinterland of Chan Chan, the capital the Chimú Empire (A.D. 1000-1460), Cerro la Virgen comprised a diverse community of craftspeople, farmers, and fisherfolk. Recent paleoethnobotanical investigations of assemblages from different household contexts afford a closer look at the diverse economic strategies of the inhabitants of different households, which I contextualize within the broader history of *corvée* labor, exchange, and social interaction witnessed during the Chimú empire. I consider issues both methodological and theoretical, including (1) the extraordinary preservation of

organic remains at the site, which allows us to examine the importance of fruits and other resources that do not often preserve in charred macrobotanical assemblages; (2) the role of plants within a broader subsistence economy that may indicate wider relations of interregional interaction and exchange; and (3) a questioning of the assumption that the community of Cerro la Virgen functioned primarily as a state-controlled agricultural enterprise.

Baret, David [77] see Sand, Christophe

Barker, Amelia [57] see Greenlow, Claire

Barker, Andrew (University of North Texas), Jonathan Dombrosky (University of North Texas), Amy Eddins (University of North Texas), Kari Schlerer (Crow Canyon Archaeological Center) and Barney Venables (University of North Texas)

[121] *Taphonomy and Negative Results: An Integrated Approach to Residue Analysis*

Residue preservation within the matrices of artifacts is a complex process that can be better understood when multiple types of biomolecules (e.g., protein and fatty acid residues) are evaluated as part of a systematic whole. Commonly, types of residues are evaluated independently, which may relate to different types of biomolecules requiring distinctive methods for extraction and analysis. Thus, the archaeologist either encounters positive results (a hit for a particular residue, such as a protein) or not. If the result is positive, archaeologically meaningful conclusions are drawn. Negative results are dismissed. From a taphonomic perspective, however, and considering complexes of residue types as interacting systems, positive results are more meaningful when negative results can be explained. Consideration of multiple types of biomolecular residues as an interacting system allows better explanation of negative results, thus increasing confidence in conclusions drawn from positive results. We apply an integrative approach to studying organic residues from ceramic artifacts from the Dillard and Switchback Sites in southwestern Colorado using total organic carbon assays and mass spectrometry of proteins and fatty acids. Our protein results are better explained in light of fatty acid and total organic carbon analyses, which generally reflect severe weathering in these artifacts.

Barker, Claire (University of Arizona)

[343] *Communities of Practice and Corrugated Pottery at Chevelon Ruin*

During the A.D. 1200s and 1300s, the Colorado Plateau experienced widespread, large-scale migration and the subsequent aggregation of groups into large Pueblo communities. During this period, people migrated to the Homol'ovi area, aggregating into seven large pueblo settlements. The demographic upheaval resulting from this large-scale population movement brought diverse individual and group identities into contact and, potentially, conflict. Chevelon Ruin, one of the aggregated settlements that comprise the Homol'ovi settlement cluster, was occupied from A.D. 1285-1400. Like the other six settlements in the Homol'ovi area, occupants of Chevelon Ruin produced both decorated Winslow Orange Ware and Homol'ovi Utility Ware. Through analysis of locally produced utilitarian corrugated pottery, this research will investigate the relationship between social identity, artifact style, and communities of practice at the site of Chevelon Ruin. By exploring the presence, extent, and significance of standardization in manufacturing methods within this production area, we will gain a better understanding of community composition and organization at the site of Chevelon Ruin.

Barkwill Love, Lori (University of Texas at San Antonio)

[262] *Early Pithouse Period Ceramics in the Upper Gila: A Look from Winn Canyon*

The Early Pithouse period (A.D. 200 to 550) is characterized by circular pithouse structures often located on isolated knolls, an abundance of undecorated brownware, and a small percentage of red-slipped ceramics generally associated with the end of the time period. Few studies have focused on these Early Pithouse period ceramics. To help fill this gap, a preliminary study was conducted on a sample of the ceramics from Winn Canyon, an Early Pithouse period site in the Cliff Valley in the Upper Gila region. Attribute and petrographic analysis were used to explore the similarities and

differences between the brownware and red-slipped ceramics. This paper will provide the findings of the ceramic analysis and discuss directions for future research on the Early Pithouse period ceramics in the Upper Gila.

[262] *Chair*

Bar-Matthews, Miryam [294] see Braun, Kerstin

Barnard, Hans (Cotsen Institute of Archaeology at UCLA), Brett Kaufman (Joukowsky Institute for Archaeology and the Ancien) and Ali Drine (Institut National du Patrimoine (Tunisia))

[51] *Overview of Two Seasons in the Roman and Neo-Punic settlement of Zita (Zyan), Southern Tunisia*

After Carthage was destroyed by Scipio Africanus Minor (Aemilianus) in 146 B.C.E., the Punic settlements that it controlled were occupied by the Romans. Exporting wine, olive oil, garum (a sauce made of the fermented intestines of small fish), and purple dye (of *Bolinus brandaris* and *Hexaplex trunculus* shell-fish), the eastern Maghreb continued to flourish. Many of the ancient monuments in modern Tunisia date to the centuries following the Roman conquest, until the center of power shifted to the Tripolitanian Region, in modern Libya, during the second half of the second century CE. The city of Zita (Zyan), near Zarzis, may have been founded during the former period or have been built on a more ancient settlement. After its abandonment by the fourth century CE, the surrounding olive orchards encroached on the site and regular plowing has obscured most of the ancient remains. During two excavation campaigns we performed a detailed surface survey and excavated part of the Roman capitol and forum (previously published in 1886), as well as the tophet (a Punic child sacrifice or burial precinct). In August 2014 we also excavated an area where large amounts of debris of industrial metal working were deposited in previously abandoned structures.

Barnard, Hans [184] see Cardona, Augusto

Barnett, Ashley [29] see Vawser, Anne

Barnett, Kristen

[312] *Housepit 54 through an Indigenous Framework: A Holistic Interpretation of an Ancient Traditional Home*

Data collection and analysis at Housepit (HP) 54 Bridge River Site, British Columbia, has provided an opportunity for a range of studies emphasizing (but not limited to) questions of subsistence, inheritance, lithic technological adaptations and spatial organization of the ancient occupations of this household during the BR3 period (ca. 1300-1000 cal. B.P.). This poster draws upon data acquired through the systematic analysis of artifacts and ecofacts and is further enhanced through the use of indigenous theory. It is through this perspective that we can begin to understand HP 54 as an indigenous household and create visibility for the traditional lifeways supported throughout these floors. The goal of this poster is to create a holistic interpretation of HP 54 in the ancient past, one that draws not only from the western theoretical lenses but also from indigenous beliefs and practices that led to the formation of the record we call HP 54. This research is designed to provide a comprehensive framework to gain a deeper understanding of not only the household structure itself, but also the individual lives lived within this indigenous home.

[312] *Chair*

Barnum, Sandra (U.S. Army Corps of Engineers, Omaha District)

[282] *Asa T. Hill, the WPA, and the Fluorescence of Systematic Archaeology in Nebraska*

The most prominent New Deal work-relief program with regard to archaeology was the Works Progress Administration (renamed in 1939 as the Work Projects Administration; WPA), which existed from 1935 to 1943. Functioning through sponsoring universities, historical societies, and other agencies, the WPA supported major field and laboratory projects. In Nebraska, almost all of the New

Deal archaeological projects were carried out with WPA-funded labor. Between 1936 and 1941, the University of Nebraska or the Nebraska State Historical Society drew on such WPA laborers to excavate numerous sites under the direction of Asa T. Hill. Marvin Kivett deemed Hill the “father of systematic archaeology in Nebraska.” Hill was a self-educated archaeologist. Hill’s archaeological work led, in 1933, to his appointment as Director of the Museum and Field Archaeology for the Nebraska State Historical Society. Between 1933 and 1941, extensive surveys and excavations of sites in Nebraska and Kansas were carried out under his direction, much of which was funded by the WPA. He mentored or worked alongside a number of prominent figures in early Nebraska archaeology, including Paul Cooper, Waldo Wedel, John Champe and Duncan Strong. Hill initiated the excavation methods still used for plains earthlodge villages.

Baroldi, Michelle [52] see Zeferjahn, Tanya

Baron, Dirk [55] see Palacios-Fest, Manuel

Baron, Joanne (University of Pennsylvania), Liliana Padilla and Christopher Martinez

[263] *La Florida/Namaan: a Classic Maya River Port*

The Classic Maya polity Namaan is referred to in inscriptions at several sites in Mexico and Guatemala, attesting to its importance as an ally to many neighbors. Namaan has long been identified as the site of La Florida, located on the San Pedro River in western Peten, Guatemala. This position lies at an intersection of routes connecting the large cities of central Peten to the fertile Tabasco Plain and the Usumacinta River Valley. Although many archaeologists and epigraphers have visited the site since the 1940s, it remains virtually unexcavated and significant portions of the site have never been mapped. We visited La Florida in 2013 and 2014 to assess the condition of the site and its monuments and to explore beyond the known site core. In this paper we present the results of these visits. Two new architectural groups and new monuments were located and new hieroglyphic passages were documented.

Barrett, Jason (TxDOT), Linda Gorski (Houston Archeological Society), Richard Weinstein (Coastal Environments, Inc.) and Roger Moore (Moore Archeological Consulting)

[43] *A Community Approach to Data Recovery Investigations at the Dimond Knoll Site, Harris County, Texas*

The Dimond Knoll Screening Project has been one of the most successful Public Outreach efforts undertaken to date by the Texas Department of Transportation’s Archeological Studies Branch. Excavation of this small floodplain mound in northwestern Harris County was completed 2012, revealing a record of regular visitation by mobile foraging groups across nearly ten millennia. Once the upper sediments of the knoll were extensively sampled through meticulous hand excavation, the remaining sandy mantle was stripped away in order to more effectively expose and investigate deeply buried cultural deposits. Rather than simply discarding the stripped soil, TxDOT made arrangements with the Houston Archeological Society to have the sediment moved to an off-site location for screening. Hundreds of artifacts were recovered over the year-long screening project, including chipped stone tools, pottery, and faunal material. The project has been featured in various local media outlets, resulting in an increased awareness of the archaeological heritage present in the Houston area. Artifacts recovered at the screening site will be cataloged, analyzed, curated and reported along with those recovered in the hand-excavated units at the site, rewarding the many community groups who participated in the screening project with a tangible contribution to their regional heritage.

Barrett, Jason W. [292] see Hruby, Zachary

Barretto-Tesoro, Grace (University of the Philippines-Archaeological Studies Program)

[238] *Evidence of Precolonial Cosmology from the Philippines*

Cosmology prior to European contact has been the focus of recent research in the Philippines. The

objective of this paper is to investigate cosmology practices in the Philippines prior to the introduction of Christianity during the Spanish colonial occupation from the 16th century A.D. onwards. This research is significant because it will show that elements of the tripartite cosmology of past populations in the Philippines which can be traced from the Neolithic period persist until the present although their exact meaning may have been lost among contemporary Philippine societies. Using data from ceramics recovered in the Philippines, this paper will explore the archaeological evidence for past cosmology dating to the 10th to the 16th centuries A.D. Analysis shows that specific design elements on earthenware pots and porcelain widely distributed in the Philippines were important to the early local populations. This indicates that in the precolonial porcelain trade, inhabitants in the Philippines were actively choosing certain designs on ceramics because they were important to their belief system.

Barrientos, Gustavo (Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata), Juan Belardi (Universidad Nacional de la Patagonia Austral, CONI), Luciana Catella (Universidad Nacional de La Plata), Flavia Carballo (Universidad Nacional de la Patagonia Austral) and Fernando Oliva (Universidad Nacional de Rosario)

[185] *Continuous Spatial Models of Artifact Relative Frequency Data as an Aid for Sourcing Chert Materials: Two Examples from Patagonia and the Pampas of Argentina*

The aim of this presentation is to introduce and discuss an approach to sourcing chert materials based on the use of spatial continuous models of relative frequency data (i.e. percentage representation of stone tool classes in georeferenced artifact assemblages), which is particularly useful in areas where there is scarce information about both the variability of one or many stone tool classes represented in lithic assemblages across the regional space and the localization of their likely or actual sources. Such models are constructed using geostatistical interpolation (kriging) under the assumption that continuous surfaces make more intelligible the spatial information recovered from relatively few, scattered, and unevenly distributed sampling locations. As long as it is expected that, in most situations, the relative frequency of a stone tool will decrease as a function of the distance from the source, the examination and analysis of the modeled continuous surfaces may provide relevant clues about source location, thus helping in planning problem-oriented surveys and implementing more analytical sourcing activities. We will exemplify the approach with two case studies from regions previously inhabited by hunter-gatherers that present remarkable differences in geology, geomorphology, and sampling coverage: southern Patagonia and the eastern Pampas of Argentina.

Barrientos, Isaac (UNAM-CEMCA), Salazar Daniel (UNAM-CEMCA) and Sion Julien (UP1-ArchAm-CEMCA)

[242] *Los Recintos Funerarios y la Veneración de los Antepasados en los Espacios Habitacionales del Grupo B de Naachtun, Guatemala*

Durante el período Clásico, el culto a los antepasados en la cultura maya tuvo muchos propósitos, como fundamentar el arraigo a un lugar y la ostentación del poder por parte de un grupo familiar o linaje; esto se lograba haciendo de la figura de los antepasados agentes socialmente activos, rememorados mediante eventos rituales dedicados a su persona. Las evidencias arqueológicas de estas prácticas sugieren un fuerte vínculo entre estos personajes y el espacio, materializado generalmente en los contextos funerarios. El Grupo B de Naachtun, al norte del Petén guatemalteco, es un área residencial de élite organizada en tres conjuntos de "unidades-patio". Las excavaciones en los patios 31, 32 y 22 denotaron huellas de reingreso al espacio sepulcral, actos rituales que involucran la extracción de un segmento óseo, así como la colocación de mobiliario que conmemora éstas prácticas; evidencias interpretadas como manifestaciones de veneración hacia los antepasados. Los resultados del estudio del material y el contexto espacial inmediato, mismos que se mostrarán y argumentarán en esta ponencia, apuntan al culto sistemático de estos personajes ancestrales que son posiblemente los fundadores del linaje, fuentes de todo poder económico y político.

Barrientos, Gustavo [251] see Belardi, Juan

Barrios, Edy (CUDEP-USAC)

[183] *Building a Community: Late Classic and Postclassic Residential Structures at Rio Amarillo, Copan, Honduras*

Rio Amarillo, an ancient town, rests 20 km east of the great Maya city of Copan in Honduras. In the last four years residences from the Late Classic and Postclassic period have been excavated at the site. Investigations of the residential buildings from Río Amarillo have allowed us to better understand the influences and allegiances of the inhabitants of this community resting on the margins of the Maya world. The architecture of the structures reflects ties to both Copan and to areas in the interior of Honduras. Artifacts from the houses nearest to the ritual core echo the dominant ideology of Copan during the Late Classic, including the worship of the great city's first ruler, K'inich Yax K'uk' Mo'. With the fracturing of the Copan polity, Rio Amarillo's population moved their residences to higher ground. The debris around these later homes demonstrates that their inhabitants continued to be involved in long-distance trade networks, but that these goods were rarer, with locally-produced ceramics and lithic artifacts dominating the assemblages.

[183] *Chair*

Barrios, Edy [366] see McNeil, Cameron

Barry, Jack [316] see Savage, Daniel

Barry, Jack (Trent University), Gyles Iannone (Trent University), James Conolly (Trent University) and Dan Savage (Trent University)

[316] *Using GIS to Explore the Strategic Location of Ancient Maya Centers Within the Vaca Plateau of Western Belize*

Settlement patterns studies in archaeology have shown that a myriad of environmental, political, social, and ideological factors influenced where ancient people chose to settle on the landscape. In efforts to better understand these complex behaviors, archaeologists have increasingly turned to GIS-based modeling approaches including viewshed and least cost path analyses. This study draws upon these techniques to explore visibility and movement across the north Vaca Plateau of west-central Belize, where a number of ancient Maya polities emerged over the course of the Classic period (A.D. 250-900). A model has previously been developed that suggests the key center of Minanha was strategically located, with a high degree of network connectivity through intervisibility with other centers, and that it is situated in close proximity to major corridors of movement. This paper expands on this model by integrating high-resolution LiDAR data, which includes a number of previously unrecorded sites, to evaluate settlement strategies within the area to the south surrounding the center of Ixchel. Implications for power, politics, territoriality, communication, and defensibility are examined in conjunction with available archaeological and epigraphic data.

Barse, William [275] see Pevny, Charlotte

Barse, William

[371] *The Culebra and Ronquin Paleosols and Their Vessel Assemblages*

Rim sherds from the Culebra and Ronquin sites along the Orinoco River reflect a broadly- shared range of common vessel shapes. The suite of bowls, jars, platters and other shape categories reflect the existence of a common household repertoire of vessels used in food serving, storage and preparation activities. This presentation reviews the commonalities in the range of vessel shapes recovered from secure, well-dated paleosol contexts in these two sites, suggesting that both were part of a riverine inter-action sphere along the Orinoco in northern Venezuela.

Bartelink, Eric [207] see Tichinin, Alina

Bartelink, Eric (California State University, Chico), Jelmer Eerkens (University of California,

Davis), Melanie Beasley (University of California, San Diego) and Karen Gardner (CF International)

[293] *Kroeber's Omnivore's Dilemma: Regional Perspectives on Late Holocene Human Paleodiets in the San Francisco Bay Area*

The analysis of ancient hunter-gatherer diet in the San Francisco Bay Area has been the subject of enormous research effort over the past century. Hundreds of "shell mounds" that once dotted the landscape around the bayshore provide evidence for significant population growth during the Late Holocene. Resource intensification models link population increase to a shift away from exploitation of low-cost, high-ranked prey toward greater use of high-cost, low-ranked prey at a number of archaeological sites, a consequence of resource depression. However, these shifts in animal exploitation often do not track the relative importance of different food resources to the diet. In this study, we use stable carbon and nitrogen isotopes of bone collagen and stable carbon isotopes of bone apatite as a measure of the relative importance of marine versus terrestrial resources, trophic level, and variation in the non-protein sources of the diet within different microenvironments of the Bay Area. Results indicate that human diets are geographically-patterned, with a greater emphasis on higher trophic-level marine protein (marine fish, sea mammals) in the North Bay and greater emphasis on C3-terrestrial and lower-trophic level resources in the South Bay. Temporal patterns, while noted, are most meaningful when examined separately by microenvironment.

Barton, C. Michael [84] see Ullah, Isaac

Barton, C. Michael (Arizona State University), Marco Janssen (Arizona State University), Dawn Parker (University of Waterloo), Allen Lee (Arizona State University) and Sean Bertin (Arizona State University)

[221] *Opening the Black Box: Enabling Transparency in Scientific Computation*

Reproducibility, enabled by transparency in reporting, is the gold standard for science. It is not systematically repeating scientific research, but the potential to do so that maintains high quality in research practice. Reproducibility also drives scientific advance because it enables new research to build on prior accomplishments. This ethos is especially effective because it emerged from within the scientific community.

Archaeology espouses this reproducibility ethos, made all the more important because archaeological practice can destroy the integrity of its data. But transparency for computational archaeological research has not yet received the consideration afforded to other archaeological practice. This is increasingly important as computational archaeology—spanning mining, synthesis, and visualization of large, complex datasets, to modeling and simulation of social dynamics—become more prevalent.

We describe community initiatives for promoting transparency in computational archaeology. The CoMSES Net Computational Model Library is a framework for publishing computational code, so that it can be used by others and authors can be credited for their work through citations. The MIRACLE project is developing cloud-based environments for reproducible workflows of complex, computational analyses of large, multi-dimensional datasets. These initiative share the goal of encouraging and enabling transparency and reproducibility in scientific computation.

Barton, Loukas (University of Pittsburgh)

[345] *Social Aspects of the Diffusion of Agricultural Products and Practices*

The adoption of agricultural products and practices is a social process. Archaeological patterns reveal more than just the timing and direction of the adoption, they help to reveal the very nature of social interaction over a wide area. In particular, the spatial and temporal patterns of diffusion point to norms and priorities in social learning, which in turn generate new avenues for exploring archaeological data. Evidence for the adoption of wheat (a western domesticate) in East Asia is best understood by models that characterize the diffusion of innovations, and the models point to specific attributes of the archaeological record that help characterize the nature of social relations in

agricultural Asia, ca. 5,000 – 3,000 years ago.

Barton, Huw

[414] *Fallow Management and the Origins of Swidden Agriculture in the Tropics*

This paper considers the idea that the origin of swidden agriculture in the tropics arose from long-term practices of fallow management. In various forms, these ideas have been expressed before (particularly in South America), though swidden systems are normally thought of as being introduced into mainland and island Southeast Asia along with rice and taro 'agriculture' from southern China. This paper suggests instead that certain 'domesticates' may have been integrated into a pre-existing fallow management system, one that may also have contained 'domesticates'. At different times, scholars of tropical agriculture have placed different emphases on the 'fallow' as either a 'pause' between sowing crops or as a functional and productive aspect of the agricultural system itself. This paper looks at evidence of the latter in the tropics of Southeast Asia and South America. When the 'fallow' is thought of as the engine behind a system of human induced disturbance designed to drive biodiversity that is good for humans, patch mosaic management, in places like Australia, can also be seen as part of this same or at least similar, behavioral approach to niche construction.

Bar-Yosef, Ofer [40] see Phillips, James

Bar-Yosef, Ofer (Harvard University) and James Phillips (Field Museum, Chicago)

[40] *Levantine Foragers during the Terminal Pleistocene and Early Holocene*

The Levant is geographically limited by the sea in the Mediterranean in the west, deserts in south and east with the only widened extension of wetter condition in the Euphrates and Tigris basins. Abrupt climatic changes allowed for the demographically growth of Terminal Pleistocene foragers in the Levant and led to increasing territoriality. Pressures were increased with the expansion of hunting-gathering groups from the Nile Valley into Sinai and the Negev. The social and economic impacts resulted in the sedentism of Natufian groups in the southern Levant and the establishment of sedentary complex societies of foragers in the Tigris basin and its northern tributaries.

[255] *Discussant*

Bar-Yosef Mayer, Daniella (Tel Aviv University), Yaacov Kahanov (University of Haifa), Joel Roskin (University of Haifa) and Hezi Gildor (Hebrew University of Jerusalem)

[368] *Neolithic Voyages to Cyprus: Wind Patterns, Routes and Mechanisms*

Humans first arrived in Cyprus around 12,000 calibrated years BP. Visits to Cyprus resulted in settlement on the island during the Pre-Pottery Neolithic A beginning around 11,000 cal BP. Later occupations of the Cypro Pre Pottery Neolithic B testify to intensive connections with the mainland. We examined the possible routes to sail from the mainland to Cyprus and back by studying: sea level; options of available watercraft; sea conditions and currents; navigation skills; sailing routes; and prevailing seasonal and diurnal wind regimes. It is suggested that the optimal sailing route and season from the mainland to Cyprus by Neolithic navigators was from southern Turkey between April and October. Their return trip was from east or southeast of Cyprus to the Levant coast. This counter-clockwise pattern enabled the permanent human settlement on the island and contacts with the mainland.

Barzilai, Omry [64] see Alex, Bridget

Barzilai, Rebecca (Indiana University, Bloomington)

[359] *Negotiating Practices at the Emerald Site (11S1): A Case Study of Two Burned Structures*

Located near Silver Creek in the Illinois uplands of the midcontinent of the United States, the Emerald Site (11S1) in Lebanon, IL is a constructed Mississippian mound center where everyday practices were entangled with the performance of Mississippian religion. Recent excavations at the

Emerald Site by Indiana University and the University of Illinois have unearthed high densities of non-domestic structures dating to the Terminal Late Woodland (TLW) Edelhardt (A.D. 950-1000) and Early Mississippian Lohmann Phases (A.D. 1000-1050), indicating complex social practices interweaving TLW, Mississippian, and diverse migrant peoples from throughout the Midwest. This poster will focus on two burned structures, one characteristic of Edelhardt Phase peoples and the other of Lohmann Phase peoples, illustrating the ways in which religious practices and social representation are introduced, negotiated, and realized at the Emerald Site, and how the Edelhardt-Lohmann moment is impacting how we understand the importance of the site and religious practices in the fluorescence of Cahokia.

Basanti, Dil (Northwestern University)

[23] *In Death Do We Join: Community Building in Ancient Ethiopian Funerary Practices*

Aksum was the capital of northern Ethiopian kingdom that is famous for its numerous pre-Christian funerary stelae dating to the first four centuries A.D. The six largest stelae employ a peculiar “house” symbolism carved into their surfaces. Art historians have also noted that later Christian churches in the Ethiopian highlands, also sites for burial, mimic the layouts of old Aksumite elite houses. Beyond this, there has been little serious interpretation on what the “house” symbolism indicates or its significance to the two traditions. Reviewing Aksumite burial practices, I argue here that the stelae served an integrative purpose for Aksumite corporate groups, and that the “house” symbolism is an extension of these identity-building efforts. I then suggest that the ideology guiding these practices continues into the Christian era and serves a similar integrative role through Christian churches; resulting in a variation of the “house” symbolism. In this way, the syncretism observed with the “house” symbolism arises from common community-building processes among the two traditions.

Basgall, Mark E. [341] see Delacorte, Michael

Basgall, Mark E. (CSU Sacramento) and Bridget Wall (CSU Sacramento)

[341] *High Elevation Archaeology of the Inyo Mountains in Relation to Adjacent Ranges*

In the years since Bettinger's seminal studies in the White Mountains of eastern California, there have been projects completed at high elevations in two adjacent ranges, the Inyo Mountains to the south and the Sierra Nevada to the west of Owens Valley. These efforts have been of limited scope, but seem to show similarities as well as important differences in patterns of land use over time. Some extensive surface collections from the Inyo range have recently become available for examination, materials from 115 locations visited by Rollin and Grace Enfield from 1940-1980. Providing a more robust and expansive portrait of high elevation archaeology in the region, these assemblages are assessed in light of previous data and models.

Basiran, Alper and Cevdet Merih Ereğ (Gazi University)

[8] *Direkli Cave: Aerial Photography of An Epipaleolithic Site*

UAVs (Unmanned Aerial Vehicles), or “drones” as they are commonly referred to, are increasingly common in archaeology. Drones are an emerging technology that can provide low cost tools for aerial photography, regional surveys, site identification, excavation documentation, mapping and 3D photogrammetry. UAVs offer a huge potential for archaeological projects, being able to collect large amounts of high-resolution surface data.

They are often cheaper than other aerial photography systems, operate under a wide variety of conditions, and can be quickly deployed in difficult environments.

During the Direkli Cave Archaeology Project, it will be tested how a budget drone will be able to collect valuable data for creating high-resolution pictures and maps.

Newly initiated research at Direkli cave is helping to define an initial understanding of Epipaleolithic hunter-gatherer traditions in the central Taurus region of southern Turkey. Detailed analysis of the Direkli chipped stone tools and faunal assemblage suggests that the cave functioned as a short-term

logistical camp in the late Epipaleolithic. Especially geometric microlit such as lunates and triangulars was used by occupations of the cave. The cave used to primarily in the late summer and fall.

Bassett, Hayden (Department of Anthropology, College of William & Mary)

[50] *Internally Divided: An Archaeological Investigation of a Jamaican Slave Village, 1766 to 1838*

On the large-scale sugar plantations of the Caribbean, enslaved Africans were forced into dense communities on the scale of small urban townships. In many cases, the "slave village" site was allotted by the plantation owner, though the internal composition was largely left to the choices and dynamics of the enslaved community. This poster summarizes the findings from a recent archaeological survey of the slave village of Good Hope estate, an eighteenth-nineteenth century sugar plantation in northern Jamaica. Home to 400 to 500 enslaved laborers at any one time between 1766 and 1838, the discovery and excavation of the village site provide insights into the internal composition and material lives of a large-scale enslaved community. Data from this shovel-test-pit survey suggests that the conditions of enslavement varied from household to household, as well as the means for manipulating one's position within the hierarchical organization of the enslaved community. Differential access to material goods, relative household location, and the physical modification of the landscape are three ways in which enslaved households negotiated internal socioeconomic divisions, while simultaneously seeking to moderate the conditions of chattel slavery.

Bates, Martin [174] see Cole, James

Batmunkh, Tsogtbaatar [53] see Izuho, Masami

Battaglia, Mario (University of Arizona) and John Murray (Blackfeet Tribal Historic Preservation Office)

[93] *Assessing the Efficacy of Lesson Modules as a Public Education and Outreach Strategy for Archaeology*

Archaeological education and outreach is becoming ever more of a priority in a discipline that struggles to make research accessible and relevant to diverse publics. In recent years, this void has begun to be filled through the creation of grade school lesson modules on various archaeological topics. However, though these modules are readily available, little has been done to assess the efficacy of such an educational outreach strategy. To address this gap, a study conducted in collaboration with the Blackfeet Tribe systematically assesses the overall efficacy of Science and Language Arts lessons covering the 10,000 year significance of bison to native peoples. The modules themselves emphasize a multi-vocal and pragmatist perspective of the past in an attempt to more broadly connect with the diverse public. This study argues that (1) the respectful incorporation of archaeological education in a non-alienating, inclusive fashion allows for the interdisciplinary potential of archaeology to be more fully realized as well as for it to be more effectively implemented and disseminated, and (2) middle school students, as the upcoming generation, are a key demographic to target in order to encourage a more far reaching appreciation of archaeological ethics, goals, and practices into the future.

Battillo, Jenna [239] see Roos, Christopher

Batun-Alpuche, Ivan [188] see Dedrick, Maia

Bauer, Andrew (University of Illinois)

[108] *The Archaeological Climate: New Materialisms and Ontologies of the Anthropocene*

Archaeologists have long documented how humans have historically responded to climate changes. With broad scholarly debate over the adoption of the "Anthropocene" to describe the current period of Earth history, they are also contributing to evaluations of how land-use practices historically influenced Earth's climate, arguably since at least the mid-Holocene. While archaeological

approaches to past climate changes have much to contribute to the Anthropocene debate, they often uncritically leave intact modernist ontological binaries of nature and society that are foundational to most historiographic framings of the Anthropocene. In one case, society responds to a recalcitrant Nature; in the other, it produces it. In this paper, I explore how new materialisms further push archaeology to reconceptualize human-environment interactions by accounting for the "vitality" (sensu Bennett 2010) of nonhumans in helping to constitute environmental conditions and social collectives. How, for example, do the temporal boundaries of the Anthropocene and notions of historical agency and determinacy change if one shows that nonhuman environmental constituents have always been entangled in human actions and rarely guaranteed to be in full conformity with human desire, design, or intention? I address this and related questions through several archaeological case studies, including mid-Holocene socio-environmental transformations in South India.

Bauer, Andrew [142] see Johansen, Peter

Bauer-Clapp, Heidi (University of Massachusetts Amherst)

[72] *A Matter of Balance: Opportunities and Challenges in "Difficult" Heritage*

Tourism centered on archaeological sites or associated material culture can benefit local communities, financially or otherwise. Yet when the site in question involves "difficult" heritage such as violence, communities often must grapple with tensions regarding how to balance memorialization or education with profitability. Such tensions can be heightened when the site involves human remains. This paper presents a case study of St Helena, a small British Overseas Territory in the South Atlantic Ocean. In the mid-1800s the island received nearly 30,000 captive Africans "liberated" from the middle passage of the transatlantic slave trade. Recently, a salvage excavation uncovered the skeletal remains of at least 325 of the estimated 8000 of these individuals who died and were buried on the island, yet this remains a little-known aspect of the island's history. As a result, local efforts to promote this heritage for tourism must negotiate the tensions associated with such difficult heritage as well as what this history means to the local community. Drawing upon fieldwork in the United Kingdom and St Helena, this paper analyzes the opportunities and challenges archaeology creates for "locals" and "tourists" and the often-complex interplay between the interests of these groups.

[270] *Moderator*

[270] *Discussant*

Baughner, Sherene

[405] *Bottom-Up Heritage Management in Ithaca, New York: Community Initiatives and Collaborations with University Archaeologists*

Discovering Enfield Falls is dramatically different from academic managed heritage projects that are top-down projects initiated by archaeologists. In our project, the heritage planning originated with stakeholders who were determined to preserve the history of a community that was demolished in the early twentieth century to create a state park. This 19th century hamlet was both a commercial center for farmers and a regional scenic tourist destination. The stakeholders did not need archaeologists to help them discover their history or value Enfield Falls as a heritage site. They needed archaeologists to collaborate with them in order to reveal the cultural landscape and history buried in the park to a larger community both locally and within the northeast region of the United States and Canada. The collaboration involved students enrolled in Cornell University service-learning courses with a participatory action research focus. From 1998 to the present, archaeologists and community members have collaborated on all stages of the work, from fieldwork to museum exhibits. In our outreach, we have jointly produced permanent indoor and outdoor exhibits, an archaeological walking trail, an extensively illustrated brochure, an orientation film for the park's museum, and two public access television films.

Baumann, Steve [29] see Greene, Richard

Baumann, Timothy (University of Tennessee), Gary Crites (McClung Museum, University of Tennessee) and Lynne Sullivan (McClung Museum, University of Tennessee)

[373] *The Emergence and Distribution of Beans (*Phaseolus vulgaris*) in the Upper Tennessee River Valley*

This is a preliminary study of beans (*Phaseolus vulgaris*) recovered from late prehistoric and historic Native American sites in East Tennessee. Beans are known to be the last domesticated plant that was adopted by late prehistoric cultures in the Eastern Woodlands. In the Southeast, the emergence of beans is not clearly understood because no regional studies have been done and very few samples have been directly dated to establish a chronology. This problem is addressed by analyzing the spatial and chronological distribution of beans recovered within and across sites from the Upper Tennessee River Valley.

Baustian, Kathryn (University of Nevada, Las Vegas)

[131] *The Bioarchaeology of Social Order: Cooperation and Conflict among the Mimbres (A.D. 550-1300)*

A comprehensive bioarchaeological assessment of Mimbres health, activity, and interpersonal violence was completed using data from a sample of 248 human burials from 17 Late Pithouse (A.D. 550-1000) and Pueblo (A.D. 1000-1300) sites in the Mimbres region. The findings presented here demonstrate broader patterns for interpretation of community experiences that have not been as well described in previous case studies from individual site samples. This larger sample of all available adult burials reveals relatively good health, low rates of interpersonal conflict (approximately 10%), and sufficient diets. Although some individuals from all time periods showed indicators of interpersonal violence, Mimbres communities do not appear to have had endemic warfare seen in other regions of the Southwest. Stress was perhaps mitigated then by social mechanisms or forms of social control that promoted cooperation and resolved conflict. The limited use of strategic interpersonal violence may have been one of the ways that social order was maintained. Mortuary data support archaeological indicators of a fairly simple political structure but atypical burials from multiple sites suggest differential status or social significance in the community. These individuals may have served special roles and both skeletal and mortuary findings better inform our interpretation of Mimbres societal structure.

Bautista, Stefanie (Stanford University)

[31] *Towards an understanding of the transition from Paracas to Nasca from a household perspective: Interpreting changes in ceramic consumption at Uchuchuma*

This paper highlights how the study of ancient dwellings and the activities that occurred within them can help archaeologists better understand the dynamic and complex nature of people, their relationships to each other, and the broader society they live in. In the Rio Grande, Nasca Region, Perú, Andean archaeologists assume that the Nasca culture (1–700 A.D.) developed directly from the Paracas (800–100 B.C.) based on the continuity of some pottery traits and settlement. While there has been extensive amount of research in this area, archaeologists still do not know how daily life was affected by this transition from Paracas to Nasca. This study tests whether Paracas household organization and domestic activities changed along with the development of the emerging Nasca society by comparing both Paracas and Nasca ceramics from a residential archaeological site. Uchuchuma, located in the Aja Valley, has both a Paracas and Nasca domestic occupation, making it the ideal locale for investigating this transition. This more in-depth analysis of Paracas and Nasca ceramic-making traditions (e.g. morphology, technological composition, and decoration) and domestic consumption will shed light on how economic relations were organized among Paracas households, and test whether practices changed or persisted during the Nasca occupation.

Baxter, Erin (University of Colorado, Boulder)

[273] *Aztec Ruins, 2.0*

This poster will present a "new" view of Aztec Ruins -- particularly Aztec West -- which refines modern base maps with historic data. This latter includes data drawn from Morris-era excavation photos, as well as additional information from unpublished sketch maps, correspondence, and field

notes. This 'new' map will include unpublished locational data on mounds, burials, floor features, wall features, remodeling, refuse, burning... etc etc. Almost no reading required.

[222] *Moderator*

Baxter, Erin [354] see Lekson, Stephen

Bayliss, Alex [348] see Whittle, Alasdair

Bayliss, Alex (English Heritage)

[348] *Approaches for Producing Precise Archaeological Chronologies*

For the fortunate few, dendrochronology allows an annual window into the archaeological record. Over the past 20 years, however, Bayesian chronological modeling has brought chronologies precise to within the scale of past lifetimes and generations within the reach of all archaeologists. Explicit statistical modelling allows radiocarbon dates to be interpreted within the framework of knowledge provided by associated archaeological evidence, providing more precise dating and thus allowing the activities of people in the past to be understood in new ways. Until now the majority of published models are site-based. These models take into account the 'relatedness' of groups of radiocarbon dates from the same site, and can also incorporate powerful prior information about the relative order of dated samples derived from stratigraphy. But archaeologists have a wide range of other types of information about the material remnants of the past at their disposal – location, artifact typologies, the character of sediments, sequences derived from seriation, cultural associations, and others. This paper discusses the kinds of archaeological information that can be the basis of our chronological models by examining their relative strengths and weaknesses and the power of existing approaches to capitalise fully on their potential.

Bazaliiskii, Vladimir [131] see Schulting, Rick

Beach, Jeremy and K. Bryce Lowry (University of Chicago)

[20] *An Archaeological Investigation of Gender on the Late Prehistoric Steppe*

In 1954, Hawkes warned that the intangible aspects of social life are the most difficult for archaeologists to comment on due to distance between object and ideology, the material and the mental world. Certainly, there is an epistemological slippage that can occur when moving between categories of social life that rely on objects to legitimize claims or complete tasks, and those aspects of society which can be veiled within larger, and immaterial, structures or norms—religious beliefs, ideological superstructures, affect. This paper will attempt to problematize discussions of gender often couched solely in terms of power, political economy, and ideology. How can a discussion of gender proceed if data speaking to power and ideology are missing, or are unclear at best? Using archaeological, ethnographic, and historical approaches we will demonstrate that views about gender are of special interest both empirically and theoretically, as they are truly “nested” within the most impenetrable sections of Hawkes’ schema—yet—not entirely out of reach. We will focus on the late prehistory of Mongolia and the wider steppe (ca. 1500-0 B.C.) in order to investigate gender roles and practices, sexual divisions of labor, and (in)equality within the oikos.

Beach, Timothy [176] see Cook, Duncan

Beach, Timothy (University of Texas at Austin)

[350] *Maya Wetland Fields from 2014 and Earlier Coring Evidence*

This paper has two main goals: first to present our latest findings for wetland field formation from a series of 2014 palustrine, floodplain, and lacustrine cores, and second to consider the relative strengths and weaknesses of the different approaches to coring: piston-, soil-, and vibra-coring compared with excavation in these environments. We first present how the new cores from 2014 at Akab Muclil and Laguna Verde compare with previous coring and excavation data toward

understanding ancient Maya wetland field uses and formation. The paper will use extensive, multiple proxies, including AMS dating, stratigraphy, magnetic susceptibility, XRD-XRF, micropaleontology, general chemistry, stable isotopes, elemental analysis, pollen, phytoliths, micromorphology, and charcoal from dated strata. Second, we discuss which coring methods work best in a variety of wetland environments of Mesoamerica for understanding the differences in the timing, use, and crop types of wetlands over the Late Holocene. Maize agriculture appeared in this region by at least 4,000 years ago, wetland fields were a Late Preclassic and dominantly Classic Period phenomenon, and ongoing work is providing a better chronology of when and how wetlands formed and how humans used these environments, which are being destroyed so rapidly in this region today.

[350] *Chair*

Beach, Timothy [350] see Hanratty, Colleen

Beamer, Dawn (The Public Archaeology Laboratory) and Joseph N. Waller, Jr. (The Public Archaeology Laboratory)

[281] *Coastal Dynamics and Site Formation: A look at the Archaeological Deposits of Coastal RI after Hurricane Sandy*

The impact of Hurricane Sandy on the southern New England coast has brought attention to the delicate nature of our coastal landscapes. Just as we are beginning to utilize new insights into climate change for urban (re)development, we must also consider coastal archaeological sites at risk in areas of high erosion. The Public Archaeology Laboratory, Inc. (PAL) surveyed 28.2 km of Rhode Island's coastline to evaluate the effects of Hurricane Sandy on coastal archaeological sites. Using GIS, PAL created a predictive model comparing archaeological site sensitivity with areas of significant storm erosion to identify areas with the highest potential for containing intact archaeological deposits impacted by the hurricane. Field reconnaissance identified a WWI era fortification and thirty-two pre-contact Native American archaeological sites, seven of which were previously documented. The data obtained during the survey contribute to our understanding of Native American resource use and settlement in the coastal zone and coastal alteration as well as site formation processes resulting from coastal dynamics and sea level rise. This poster will present on the Hurricane Sandy archaeological project, consider how natural processes have shaped the coastline and impacted cultural deposits over time, and discuss the implications for the future of these sites.

Beasley, Melanie [293] see Bartelink, Eric

Beasley, Melanie (University of California, San Diego)

[293] *Men at Work: Economic Complexity and Exploitation of Dietary Marine Protein Sources in the San Francisco Bay Area*

In the San Francisco Bay Area, distinct dietary niches were exploited in prehistory, and these different food economies are most readily distinguished in terms of their primary protein sources. This paper highlights the use of external auditory exostoses (EAE), a pathology linked to the exploitation of marine resources in cold water, to evaluate varying economic complexity in acquisition of marine protein food sources between different sites around the Bay Area. The high occurrence of EAE in males compared to females across the Bay Area suggests that the males were habitually exposed to cold water and/or sea spray at a higher frequency than females. This indicates that males were likely the primary procurers of marine dietary resources, which supports ethnohistoric observations that men were primarily responsible for fishing activities. However, there is variation of occurrence of EAE between sites within the Bay Area suggesting that there was a varying degree of reliance on a marine substance economy across the region, supporting the general trends seen in the isotopic evidence.

Beaudoin, Matthew (Timmins Martelle Heritage Consultants Inc.)

[13] *Who Shot First?: Codified Categories Creating Imaginary Archaeological Pasts*

Archaeologists in Canada are empowered by the Canadian state through licensing and/or permitting systems; as such, archaeological practices are intrinsically entangled with various levels of governance. While it would be convenient to argue for an archaeology either free entirely of state control, or entirely and purposefully guided to fulfill state mandates, the reality is more nuanced. Archaeology is often structured by interpretive conventions that act to replicate the dominant archaeological zeitgeist, which complicates presumptions of unrestricted actors or invisible structuring controls. By exploring how archaeological sites are uncritically categorized and labelled in Brant County, Ontario, Canada, I demonstrate how the conventional taxonomic practices serve to create an imagined colonial past where the nineteenth century Ontario landscape is populated by white European people of English descent and devoid of various 'Others'. This imaginary past is not born from the purposeful guidance of state regulators, but rather reinforced by the state's codification of existing archaeological conventions and the uncritical acceptance of conventional categories by archaeologists.

Beaudry, Mary (Boston University)

[36] *Discourse and Dissonance in the Archaeological Archive*

A process begun afresh for each archaeological site or research project involves constructing the archive through integrating differing lines of evidence. For historical archaeologists the archive includes written records, oral traditions, and material culture; often elements of the archive provide overlapping, conflicting, or entirely different insights into the past, requiring resolution and integration because of differences in scale, completeness, representativeness, temporal resolution, and lack of correspondence. The documentary record of a site can be as remarkably rich in detail and length of coverage as the archaeological record is deficient in the sorts of easily-dated sealed deposits that provide tight chronological control required to link episodes of deposition and particular objects with known inhabitants of the site. Or the reverse can be true; at times there are few if any documents to help one understand who lived at a site at a given time period, and the site is not recent enough for oral history to provide insight into what happened there in the past. This paper considers the intertextuality of sources and analyzes contrasting examples of success and of failure in attempts at establishing a dialogue between above-ground and below-ground evidence.

Beaupré, Andrew (College of William and Mary)

[405] *One Site, Multiple Pasts: Negotiating Identity and Archaeological Heritage along the US/Canadian Border*

Fort Saint-Jean lies in the Richelieu River Valley approximately half-way between the modern American/Canadian border and the City of Montreal. The valley has been a space of contestation between French, British, Canadian and American ideas, identities, and empires. For over three hundred years this contestation has taken numerous forms, ranging from ethnic stereotyping to open warfare. When I began directing the Laval University archaeological field program at Fort Saint-Jean, our research questions were geared toward the role the site played in Canadian military history. At that time, I was unaware of the significance of this specific National Historic Site to the heritage of multiple modern peoples. French-Canadian Nationalists vaunt the Richelieu Valley for its role in the 1837 rebellion, for the Loyalists Fort Saint-Jean is a figurehead of imperial control of North America. For all Canadians, the site can be seen as a shrine to Canadian military heritage. Finally the site is often employed by Americans to commemorate the short lived invasion of British Canada by the Continental Army. This paper discusses the path taken by one graduate student through the complexities of research partner and stakeholder interactions on the topics of ethnic and collective North American heritage.

Beaver, Joseph (University of Minnesota Morris) and Rebecca Dean (University of Minnesota Morris)

[276] *Macroscale Analysis of Faunal Remains in the Hohokam Area of Southern Arizona: Preliminary Results*

Pre-Contact societies in southern Arizona developed large-scale, agriculturally-based communities with essentially no access to domesticated meat. Their hunting opportunities were limited, as well, by the need to live close to water sources for irrigation. The resulting trade-offs between community

needs have important implications for political organization, labor choices, and gender roles. In this poster, we present preliminary results of a GIS analysis of relationships between species representation and environmental characteristics in the Hohokam area. We examine the effects of agricultural labor constraints, species habitat constraints, and diachronic changes in human population on archaeofaunal patterns. Our data set consists of over 100 faunal assemblages ranging from the Early Agricultural Period to the Hohokam Classic Period, covering a wide range of micro-environments in southern Arizona.

Beck, Robin [81] see Rodning, Christopher

Beck, Kelly (University of Utah)

[310] *Ecological Baselines, Long-Term Population Histories, and the Zooarchaeological Record*

The potential for zooarchaeological data to inform modern conservation issues is unquestioned by archaeologists; however, with a few notable exceptions, such an approach has been underutilized. Zooarchaeological data are uniquely positioned to provide a long-term view on the population history and variation in foraging ecology of a species. Such information is paramount to conservation efforts for threatened taxa, particularly in addressing what has been called by conservation ecologists the "Shifting Baselines Syndrome." This poster uses ancient DNA and stable isotope data to investigate the late Holocene population history and feeding ecology of Guadalupe fur seals from San Miguel Island, California. Ancient DNA sequence variation suggests that Guadalupe fur seal populations on San Miguel Island were fairly substantial and remained stable throughout the late Holocene. Stable carbon and nitrogen isotope ratios from these same specimens indicate little variation in fur seal feeding ecology across the same time span. Together, these inferences of late Holocene Guadalupe fur seal population history and feeding ecology provide significant, new baseline information regarding long-term variation in these ecological characteristics important to ongoing conservation and management efforts.

Beck, Colleen (Desert Research Institute), Lauren W. Falvey (Desert Research Institute) and Harold Drollinger (Desert Research Institute)

[311] *Protest Graffiti at the Historic Nevada Peace Camp*

The Peace Camp, near the Nevada National Security Site, is the location where protesters have gathered for several decades to voice their opposition to nuclear testing and environmental issues. This National Register eligible property contains an abundance of archaeological features, such as rock cairns, tent pads, sweat lodges, and geoglyphs. Associated with these features are two concrete highway drainage tunnels that served as a passageway and a place of respite from the desert conditions. In addition to these transient uses, their concrete walls provided a canvas where protesters could express their feelings in a setting much more private and enduring than a group protest activity. The tunnel interiors are covered with colorful graffiti: literary quotes, pictures, abstract designs, and personal sentiments. This remote and concealed locale contrasts with the urban displays where the drawings are created to be seen by and shared with others. A detailed analysis of this artistic legacy has defined hundreds of diverse panels of texts and images with most expressing the activists' goals of peace and saving the Earth by stopping nuclear testing.

Beck, Jess (University of Michigan - Museum of Anthropology)

[332] *Commingled, Communal and Complex: Reconstructing Iberian Copper Age Mortuary Practices*

Fragmentary and commingled human remains recovered from salvage excavations present bioarchaeologists with a number of interpretative challenges, including calculating MNI in the absence of detailed provenience information, untangling post-excavation commingling of remains, and analyzing high volumes of recovered material. Importantly, analytical techniques developed in recent research on forensic and archaeological taphonomy can help overcome some of these difficulties. Here I focus on the case of Marroquíes Bajos, a 113 hectare Copper Age enclosure site in Andalusia that was salvage-excavated in advance of urban expansion of the city of Jaén. Excavations revealed seven discrete mortuary areas, ranging from commingled deposits in wall

trenches to richly accoutred interments in artificial caves. Using the lens of forensic taphonomy to assess the preservational patterning of skeletal and dental remains from three previously unstudied necropolises allows me to identify the types of burial practices likely used at each locale. In addition to unpacking late prehistoric funerary practices, investigating the demographic composition of these three mortuary populations through an analysis of dental development and wear provides insight into how Copper Age communities at such large-scale centers were organized socially, illuminating the ways in which community identity was formed and maintained during the Iberian Chalcolithic.

Beck, Jr., Robin [188] see Moore, David

Becker, Rory (EOU) and Jacob Jensen (University of Utah)

[4] *Shedding New Light on the Past: The Potential for Short Wave Ultraviolet Photography in Archaeology*

Recent advances technology allow digital cameras to be modified to record monochrome ultraviolet light at a high level of sensitivity. The ability to collect imagery on archaeological targets in short wave ultraviolet (wavelengths of 280 nanometers or less) reveals information previously hidden from view. Advances in camera technology, lens & filter types, and specialized lighting equipment needed to taking short wave ultraviolet images are discussed along with methodologies for collecting high quality data. Comparisons between cameras, lenses, and filter types show the variation in image quality and information gathered at the different wavelengths of ultraviolet light.

[4] *Chair*

Becker, Matt [52] see Cole, Matthew

Becker, Sara (York College of Pennsylvania) and Paul Goldstein (University of California, San Diego)

[384] *Laboring in Tiwanaku's Moquegua Colony: A Bioarchaeological Activity Indicator Comparison Using Population-Based and Life Course Approaches*

Diverse, lower elevation areas were home to producers and procurers of goods not easily grown or obtainable in the South Central Andean heartland of the Tiwanaku state. Various Tiwanaku colonial settlement clusters, near present-day Moquegua, Peru, comprised one such region. Tiwanaku colonists in this area participated in activities that included farming of corn and coca, as well as transportation of goods between the heartland and colony. For example, Omo-style (Omo M16D and Rio Muerto M70 sites) burials included people who may have embraced more of a pastoralist lifeway, while Chen Chen-style (Omo M10, Chen Chen, and Rio Muerto M43 sites) burials comprise people with potentially a more agrarian lifestyle. In addition to site-based burial differences, prior research has shown individual, gender, and subgroup-specific variability in grave good assemblages, isotopic differences reflecting diet and migration patterns, and cranial modification, likely reflecting the multicultural Tiwanaku way of life. This research uses patterns of specific skeletal evidence of activity (i.e. musculoskeletal stress markers and osteoarthritis) to address labor differences, employing both a population-based perspective by burial area and a life course approach by individual burial, in order to understand the Tiwanaku colonial life and workforce in the Moquegua region.

Beckett, Ronald [299] see Conlogue, Gerald

Becks, Fanya (Stanford University)

[224] *Moderator*

Beddows, Patricia [370] see Chatters, James

Bedell, John [29] see Potter, Stephen

Bedford, Clare (University of Central Lancashire), David Robinson (University of Central Lancashire), Fraser Sturt (University of Southampton) and Julienne Bernard (East Los Angeles College)

[3] *A Matter of Time – Applications of Portable X-Ray Fluorescence in Establishing Rock Art Chronologies*

The aim in this examination was to examine the potential for portable XRF technology to contribute to chronologies of in situ rock art. In order to do this pXRF data from Chumash rock art panels in the Wind Wolves Preserve in South Central California were compared with one another, and with readings from ochre found in excavated deposits. These ochre deposits are associated with other artifacts which have known dates. The results showed that multiple pigments were used within each rock art panel and within individual elements, indicating that multiple painting events may have taken place over a period of time. The pXRF data can be used to link areas of panels in which the same pigment material was used in order to tie together chronologies based on superimposition. The results also demonstrated the potential for comparison of chemical composition to be used to link ochre from excavated deposits with in situ rock art, thereby providing a probable date for its production.

Bedford, Stuart (Australian National University), Matthew Spriggs (The Australian National University) and Richard Shing (Vanuatu Cultural Center)

[77] *"By all means let us complete the exercise ": the 50 year search for Lapita on Aneityum, southern Vanuatu comes to a conclusion.*

Archaeological research on the island of Aneityum, the southern-most inhabited island of the Vanuatu archipelago (the former New Hebrides) began in 1964 under the direction of Richard and Mary Shutler. It was soon after this that William Dickinson first began analysing pottery sherds from various sites across the archipelago. Since those early beginnings he has studied 100s of samples including 112 samples from the single site of Teouma. Early pottery sites remained elusive on the southern islands for decades and particularly on Aneityum. More recent assessments of its geomorphology, a key aspect regularly emphasised by Dickinson, along with some serendipitous test-pitting led to the discovery of a Lapita site on the island. Dickinson's petrographic expertise was once again called on some 50 years after research first started on the island.

Beekman, Christopher (University of Colorado Denver)

[39] *Western Mexico: Opening Act of the Mesoamerican Epiclassic*

The Epiclassic has been described as a major watershed in Mesoamerican prehistory, but in different or even contradictory ways. The period has been claimed to usher in a shift from prestige to mercantile economies, religious to military political systems, territorial states to city-states, parochial to international art styles, and in the case of western Mexico, from non-Mesoamerican to Mesoamerican society. These metanarratives have privileged formal characteristics, which are in any case found empirically wanting, at the expense of understanding the causes, processes, or complexity of the disruptions characterizing this era. In western Mexico, the Teuchitlán culture was replaced by new settlements of Bajío origin ca. A.D. 500, a century earlier than is typically recognized as Epiclassic. Even so, the processes in motion are the same noted elsewhere in many areas of Mesoamerica – namely climate change, warfare and population dislocation, the disruption of polities dependent upon a relatively sedentary and docile population, new demands on the prestige economy, and major changes in iconography. These were epic processes in the sense proposed by the organizers, and they can only be clarified by moving beyond the simple dichotomies used to define the Epiclassic.

Beisaw, April (Vassar College)

[289] *Mapping Contagious Abandonment and Resilience, North of New York City*

The lands around New York City's rural reservoirs contain ruins of residences, schools, churches, farms, and other businesses, displaced by watershed creation that began in the mid-nineteenth century. But even the forests around them are artifacts of the abandonment. Here, the spaces in between buildings and trash piles are the places where the region's economy flourished before the

reservoir changed everything. Treating each ruin as an individual site would ignore the interconnectedness of rural economies and the contagiousness of abandonment. However, treating these ruins as individual features within larger sites of watershed creation, their interconnectedness is prioritized. Spatial gaps between each ruin come into focus as places where economic and social activities once took place. The secondary growth forest, the dry creek beds, and the quarried cliffs are cultural features in need of interpretation. Standing and occupied structures are also integral features whose documentation allows for assessments of resilience. Together, these multiple feature types provide information on not only where but also when and why abandonment occurred across vast sites. This landscape contains 150-years of data on cultural impacts of environmental engineering that can inform future watershed projects and contribute to research on rural and urban abandonment.

[222] *Discussant*

Bekvalac, Jelena [299] see Conlogue, Gerald

Belanger, Claude [147] see Pierce, Karen

Belardi, Juan [185] see Barrientos, Gustavo

Belardi, Juan (Univ Nac de la Patagonia Austral), Flavia Carballo Marina (Universidad Nacional de la Patagonia Austral), Patricia Madrid (Universidad Nacional de La Plata), Gustavo Barrientos (Universidad Nacional de La Plata. CONICET) and Patricia Campan (Universidad Nacional de la Patagonia Austral)

[251] *Hunting Blinds from Plateaus and Hills in Southern Patagonia (Santa Cruz, Argentina): Tactics and Beyond*

The aim of this paper is to present and discuss the distribution patterns of Late Holocene hunting blinds from two distinct environments of southern Patagonia (Argentina): basaltic plateaus and hills. These are mostly semicircular stone structures built for the hunting of guanaco (*Lama guanicoe*), a medium-size wild camelid that was the main staple for the hunter-gatherer populations throughout the Holocene. Despite of the existence of a number of shared traits (e.g. obsidian from the same source, similar rock art motifs) that suggest tight social ties and interactions, both environments show differences in frequency and diversity of hunting blinds as well as in the inferred tactics implemented by the hunters, which can be explained by differences in topography, seasonality, and prey biomass.

Belfer-Cohen, Anna [16] see Goring-Morris, Nigel

Belfer-Cohen, Anna (The Hebrew University of Jerusalem) and Nigel Goring-Morris (The Hebrew University of Jerusalem)

[82] *Reflections on the Origins of the Neolithic "House" in the Near East*

Large-scale durable architecture appears quite suddenly with the emergence of the semi-sedentary Natufian (ca. 15,000 calB.C.) in the Near East. Subsequently, during the course of the Natufian, structure sizes diminish. Construction traditions, including house that were semi-subterranean, constructed with wooden posts, stones and puddled mud continued during the PPNA (ca. 10,000-8,500 calB.C.), albeit with the innovation of mud-brick superstructures. An important distinction between the Natufian and the PPNA is the appearance of public architecture, reflecting the dichotomy between residential housing, 'homes', and communal structures, hardly recognized during the Natufian. This portrays changes in the social dynamics of communities participating in the processes of Neolithisation, culminating in the fully sedentary village societies of the PPNB (ca. 8,500 calB.C. onward).

Changes were quite rapid, involving the shift to rectangular architecture, assumed to indicate modifications in basic social unit behaviors - the rectangular house is supposed to be the domain of a nuclear-com-extended family as the plan enables additions according to need. Through time the sense of ownership grew, most probably together with hygienic demands accompanying increasing

sedentism. Starting with the Early PPNB there is extensive use of plastered floors and the beginnings of systematic house cleaning and garbage disposal.

Belkin, Sara (Boston University) and Jennifer Wildt (Boston University)

[93] *High School Students, Archaeology, and Public Outreach*

Since 2009, an archaeological field program for high school students has conducted excavations at the Mary M.B. Wakefield Estate in Milton Massachusetts. Co-Directed by two graduate students in Boston University's Department of Archaeology, this program has taught professional level excavation methods to dozens of local and non-local students for two two-week sessions each July. These students work alongside graduate volunteers as they learn to excavate small to large units, draw plan views and profiles, and wash and handle all types of artifacts. From excavating a late eighteenth-century summerhouse foundation to an early nineteenth-century cobble-paved yard, these students are also expected to aid the co-directors in interpreting the past by connecting their individual units with what past activities and episodes their stratigraphy and artifacts represent. This poster will present our experience with working with high school students, integrating our program within recent developments in community-archaeology. Our poster will address the particulars of our program but also seek to show the benefits of teaching archaeological skills to high school students beyond the context of archaeology.

Belknap, Daniel [243] see Kelley, Alice

Bell, Colleen (University of Tulsa)

[139] *What Were They Thinking? Using Electroencephalogram (EEG) to Map Brain Activations during Stone Tool Manufacture*

While psychologists have been using many different methods to map brain activity during various tasks, archaeologists have yet to fully utilize the potential of these techniques to examine early human cognition. Paleolithic stone tools provide a promising line of evidence in human behavioral and cognitive evolution. Recently, brain imaging modalities such as Functional Magnetic Resonance Imaging (fMRI) and Positron Emission Tomography (PET) have been used to more directly link cognition and stone tools. This paper will review these previous studies and propose a new protocol. In contrast to earlier research, which has used hemodynamic brain activity mapping techniques (fMRI, PET, and fTCD), the research proposed here will be conducted through electromagnetic imaging with electroencephalogram (EEG) to examine the parallels of cognitive development with lithic industry advancements. Through the use of the EEG, a modality with better temporal control, we might isolate where in the lithic reduction process previously noted cognitive differences occur as well as provide a naturalistic knapping environment during the brain imaging.

[139] *Chair*

Bell, Ellen (California State University, Stanislaus)

[366] *Discussant*

Bello, Charles (Federal Emergency Management Agency (FEMA-DHS))

[336] *Collaborative and Community-based Archaeology (Heritage) – Introduction to the Session and Some Views on Successfully Partnering with Indigenous and Local Communities.*

The concept of conducting research & historic preservation endeavors in effective partnerships with indigenous and local communities just makes sense and is only fair. Clearly, archaeology and heritage management impact indigenous, local, and descendant communities. It is also clear that these groups often have relatively little input to what others are trying to accomplish. This paper addresses a few key concepts and recurring purposes and goals: the tangible and intangible aspects of heritage; the leading roles of descendant communities/stake-holders; equitable decision-making processes; relevant, responsible, and mutually satisfying scholarly practices; community benefits and

fair and appropriate access to and retention of data; and “Engagement” and citizen science and long-term community commitments.

[336] *Chair*

Bellorado, Benjamin (University of Arizona)

[354] *Beyond the Dates: Reconstructing the Social Histories of Southeastern Utah Cliff Dwellings with Tom Windes*

For over a dozen years, Tom Windes and his Woodrat crew have been scampering in and out of the canyons of the Cedar Mesa area, mapping hard to reach cliff dwellings and taking tree-ring samples from archaeological wood in intact structures. Beyond just obtaining tree-ring dates during this work, Tom has developed new dendroarchaeological sampling methods, trained a new generation of researchers in these techniques, and pushed the limits of standard tree-ring analysis and interpretative methodologies. More than just dating ancient structures, Tom and his colleagues are developing new ways of reconstructing the social histories of cliff dwellings and ancient communities in Southeastern Utah based on detailed architectural documentation, tree-ring dating of structural timbers, and landscape level analyses. This presentation outlines Tom's various contributions to the dendroarchaeological sciences, his undying support of a new generation of researchers, and some of the new methods Tom helped to inspire that are pushing and challenging interpretive frameworks of Southeastern Utah prehistory.

Bellorado, Benjamin [354] see Towner, Ronald

Belmaker, Miriam [368] see Brown, Ashley

Beltran, Jose Carlos [189] see Morales, Jorge

Beltrán Medina, José Carlos (Centro INAH Nayarit), Katrin Sieron (Universidad Veracruzana) and Juan Jorge Morales

[189] *El sitio megalítico de Ahuacatlán, ejemplo de erupciones volcánicas y de cambio cultural*

Al pié del volcán Ceboruco se encuentra el sitio prehispánico de Ahuacatlán con una amplia distribución en el paisaje, así como una larga secuencia cultural de más de mil años representada por materiales Capacha, Tumbas de Tiro y de la época Aztatlán, procedentes de su rico sementerio. Las excavaciones arqueológicas permitieron conocer el depósito estratigráfico del sitio, que muestra varias erupciones de baja intensidad y 2 eventos catastróficos que impactaron la región, una erupción pliniana al rededor del 3000aC y otra alrededor del 1000dC que destruyeron la región. Aparte del cambio físico, estos eventos muestran un fuerte cambio conceptual y formal entre la tradición Tumbas de Tiro y las tradiciones del epiclásico, con la posterior tradición Aztatlán del horizonte Tolteca. Hasta donde estos eventos naturales forzaron la recomposición social y cultural de la región?

Belyaev, Dmitry (Knorozov Center for Mesoamerican Studies, Russian State University for Humanities)

[86] *Captives, Messengers, Pilgrims, Refugees, Wives: Classic Maya Written Accounts on Travel in the Upper Usumacinta*

This presentation reviews references to travel in Classic Maya inscriptions at the archaeological sites of the Upper Usumacinta region. Although direct accounts of going to, or coming from, specific places are few, many texts and captioned images mention non-local individuals or describe events at other sites. The vast majority of such contexts involve warfare, but there are also references to visiting dignitaries, exiles, artisans, messengers, pilgrims, and, above all, brides from other royal families. The combined data from textual sources paints a picture of substantial mobility at least among the Classic Maya elites who produced and used hieroglyphic texts. In addition to revealing the political and historical fabric of the region, travel accounts shed light on the network of land and riverine routes in the Western Maya lowlands.

[26] *Discussant*

Bement, Leland [122] see Reedy, Chelsea

Bement, Leland (Oklahoma Archeological Survey, OU)**[148] *Beaver River Complex Contribution to Folsom Archaeology: An Update and Future Directions***

The Beaver River Complex (NW Oklahoma) of early Paleoindian (Clovis and Folsom) large-scale bison kill sites began contributing to our knowledge of Folsom hunting organization two decades ago with the identification, excavation, and analysis of the Cooper site. Since then a total of five Folsom kill components have been identified at three arroyo kill sites within a 700 m reach of the Beaver River. The most recently discovered site, Badger Hole, contains the youngest Folsom kill component of the sample, dating to 10,350 radiocarbon years before present. The results of the 2011 and 2012 excavations and subsequent analyses of this site's lithic materials and dating are combined with that from the other Beaver River complex sites and regional sites to provide an update on the current state of analyses and the direction for future southern Plains Folsom research.

Bender, Shilo (University of Missouri), Lauren Trimble (University of Missouri), Todd VanPool (University of Missouri) and Christine VanPool (University of Missouri)**[6] *Provenance Analysis of Obsidian Artifacts from 76 Draw, New Mexico***

During the 13th and 14th Centuries, southern New Mexico was a borderland where the Medio period Casas Grandes, Salado, and El Paso phase cultures intersected. The complex cultural setting is illustrated by contemporaneous settlements associated with the various cultures in close proximity of each other. Recent research at 76 Draw, a large Medio period settlement near Deming, New Mexico, focused on understanding the nature and degree of interaction among the various cultures. We hope to contribute to this understanding by determining the chemical source of obsidian artifacts recovered from the site. Obsidian artifacts recovered from 76 Draw reflect several different sources, the most common of which are Mule Creek, Sierra Fresnal and Antelope Wells. We find that obsidian was transported from the Sierra Fresnal and Antelope Wells sources in a raw or preform state, but Mule Creek obsidian was likely introduced as finished, bifacial tools.

Bender, Laura (Midwest Archeological Center, NPS)**[359] *The Search for Little Bow's Village, Cedar County Nebraska***

The Corps of Discovery Expedition traveled the stretch of the Missouri River that today divides Nebraska from South Dakota in August of 1804. From their vantage point on the river, Meriwether Lewis and William Clark both note an abandoned Omaha village at the mouth of what is now Bow Creek, Cedar County, Nebraska. The explorers' map identifies the village as having been founded by Omaha leader Little Bow after branching off of the main Omaha tribe. Since the 1940's archaeologists have made attempts to relocate this village as described by Lewis and Clark without success. This poster describes a renewed effort to identify the site.

Benfer, Adam (University of Calgary)**[246] *Navigating Prehispanic Central America: Discerning Aquatic Transportation Routes and Technologies***

In the lowland tropics of southern Central America during the later prehispanic periods, the oceans, lakes, and rivers were interregional highways that linked dispersed societies for purposes of trade and communication. Using ethnohistoric sources, archaeological finds, and ethnographic data, we review the types and varieties of indigenous watercraft that might have been used to navigate these natural transport networks. Along the way, we consider the lifeways of these prehispanic boatmen and boatwomen and the roles that they may have served in the distribution of material culture. Focusing on our research in the San Juan River basin of Nicaragua and Costa Rica, we demonstrate how Geographic Information Systems can be and are being used to map out prehispanic aquatic transportation networks based on archaeological data, indigenous watercraft technologies, and water-body navigability.

[246] *Chair*

Bengtson, Jennifer (Southeast Missouri State University), Jeffrey Painter (Michigan State University), Frank Raslich (Michigan State University), Nikki Silva (Michigan State University) and Andrew Upton (Michigan State University)

[365] *Migration and Cohabitation at Morton Village: Future Research Directions*

New evidence for Oneota/Mississippian cohabitation at Morton Village leads us to develop novel questions and models for understanding the nature of social interaction at the site, while also recontextualizing previous analyses and interpretations within a revised framework of migration, cooperation, and ethnogenesis. In addition to carrying out additional excavations to further test hypotheses about the nature of co-habitation and social stress at the site by examining site structure, foodways, architecture, and other material culture, future research directions include, 1) a consideration of Turner's (1969) concept of *communitas* as a potential interpretive framework; 2) resituating bioarchaeological trauma analyses within the contemporary sociocultural literature on community experiences of violence in migrational contexts; 3) modeling social interaction and raw material distribution patterns through the application of geochemical analysis as a method of clarifying cultural integration; 4) development of a model for comparing regional Oneota and Mississippian mortuary practices that explicitly considers the nature of migration and cohabitation; 5) ceramic use-wear analysis; and 6) ceramic analysis as a means of exploring movements of individuals, ideas, and material culture with a particular emphasis on exchange, mobility, and the social negotiation of identity.

Benjamin, Jonathan

[74] *Human Response to Sea-Level Change in the Early Holocene: Examples from the Continental Shelf*

Human response to sea-level rise is an important aspect within the broader topic of coastal prehistory. Sites found on today's continental shelf directly contribute to the archaeological record and are, in some cases well preserved under water. Recent emphasis on continental shelf archaeology, or submerged prehistory, has encouraged prehistorians to embrace underwater archaeology in order to fully appreciate past lifeways and adaptation to sea-level change in the final Pleistocene and early Holocene. Examples from northern Europe and the Mediterranean basin will be discussed.

[243] *Discussant*

Benn, David (Bear Creek Archeology Inc)

[353] *Cosmograms and Archetype Ancestors at the Pierson Creek & Yaremko Sites, Iowa*

Recently discovered geoglyphs at two Late Woodland sites in northwestern Iowa take the form of anthropomorphic turtles, bison, thunderers and a "stickman" similar to the petroglyphs at Pipestone Monument in southern Minnesota. Excavations indicate the geoglyphs functioned as cosmograms where vision quests and other life-renewal rituals probably were conducted. The cosmograms and associated evidence for rituals are compared to ethnographic descriptions of Lakota tribal myths to reveal possible symbolism for the figures. The two sites are hypothesized to have been part of a "sacred" locality where multiple ritual sites were integrated as a structured mythological landscape. In this narrative, archaeological investigation is perceived to be encountering two levels of inquiry: the rationality of place and the dream state of mythology.

Bennett, Stacey [150] see Kilby, David

Bentley, R. Alexander

[191] *Validating Niche-Construction Theory through Path Analysis*

Under the conventional view of evolution, species over time come to exhibit those characteristics that best enable them to survive and reproduce in their preexisting environments. Niche construction provides a second evolutionary route to establishing the adaptive fit, or match, between organism

and environment, viewing such matches as dynamical products of a two-way process involving organisms both responding to problems posed by environments as well as setting themselves new problems by changing their environments through further niche construction. Path analysis forces researchers to specify how variables relate to one another and encourages development of clear and logical theories concerning the processes that influence a particular outcome. As we show through a case study—the coevolution of cattle husbandry and the tolerance for milk consumption—path analysis can also call attention to potential areas of weakness and ambiguity in data sets and how they are used in constructing archaeological and evolutionary inferences.

[191] *Chair*

Bentsen, Silje [7] see Phillips, Cassidy

Bentz, Linda (San Diego State University) and Todd J. Braje (San Diego State University)

[328] *Fighting the Tigers: Chinese Mobility as Resistance During the Exclusion Era*

During the mid-nineteenth century, Chinese and many other immigrants flooded California's shores in pursuit of economic opportunities. Over the next several decades, Chinese labor became threatening to national Euro-American interests and federal and state governments passed a variety of taxes, ordinances, and legislation targeting Chinese communities. The most restrictive of these were the Chinese Exclusion and Geary acts, which barred immigration by Chinese laborers and severely limited their mobility patterns. Through ingenuity and active resistance, however, Chinese settlers frequently traveled between the West and their homeland and found ways to circumvent racist regulations. Employing historical documents, immigration files, and archaeological surveys and excavations, we present a case study of Chinese fishermen who lived in Santa Barbara, California, circa 1880 to 1915, that illustrates how they skirted exclusion laws and successfully carved out economic opportunities at the margins of American society.

Benz, Marion, Kurt W. Alt (Center for Natural and Cultural History of the Tee) and Vecihi Özkaya (Dicle Üniversitesi, Edebiyat Fakültesi, Arkeoloji)

[16] *Evidences for Social Structure and Ritual Practices from Körtik Tepe at the Beginning of Settled Life*

Until the end of the 1990s, southeastern Turkey was considered a secondary center of Neolithisation. However, excavations in the context of the Ilisu Dam project have shown that there was a long local tradition of permanent settlement since at least the Epipaleolithic. Evidences from Körtik Tepe indicate strong commitments to the site and to households. Social and emotional relationships were consolidated by intense ritual behavior, including burials beneath house floors, the increasing use of body adornments, and rich symbolism. Some decorated objects and burial rites were highly standardized. Many of the dead were buried in a hocker position with their head pointing to the north/northeast. However, despite the enhanced materialization, and the differentiation and institutionalization of social identities, some behaviors resisted or denied these changes. Many valuable objects were deliberately destroyed to cover the dead bodies or to serve as "offerings" for the dead, though no true ancestor cult can be discerned. It seems that the people of Körtik Tepe were on the threshold of the institutionalization and objectification of social roles and ritual behavior, but basically were still hunter-gatherers and fishermen intimately embedded in their natural environment.

Berbesque, J. Colette [415] see Buck, Laura

Berdan, Frances (California State University San Bernardino)

[346] *The Technology of Aztec Featherworking: Glyphic Clues in the Florentine Codex*

Featherworking was among the finest of the luxury industries in the Aztec world. The craft employed complicated techniques and some expensive materials, but a relatively straightforward and inexpensive toolkit. Book 9 of the Florentine Codex features a detailed account of this featherworking technology. Forty-one illustrations accompany the Nahuatl textual account, and 27 phonetic glyphs (as single elements or in structured combinations) are embedded in these illustrations. Renewed

interpretations of these illustrations and new translations of the phonetic glyphs reveal otherwise undocumented or ambiguous details about the types of feathers, the identity of auxiliary materials, the uses of various tools, and the techniques of featherwork construction. These glyphic translations and interpretations are placed in the context of extant Aztec-period feathered objects.

[194] *Discussant*

Beresford-Jones, David [31] see Lane, Kevin

Berger, Elizabeth (UNC-Chapel Hill)

[283] *Bioarchaeology, Human Ecology, and Subsistence Change in Ancient China*

This paper will explore the links between bioarchaeology and human ecology, and how they can contribute to studies of ancient Chinese subsistence. Both fields deal with similar types of data, including measures of nutritional status, fertility, disease burden, food production, and human-environment interaction. However, the two fields differ widely in both the time scale and the resolution of their data. Can models from human ecology inform bioarchaeological research? Can the long time scale available from bioarchaeology contribute to human ecology? The paper will use preliminary results from bioarchaeological research on the origins of pastoralism in China as a case study.

Bergh, Stefan [185] see Driscoll, Killian

Bergin, Sean (School of Human Evolution and Social Change, ASU)

[51] *Modeling the Influx of Agriculture: An Agent-Based Model Exploring Agricultural Spread Scenarios in the Western Mediterranean*

During the sixth millennium B.C. agropastoral subsistence spread rapidly across Mediterranean Europe. The results of the currently available radiocarbon chronology suggest that this transition may have occurred in less than 1,000 years. The swift proliferation of new types of material culture and new modes of subsistence has led researchers to hypothesize that the appearance of agriculture in the west Mediterranean was the result of a migration of farmers, the adoption of agriculture by indigenous groups, or a combination of these processes.

In archaeological research, agent-based models (ABM) are emerging as productive analytical tools for understanding prehistoric complex systems. Given the variety of environmental, economic, demographic and social factors involved in the spread of agropastoralism, ABMs can play a pivotal role in researching the advent of the Neolithic. Four general models have been commonly advanced to explain the spread of agriculture through Europe's western Mediterranean region and this project will evaluate each of them. This submission outlines an ABM under development that can be used to test these alternative hypotheses and the generation of test implications that can be evaluated with empirical data.

Berlanga Trindade, Thiago [326] see Pugliese, Francisco Antonio

Berman, Mary Jane (Center for American and World Cultures)

[387] *Investigating Variability in Lucayan (Bahamian) Microlith Assemblages*

Chert is an imported non-local raw material that the Lucayans (Bahamas) obtained by way of direct procurement or trade and exchange with the Greater Antilles. The physical composition, morphological characteristics, and measurements of chert microlith assemblages from four Lucayan sites are compared to determine differences and similarities. The observed variability is explained in terms of inter-site differences in tool use and site function, and temporal changes in inter-island socio-political relations. While starch grain and phytolith analyses have determined that some microliths were used to process multiple plants, a few microliths yield evidence for one plant. Based on ethnographic data, the study will examine if these were single tools or components of specialized composite tools.

Bermann, Marc**[184]** *Discussant*

Berna , Francesco [174] see Hlubik, Sarah

Bernal, Marcela**[107]** *The Archaeology of Nuestra Señora Santa María de los Remedios del Cabo de la Vela, a colonial enterprise settlement for pearl fishing in the sixteenth century.*

While the subject of the contact can be approached from different perspectives (political, economic, social, cultural, religious), in this study the reflection will have to do with power and social control over the daily customs and practices of each group involved in a contact society (which includes categories such as physical space management, nutritional practices and identification of material goods to each of the groups), settle in el Cabo de la Vela to continue with the enterprise for pearl fishing in the sixteenth century. This Spanish settlement could have developed a control as strict or flexible triggering a series of socio-cultural dynamics that may have caused the members of this society to transform their culture and society into a new one. This essay includes some data and results of the first stage of the research.

Bernard, Julianne [3] see Bedford, Clare

Bernard, Julianne**[143]** *Introducing the Cache Cave Archaeological Project: Background, Aims, and Methods*

Caching in caves and rockshelters has been documented in many parts of the Chumash region and beyond, but the discovery and excavation of this Cache Cave provides one of the first opportunities to document cached items in context, assess formation processes, and interpret a site of this kind with preservation of perishable artifacts, as well as materials that are potentially associated with their manufacture and maintenance. This paper introduces the Cache Cave site, situates this site among other cache cave sites in California and the Great Basin, provides an overview of the methodological approaches taken in documentation and excavation, and outlines the goals and potentials of continued research at this important site.

[143] *Chair***Bernard, Henri (Université Paris 1 Panthéon Sorbonne)****[172]** *An Ear of Corn of Jade from Arroyo Pesquero, Sacred Offering*

There are many objects in olmec-style with iconography in public and private collections outside of Mexico attributed to the archaeological site of Arroyo Pesquero, a remarkable site known for its beautiful offerings on hard stones (jade, serpentine) especially masks, has been the subject of few campaigns of archaeological research in 1969 a short stay for the Archaeologist Manuel Torres and in recent years by the Arroyo Pesquero Archaeological Project directed by Carl Wendt, in that project, in 2012 exploration season, an extraordinary and unusual archaeological specimen an ear of corn made of mottled brown and white jadeite was discovered, confirming the importance and significance of this site for the olmecs. The objects with origins attributed to this site in American collections have been the subject of several studies in counterpart European collections are often poorly documented and do not receive adequate recognition. This presentation is a compilation of the objects attributed to Arroyo Pesquero organizing the collections on existing types and trying to trace possible links particularly with the piece found in 2012.

Bernardini, Wesley (University of Redlands)**[358]** *Sight Communities in the American Southwest*

Communities can be conceptualized along a number of dimensions – spatial, demographic, economic, ritual, among others. This study proposes that it may also be productive to consider

communities organized around vision. It is well established that people construct mental representations or “cognitive maps” of their surroundings to organize spatial information and experiences and for spatial orientation and navigation. Populations who shared significant portions of their cognitive maps are likely to have shared important details of their cosmologies such as concepts of familiar and foreign, landmark references, and ritually charged places. This study uses GIS to identify the anchor points around which sight communities may have been oriented, and assesses the social consequences of visual landscapes that changed as populations fluctuated and migrated across them.

Bernatchez, Jocelyn and James McGrath

[356] *The Ochre Assemblage from Pinnacle Point 5-6*

In recent years, southern Africa has figured prominently in the modern human origins debate due to increasing evidence for precocious behaviors considered to be unique to our species. These significant findings have included bone tools, shell beads, engraved ostrich eggshell, and heavily ground and engraved ochre fragments. The presence of ochre in Middle Stone Age (MSA, ~250-40kya) archaeological sites in southern Africa is often proposed as indirect evidence for the emergence of symbolic or artistic behavior, a uniquely modern human trait. However, there is no remaining artwork from this period and there is significant debate about what the ochre may have been used for. Compared to other artifact classes, ochre has gone largely unstudied. A solid understanding of the ochre record throughout the MSA is necessary in order to fully assess the role of ochre in the behavioral development of modern humans. This paper presents the ochre record from a long sequence of the MSA at Pinnacle Point 5-6 in Mossel Bay, South Africa.

Bernemann, Amanda

[359] *Oneota Subsistence Practices at the Christenson Site (13PK407)*

The Christenson site (13PK407) is a Moingona phase Oneota site along the Des Moines River, dating to around A.D. 1250. Excavations took place in both 1983 and 2001 in order to salvage the site from erosion by the Des Moines River. Analysis of the 1983 deer remains indicated a mid- to late-winter season of death, suggesting that the Christenson site represented a winter occupation. This season of occupations differs from other Moingona phase Oneota sites, and this reanalysis of the 2001 faunal remains provides an opportunity to study possible seasonal differences in Oneota subsistence. Along with a study of diet breadth, analysis of the spatial distribution, breakage patterns, degree of burning, and other modifications of the assemblage allow for better understanding of the diet and subsistence practices at Christenson. Additionally, further understanding of this site provides more insight into the larger subsistence strategies of the region at this time.

Berquist, Stephen (University of Toronto) and Edward Swenson (University of Toronto)

[142] *Infra-structuration of Imperial Power in Ancient Angkor and the Andes*

A comparison of the agricultural reclamation projects and religious architectural programs of the Chimú, Inka, and Angkorian empires will serve to demonstrate that statecraft was an inherently technological pursuit in ancient societies. Supra-local political regimes were literally built by and through infrastructure that reconfigured different communities of practice. An important objective of the paper is to demonstrate that an analysis of the materials, temporalities, and technologies underlying the production and maintenance of state infrastructures (and counter-state infrastructures) can illuminate cultural variation in the ideological and economic construction of centralized power in archaic complex society.

Berrey, Adam [36] see Drennan, Robert

Berrey, Charles (University of Pittsburgh) and Scott Palumbo (College of Lake County)

[246] *Interregional Exchange and the Rise of Inequality in the Intermediate Area*

Interregional exchange has long played a prominent role in explanations of hierarchical development

among early complex societies in lower Central America and throughout the Intermediate Area. It is argued to have been a primary basis of social power among highly developed chiefdoms of the sixteenth century, and to have played a vital role in the onset of inequality approximately 1000 years earlier. However, while interregional exchange was undoubtedly an important element of early inequality in many parts of the Intermediate Area, its role has often been emphasized at the expense of other activities that were also important, and of the factors that prompted inequalities to develop. Recent archaeological research has revealed that the factors underlying early inequality (including the activities that were used to support it) were highly variable from one region to the next, and that more attention must be paid to local and regional-scale processes in studying the development of inequality in the Intermediate Area.

Berry, Meg (Center for Rock Art Research and Management - University of Western Australia)

[353] *Digging Deeper: The Use of Rock Art in Archaeological Contexts to Understand Past Lifeways on Murujuga, Northwest Australia*

Murujuga comprises one of the most complex rock art provinces in the world. The iron red boulders of this ancient landscape host petroglyphs which communicate a myriad of sociocultural dynamics of groups utilizing changing landscapes over millennia. These petroglyphs are situated within a landscape marked by complex and diverse archaeological signatures including stone arrangements, lithic scatters, quarries, middens and hut structures. Our archaeological understanding of the prehistoric lifeways on Murujuga is dominated by Holocene evidence, with the oldest subsurface material being dated to only 8,500 BP. However, the rock art corpus speaks to use of landscapes for much longer than this and for possibly more than 30,000 years. In this paper I will analyse the rock art motifs that have previously been identified as the earliest phase of petroglyphs across Murujuga. I will contextualize this line of evidence with preliminary archaeological excavations undertaken during 2014 by the Center for Rock Art Research and Management at the University of Western Australia. This paper will illustrate the interplay between subsurface archaeology and analysis of the extensive Murujuga rock art corpus, and it will explore and further our understanding of how cultures utilized and socialized Murujuga landscapes from the Pleistocene onwards.

Bertilsson, Ulf (Director of Swedish Rock Art Research Archives)

[137] *Carved Footprints and Prehistoric Beliefs: Examples of Symbol and Myth, Practice, and Ideology*

Footprints are frequent on prehistoric petroglyphs. The author has studied its design, sprawl, dating and interpretation in archaeological research as a wider investigation of this theme. Case studies of significant rock art sites in Scandinavia, the Mediterranean and the Near East show that the footprint is a general phenomenon, occurring in all these areas during the time period c. 3000 B.C.-500 B.C. The footprints have been interpreted in different ways; as the epitome of an otherwise invisible deity, a sign of reverence or as a symbol of a dead person. Footprints may have more complex meaning manifested in a partly sliding form scale, also related to the time factor. They stand out as symbols of great vitality, length and spread in the prehistoric imagery and world of conceptions. This indicates archetypal characteristics, and representation of a phenomenon that in recent research has been termed core universals. This is further illustrated by the fact that footprints also occur in the Native American rock art e.g. the Central Mississippi River Valley, a fact that opens up avenues for further investigation into this specific symbol.

Bertin, Sean [221] see Barton, C. Michael

Bertolazzi, Riccardo (Riccardo Bertolazzi, University of Calgary)

[368] *Statuae Meae Ubique Steterunt: Some Considerations on Julia Domna's Statue Bases from North Africa*

Roman African provinces are characterized by an extraordinary number of epigraphic sources concerning the dynasty of the first African emperor, Septimius Severus. Among these are many statues dedicated to Severus' Syrian wife Julia Domna, whose presence at the side of both her husband and her son Caracalla is recorded by the historical accounts on this period. A survey of the

African inscriptions that commemorated the erection of statues in her honor leads to the conclusion that at least forty-five individual statues were put up during the reigns of both Severus and her son Caracalla. This number, if compared to the few statues erected to previous imperial women, is extremely significant for understanding the high profile role enjoyed by Domna. Her statues were present in many important cities, as well as in the important camp of Lambaesis. Furthermore, the triumphal arches built in the cities of Assuras, Theveste and Cuicul reveals the presence of other statues dedicated to Domna. It is therefore possible to observe that in North Africa she was perceived as a central member of the imperial family, rather than a mere instrument of propaganda used by Severus to promote the dynasty among his subjects.

Bestel, Sheahan

[313] *Starch in Cuba*

Evidence of subsistence and diet in the Caribbean is examined using evidence from starch grains extracted from human dental calculus. This is compared with isotope data to examine distinct populations of humans in Cuba.

[271] *Discussant*

Bethke, Brandi [300] see Ballenger, Jesse

Bettencourt, Nichole (Washington State University) and Rafael Segura-Llanos (Southern Illinois University)

[155] *A Tale of Two Styles: A Geoarchaeological Investigation into Lima & Ychsma Construction Materials at Cajamarquilla, Peru*

This paper examines construction materials from Cajamarquilla, one of the largest prehistoric urban sites on the Central Coast of Peru. Little work has been published about the architecture at Cajamarquilla, other than to comment on the enormity of the site and its constructions. Rammed earth (tapia, in Spanish) is the main construction style at Cajamarquilla, but with marked observable differences between the Lima Phase (A.D. 500 – 800) and Ychsma Phase (A.D. 1100 – 1450) occupations. Lima walls were built using large, uniform courses of tapia and appear to be tempered with small pebbles and seem homogeneous, whereas Ychsma walls were built with small, uneven courses of tapia and the tempering materials used were much less uniform in size and included organic materials. The level of socio-political complexity is unclear for these cultures, especially the Lima culture, which created massive, well planned construction projects but lacked a regional system of ranked settlements usually seen in a state level society. This study aims to characterize the raw materials and preparation methods using bulk and thin section analyses in order to determine relative labor investment for construction materials to provide additional evidence for different technological and social conditions that prevailed during Lima and Ychsma occupations.

Bettinger, Robert (University of California-Davis)

[1] *Aboriginal Sociopolitical Groups in California and the Great Basin: The Rise of Orderly Anarchy*

Socio-political development in aboriginal California follows a trajectory quite different from that in much of western North America, culminating in very small socio-political units, in some places independent family groups approximating those characteristic of the Great Basin. The key development leading to this family-level organization was in both places the privatization of stored plant food, which incentivized the intensive use of plant foods (pinyon and acorn) that were abundant but costly process. Privatization was the result of a technological breakthrough, the appearance of bow and arrow technology, which permitted the formation of smaller, family-centered social units more inclined to invest in costly resource procurement because the proceeds of that went directly to offspring and close relatives, culminating in a system termed “orderly anarchy.”

The alpine zone (above 10,000 feet) of White Mountains of eastern California is the most extensive, and by far the most intensively occupied by aboriginal groups, in the Great Basin. The earliest consistent use, beginning about 5500 BP, is by hunting parties. Beginning sometime after A.D. 600,

the White Mountains village residential pattern is distinctive, featuring one or more well-built dwellings, well-developed middens, and extensive assemblages of chipped and ground stone. While hunting was clearly important to the village pattern, artifact counts indicate a surprisingly heavy reliance on plants, with milling equipment on average accounting for roughly 30% of all formal tools. The key distinction between the White Mountains pattern and its counterparts in central Nevada (Alta Toquima) and Wyoming (High Rise) is intensity of use. While High Rise houses were never used intensively, and Alta Toquima houses only rarely, all White Mountains houses were used repeatedly and intensively. This occupational intensity peaks after A.D. 1300, probably reflecting developments connected with the Numic spread. Earlier village use between A.D. 600 - 1300 noted here and at Alta Toquima is more likely the result of Basin-wide trajectory of regional intensification.

[178] *Chair*

Bettinger, Robert [135] see Garvey, Raven

Betts, Matthew [80] see Martindale, Andrew

Betz, Barbara (The Ohio State University)

[205] *The Tooth About Pastoralism: Oral Health, Physiological Stress and Diet in a 19th Century Mobile Pastoralist Population from Mongolia*

To better understand diet, oral health, and physiological stress loads of historic 19th century mobile pastoralists from Central Asia, the frequency of caries, ante-mortem tooth loss (AMTL), and linear enamel hypoplasia (LEH) were assessed macroscopically from a skeletal sample (n=40) of a pastoralist population from Urga (Ulaanbaatar), Mongolia. Results show a low percentage of individuals affected by caries (11.4%) consistent with a diet low in sugars and carbohydrates but high in animal products. Thus, despite potential access to agricultural products within their interaction sphere, such foods did not appear to have played a significant role in this population's diet. However, examination showed high prevalence of AMTL (67.5%), which may lead to underestimation of carious lesion prevalence. While LEH frequency among the Urga population appears high (77%), comparison with a contemporaneous sedentary, agriculture-dependent population from Guangdong province in southern China (n=37) shows a significantly higher percentage of individuals with LEH (100%) and evidence of multiple periods of stress (Urga: 27%, Guangdong: 92%). These results suggest that there are generally lower physiological costs associated with a pastoral rather than agricultural lifestyle and that mobility, population density, and diet have a significant effect on stress loads in these settings.

Betzenhauser, Alleen (Illinois State Archaeological Survey) and Timothy Pauketat (University of Illinois at Urbana-Champaign)

[237] *Elements of Cahokian Neighborhoods*

American Indian neighborhoods were very much under construction during the late-eleventh century at Cahokia. A social order that transcends pre-Mississippian village life may now be defined based on large-scale excavations at East St. Louis and Cahokia proper. Architectural patterns and craft production debris within the greater central complex indicate possible religious if not political or ethnic divisions that did not form organically. The central problems of a Mississippian analysis, however, are distinguishing (1) neighborhoods from other kinds of occupational zones and (2) human neighbors from other-than-human residents. We use new measures of architectural diversity, density, and positioning to identify the elements of Cahokian neighborhoods and how they were created, maintained, and reconfigured. Ultimately, we will demonstrate how these varying neighborhoods were implicated in processes of urbanization, community formation, and the development of social divisions within the central complex and beyond.

Bevan, Andrew [89] see Martinon-Torres, Marcos

Bevan, Andrew (University College London)

[221] *Scripting the Spatial Analysis of Archaeological Datasets*

For some time, interpreted languages such as Python, Matlab and R have made it easy to document and run computational function calls either line-by-line or in a script. While the spatial functionality provided within these environments has long been seen as inferior to GIS packages, it has now reached considerable maturity. The open source, multi-purpose and often 'bleeding edge' nature of these working environments also mean that there are often considerable analytical advantages to using them instead of mainstream GIS. This often means that while visualisation and querying of spatial data in archaeology might still first be explored via earth viewers and traditional GI systems, entire final spatial analytical workflows can now be conducted and shared via scripts in a manner similar to standard statistical and non-spatial methods. This should have considerable implications for how we teach students, make working notes, conduct peer review and archive spatially-explicit archaeological research, and this paper considers these issues via a series of practical examples in R.

[221] *Chair*

Bey III, George [113] see Parker, Evan

Bey III, George J. [263] see Gallareta Cervera, Tomás

Biagetti, Stefano (CaSEs - Univ. Pompeu Fabra (Barcelona, Spain))**[23]** *Resilience and identity: the ethnoarchaeology of the Kel Tadrart Tuareg (SW Libya)*

In the Tadrart Acacus (SW Libya), ethnoarchaeological research carried out between 2003-2011 has shown that its current inhabitants, the Kel Tadrart Tuareg, are a successful example of adaptation to extreme climatic and environmental conditions. Their exceptional resilience, characterized by high degree of variability and opportunism, escapes some of the traditional assumptions often done in ethnography and archaeology regarding the classification and identification of societies, such as mobility, food security, or interaction with neighboring groups. Indeed, this study demonstrates that identity and self-representation play major role in shaping individual and communal choices in the Kel Tadrart society, leaving specific material correlates that might elude our traditional interpretive tools. These data reveal the often underestimated complexity of arid zones pastoral societies of the present, raising issues related to mainstream approaches to Saharan Holocene archaeology, where arid times are generally associated with marked drops in both cultural and social level of communities.

Bicho, Nuno [53] see Goncalves, Celia

Bicho, Nuno (Universidade do Algarve), Jonathan Haws (University of Louisville), Mussa Raja (Universidade Eduardo Mondlane), Omar Madime (Universidade Eduardo Mondlane) and Célia Gonçalves (Universidade do Algarve)**[174]** *Middle and Late Stone Age of the Niassa Region, Northern Mozambique. Preliminary Results*

Located between modern-day South Africa and Tanzania, both of which have well-known and extensive Stone Age records, Mozambique and its Stone Age sequence remain largely unknown in the broader context of African Pleistocene prehistory. This is in spite of the country's critical position linking southern and eastern Africa, and of its clear potential to inform various models about recent human evolution. Specifically, the geography of Mozambique makes its sea coast a natural area of interest to evaluate recent scenarios about the importance of coastal adaptations to the success and diffusion of *Homo sapiens* outside of southern Africa. Here, we present the results of field survey in the Niassa lake region. Two main contexts were surveyed: river valleys running to the Niassa (Malawi) lake and limestone bedrock exposure where Middle and Late Stone Age sites and deposits were found during 2014, including dozens of surface sites as well as a few in situ localities in rockshelters with both lithic artifacts and well preserved faunal remains.

Biehl, Peter [218] see Curtis, Caitlin

Biehl, Peter (SUNY Buffalo)

[297] *The Neolithic House: Ruth Tringham's Interdisciplinary Approaches to (Re)Constructing Prehistoric Village Life in Southeast Europe and Anatolia*

People create themselves through the houses they build. Ruth Tringham's archaeological as well as anthropological inquiry has identified houses as active material culture entangled with both material and immaterial social values and rules. Architecture is the material expression of culture, both enabling and constraining the relationship between people and their actions. In archaeology, we receive the final phase of the use-life of a house, yet abundant evidence exists for its making and constant re-making as living space. This paper will explore the intersection of architecture and archaeology focusing on Ruth Tringham's interdisciplinary approaches to (re)constructing architecture from Neolithic Southeast Europe and Anatolia. The spaces and materialities associated with archaeological investigation – dirt, waste, rubbish, ruins – can be useful as themes for thinking about the Neolithic house, its functions and meanings as well as its construction of mudbrick, daub and wattle, timber or stone. The paper will also try to elucidate and challenge conventional narratives of sedentism to seasonality, and spatial organization to early social complexity. It will also scrutinize the complex processes involved in constructing and re-constructing architecture and the reciprocal relationship between people and the things they built.

[218] *Chair*

Biermann, Rebecca, Alison S. Brooks (The George Washington University) and David R. Braun (The George Washington University)

[121] *Accuracy and Precision of 3D Modeling in Lithic Analysis*

Studies of stone artifacts increasingly rely upon measurements of 3D models, due to the ability to capture a larger range of volumetric and angular attributes on these models. Despite the enthusiasm for these new techniques, little research has been conducted on the efficacy of digital reconstructions for quantitative lithic analysis. The objective of this project is to quantify the advantages and disadvantages of two methods of 3D data capture (e.g. photogrammetry and laser scanning).

We capture 3D models of experimentally produced stone artifacts (produced on basalt and obsidian) using both multiple image photogrammetry and laser scanning. The accuracy of these methods is tested through comparisons with standard digital caliper measurements. Precision is investigated by recreating each model twice. Results show that technique and raw material can have an impact on model accuracy. Obsidian is slightly more accurately modeled by photogrammetry and basalt flakes are slightly more accurately modeled by laser scanning, although both of these techniques are imperfect. Both techniques exhibit relatively high levels of precision. Results show that only photogrammetric volume is imprecise. Here, we review the strengths of the different methodologies and provide recommendations for future use of 3D modeling in archaeology.

Bigelow, Nancy [7] see Hornbeck, Bobbi

Bigman, Daniel [8] see Nowak, Jesse

Bigoni, Lucie [207] see Velemínská, Jana

Billen, Nicolas [100] see Loos, Lukas

Billen, Nicolas (GIScience, University Heidelberg), Lukas Loos (GIScience, University Heidelberg), Michael Auer (GIScience, University Heidelberg) and Alexander Zipf (GIScience, University Heidelberg)

[100] *MayaArch3D: System Architecture, Admin and Security Features, Attributes and Maya Calendar Translation Services*

The MayaArch3D project is developing and investigating a bundle of different services and tools for the integration, analysis and presentation of archaeological data-sets. The architecture of this system is designed in a scaleable, flexible and standardized way. Whenever possible, the system uses well known specifications, like OGC-WMS, OGC-WFS and W3DS. For not yet existing standardized service interfaces, the project investigates new suitable approaches. Such interfaces include for instance a Time Service, an Attribute Service and the Geometry Service for single objects. Each component is designed as an exchangeable artifact. All these services are connected to the different data sources: 2D database, 3D database, attribute database and shapefiles. Everything is brought together in the WebGIS Frontend for 2D and 3D visualization and analysis. To prevent misuse of this collection of spatial referenced datasets (e.g. looting), the project developed a role based security concept, using a Lightweight Directory Access Protocol Service (LDAP) for managing of different rights and security levels. The system uses as many open source components as possible.

Billman, Brian [11] see Longo, Julia

Billman, Brian (UNC & MOCHE, Inc)

[404] *Discussant*

Billo, Evelyn [409] see Mark, Robert

Binning, Jeanne (California Department of Transportation), Jill Minar (Fresno City College), Clifford Walker (Mojave River Museum) and Dan Stueber (Archaeological Investigations Northwest)

[386] *A Biface Cache from Paradise Springs, Central Mojave Desert*

A cache of eight pressure-flaked bifaces, including two Humboldt Basal-Notched knives of Coso obsidian and six chert dart-point preforms, was found at Paradise Springs, south of Fort Irwin in the Central Mojave Desert. Hydration rinds on the two Humboldt bifaces indicate that the cache dates to about 1400 cal BP. The function of the cache within its social context, the special role of the Humboldt Basal-Notched knife, and the persistence of the altatl and dart into bow and arrow times are discussed.

Birch, Jennifer (University of Georgia)

[26] *Making Communities Work: Organizational Diversity in the Eastern Woodlands of North America*

Stephen Kowalewski has advanced a number of conceptual frameworks for the comparative study of organizational complexity. His multiscalar, cross-cultural approach permits the recognition of broad patterns while incorporating meaningful variation. In a 2013 paper, Steve explores the “work” involved in the formation of large, co-residential communities. He suggests that we might productively focus on the labor process, as community members purposefully redirected people’s time, energy, and resources to particular ends. In this paper, the social and physical work of making community is used as a framework to explore the development of organizational complexity and diversity in eastern North America. Archaeological, ethnographic, and historical data are combined to understand relations of production, consumption, power, ideology, and the development of sociopolitical organization in multiple subregions. For some communities, work became more intense, differentiated, and specialized in the absence of clearly defined hierarchies. In others, highly visible leaders emerged, though the relationship between political complexity and labor is far from clear. Thinking about how habituated practices of work structures social relations and articulates with large-scale, long-term societal patterning allows us to transcend normative constructs of eastern North American societies as “chiefdoms” and “confederacies.”

[177] *Chair*

Birch, Dylan (Art History Society - CSU Los Angeles)

[133] *Tula 2014: Reexamining Ball Court 2 through Cross-Cultural Comparisons with the Yucatan*

The Proyecto de Investigación, Conservación y Mantenimiento para la Zona Arqueológica de Tula 2014, directed by Dr. Robert Cobean focused on the restoration of Ball Court 2. Today, the three major ceremonial centers exposed at Tula are the Palacio Quemado, Pyramid B and Pyramid C; these structures form an L-shape that faces the Adoratorio situated in the center of the plaza. The positioning and architectural dimensions of Ball Court 2 in Tula's main precinct are almost exact with the largest Ball Court at Chichen Itza. Ball Court 2 served as a ritual and political centerpiece at Tula Grande; a second and smaller Ball Court at Tula has numerous associations with the rain god Tlaloc, while the religious components of Ball Court 2 are less understood. This colossal structure contains an I-shaped playing surface surrounded by staggered palatial chambers for the Toltec elite. The summer 2014 excavations reopened the work of Eduardo Matos Moctezuma at this Ball Court forty years prior, after a small team of graduate students from Zacatecas and the United States focused on repairing its eastern façade. The following presentation utilizes the summer 2014 Tula project to illustrate the ritual identity of Ball Court 2 in greater detail.

Birch , Jennifer [177] see Brannan, Stefan

Bird, Douglas [296] see Codding, Brian

Bird, Douglas (Stanford University)

[296] *A Kangaroo Hunt*

O'Connell is best known for championing an approach to exploring the evolution of human behavior and its attendant archaeological patterns through the distinctive lens of human behavioral ecology. His contributions in developing ways to operationalize theory for generating testable hypotheses about big questions in the human experience have indelibly shifted the trajectory of empirically bent studies of subsistence. However, far less appreciated are his keen ethnographic descriptions of the social contexts in which decision-making unfolds. Here I use an important essay that O'Connell (2000) wrote which describes an emu hunt conducted in Alyawarra country in 1974 as a springboard to discuss the contexts of contemporary hunting practices among Martu in Australia's Western Desert. I argue that insights into both the Alyawarra and Martu situations provide important directions for framing new questions and theoretically driven hypotheses concerned with subsistence transitions.

Birge, Adam (University of Texas at San Antonio) and Cassandra Koontz (Vanderbilt University)

[208] *Trophies of Violence: The Manufacturing and Processing of Human Trophy Heads at Uraca*

Human trophy heads appear in the iconography of prehistoric Andean ceramics, weavings, and statuary as early as the Late Formative (400 B.C. – A.D. 100), and actual trophy heads are not uncommon bioarchaeological finds in south-coastal Peru. Human trophy heads were prepared by cleaving the head from the body, cutting the occipital and parietal bones to remove the brain, drilling holes in the frontal bone, and threading that hole with a carrying cord for display. At the Middle Horizon cemetery of Uraca in the Middle Majes Valley (Arequipa, Peru), eleven trophy heads were recently excavated from two sectors: Sector I, located near the ritual petroglyph field of Toro Muerto, and Sector II, located farther to the north. We examine differences in cutmark type, number, and location between sectors in order to shed light on the changing contexts of violence in the Middle Horizon Majes. We also examine the spatial distribution of trophy head styles from published samples in southern Peru to determine whether Uraca styles are more consistent with Wari, Nazca, or local traditions. Lastly, lithic artifacts from both sectors are examined to explore whether they may have been involved in trophy head manufacture.

Birkmann, Joseph [180] see Graves, Michael

Birmingham, James (Rensselaer Polytechnic Institute)

[400] *Potsherds, Paving Stones, and Puppets: Possible Paths for an Anarchist Archaeology*

This presentation will explain three possible strains an anarchist archaeology might pursue. While I will briefly explain how my own work in the related field of material culture studies relates to anarchist scholarship, the focus will be on exploring what an anarchist archaeology might look like. In brief one focuses on the far past or perceived "past" and what we may learn from it; the next on more recent resistance and alternative political forms; and the final on the contemporary anarchist milieu.

Bishop, Katelyn (University of California, Los Angeles) and Samantha Fladd (University of Arizona)

[22] *The Distribution of Articulated Animal Remains: An Analysis of Household and Community Ritual in Chaco Canyon*

Chaco Canyon is thought to have been a regional center during the Pueblo II period. Its identity as such makes it a particularly interesting locale at which to compare the relationship between public community-based and more exclusive household-based rituals. In this paper, the nature of articulated animal remains and their deposition are examined in order to elucidate social relationships at both the community and household scale, particularly at the largest and most well-studied site, Pueblo Bonito. To do so, we seek to identify the characteristics of ritual activity as outlined by Bell (2009[1992]) to suggest that cases of articulated faunal remains were deliberately deposited as acts of ritual expression. This will include an examination of the characteristics of the faunal remains, associated materials, geologic composition, and the spatial and architectural framework of the associated deposits, as ascertained from excavation records. By considering the differential context and content of structured deposits containing faunal material, we address the flexible relationships, or lack thereof, between community and household rituals across the site, and, more broadly, the region.

Bishop, Ronald (Smithsonian Institution), Socorro Jiménez (Universidad Autónoma de Yucatán, Mexico) and Erin Sears (University of Kentucky)

[86] *Volcanic Ash in the Ceramics of the Greater Palenque Region and Usumacinta Drainage, Chiapas and Tabasco, Mexico*

Knowledge about the movement of pottery with volcanic constituents throughout the northwestern Maya Lowlands, from Preclassic through Postclassic times is closely tied to sub-regionally specific resources of the Usumacinta Drainage—from its origin in the highland to the Gulf delta. Following pioneering work in the region by Blom, Berlin, Ochoa, and Rands, we focus on sites in the greater Palenque subregion and their links to sites along the Usumacinta and in the Chiapas Sierras. Although Karl Saper, 19th Century explorer and antiquarian, noted the possible presence of volcanic ash near Palenque, no continuously exploited sources, other than those of Usumacinta have been determined. The volcanic pottery, therefore is either imported to Palenque or the tempering materials are imported—or both. In this presentation we present aspects of the compositional and archaeological patterning that we observe in our use of an extensive data base of temper examinations, petrographic analyses and chemical characterizations using neutron activation to investigate subregional sources of raw material procurement, ceramic manufacture, distribution, and changes in technology through time.

Bishop, Gale (Emertius Professor of Geology, GA Southern University), Kelly Vance (Department of Geology and Geography, Georgia South), Brian Meyer (Department of Geosciences, Georgia State University), Fredrick Rich (Department of Geology and Geography, Georgia South) and Mehmet Samiratedu (Georgia Southern University Sea Turtle Program @ S)

[178] *Rising Sea Level and Sea Turtle Nesting on St. Catherines Island, GA; What the Present and Past tell about the Future!"*

Geologists involved in sea turtle conservation have documented deterioration of sea turtle nesting habitat during sea level rise in The Modern Transgression on a "Sentinel Island." Deterioration of habitat has resulted in rapid erosion of backbeach nesting habitat at ~ 3.0 m per year (declining from 25% to 12% adequate habitat in a decade), including fragmentation of three beaches in 1990 into eight beaches in 2013, formation of washover fans and wash-in fans onto backbeach marsh meadows and into maritime forest, formation of nearly continuous tree "boneyards," scarps, and relict marsh mud exposures along most of the beach. All these phenomena contribute to difficult

nesting conditions for loggerhead sea turtles; forcing relocation of “at risk” nests into nurseries. Erosional effects are expected to continue and accelerate as the rise of sea level accelerates leading to an increasing trend of barrier island erosion and deterioration of loggerhead sea turtle nesting habitat on St. Catherines Island, on the southeastern coast of the USA, and around the World.

Collaborative, interdisciplinary research amongst geologists, archaeologists, and other scientists in “Conservation, Research, and Education” has dramatically enhanced our understanding of processes being driven by rising sea level on the Georgia Coast.

Bishop, Katelyn [273] see Watson, Adam

Bissett, Thaddeus [125] see Anderson, David

Bissett, Thaddeus (Tennessee Valley Authority) and Martin Walker (University of Tennessee, Knoxville)

[275] *Examining the influence of Middle and Late Holocene shorelines and tidal zones on shell ring locations along the lower Southeastern coasts.*

This study examines the interplay of Holocene sea level change and the locations and timing of construction of Archaic coastal shell rings. Based on 161 radiocarbon dates from 32 shell rings located on the lower Atlantic and Gulf coasts, most shell ring construction took place from 5000—2750 cal BP, with the greatest intensity occurring during a roughly 1,000 year window between 3500 and 4500 cal BP. We use a high-resolution reconstruction of past sea levels (Balsillie and Donoghue 2004) and GIS to model shoreline migration and the average area of intertidal zones near locations of radiocarbon-dated shell rings at 250-year intervals from 6000-2500 cal BP. By roughly 5000 cal BP, sea levels had begun to approach modern elevations. However, moderate fluctuations (e.g., over 2 m between 3900 and 3750 cal BP) continued during that period. Combined with the relatively gentle slope of the continental shelf along much of the lower Atlantic and Gulf coasts, these fluctuations could produce shoreline movement by tens of meters in a decade, and in some cases by 2 km or more in a single 250-year interval, while daily tidal ranges could have produced intertidal zones of as much as 2 km wide.

Bisson, Michael (McGill University)

[64] *Technological, Typological and Forensic Analysis of the Small Finds from the Early Middle Paleolithic Beds at Tabun Cave, Israel*

Tabun Cave, Israel, has provided the reference sequence for the Late Lower and Middle Paleolithic in the Levant. Re-excavation by Jelinek (1968-73) recovered a large sample of lithics including over 23,000 small finds. This paper reports the first detailed typological, technological and forensic analysis of the small lithics from beds 60 to 68, the Early Middle Paleolithic (EMP) “D-Type” Levallois Mousterian. These pieces provide clues to lithic reduction sequences, as well as examples of small retouched tools and tool fragments. High and low power microscopy has found evidence of the use of small lithics as expedient cutting tools. The small lithics closely mirror the technological characteristics of the extensively studied larger specimens at Tabun, and it would have been possible to reconstruct the entire sequence of the site based solely on the small finds.

Biwer, Matthew (University of California, Santa Barbara) and Donna Nash (University of North Carolina, Greensboro)

[347] *A Preliminary Comparison of Paleoethnobotanical Remains from Cerro Baul and Cerro Mejia in the Upper Moquegua Valley, Peru*

This paper presents preliminary analysis of macrobotanical remains from the Middle Horizon Wari Imperial sites in the Upper Moquegua Valley, Peru. Plant remains from the sites Cerro Baúl and Cerro Mejía are compared to begin constructing a baseline for Wari residential subsistence at the colony and the greater Empire. Additionally, paleoethnobotanical remains from the sites are compared to further develop archaeological interpretations of Wari social practices surrounding food.

Black, Michael (Phoebe Hearst Museum of Anthropology, UC Berkeley)

[160] *Discussant*

Black, Stephen (Texas State University, San Marcos)

[256] *An Extraordinary Earth Oven Facility at Kelley Cave*

Feature 4 is a complex, well-preserved feature documented in Kelley Cave, a dry rockshelter in Eagle Nest Canyon that was investigated in 2013-2014 by the Ancient Southwest Texas Project of Texas State University. What we first recorded and still habitually refer to as "a feature" is a stratigraphically complex set of deposits and interfaces that formed near the mouth of the rockshelter over time. We think it represents an earth oven facility reused many times to bake agave lechuguilla, wild onion, and other plant resources. The evidence includes layers of discarded uncharred and charred plant fiber (e.g., cut leaf bases and quids), ash, charcoal, and fire-cracked rocks. The stratification is preserved owing to fortuitous circumstance. A very large roof-fall slab purposefully set upright has sheltered and protected deposits from slumping down the talus. Late in the facility's use life, the 3m+ oven pit was filled with a thick layer of plant debris that was soon capped by a 3-5cm mud drape. The interlocked fiber-mud layers proved resistant to burrowing animals and has protected an exceptional archaeological record. This presentation highlights the field investigations, stratigraphy, and ongoing analyses.

[256] *Chair*

Black, Marielle [341] see Morgan, Christopher

Black, Steve [342] see Crater Gershtein, Eli

Blackmore, Chelsea (University of California, Santa Cruz)

[269] *Queer and Complex: Everyday Life and Politics in Mesoamerican Prehistory*

When we speak of complex societies, archaeologists focus primarily on broad systems of power, socio-political access, and economic control. These discussions, both explicit and implicit, continue to be framed by heteronormative, androcentric and classist assumptions. Elites and men (as conceptual and literal heads of households) remain the primary frame of reference for how states operate and who and what matters in our discussions of complexity. In this paper, I explore how notions of complexity have affected discussions around ancient Mesoamerican everyday life and practice. Using queer and feminist theory, I interrogate the ways in which the normalization and standardization of archaeological evidence ignores social variation and the impact that "queered" identities (whether queered/marginalized by the discipline or by social standards in the past) had in shaping civil society. Interpretations of the ancient Maya state, for example, remain intellectually and materially divided for the most part from discussions of lower status peoples and everyday life. Given the extensive conversations and critiques that have attempted to redress this issue both within and outside of anthropology, why does it persist? And in what ways can queer theory help us unsettle these assumptions?

[269] *Chair*

Blackwell, Bonnie A.B. (Williams College & RFK Science Institute), SeiMi Chu (RFK Science Research Institute, Glenwood Landing,), Iffath Chaity (RFK Science Research Institute, Glenwood Landing,), Dušan Mihailovic (Department of Archaeology, Belgrade University, Se) and Mirjana Roksandic (Dept of Anthropology, University of Winnipeg, Cana)

[396] *ESR Dating Ungulate Tooth Enamel at Pešturina, Serbia: The Lumpiness Factor*

Sitting on a major mammalian migration route from Asia into Europe, Pešturina contains at least four archaeological layers, including Aurignacian, Denticulate and Charentian Mousterian. A series of matrix-supported silty conglomerates holds five recognizable archaeologically and geologically distinct layers. All the layers contain éboulis clasts ranging from silt-sized grains to over 1 m³. Skeletal remains, including teeth, from Late Pleistocene herbivores occur associated with Paleolithic

artifacts in all layers. A roof collapse forms the base of the currently excavated test pits. From the Mousterian layers, 39 enamel subsamples from 11 ungulate teeth were independently dated with standard ESR, using a four-component volumetric dose averaging model. Since the teeth contain almost no U, the dates are independent of the U uptake model selected for the age calculation. Although one tooth was reworked into Layer 4, most appear to be in stratigraphic succession and likely date the layers in which they occurred. Since Layer 3, which contains a Denticulate Mousterian assemblage, dates to 39 ± 3 ka and correlates with MIS 3, Layer 4 with Charentian Mousterian dates to MIS 5. Thus, humans using the Mousterian had arrived near the Sićevo Gorge by MIS 5 and persisted there until at least 39 ka.

Blair, Elliot [140] see Blanton, Dennis

Blair, Elliot (UC Berkeley) and Kent Lightfoot (UC Berkeley)

[178] *Pluralistic Communities, Coalescence, and Population Aggregation at Mission Santa Catalina de Guale*

Recent ethnohistorical research on the Spanish mission communities of La Florida has done much to document and elucidate complicated patterns of indigenous population relocations. These migrations, aggregations, and dispersals—due to multiple factors such as epidemics, Spanish reducción policies, and flight from antagonistic native groups—resulted in the formation of complex and diverse colonial social networks. At Mission Santa Catalina de Guale (GA), the most pronounced of these was the 1663-1666 aggregation with Mission San Diego de Satuache. Discussing this event, and drawing on recent geophysical and archaeological evidence, this paper discusses the aggregated, pluralistic community that formed on St. Catherine's Island during the latter portion of the late 17th century.

Blair, Christopher

[213] *A Three Dimensional View of Architecture and Building Material Use at Structure B-4 Cahal Pech, Belize C.A.*

Excavation information at Cahal Pech structure B-4 present some of the most complete data on the Maya formative period in the Western Belize River Valley. Structure B-4 contains fourteen floors which represent increasingly complex and chronological construction events. Excavated floor level information contains architectural and construction material elements which can be stored and analyzed in a Geographic Information Systems (GIS) database. Using available excavation and publication data, this paper will discuss the structure B-4 archaeological sequence and demonstrate the utility of excavation analysis in three dimensional (3D) GIS software. Each excavated floor will be discussed along with the building material, architectural style and temporal importance of each successive construction event.

Blair, Elliot [140] see Dalton-Carriger, Jessica

Blake, Michael [80] see Martindale, Andrew

Blake, Michael (University of British Columbia), Robert Rosenswig (SUNY Albany) and Nicholas Waber (University of British Columbia)

[151] *Izapa's Hinterland: The Use of Lidar Mapping to Examine the Layout and Spatial Orientation of Secondary Centers in the Soconusco region, Chiapas, Mexico*

We analyze the settlement layout patterns and orientations of major buildings at eight Middle and Late Formative period sites that fall within Izapa's hinterland. Our previous examination of Izapa's layout, using high-resolution Lidar maps, confirmed the observations of earlier researchers that the site had a dual orientation: N-S aligned to the volcano Tacaná and E-W to winter solstice sunrise. This dual orientation led to an off-square (97 degrees) layout of the site during the Late Formative period, and perhaps dates even earlier to the Middle Formative. New Lidar mapping of the Izapa's hinterland provide accurate plans of individual mound orientations along with complete layout patterns for eight major sites. These new Lidar maps show that these secondary centers have

layouts that are very similar to Izapa's pattern, but they also reveal significant orientation adjustments to both the volcano Tacaná and to solstice sunrise locations on the distant horizon. These data show the pervasive significance of the duality of sacred mountains and solar movements in the cosmology of the ancient peoples of the Soconusco.

Blancas, Diana Karina [141] see Ulloa-Montemayor, Ximena

Blanton, Richard (Purdue University)

[194] *Frannie Berdan and Economic Anthropology*

We all know of Frannie Berdan's many contributions to historical scholarship, archaeology, art history, and Aztec studies, but my goal in this paper is to assess Frannie's influence on the growth of economic anthropology during a time when the discipline was just beginning to rethink the anti-market theories of Karl Polanyi. The principal institutional context of change was the Society for Economic Anthropology, of which Frannie was a founding member and a founding board member. In the Society's early meetings, her presentations on Aztec economy were well argued and rich in detail, leaving substantivists little option but to modify their positions. While the rethinking of economic theory by anthropologists has had a long and complex history, and still is ongoing, my sense is that, having attended those same critical meetings, Frannie can be considered to have a place in any consideration of the history of ideas.

[26] *Discussant*

Blanton, Dennis (James Madison University) and Elliot Blair (University of California, Berkeley)

[140] *The Complex Story of Complex Beads: Elemental Analysis of Some Early Types from the Southeastern US*

Glass beads are one of the most important artifact types on colonial archaeological sites, providing insights into colonial trade networks and helping address critical chronological issues. In this paper, using a sample of 16th to 17th century beads from Mission Santa Catalina de Guale (GA), the Glass Site (GA), and Jamestown (VA), as well as a comparative sample from Venice, we use LA-ICP-MS and XRF analyses to examine elemental variability within and across these assemblages. Primarily focusing on Nueva Cadiz and seven-layer chevrons, this paper is our first attempt at elementally characterizing some of the earliest glass bead types found in the Southeastern United States. With this data we explore the idiosyncratic provisioning strategies of Spanish entradas, address lingering questions surrounding the origins of some early bead types recovered at Jamestown, and consider the complex patterning of beads circulating through international markets and diverse colonial enterprises—including entradas, missions, and settler societies.

Blanton, Richard E. [237] see Antorcha Pedemonte, Ricardo

Blessing, Sarah [204] see New, Briana

Bletzer, Michael

[81] *A'tzi-em and Po-ya-o-na: Archaeological and Historical Insights into the Native-Spanish Encounter in New Mexico's Piro province, 1581-1681*

This paper presents an outline of the colonial encounter between the A'tzi-em/Piros and Spaniards during the years 1581-1681. Archaeological evidence of Spanish-induced settlement changes comes from two long-term archaeological projects at the sites of the Piro pueblos of Teypana and Pilabó, Socorro County, New Mexico. Analysis of primary documents provides additional information on such issues as native accommodation and resistance, factionalism, and the ultimate disintegration of the last Piro pueblos in the years prior to the Pueblo Revolt of 1680.

Bliege Bird, Rebecca [296] see Zeanah, David

Bligh, Frances [345] see Przelomska, Natalia

Blinman, Jessica [103] see Mitchell, Spencer

Bloch, Lee (University of Virginia)

[374] *Esnesv Stories: Muskogee Oral Traditions, Trader-Diplomats, and Sacred Landscapes*

It has long been obvious to archaeologists that Mississippian and Woodland mound centers in Southeastern and Midwestern United States were parts of large-scale regional exchange networks. However, modeling how goods moved from point A to point B remains more troublesome. Do these goods represent direct or down the line exchange? Do they represent a shared ceremonial complex or loose connections between very different complexes? Oral traditions maintained by a descendant Muskogee (Creek) tribal town provide an explanation. These stories describe the deeds of esnesv, persons of a special social status that combines the roles of trader, traveler, diplomat, and holy worker. Esnesv travelled great distances across the Southeast, often across "enemy" territories, and facilitated exchange relationships. They also carried information about peoples throughout the region and could mediate conflict between groups. Rituals surrounding esnesv suggest that this role was considered sacred. Framed within contemporary Muskogee theories of embodiment, esnesv can be understood to carry animate objects laden with cosmological Power and entangled with human lives, enfolding places and communities into each other as they physically moved fragments of landscapes across the region.

[374] *Chair*

Blom, Ronald [199] see Comer, Douglas

Blomster, Jeffrey (George Washington University)

[410] *Living on the Dead in the Mixteca Alta, Oaxaca*

In exploring the bioarchaeology of ancient Oaxaca, an important component is the social context of human burials. This paper explores the placement of four burials, containing seven individuals, associated with the same Yucuita phase (500-300 B.C.E.) household at Etlatongo, Oaxaca. This household appears to have been located in the same space for several generations, shifting slightly both horizontally and vertically through time. These burials are associated with the first occupation of this household, and they represent a variety of burial positions, including extended and seated, as well as placements, from features dug below the house to those placed directly on the house floor. Exploring the placements of these burials, it is possible to reconstruct the sequence in which they were interred. I argue that the parallel burials placed on the house floor belonged to the founders of this household. Upon their death and interment, the house was terminated and occupation shifted. Prior to this space being filled in, however, a shaft was built that provided access, both physical and spiritual, to one of the burials. Successive generations lived on their ancestors, who played an important foundational role in establishing this household.

[216] *Discussant*

Blong, John (Texas A&M University)

[171] *Prehistoric Foragers in the Central Alaska Range*

Upland landscapes in the central Alaska Range play an important role in understanding prehistoric hunter-gatherer settlement organization, subsistence activities, and lithic assemblage variability in interior Alaska. Previous research hypothesizes that late Pleistocene and early Holocene seasonal upland hunting conditioned lithic assemblages in the interior, and that seasonally available upland resources grew in importance through the middle and late Holocene, as interior foragers shifted to a logistically organized settlement system. To further evaluate these hypotheses, we conducted fieldwork in the upland upper Susitna River basin, central Alaska Range, to add to our knowledge of prehistoric forager activity in the understudied uplands of interior Alaska. This study utilizes paleoecological and geoarchaeological data from the Susitna study area to provide the ecological

context for prehistoric upland landscape use. This study also incorporates site structure, faunal and lithic assemblage data from the study area to evaluate settlement organization and lithic assemblage variability in interior Alaska. This paper presents the results of these analyses, focusing on understanding how foragers utilized upland landscapes from earliest colonization through the late Holocene, and the influence that ecological change and volcanism had on landscape use in the uplands of the central Alaska Range.

Blount, Clinton [310] see Garlinghouse, Thomas

Bluma, Jacquelyn

[265] *A Closer Look at Immigrant Life Expectancies from German Cemeteries in Southeastern Wisconsin*

This study describes statistics of life expectancies among the immigrant population and its sub-sets throughout the mid-nineteenth to early twentieth centuries in southeastern Wisconsin. At this time, German populations were becoming established as a major cultural and ethnic force in Milwaukee and the surrounding counties. Data from individuals disinterred from two unmarked cemeteries in Ozaukee county were analyzed to assess cultural and physical disparities in the mortuary record among these immigrant populations. This analysis is supplemented with other data local to the region.

Boanasera , Tammy [342] see Crater Gershtein, Eli

Boaretto, Elisabetta [64] see Alex, Bridget

Bochniak, Victoria (University of Idaho)

[374] *Oral History and Archaeology: A Case from Crow Country*

Arrow Rock, located in the Pryor Mountains of southern Montana, is a place for travelers to offer gifts in return for their safe passage through the Pryor Gap. These gifts are mostly left by members of the Crow community and meant for the Awa-Kulay, or Little People, living in the mountains. The Little People are described as dwarves that are both human and supernatural beings that can act as spiritual guides for the Crow Tribe. Throughout Crow history stories are told of the Little People being seen across Crow Country, visiting individuals during vision quests, and at larger social events. Arrow Rock is an important location for the relationship between the Crow and the Little People because it is said to be where they met for the first time. Arrow Rock is also unique for archaeologists due to two archaeological collections of gifts left for the Little People. The first was excavated in 1939 by Oscar T. Lewis and the second by Nels Nelson in 1946. This paper presents the initial findings of a reanalysis of those collections in conjunction with Crow Oral Histories.

Bocinsky, R. Kyle [84] see Crabtree, Stefani

Bocinsky, R. Kyle (Washington State University), Keith W. Kintigh (Arizona State University), Timothy A. Kohler (Washington State University) and Margaret C. Nelson (Arizona State University)

[167] *Toward Effective Cyber-Infrastructure Support of Socio-Environmental Research*

Understanding coupled human and natural systems is a major research focus for the social and natural sciences. Scholars interested in historic environmental conditions (including those of deep prehistory) cannot simply extrapolate the past from the present. Instead, they need environmental knowledge specific to their spatial-temporal problem contexts. However, in accounting for environmental change they are likely to find that state-of-the-art data on past environments are difficult to discover and even more difficult to integrate, process, and interpret. Here we introduce our ongoing effort to design and prototype SKOPE—Synthesized Knowledge Of Past Environments—a cybertool that, for a given location and temporal interval, integrates contemporary, historical, and paleoenvironmental data from federated data sources on the Web and returns a synthesis of key

environmental parameters relevant to humans. The proffered environmental data are documented with record of their provenance and, to the extent possible, assessments of their accuracy and spatial and temporal resolution. While the tool is designed to be extensible, our initial efforts address the US Southwest over the last two millennia.

[330] *Moderator*

Bode, Leslie (University of Nottingham)

[154] *Discussant*

[154] *Chair*

Boen, Renee (Bureau of Reclamation), Jessica Bush (Kadmas, Lee & Jackson, Inc.) and Heidi Sieverding (Kiksapa Consulting, LLC)

[230] *Sourcing Quartzite Projectile Points from 39FA65, The Ray Long Site, Fall River County, South Dakota*

The purpose of this research was to determine if the tool stone used for two quartzite Angostura projectile points from the Ray Long site (39FA65), Fall River County, South Dakota, could be linked to a specific quarry or geologic formation. The Ray Long site is the type-site for the Paleoindian period Angostura complex which has a regional distribution of Utah, Colorado, southeastern Idaho, Wyoming, southwestern South Dakota, and western Nebraska. The seven quarries selected for the study are located in the Black Hills Uplift in South Dakota and the Hartville Uplift in Wyoming. The study applied macroscopic and microscopic examination to lithologically describe and XRF testing to define initial XRF signatures for the quarries and the two projectile points. Results suggest that the tool stone material used to produce the projectile points likely originated in the Spanish Diggings quarry complex in the Cloverly Formation of the Hartville Uplift.

Boger, Rebecca (Brooklyn College, CUNY)

[290] *Building Resilience and Sustainability through Collaboration and Community Research*

The island of Barbuda, West Indies has a relatively unique history, land tenure and geography. Despite its arid climate and thin soils, the enslaved and eventually free people of Barbuda developed a complex herding ecology and built historic wells that are strategically located around the island to support their sustainably resilient agricultural practices. Now, these wells are largely abandoned and people are increasingly dependent on external food and water. An interdisciplinary team of archaeologists, anthropologists, and geoscientists are working closely with US undergraduate and graduate students, along with Barbudan experts and high school students to document these historic wells and assess the state of food and water resources on the island. Our research approach integrates traditional ecological knowledge (TEK) with western science to take a long-term perspective and assessment of the present situation. The methods used for data collection are varied and include kite and unmanned flight air photography, GPS mapping, water and soil testing, surveys and focus group discussions. Together, this collaboration is building a robust dataset while enhancing the capacity of people to address the challenges being brought about by climate change.

Bogle, Johnny (GSU)

[246] *Seeking Isla Palenques's Deeper Meaning*

Although Isla Palenque is an important Panamanian archaeological site that has been investigated several times from the 1960s through the 80s, there remain important questions associated with the human occupation of the settlement. Current changes in Panama's tourism growth make this emergent study important, because while this site has remained relatively "unchanged" for decades, current construction projects are beginning to limit study of the island that has been notoriously difficult to investigate due to ecological, political, and historical factors. Original studies established culture chronologies and regional comparisons related to "adaptive radiations" of early settlers, but the broad focus and older methodology invite an update to help advance theory aided with newer technological methods. Initial interpretations labeling the island an important "ceremonial center" highlight its significance, but shed little light on deeper explanations of the function of the island over

time, or reasons for its initial occupation. My current investigation looks to expand outside the original centralized excavations by broadening the study area to a community settlement survey of the entire island. Current data that elucidates the social organization of the island enabling a deeper understanding of relations associated with trade and exchange in southern Central America will be presented.

Bohorquez Gerardy, Stefan (Cerro Hojas-Jaboncillo Project)

[367] *Las Voces del Barro y el Paisaje Manteño en Hojas-Jaboncillo, Manabí Central (Ecuador)*

El gobierno ecuatoriano ha apoyado desde el 2009 al proyecto arqueológico “Cerro Hojas-Jaboncillo” y al estudio de la sociedad Manteña, en la provincia de Manabí (Ecuador). Actualmente la investigación está dirigida a los procesos constructivos de las estructuras y las modificaciones del paisaje, innovaciones en tecnología, estilos e iconografía cerámica, y en la dispersión y conectividad de los asentamientos manteños. El paisaje cultural manteño no solamente pudo ser apreciado en las áreas en las que este grupo social imprimió su huella con su forma particular de transformación y construcción de estructuras, sino también en su iconografía cerámica, donde la reunión de elementos del diseño decorativo nos tiene preparado un discurso acerca de su propia concepción de su ocupación y control. El barro de las paredes de las estructuras también expresa su existencia. En un medio adverso para la conservación, este barro cuidadosamente preparado sigue allí y se lo puede observar con un ojo entrenado incrustado en el paisaje manteño de Cerro de Hojas-Jaboncillo.

Boileau, Arianne [166] see Walker, Karen

Boivin, Nicole [105] see Faulkner, Patrick

Bolé, Jacques [77] see Sand, Christophe

Bolhar, Robert [77] see Weisler, Marshall

Bollwerk, Elizabeth (The Thomas Jefferson Foundation - Monticello), Eve Hargrave (Illinois St. Arch Survey/Prairie Research Institut), Elizabeth Konwest (Indiana University) and Rebecca Simon (Crow Canyon Archaeological Center)

[235] *In Progress: Updating and Redesigning the SAA's Archaeology for the Public Webpages*

There is no doubt that public archaeology is delving into the digital realm. While the web provides a number of new and exciting avenues for the public to interact with archaeology, its complexity also introduces new challenges for individuals and organizations who want to use websites as an engagement tool. This paper discusses recent efforts to redesign a major online resource for public archaeology: the SAA's Archaeology For the Public website. The authors first provide a brief history of the development of the site, which was designed to serve as a “web-based interface between the field of archaeology and its many diverse publics”. They briefly discuss what the site has accomplished and the challenges it has faced. In particular, they highlight the difficulties inherent in creating and maintaining a dynamic web-based resource that is meant to serve multiple audiences. The authors then discuss the overall philosophy that has guided efforts to gather audience feedback and evaluate the website for a redesign. Finally, the paper concludes by considering on a broader level how organizations like SAA can create meaningful digital resources that effectively serve multiple audiences who are interested in archaeology.

Bolunia, Mary Jane Louise (National Museum of the Philippines), Rey Santiago (Retired archaeologist) and Alfredo Orogo (National Museum of the Philippines)

[238] *Early Maritime Involvement of Butuan with Other Southeast Asian Polities and China*

The significance and importance of Butuan as a trading center as early as the 10th century C.E. can be based on the thousands of artifacts excavated from 1976 to 2014 ranging from Chinese ceramics belonging mostly to the Song Period (ca. 10th-13th centuries), Southeast Asian and locally produced

earthenware pots and stoves. Another very important artifact encountered were plank-built edge-pegged boats that measures approximately 15 meters long and 3 meters wide. In 2012, a larger boat was excavated projected to reach 25-30 meters long. Questions regarding Butuan's position as a trading center can be answered further by the results of the geomorphological studies conducted in 1986 and 2001. Major geologic events drastically changed Butuan's landscape as a group of islands prior to the 15th century and to its present form as part of Mindanao Island today. To further determine the use and capability of the boats in the open seas, replicas were built and actual sailing were undertaken in the South China Sea reaching the waters of South Vietnam and returning to the Philippines.

Bon, François [35] see Jarry, Marc

Bon, François (Université de Toulouse II - Jean Jaurès/UMR 5608 TRACES), Romain Mensan (UMR 5608 TRACES), Lars Anderson (Université de Toulouse II - Jean Jaurès/UMR 5608 T), Mathieu Lejay (Université de Toulouse II - Jean Jaurès/UMR 5608 T) and Hélène Salomon (Université de Liège)

[181] *The Aurignacian Open-Air Campsite of Régismont-le-Haut (Hérault, France)*

Régismont-le-Haut (Hérault, France) counts among the rare open-air Aurignacian campsites in southwestern France having both spatially conserved activity areas and explicit traces of a constructed living space. This minimally disturbed single habitation occupies two perpendicular paleochannels, whose geometry separates the site into two main zones.

Throughout its excavation numerous combustion structures (27), all being surrounded by differentially diffuse archaeological material, have been discovered within the two paleochannels. The density and nature of archaeological materials, the character and location of the hearths, and their association with features indicating a possibly structured living space (in particular possible post-holes and associated wedging stones), have allowed us to characterize the two zones. The first contains several polyvalent units, which we interpret as a domestic zone. The second contains several structures having seemingly specialized purposes, including a probable bison primary butchery area and several ochre processing and use areas, which we thusly interpret as a multi-function workshop zone. The fact that all of the material is encased in a single occupation surface, along with the seeming coherence and complementarity between the various structures and zones, pleads in favor of a single episode of occupation, likely in the form of a relatively large seasonal residential campsite.

Bonacchi, Chiara (UCL Institute of Archaeology), Andrew Bevan (UCL Institute of Archaeology), Daniel Pett (British Museum) and Adi Keinan-Schoonbaert (UCL Institute of Archaeology)

[235] *MicroPasts and Research-Led Public Archaeology*

A core aim of public archaeology is to study and strengthen the public value of archaeological research. In pursuing this goal, the MicroPasts project sees archaeological research, public engagement with archaeology and the study of the cultural, social and economic implications of citizen participation as overlapping and mutually reinforcing areas, that can generate high quality new resources (data, enhanced interpretations, skills, funding, etc.) and processes (e.g. methodological innovations, learning, etc.). Digital technologies can act to super-charge these opportunities for effective community and crowd-fueled research. MicroPasts supports both online and offline collaborations between academics and other members of the public in order to: produce open research data together via crowd-sourcing; discuss how this data can be used for future research projects; and crowd-fund community archaeology agendas. This paper will introduce the MicroPasts project and consider the strengths and weaknesses of the public archaeology model behind it. Thereafter, it will discuss the value of digital participation in the project for both academics and communities. It will present: (a) the results of the analysis of socio-demographic, attitudinal and behavioral data relating to volunteer participation; and (b) a summary of the archaeological analysis allowed by the open data created via crowd-sourcing.

Bond, Stanley

[83] *Discussant*

Bond, Julie [351] see Maher, Ruth

Bondura, Valerie (Columbia University), Alfonso Fanjul Peraza (Universidad Autónoma de Madrid) and Vanesa Trevin Pita (Universidad A Coruña)

[394] *Resistance, Refuge, and Retaliation: The Use of Caves during the Spanish Civil War in Asturias*

During the 2014 field season of the Archaeology of Violence in Asturias Project, a survey of caves in the Spanish province of Asturias was undertaken with the aim to document the usage of these subterranean shelters during the Spanish Civil War (1936-39) and their continued importance as vital landscape features in the guerrilla resistance movement (1939-65). These caves-- as well as other features such as roads, valleys, industrial buildings, and villages-- have long been ignored in anthropological and archaeological projects in Spain in favor of military archaeology-based approaches that focus on more formalized, "official" war sites: trenches, battlefields, and military prisons. This paper argues for a more macroscopic view of the Civil War, moving beyond site-based analysis to inter-site landscape interpretation. The diversity of use-types discovered through the survey of the caves as well as the caves' articulation with other kinds of features demonstrates the materially totalizing nature of the conflict, forcing a broader archaeological interpretation of the Spanish Civil War that moves beyond isolated sites towards more complex understandings of a dynamic network of violence, power, and politics that shaped and was shaped by the particular landscape of Asturias.

Bongers, Jacob [169] see Jackson, Brittany

Bongers, Jacob (UCLA Cotsen Institute of Archaeology), Brittany Jackson (UCLA Department of Anthropology), Terrah Jones (UCLA Cotsen Institute of Archaeology), Susanna Seidensticker (UCLA Department of Anthropology) and Charles Stanish (UCLA)

[169] *The Treatment of the Dead in the Mid-Chincha Valley, Peru*

This paper investigates post-mortem human body manipulation associated with above-ground and semi-subterranean tombs known as chullpas, which date from the Late Intermediate Period (A.D. 1000-1476) to the Late Horizon (A.D. 1400-1532) in the mid-Chincha Valley, Peru. Mortuary rituals are cross-cultural social processes that comprise a range of practices. One such practice is the treatment of deceased bodies which varies across time, space, and social organization. A 2013 survey of the mid-Chincha Valley discovered a large number of chullpas that exhibit evidence of post-mortem human body manipulation including bones with red pigment, reed posts put through vertebrae, and worked bones. The intensive analysis of human remains and grave goods recovered from a single chullpa in 2014 found the above evidence in addition to cut marks on different human bones and numerous textile bundles containing human remains. Associated ceramic and textile data suggest members of the Chincha Kingdom (ca. A.D. 1100-1450) engaged in these practices. Here, we present these data and characterize the post-mortem human body manipulation performed in the mid-Chincha Valley. We argue that this funerary practice played a significant role in group identity building and the construction of space and place in this coastal valley.

Bongiovanni, Rosanne [206] see Green, Kirsten

Bonhomme, Vincent [412] see Horneman, Rennie

Bonsall, Clive (University of Edinburgh), Catriona Pickard (University of Edinburgh) and Peter Groom (University of Edinburgh)

[40] *Intensification of Aquatic Resource Exploitation at the Terminal Pleistocene/Early Holocene Boundary?*

Intensive and specialized exploitation of marine resources has traditionally been attributed to the Early Holocene in Europe, from c. 11,500 cal BP (e.g. Clark 1965, 1975; von Brandt 1984) as a response to changing climate, reduction in large mammal biomass, and consequent broadening of the resource base. However, the technical sophistication of fishing gear recovered from Early Holocene archaeological contexts is suggestive of a long history of development. This paper presents a synthesis of the evidence for marine exploitation in the Upper Palaeolithic of Europe. Widespread and diverse evidence for fishing in the Upper Palaeolithic suggests there was little change in the fishing activities practiced on either side of the Terminal Pleistocene/Early Holocene Boundary.

[74] Chair

Bonsall, Clive [74] see Gurova, Maria

Boomer, Ian [25] see Whitbread, Ian

Boone, James (University of New Mexico)

[228] *Signaling Entitlement: the Behavioral Ecology of Conspicuous Consumption*

Everyone agrees that conspicuous consumption is some kind of social display, but what kind of display is it? I argue that conspicuous consumption is (or is like) a territorial display in social space, wherein social space is defined as a kind of virtual territory in which resources produced by collective action with a social group are allocated and defended. There is general agreement that conspicuous consumption involves the expenditure of surplus production, but there is continuing debate over the precise functional context of surplus production: is it optional (as in a community ritual fund) or is it a critical part of a long term survival strategy? This presentation will attempt to clarify two critical issues associated with conspicuous consumption: 1) the role of surplus and its disposition in middle-range communities and 2) the role of prestige (rather than dominance) hierarchies in the allocation of resources produced collaboratively by such communities.

Boone, Cristie (Ichthyofaunal Analysis)

[406] *Big Reasons to Eat Small Fishes: Nutritional Composition and Subsistence Decisions along California's Central Coast*

While behavioral ecology approaches to human subsistence in archaeology often focus on calories, nutritional content is another aspect that can influence a resource's desirability. In particular, fats are an important dietary source of easily digestible calories for hunter-gatherers. Proximate composition (fat, protein, moisture, and ash) is presented here for several fish species commonly found in archaeological sites along the central California coast, and combined with data drawn from the literature for some species that are also commercially important today. Results portray a wide range of fat content among fishes, indicating that in fat-limited environments, Clupeiformes (sardine, herring, and anchovy) might be more highly valued. Proportions of these small schooling species in Monterey Bay Area archaeological assemblages are discussed in relation to culture history, subsistence, and paleoclimate.

Booton, Ross [53] see Goldfield, Anna

Borck, Lewis (University of Arizona / Archaeology Southwest)

[400] *Hidden Revolutions: Re-examining Transitions in the American Southwest from an Anarchist and Network Perspective*

Globally, archaeologists often talk about cultural change as a dynamic, directional process that leads toward either failure (collapse, reorganization, abandonment, and "stability") or state level societies. This evokes a unilinear evolutionary framework that most admit is flawed. But what if state level societies were not the "pinnacle" of human civilization? What if states represent societal failure instead? From this position, often glossed over historic periods may stand out as lynchpins vibrating dangerously on the rickety cart of human history. This paper, using both social network and anarchist

theory, will re-examine one of these potential lynchpins: the widespread transition from dispersed pithouse communities into aggregated aboveground settlements that occurred throughout the American Southwest. I will argue that this was not merely a transition, but a Pithouse to Pueblo Revolution. This reevaluation can lead to many insights as to the “failure” of Southwestern indigenous groups to create state level societies and instead highlights their successes in maintaining incredibly complex egalitarian forms of social organization. This paper will finish by using macroregional data to examine how the above examination helps explain why local groups resisted the spread of a religious ideology (Salado) introduced by northern migrants into the southern Southwest.

[400] *Chair*

Boremanse, Didier

[242] *Religious Rites of the Lacandon*

According to Lacandon worldview till the last century, the ruined buildings of Classic Maya culture, and the funerary caves found near small archaeological sites on the shores of lakes in the forest, were respectively the “houses” of celestial and terrestrial deities (who once lived on earth). From these shrines the ancestors of the Lacandon collected stone relics which they deposited at the bottom of their incense burners. A Lacandon censer is a clay pot with an anthropomorphic head modeled on its rim, to which offerings of food and drink were made. Each censer represented a specific deity, with whom the celebrant could communicate because the sacredness and healing power of the censer derived from the relics it contained. Some gods were irascible and vengeful. For the slightest offense they sent an illness or another misfortune to the wrongdoer, or to a member of his family. Through divination a man could learn which gods were upset, what fault had been committed, which deities consented to mediate and what payments they requested. In subsequent rituals the celebrant entreated the mediators to help curing the ailing person, and to bring his/her share of offerings to the angry gods in order to appease them.

Borenstein, Gabrielle [212] see Gill, Lucy

Borenstein, Gabrielle (Columbia University)

[401] *Emergent Spirituality: The Anthropomorphic and Zoomorphic Ossuaries of Peqi'in (Upper Galilee, Israel)*

The creative and diverse mortuary practices of the Chalcolithic period in the Southern Levant demonstrated a profound departure from the single-person, intramural interments of the earlier Neolithic periods. During the Chalcolithic, formalized structures and subterranean chambers were constructed for corpse depositions that were more complex in nature. Of particular interest, many of these structures exhibit innovative tendencies that allude to portraiture. Iconographic motifs are not exclusive to the Chalcolithic period, but the artifacts from the site Peqi'in mark a significant shift from the preceding Neolithic. Accordingly, this paper examines these anthropomorphic and zoomorphic ossuaries as a lens to symbolic expression – figurative representations – in mortuary contexts. Specifically, I consider the associated meaning of exaggerated facial features – the uniquely modeled eyes, ears, mouths, and snouts – as well as the accompanying head accouterments as a means to interpret what appears to be an increased concern for realism. Using new criteria for classification and comparative examples from contemporaneous sites such as Shiqumim, Giv'atayim, and Azor, it endeavors to deconstruct this assemblage in the broader context of secondary cave burials and examine what these mortuary changes represent in terms of death and belief on a site-specific and regional level.

Borie, Cesar [2] see Salazar, Diego

Borrero, Mario (University of California, San Diego)

[27] *Forgotten Finds: Updating Existing Collections for Modern Research*

The existing collections of our nation's institutions hold great potential for future research and should

be subject to modern scientific inquiry. If these collections are not catalogued or sorted properly, they can lie forgotten and virtually inaccessible to scholarly research. The example presented here is of a legacy collection, comprised of artifacts from the Tulare Lake area in Kings County, California. This selection is primarily of lithic tools, which represent ancient California life-ways, with rough dates from 9000 B.C.E. to 1000 C.E. The majority of this collection was "gifted" to the museum, as such the material itself had lost most of its provenance by the time it entered museum collections. This did not diminish the quality of the collection as the stone-tools represent a wide variety of both material and morphological types. Beyond its academic potential this assemblage also maintains cultural significance for the Yokut community. The priority was to offer the most complete classification of the material possible and to generate a rich understanding of the overall collection. These efforts have already produced novel results and stand to highlight the potential benefit for updating existing collections for their use in modern study.

Borrero, Luis (CONICET), Fabiana María Martín (CEHA, Instituto de la Patagonia, Universidad de Ma) and Francisco J. Prevosti (División Mastozoología, Museo Argentino de Ciencia)

[87] *The Fossil Signature of Late Pleistocene Patagonian Carnivores*

A regional study of Late Pleistocene bone assemblages is used for the study of Patagonian extinct carnivore niches. The excavation of dens, distributional patterns, habitat and prey selection and the study of living analogs are some of the main research lines. This study offers information about the conditions of the environment immediately before the arrival of humans, and indicates the conditions under which Patagonian archaeological bone assemblages are destroyed or contaminated with bones derived from the activities of carnivores.

Bortolini, Eugenio [191] see Lake, Mark

Bos, Kristen [384] see Buikstra, Jane

Bosch, Stephanie (Miami University) and P. Nick Kardulias (College of Wooster)

[92] *Lithic Raw Material Procurement at the Multicomponent Prehistoric Wansack Site (36ME61), Mercer County, Pennsylvania: Evidence for Mobility and Trade Patterns through XRF Data*

The Wansack Site (36ME61) is a multicomponent, prehistoric site located in western Pennsylvania (Mercer County). Four seasons of excavation (1974-1977) yielded ample evidence of occupation spanning the Archaic, Woodland, and Late Prehistoric. The present study analyzes the patterns of raw material procurement, seen through the lithic artifacts collected from the site. The primary method utilized to do this is X-ray fluorescence spectrometry. Samples of chert from Flint Ridge, Upper Mercer, and Sky Hill outcrops provide a baseline for source types that occupants of the Wansack Site may have used. The elemental composition of source specimens is compared to that of 198 artifacts recovered from the Wansack Site to determine the point of origin of the latter. Flakes from all stratigraphic levels of occupation are tested, as well as across the site from each period. This study focuses on what the patterns of raw material procurement at the Wansack Site show about the changing dynamics of mobility and trading relationships from the Archaic through the Late Prehistoric periods in the upper Ohio River drainage. The data show a trend of residential mobility gradually being replaced by logistic mobility, as well as small-scale, local trading relationships increasing in importance and complexity.

Bostwick, Todd [209] see Lack, Andrew

Bostwick, Todd (PaleoWest Archaeology) and Steven James (California State University at Fullerton)

[282] *Desert Digs: New Deal Archaeology in Southern Arizona, 1934-1941*

The Sonoran Desert of Southern Arizona is well known for its wealth of archaeological sites left behind by PaleoIndian, Archaic, and Formative period cultures. During the Great Depression, archaeological surveys and excavation projects provided employment opportunities for hundreds of young men and women seeking jobs. Bryon Cummings and Emil Haury at the University of Arizona

in Tucson and Odd Halseth at Pueblo Grande Museum in Phoenix took advantage of a variety of New Deal work programs to undertake these archaeological investigations at a scale previously unheard of. This presentation summarizes these important projects and discusses how their results significantly advanced our knowledge of the prehistoric cultures of Southern Arizona through published and unpublished reports, master's theses, and museum exhibits. This New Deal archaeology was undertaken between 1934 and 1941 through the Public Works Administration (PWA), Civilian Conservation Corps (CCC), and Works Project Administration (WPA) at Ventana Cave, Pueblo Grande, Besh-Ba-Gowah, University Indian Ruin, Valshni Village, Jackrabbit Ruin, and other sites.

Boswell, Alicia (UCSD)

[404] *Reassessing the Late Andean Period in the Moche Valley: the View from Cerro Huancha*
In this paper I review the history of thinking about the Late Andean Period in the Moche Valley and present recent research from the site of Cerro Huancha, a large center located in a tributary of the Moche River in the chaupiyunga ecological niche. Encompassing the duration of the Inca and Chimú Empires, A.D. 1000 – 1532, the Late Andean Period was a time of change in political power and Cerro Huancha provides insight to how these two empires administered and interacted with populations in the Moche Valley.

[404] *Chair*

Bouchard-Perron, Julie-Anne (University of Nottingham)

[154] *Colonialism, Nationalism and the Appropriation of new landscapes: Consuming Old and New Worlds in Historical Quebec City (Canada)*

Since the Age of Discovery, Quebec City and its broader area have seen their lot of colonists and travellers, some of whom chose to establish themselves in the region. Their relationship with this initially new, landscape was transformed through time, following wider political events and social convictions. The nature of the settlers' attitudes and perceptions to the territory impacted their foodways by calling upon particular social networks. In doing so they reflected colonialist and nationalist discourses, reproducing their inherent inequalities and their particular grip over territory. This paper is based on a reconstruction of Quebec City region's foodways, from its exploration (1541) to its intensive industrialization (1900s), through the analysis of plant remains from five archaeological sites and critical revisiting of historical documentation. Within this framework, plant ecological preferences are used as a proxy of their geographical provenance; their consumption is seen as a form of territorial political and social incorporation, which can be diachronically and synchronically tracked.

[154] *Chair*

Boudreaux, Sarah Nicole (University of Texas at San Antonio)

[375] *Distribution Patterns and Production Technology of Ancient Maya Ceramics in the Three Rivers Region*

Since 2009, investigative research for the Dos Hombres to Gran Cacao (DH2GC) project has focused on an unsurveyed area in the immediate northeastern periphery of Dos Hombres and has expanded to include an area located two kilometers southeast from the La Milpa site core. The incorporation of a broad multiregional comparative dataset will facilitate a greater understanding of the sociopolitical dynamicity on multiple social and economic levels within the Three Rivers Region in Northwestern Belize. This paper will specifically focus ceramic data that has come from the DH2GC project, La Milpa periphery, and other areas of the Programme for Belize property. Topics such as ceramic distribution patterns and part-time ceramic provisioning within a larger regional context will be discussed. Also, an observed (probable) intermittent ceramic production area found in the outskirts of the La Milpa site-core will be presented.

Boulanger, Matthew (University of Missouri) and Michael Glascock (University of Missouri)

[123] *The Afterlife of Archaeometry: The Lawrence Berkeley National Laboratory Database Project*

What happens to artifact-sourcing data after a laboratory closes? We provide an update on the ongoing effort to preserve archaeometric data produced between 1968 and 1990 at the Lawrence Berkeley National Laboratory. Over the past decade, we have located and digitized chemical and contextual data for over 10,000 archaeological specimens analyzed by the laboratory. Our efforts are now turning toward analysis and application of these data, many of which have never been published let alone studied. Aside from representing one of the single largest databases of neutron activation data for archaeological research, the Berkeley database project demonstrates the fundamental need for explicit data-storage protocols, data-management plans, and an infrastructure for the long-term preservation and sharing of archaeometric data. Determining how best to preserve and retain the utility of these data is increasingly pertinent given the widespread and decentralized nature of archaeometry in the twenty-first century.

Boulanger, Matthew T. [230] see Goodwin, Whitney

Bourgeon, Lauriane [112] see Hutchinson, Vance

Bourgeon, Lauriane (Université de Montréal)

[357] *Humans and Carnivores at the Bluefish Cave II (Northern Yukon): Interpretation of the Faunal Remains*

While research is still ongoing, the earliest date for the first modern humans in America is well accepted at 14,000 cal BP. Some archaeological sites propose a date prior to the end of the Last Glacial Maximum, however. This is the case of the Bluefish Caves which proposes a human presence in northern Yukon as early as 25,000 uncal BP. Here, approximately 18,000 bone specimens recovered from Cave II have been determined and examined under stereomicroscope. This zooarchaeological and taphonomic study reveals significant additional details about the broad faunal spectrum in the cave, the main agents responsible for the accumulation and modification of the bone assemblage, as well as the cultural activities performed at the site. The ungulate fauna is dominated by horse, bison, caribou and Dall sheep, mixed with some carnivores such as lion, wolf and smaller canids. The highly fragmented material is consistent with patterns of breakage and marrow extraction processed by humans. However, carnivore action is significant and indicates that carnivores played a major role in the modification of the assemblage. Overall, only a few traces can be attributed to human activities. The time, duration and ultimate role of human activity at the site is evaluated here.

Boutin, Alexis (Sonoma State University)

[299] *Narrativizing a Bioarchaeology of Care: A Case Study from Ancient Dilmun*

Since 2008, the Dilmun Bioarchaeology Project has been studying and publishing the materials from Peter B. Cornwall's 1940-41 expedition to Bahrain and eastern Saudi Arabia, which now reside in the Hearst Museum of Anthropology at UC Berkeley. By analyzing these skeletal and artifactual remains, our multi-disciplinary team is adding to anthropologists' understanding of how life was experienced and death commemorated in Dilmun. One of the most exceptional skeletons belongs to a young woman who lived and died during the Early Dilmun period (ca. 2050-1800 B.C.E). Humerus varus deformity, femoral anteversion, and unusually short stature would have differentiated her visibly from the surrounding population and somewhat modified her mobility. Yet she was buried with more elaborate grave goods than her contemporaries, raising the possibility that her loss was especially profound. With guidance from the Index of Care, I will present a fictive osteobiographical narrative that explores the care that this young woman may have required at certain stages of her life course. This type of writing prompts a critical examination of the ways that bioarchaeologists interpret and disseminate their findings. It also provides a more humanizing view of past personhoods that communicates effectively and accessibly with broad public audiences.

Bouwman, Abigail (University of Zurich), Giada Ferrari (University of Zurich) and Frank Rühli (University of Zurich)

[264] *How to Use DNA Analysis to Assess Health in the Past. Applications for New World Soft-*

Tissues

Human remains can offer many insights into our past culture, especially about our attitudes to death. However, how we lived is a much larger question. Whilst paleopathology can give us some understanding of the diseases that affected our ancestors, DNA evidence can give us so much more. Mummification, either artificial or natural, of human remains is highly variable, for example frozen ice-mummies such as the Tyrolean Iceman have a very different thermal history to heat desiccated mummies such as found in pre-dynastic Egypt. This can affect DNA preservation and amplification. In the same way, soft tissues from the Arctic and southern Peru can not be considered as similar test samples in terms of treatment. However, non-skeletal material is a valuable resource as many pathogens are concentrated in organs rather than in bone, and thus, if DNA preservation and extraction issues and amplification inhibition can be overcome, we can expand an exciting field of archaeological research. Here we shall present what needs to be undertaken to ensure that any DNA preserved in tissues can be studied, and what these studies can reveal about our past health.

Bovy, Kristine [168] see Butler, Virginia

Bovy, Kristine (University of Rhode Island) and Michael Etnier (Western Washington University)

[168] *Taphonomic and Taxonomic Comparisons of Bird and Mammal Remains from Tse-whit-zen*
Birds are often relatively scarce in Northwest Coast shell middens in comparison to fish, mammal and shellfish. However, large numbers of bird bones have been recovered from Tse-whit-zen. In fact, bird bones are both more numerous and more identifiable than mammal bones at the site. In the largest house structure, 47% of the bird bones greater than 1/4" in size were identified to taxon (79% of those were identified to element). In contrast, the mammal identifiability rate ranged from 7% to 16%. The differences are driven primarily by fragmentation rates, with mammal bones experiencing a high level of pre-depositional crushing, presumably for grease extraction. Despite the major differences in fragmentation, the percent of burned bones is broadly similar between birds and mammals (32-33%). The interpretation of the burning patterns, however, is different for birds versus mammals. Mammal bones appear to have been burned as part of the grease extraction process, whereas the bird bones often reflect the effects of roasting whole birds over open flames. Murre, duck and deer dominate the Structure 1 assemblages during both chronozones 3 (1450-1000 BP) and 4 (700-350 BP), with an apparent pulse in Pinniped and pelagic bird taxa around 700 BP.

Boyd, Joshua [122] see Pelton, Spencer

Boyd, Charles (Radford University), Terry Melton (Mitotyping Technologies, a division of AlBioTech) and Donna Boyd (Radford University Department of Anthropological S)

[202] *Bioarchaeological Evidence for Matrilineal Descent in a 13th Century Native American Village*

The 13th Century Late Woodland Shannon site (44MY8), located near Blacksburg in Montgomery County, Virginia, was excavated in the 1960s. Excavations identified palisade lines, several circular structures, refuse-filled pits, and over 130 burials. Most burials were single, primary interments located around structures or between structures and palisade lines. Researchers have assumed that individuals buried close to one another around structures were genetically related, or at least shared clan affiliations. Recent mitochondrial DNA analysis of 11 adults from the site (7 males and 4 females) illustrates burial practices generally reflective of a matrilineal descent system. Two sets of male and female maternally-related individuals were buried in close proximity with similarities in grave goods. This possibly reflects the avuncular support relationship between a woman, her children, and her brother. In contrast, three other maternally-related adult males are buried in clusters of burials separate from one another. This may reflect matrilineal postmarital residence. However, rigid spatial segregation of interred individuals by age or with distinctive grave goods is not evident. This suggests that the Shannon site and other comparable Late Woodland villages in Southwest Virginia represent decentralized, sociopolitically autonomous matrilineal communities.

Boza Cuadros, Maria Fernanda (Syracuse University)

[31] *Building Control: Architecture and the Regimentation of Daily Life in Eighteenth Century Santa Cruz de Lancha, Peru*

Social control, central to Spanish colonial rule, was exercised through the regimentation of everyday life, the design and construction of space, and the imposition of practices such as sleeping on beds and mode of dress. In this paper I examine the built space at Santa Cruz de Lancha, an eighteenth century Jesuit hacienda in the Pisco valley, and elucidate on the ways in which the site architecture structured everyday life at the estate. Further, I pose and evaluate questions for future research that will bring to light the ways in which the African laborers at the hacienda contended with their enslavement, particularly in the configuration of their domestic spaces. Given the remarkable preservation of the site, Santa Cruz de Lancha is an ideal place to examine the daily operations and lives of a colonial hacienda's inhabitants.

Bracco, Jean-Pierre (LAMPEA-AIX MARSEILLE UNIVERSITY) and Damien Pesesse (Université de Rennes 2 - Creaah UMR 6566)

[181] *The Gravettian Open Air Site of la Vigne Brun (Loire Valley, France). Shedding New Light on a Famous Unknown Site*

Excavated especially in the late 70s and early 80s, the site of la Vigne Brun provided numerous dwelling structures unique in Western Europe. Each structure is a circular excavation of 6 m in diameter, is coated with ochre, and has a central hearth. This site is generally interpreted as the result of a single occupation and all the dwelling structures of are considered contemporary. New research by a multidisciplinary team shows that site formation processes are much more complicated and allows us to propose the hypothesis of an aggregation site that is not only related to social practices, but also the hunting of horses.

Bracken, Justin (CUNY Graduate Center)

[219] *Muralla de Leon: Exploring the Fortifications*

The summer of 2014 saw the return of archaeological investigation after a 30-plus year hiatus to Muralla de Leon, located on the shores of Lake Macanché in the Petén of Guatemala. Ringed by a partially-collapsed wall of varying height, the site appears to have been a locus of contestation at various eras of Maya history. A Postclassic temple assemblage within indicates occupation by the Kowoj, who were subsequently driven from the area by the rival Itzá. However, preliminary evidence dates the initial construction of the wall to an earlier time, perhaps making the Kowoj only one of many groups to take refuge within the fortifications. This past summer's work invoked a dual-pronged approach that sought to generate a digital map of the site while also obtaining general site chronology and architectural insight via targeted excavation. In the course of the mapping effort, a number of previously undocumented structures were located throughout the general vicinity. The ongoing exploration of these settlements will serve to describe in detail the occupational history of the region around Lake Macanché, while at the same time providing context for the construction and function of the wall through comparison of what lies inside with what lies beyond.

[219] *Chair*

Bradley, Savannah [113] see Trachman, Rissa

Brady, James (Cal State L.A.)

[355] *Landscape Archaeology in Northern Belize: The Need for a Critical Reassessment*

Michael Smith and Katharina Schreiber note that, "For the Classic Maya, studies of sacred landscapes are dominated by research on caves." Unfortunately, northern Belize lacks large caves that have attracted archaeological interest and no large cave survey has been conducted in the region. Lacking such studies, archaeologists appear to be at a loss on how to engage sacred landscapes. An underappreciated aspect of the Petexbatun Regional Cave Project was its articulation of an explicit model of the general principles on which ancient Maya landscape was conceptualized. The California State University, Los Angeles Archaeological Field Program has applied this model to three studies in northern Belize at Maax Na, Chawak But'o'ob and La Milpa.

This presentation discusses the nature of sacred landmarks in the region which abound in the karstic landscape and provide surface archaeologists with abundant opportunities for empirically documenting the sacred landscape within their site boundaries.

[355] *Chair*

Brahe, Henrik [409] see Hinojosa-Balino, Israel

Braje, Todd (San Diego State University)

[32] *Defining Marginality Under Shifting Baselines: Historical Transformations of California's Channel Island Ecosystems*

Spanish arrival to California's Channel Islands in A.D. 1542 marked the beginning of widespread ecological changes for island land and seascapes. Over the next several centuries, the Chumash and Tongva were removed to mainland towns and missions, sea otters were extirpated from local waters, commercial fisheries and ranching operations developed, and a variety of new domesticated plants and animals were introduced. The ecological fallout was both swift and extensive, resulting in new terrestrial floral and faunal communities, transformed hydrological systems, and exceptionally productive shellfisheries. While archaeologists have long recognized the pervasive effects of these historical transformations, it has only been in the last several years, after decades of restoration biology, that we have come to appreciate how dramatically baselines shifted after Spanish arrival. Island terrestrial ecosystems may still be considered marginal to their mainland counterparts, but the degree of this marginality and its influence on the evolution of Chumash socio-political systems bares reevaluation.

Braje, Todd J. [328] see Bentz, Linda

Brandes, Ulrik [229] see Habiba, Habiba

Brandl, Kathleen (Bachelors of Science in Anthropology from University of California, Davis) and Teresa Steele (Associate Professor of Anthropology at University)

[165] *Zooarchaeology and Historical Archaeology: A Case Study of the Leland Stanford Mansion*

Investigating the socioeconomic status of occupants in 19th century historical sites has long been a goal of archaeological investigations; more recently, analyses of the animal bones preserved in these sites (zooarchaeology) have been used to compliment conclusions drawn from other lines of evidence. Following in this tradition, we will use faunal remains to examine changes in socioeconomic status of the inhabitants of the Stanford Mansion in Sacramento, California. The Stanford Mansion was the epitome of luxury when it served as the Governor's mansion in the late 1800s. However, after the house was graciously donated by Jane Stanford to the Catholic Diocese of Sacramento, it became an orphanage and subsequently a home for dependent high school girls. We hypothesize that the conversion of the Stanford Mansion from the Governor's mansion to an orphanage and girls home will be evident in the animal bones, which will reflect meat cuts, excavated at the site. We expect to see a decrease in the quality of butchered meat from older to younger archaeological layers, reflecting the transition of social strata that occurred at the mansion.

Brandt, Steven (University of Florida)

[412] *Not Always Shiny and Pretty: The Darker Side of Obsidian in Symbolizing Power, Ethnicity and Inequality in Contemporary Ethiopia*

This paper builds upon previous research among craftspeople of Southwestern Ethiopia who still procure obsidian on a regular basis to manufacture scrapers for the production of leather products. Previous ethnoarchaeological studies of these male and female hide workers of multiple ethnicities have provided a wealth of information on the role of lithics in past and present societies, and have been especially important in helping to debunk the idea that men were largely, if not exclusively responsible for the manufacture of flaked stone artifacts in Stone Age societies. More recent analyses of the crafters' scrapers using pXRF instruments have also revealed a strong correlation

between specific obsidian sources, social boundaries and ethnicity. However, there is also a darker side to the hide workers' contemporary use of volcanic glass: it brands them as prominent members of scorned caste groups whose economic, social and political roles in Ethiopian society have been severely marginalized. The paper concludes with a consideration of how studies of obsidian materiality can potentially provide archaeologists with novel ways of interpreting changes in lithic raw materials within ancient societies.

Brannan, Stefan (University of Georgia) and Jennifer Birch (University of Georgia)

[177] *Palisaded Enclosures and Political Complexity in the Eastern Woodlands of North America*
Earthworks and enclosures have a long history of construction and use in the eastern Woodlands of North America. However, the development of palisaded enclosures around permanent settlements occurs concomitantly with the transition to maize horticulture, the transition to settled village life, and an increasing concern with boundary maintenance. In this paper, we employ data from Northeastern and Southeastern North America to examine how processes of enclosure transformed the relationships between people living within walled communities and those in the outside world. We argue that enclosed settlements developed initially as defensive communities. Subsequently, these groups developed more complex forms of social, political, and economic organization to meet the challenges of living together in circumscribed groups. These organizational structures differed in the Northeast and Southeast. Dynamic processes including climatic change, aggregation and dispersal, migration, alliance formation, and the emergence of regional polities and confederacies shaped the historically contingent biographies of enclosed places.

Brant, Erika

[378] *Rejection or Reinvention: Rethinking Social Hierarchy in the Post-Collapse Colla Polity (A.D. 1000-1450) of Southern Peru*

The collapse of the highland state of Tiwanaku, around A.D. 1000, was accompanied by a dramatic uprising against the ruling elite. Elite ancestor effigies placed in large open plazas were iconoclastically disfigured, while the Putuni Palace, home to Tiwanaku's ruling dynasty, was leveled. In the post-collapse period, Titicaca basin peoples abandoned the symbols of Tiwanaku's authority. A 1500-year tradition of ritual architecture and craft goods disappeared, and ritual practice turned to the worship of ancestors placed in modest burial towers, or chulpas. Does such a transition in ritual architecture and the rejection of state-affiliated material culture signal a reinvention or, conversely, a rejection of hierarchy in the post-collapse period? Excavations conducted at the post-collapse Colla necropolis and pilgrimage center of Sillustani revealed a series of kin-focused ritual compounds as well as a previously understudied domestic sector characterized by multiple elite houses. Such findings suggest a more segmented, and possibly situational, role of leadership during the Late Intermediate Period (A.D. 1000-1450).

[378] *Chair*

Braswell, Geoffrey (UC San Diego)

[196] *Discussant*

Braun, David R. [121] see Biermann, Rebecca

Braun, Kerstin, Miryam Bar-Matthews (Geological Survey of Israel, Jerusalem), Curtis W. Marean (Institute of Human Origins, Arizona State University), Alan Matthews (Fredy and Nadine Herrmann Institute of Earth Sciences) and Rainer Zahn (Institut Català de Recerca i Estudis Avançats,)

[294] *Long and Continuous Record of Climate and Environmental Change from Speleothems of the Cape Floral Region of Southern South Africa*

South African climate is determined by the alternating influence of subtropical trade-winds bringing rainfall to the east coast during summer and temperate westerlies causing rainfall in the south-west during winter. High growth season temperatures favor C4 grasses in the summer rainfall region whereas C3 grasses dominate the winter rainfall region. Pinnacle Point on the central south coast

has mixed summer-winter rainfall and C3-C4 vegetation. Millennial and longer time-scale changes in rainfall regime and vegetation are recorded in the $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ of speleothems. The $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ records of Pinnacle Point speleothems cover the interval between 330 and 41 ka (Bar-Matthews et al. 2010, and this study). Higher $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values indicate high summer rain and abundance of C4 grasses in MIS 7 (~240 ka and ~230 – 205 ka) at the MIS 6/5 transition and in MIS 4 and frequently coincide with phases of southward shift of the Intertropical Convergence Zone and increased rainfall amounts in the summer rainfall region (Wang et al. 2008, Ziegler et al. 2013). The speleothem $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ variability deviates from the glacial-interglacial pattern depicted by the Antarctic Dome C record (Jouzel et al. 2007) probably reflecting the influence of the Agulhas Current.

Braun, David [174] see Hlubik, Sarah

Braund, Kathryn [103] see Ervin, Kelly

Bravo Foster, Marina [174] see Nightingale, Sheila

Bray, Peter (University of Oxford, RLHA)

[241] *Beyond Provenance: Using the Chemical Composition of Copper-Alloys to Explore Technology and Metal Flow*

The vast chemical datasets for copper-alloy objects are a tremendous, but underused, opportunity. These data were often considered objective fixed points that represented chronological sequences and geographical provenance. Recent work has demonstrated that, though the object composition is fixed, it is only a final characterization. Bringing together material science, archaeological, and conceptual approaches, we discuss the life histories of units of metal. Before being cast into the final object a unit of metal may have gone through chains of melting, mixing, deposition and recovery, alloying, and smithing. Luckily there are predictable chemical changes that accompany these technological effects. Our analysis approach emphasises a pragmatic way of interpreting data, which teases apart the palimpsest of factors that contributes to the analyzed values. Using this new method, this paper will discuss case studies exploring how technological changes occurred within early metallurgy. The first is 'horizontal' using the chemical dataset for Bronze Age Europe. From individual objects, through workshops, regions, and onto a continental scale, we will discuss the nature of the flow of metal and ideas. A second case study is 'vertical' and compares the characteristics of technology and exchange for Britain from the start of metallurgy to the Industrial Revolution.

Bray, Tamara (Wayne State University)

[303] *Archaeology, Identity and Art: The Caranqui Murals of Ibarra, Ecuador*

The incorporation of signs and symbols derived from an ancient, indigenous past has a long and venerable history in the tradition of New World muralism. As an important form of public art, murals merit a more sustained consideration of content, context, and communicative intent. The use of specific, realistic archaeological content in contemporary works is an interesting phenomenon that underscores the relation between the politics of identity (re-)construction and historical "veracity"/materiality, as well as the different of ways in which archaeology figures in society today. This paper explores the intersection of public art, community identity, and local archaeology in the context of a recently painted set of murals created by a group of local activist artists in the vicinity of Ibarra, Ecuador.

Bray, Peter [402] see Hsu, Yiu-Kang

Brellas, Demetri [154] see White, Chantel

Bremer, J (Santa Fe National Forest) and Anne Baldwin (Española Ranger District, Santa Fe

National Forest)**[34] *Evolving Histories and Changing Archaeologies on the Santa Fe National Forest***

The management of cultural resources on the Santa Fe National Forest includes interpreting the evolving histories of communities and coordinating those histories with the present state of archaeological practice. At the time of its designation in 1915, the Forest had active excavations and ethnographic research being conducted on it with continuous research since that time. This research has consistently involved using local community members as participants or interpreters. Frequently these community members were descendants of those responsible for cultural remains on the landscape. We explore the unique relationship between cultural resources on the Forest and local indigenous communities (both Pueblo and Hispanic). We also discuss how that relationship has influenced history making and how contemporary archaeological practice has affected that relationship.

Brennan, Candice, Jennifer McElhoes (California State University, Long Beach), Cindi Alvitre (California State University, Long Beach) and Carl Lipo (California State University, Long Beach)

[95] *Best Practices and Community Engagement for Reinternment of CA-LAn-270 (Los Altos Village) Cultural Materials on a National Registry Listed Site*

Within the core of NAGPRA is a spirit of collaboration and consultation between institutions, investigators and native communities. At CSULB, we have partnered with Tongva/San Gabrielino community members and university administration to reinter cultural remains from CA-LAn-270 (Los Altos Village Site), a site excavated in the 1950s. Community interests have centered on placing the re-interment place on university campus property and at a location of CA-LAn-234, a National Register listed location. With a overlap of archaeological and community interests and with cooperation from university administration, we have establish a program that seeks to find common ground across interests while also mitigating impacts to the archaeological record. Here, we make use of geophysical studies and remote sensing to guide the project to minimize impact during the preparation of the area for reburials. Impacts to LAN-234 are mitigated through a field school component that brings together the community, archaeologists and students, as well as seeks to learn more about this significant deposit. Our approach reflects community involvement and university administration approval while also using best practices for conducting archaeological field work on a nationally registered historic site in addition to meeting the needs of the local community and preserving the archaeological record.

Brenner, Mark [130] see Lohse, Jon

Brenner Coltrain, Joan [162] see McCool, Weston

Breschini, Gary [373] see Cole, Kasey

Breslawski, Ryan (Southern Methodist University) and David Byers (Utah State University)

[35] *Controlling for Carnivores and Shaft Fragmentation in Skeletal Element Analysis: Some Insights from Southern Idaho Cave Deposits*

Although caves are often excellent for organic preservation, they also attract carnivores and introduce the potential for rock fall. Carnivores systematically remove spongy long bone ends from assemblages, while experimental studies have shown that rock fall can fragment dense long bone shafts. As a result, these processes may bias faunal assemblages in opposing directions. This has implications for the interpretation of correlations between bone density and skeletal element frequencies in caves. We explore this problem with two bison dominated late Holocene paleofaunas from southern Idaho. The first fauna was recovered from Baker Cave, an archaeological site contained in a lava blister with abundant evidence for both carnivore scavenging and bone fragmentation. The second fauna contains bison remains recovered from a fissure in a lava flow north of Grace, Idaho. This fauna contains evidence for carnivore scavenging but not for human activity. Bone counts in each assemblage are significantly different depending on whether shafts or

ends are counted. We use a taphonomic simulation to show how carnivores and rockfall might differentially bias long bone representation, and we suggest that zooarchaeologists should consider both processes in the interpretation of correlations between bone density and skeletal element representation in caves.

Breternitz, Cory [123] see Hill, Rebecca

Breternitz, Cory (PaleoWest Archaeology)

[354] *Tom Windes: Celebrating 40 Years of Innovative Research on the Colorado Plateau*

Tom Windes has been a leader of innovative research on the Colorado Plateau for over four decades. His early work as the archaeologist on the Manti-LaSalle National Forest in southern Utah lead to one of the first pot hunting prosecutions under ARPA. His Forest Service career was followed by work with the Zuni Tribe and then nearly three decades of association with the National Park Service's Chaco Center. Tom has become synonymous with all things Chaco, serving as Project Director for the Chaco Center's work in Marcia's Rincon and the excavations at Pueblo Alto. Tom continued his association with Chaco Canyon with surveys of the Eastern Community, Navajo sites, and has maintained rain gauges throughout the San Juan Basin. He is an expert on Chuska ceramics and the larger Chacoan world in the San Juan Basin and beyond. For the past 15 years he and a dedicated of volunteers, the Wood Rats, have been mapping and collecting dendrochronological samples from prehistoric sites in SE Utah, Mesa Verde, Chaco Canyon, and historic site in New Mexico. Above all, Tom is an excellent teacher and mentor enriching the lives of his colleagues, dedicated group of volunteers, and students.

[209] *Discussant*

Brewington, Seth (City University of New York, The Graduate Center)

[351] *Long-term Seabird Exploitation in the Faroe Islands*

Fowling traditionally played an important role in the subsistence economy of the Faroe Islands. The large-scale, sustainable exploitation of wild seabirds in the Faroes is noted in written sources at least as far back as the 16th century. Though the practice of fowling in these islands no doubt far precedes the earliest written documentation, archaeological evidence for the activity has until recently been limited. However, recent archaeofaunal data are beginning to provide a more complete picture of the important role played by wild resources such as seabirds in the settlement-period palaeoeconomy of the Faroes. The evidence suggests that seabirds, particularly puffin (*Fratercula arctica*) and guillemot (*Uria aalge*), were harvested in significant numbers from initial settlement onward.

[161] *Discussant*

Brezine, Carrie (Michigan Society of Fellows)

[241] *Bodies of Technology: Dress in Colonial Peru*

The textiles of Magdalena de Cao Viejo provide an opportunity to study technological changes in one coastal Andean settlement between the late 16th and the early 18th century. As a colonial reducción, Magdalena was home to people of both Andean and Spanish descent. Among the more than 3,000 textile artifacts are examples of cloth woven with precolumbian methods and indigenous fibers, fabrics created on European-style floor looms, and examples which combine Andean and European techniques and materials. The size of the collection makes it possible to ask questions such as how widely new technologies were adapted and whether there was any relationship between gender and the use of new techniques. The variety of textiles illustrates how technologies can be accepted, changed, combined, or rejected by individuals. Because many of the fabrics were once part of garments the textiles of Magdalena illuminate ways that technologies are both intimate and public. Technological choices are not only decisions about methods of production but statements of identity which persist long after the process of creation is complete.

Bria, Rebecca (Vanderbilt University)

[142] *The Infrastructure of Community: Agricultural Intensification and the Development of Corporate Groups at Hualcayán, Peru*

This paper examines how the construction of agricultural infrastructure was essential to the constitution of a new kind of community in the highland Andes after the collapse of the regional Chavín religion (500/200 B.C.). It presents recent excavation data from Hualcayán—a long occupied ceremonial center in Ancash, Peru—to discuss how local people reorganized their community when they abandoned a central Chavín mound and built segregated structures for agricultural production, such as terraces, canals, and ritual enclosures. The new infrastructure changed the ways that people cooperated and interacted: canals required water allocation and cleaning; terraces required clearing and structural maintenance; and fields required coordinated planting and harvesting, ritual propitiation, and pastoralism for fertilizer. Enclosures in the fields indicate that distinct groups oversaw ritual practices. In building this infrastructure, local people rejected the universalizing styles and rituals that characterized Chavín to establish a community focused on the coordinated activities of local corporate groups. The paper argues that infrastructure is not a mere reflection of broader political or social ideas, such as community. Rather, a community of human and non-human actors is created in the social interactions and practices through which people build, maintain, and care for essential and enduring material structures.

Bria, Rebecca [250] see Granley, Elisabeth

Bria, Rebecca E. [252] see Casanova Vasquez, Erick

Bridges, Elizabeth (University of Michigan)

[291] *Reevaluating Vijayanagara Imperial Collapse*

This paper reexamines notions of imperial collapse by looking at recent archaeological work at the eponymous capital of the Vijayanagara Empire and at settlements of one of its subordinate regional polities. The Vijayanagara Empire is well-known archaeologically through work at its primary capital at modern day Hampi, Karnataka, India, which is today recognized as a UNESCO World Heritage Site. The former primary capital city was intensively occupied until just after the empire suffered a serious military defeat in 1565 CE, following which the imperial court left to reestablish itself at two subsequent capitals quite distant from the original. This process has often been termed as the “collapse and abandonment” of Vijayanagara, though in reality, both the central government and its regional subsidiaries persisted and even flourished. The Keladi-Ikkeri Nayakas were established as regional leaders under the Vijayanagara Empire and later ruled as an independent state based in modern Shimoga District, Karnataka. The historical record and archaeological evidence from Nayaka sites is reviewed against the record of the imperial capital to argue that flexibility in imperial political strategies facilitated socio-political continuity, rather than collapse, on the periphery.

Briggs, Rachel (University of Alabama)

[173] *Characterization of the Mississippian Standard Jar*

The Mississippian standard jar is a specific kind of vessel form that, in tandem with maize agriculture and shell-tempering, was disseminated throughout the Eastern Woodlands during the late prehistory. As previous researchers have noted, the jar appears to be specifically adapted for slow, long-term boiling, especially when compared to earlier Woodland Period jars that are generally better suited for short-term cooking. Following the proposition that pots are tools, I characterize the Mississippian standard jar as expressed during the Moundville I phase (A.D. 1120-1260) at the Mississippian civic-ceremonial center of Moundville in west-central Alabama. I argue that the particular culinary advantages offered by this form made it a specialized, nextamazing tool, and was intimately tied to an ancestral hominy foodway.

[173] *Chair*

Brin, Adam [123] see Ellison, Leigh Anne

Bringelson, Dawn

[83] *Dealing with Reality: Managing Education at the National Park Service-Midwest Archeological Center*

The National Park Service takes pride in high caliber interpretation of natural and cultural resources, and is known as the major supplier of informal education in the United States. With the centennial of the NPS approaching in 2016, the Service is directing all parks and programs to intensify education efforts. In addition, the NPS Call to Action of 2012 establishes the increasing of NPS relevancy to young people as a priority. Maximizing educational products and impacts is of particular concern for archaeologists, as enhancing understanding and stewardship is critical for long-term preservation of these non-renewable resources. However, ever-increasing workloads for NPS archaeologists are pulling staff time and funding from such efforts. The challenge to increase the relevancy of NPS archaeology to young people and other audiences requires creative partnerships and focused priorities, which leverage the resources spent on research and management. The Midwest Archeological Center works to maximize outreach through partnerships with educational organizations and NPS units across the Midwest Region, and strives to increase our impact through expanded content and delivery channels.

Bringelson, Dawn [120] see Hunter, Ryan

Brink, Laura (Far Western), Jelmer Eerkens (UC Davis), Alex DeGeorgey (Alta Archaeological Consulting) and Jeff Rosenthal (Far Western)

[293] *Reconstructing Mobility in the San Francisco Bay Area: Strontium and Oxygen Isotope Analysis at two California Late Period sites, CA-CCO-297 and CA-SCL-919*

Stable isotope analysis can reconstruct individual mobility of prehistoric California on a scale that can distinguish movement between different parts of the San Francisco Bay Area. This study uses strontium and oxygen isotope analysis to compare individual mobility patterns of two Late Period sites, CA-CCO-297 and CA-SCL-919. Three life stages are used for comparison, including early childhood from first molars, early adolescence from third molars, and adulthood/time of death from bone. Isotopic ratios from bone resulted in consistent and site-specific signatures for both sites, while enamel ratios were much more variable, suggesting higher mobility during childhood and adolescence than during adulthood. CA-SCL-919 is composed mainly of non-local individuals born in a wide variety of locations, while many individuals interred at CA-CCO-297 were born locally. Both sites revealed mobility shifts from childhood to adolescence, possibly due to post- or pre-marital residence changes. The data also suggest sexual differences in movement patterns, which may inform on post-marital residence patterns. This work gives insight into ancient kinship organization in the San Francisco Bay Area, differentiates site-specific mobility patterns from life-history mobility signatures, and provides testable hypotheses on the structure of post-marital residence patterns during the Late Period of the San Francisco Bay Area.

Brisbin, Joel [85] see Glowacki, Donna

Bristow, Emilia [284] see Artz, Joe

Brite, Elizabeth (Purdue University)

[291] *Ingenuity from the Periphery: Contributions to Old World Transformations from the Aral Sea Deltas*

The deltas of the Aral Sea lie within an internal drainage basin where critical water resources are prone to unpredictable change. The nature of this resource landscape discourages the emergence of enduring centralized states and was a key factor that led to the peripheral status of the deltas in world history. Nevertheless, complex social institutions did develop there in the early 1st millennium B.C. – late 1st millennium A.D., and these were based on especially diverse and flexible economic strategies. After the Arab conquests in the 8th century A.D., when the deltas of the Aral Sea became linked with core areas of the Old World, the ingenuity embedded in these local systems became an important source of new innovations that drove cultural transformations in both core and periphery

regions.

[291] *Chair*

Brite, Elizabeth [291] see Paris, Elizabeth

Britt, Kelly (FEMA)

[34] *Mandating Community Archaeology: Using Law to Bridge the Gap Between Public Outreach and Community Engagement*

The task of decolonizing the practice of archaeology for a collaborative community project in the public sector is one that is at times easier said than done. While many archaeologists working in federal, state and local agencies may subscribe to a postcolonial approach to research and dissemination of data, political bureaucracy, budget cuts, limited staff and time, among other issues, all make this endeavor challenging to say the least. However, for federal agencies, a variety of laws and ordinances requiring public outreach provide opportunities to pursue a community centered practice. Compared to many academic community archaeology projects, a federal approach appears to be more top-down 'outreach' rather than dialogic 'engagement' with the community. Consequently, this paper will discuss ways in which 'outreach' can be a stepping stone to a community-based approach to these projects. It will highlight several successes and hardships in conducting community-engaged archaeology in the Federal Emergency Management Agency (FEMA). Given this agency's mission to support citizens and first responders in all stages of disasters from preparation to recovery, it is not the first agency one thinks of when imagining public sector archaeology, yet it provides a unique setting in which to conduct community archaeology.

Britt, Tad, and Lindsey Cochran

[284] *Predictive Modeling of Archaeological Sites in Death Valley National Park*

Archaeologists have long worked to develop predictive modeling tools, techniques, and methods, as it is well known that human habitation locations are patterned and often align with environmental constraints. The National Center for Preservation Technology and Training (NCPTT) and the National Park Service (NPS) have developed methods to move a database with over 2,000 archaeological sites into a statistical prototype based on Maximum Entropy niche modeling. Layers of DEM, LiDAR, GIS, environmental data, and information from state site files combine to produce statistical and graphical readouts of a grid-based model of archaeological sites. The resulting models determine the probability of the occurrence of cultural resources in the park by displaying potential spatial and temporal locations of cultural resource sites in Death Valley National Park as well as to create quantitative readouts of the veracity and percent contribution of each environmental variable. This paper will discuss methods undertaken to identify and eliminate bias within raw datasets, then examine how these changes influenced our interpretation of the model accuracy and directions for future development.

[284] *Chair*

Britt, Krystal (University of Illinois at Chicago) and Richard Lange (Arizona State Museum)

[343] *The Multi-Kiva Site: A New Perspective on the Pueblo III Period Occupation of the Middle Little Colorado River Valley*

Previous research in the middle Little Colorado River valley of Northern Arizona has characterized the Pueblo III period (1125-1275 C.E.) as dominated by dispersed pithouse villages which were later replaced by the aggregated cluster of masonry pueblos at Homol'ovi. Recent survey and excavation in this region shed new light on the occupation and land use of the middle Little Colorado River valley prior to Pueblo IV. The landscape is dotted with mid-sized pueblos that may have acted as centralized locations which facilitated the integration of dispersed settlements. This paper will present data from testing and excavation of one such pueblo, the Multi-Kiva Site (AZ P:3:112[ASM]), in 2012 to 2014. Additionally, this paper seeks to draw comparisons between Multi-Kiva and other contemporaneous and analogous pueblos in the region through architectural and ceramic analysis to refine our understanding of the Pueblo III period in the middle Little Colorado River valley and

beyond.

Britton, Emma

[245] *Results of Petrographic Analysis of Polychromes across the Casas Grandes World*

This research, part of my dissertation, focuses on the mineralogical variability of Casas Grandes polychromes. Whereas past studies have suggested that some Casas Grandes polychrome types are more common in some geographic areas than others (see Brand 1935; De Atley 1980; Findlow and DeAtley 1982; Kelley et al. 1999; Larkin et al. 2004 for more complete discussions), these studies have been challenged as they assume polychromes recovered at sites are made locally, rather than imported (Douglas 1995; Minnis 1984, 1989). Recent studies refocus on polychrome production, as a result (Carpenter 2002, Sphren 2003, Woosley and Olinger's 1993). In my presentation, I will discuss the results of petrographic analysis of polychrome sherds from Sayle's 1936 surface collections, which is geographically extensive. Sayle's (1936) collection will be utilized to determine the extent, strength, and directionality of human relationships across the Casas Grandes region. These sherds are used to examine three interrelated aspects of ceramics: similarities and differences in production sequences, centers of production and distribution, and shared knowledge as determined through paste recipes. Characterization studies, like petrographic analysis, aid in my understanding of variability or standardization of paste-temper across the region, helping to determine past communities of practice and networks of knowledge.

Britton, Kate (University of Aberdeen and Max Planck Institute for Evolutionary Anthropology)

[337] *Stable Isotope Analysis of Permafrost-Preserved Human Hair and Faunal Remains from Nunalleq, Alaska: Dietary Variation, Climate Change and the Pre-Contact Arctic Food-Web*

The reconstruction of diet and subsistence strategies is integral to understanding past societies and human-environment interactions. Here we present stable carbon, nitrogen and sulphur isotope data from non-mortuary human hair and faunal remains from the site of Nunalleq, Alaska. Spanning the Little Ice Age (c. 1350 to 1650 A.D.), this large, complex and well-preserved site offers a near-unique opportunity to reconstruct the pre-contact Arctic food-web and to explore temporal and site-spatial variations in human diet and subsistence. Overall data suggest a mixed diet (including marine and terrestrial protein), but inter-individual isotopic variations suggest intra-group differences in the consumption of higher trophic level foods. The analysis of longer strands of hair, permitting the reconstruction of time-series dietary information, indicates both seasonal dietary homogeneity and heterogeneity amongst different individuals. The implications for our understanding of geographical, temporal and socio-cultural complexity in pre-contact Arctic subsistence will be explored.

[337] *Chair*

Britton, Kate [337] see Forbes, Véronique

Briz, Ivan [73] see Caro, Jorge

Brock, William [191] see Bentley, R. Alexander

Brodbeck, Mark (HDR) and Deil Lundin (AZTEC Engineering)

[272] *Pueblo I/Pueblo II Subsistence Strategy in Klethla Valley: A View from a Resource Processing/Storage Site along Begashibito Wash*

The Arizona Department of Transportation conducted a highway widening project on US 160 between Cow Springs and Tonalea which required archaeological excavations at site AZ-J-33-35 (NN) as mitigation. The site is along Begashibito Wash in the western reaches of the Klethla Valley in northern Arizona. The excavations at AZ-J-33-35 (NN) uncovered an architecturally unique resource processing/storage site where locally available plants and corn were harvested, processed, and stored. Evidence for use of the site ranges from the late Basketmaker III through Pueblo III periods; however, radiocarbon dates and diagnostic ceramics indicate the primary occupation and most intensive use of the site took place intermittently during the Pueblo I and Pueblo II periods, ca.

A.D. 800 to 1150. While maize was represented at the site, primary reliance on native resources was indicated by several lines of evidence. This exhibit presents the results of the excavations with emphasis on the site's function within the settlement-subsistence networks of prehistoric Klethla Valley.

Brodie, Neil (University of Glasgow)

[279] *Syria: Cultural Property Protection Policy Failure?*

International 'cultural property protection' policy is structured around two UNESCO Conventions: the 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property and the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage. Together, these conventions encourage a policy which aims at cultural site protection at source and the recovery and restitution of stolen or otherwise illicitly-traded cultural objects. The widespread looting of archaeological sites that broke out in Syria in 2011, nearly thirty years into this UNESCO-inspired policy regime, suggests that as regards looting and trafficking of cultural objects, the policy is not working. It has failed. In this paper, I discuss possible reasons for this failure.

Brooks, Alison S. [121] see Biermann, Rebecca

Brooks, James (Dept of Anthropology, UC Santa Barbara)

[175] *Discussant*

Broughton, Jack [119] see Hart, Isaac

Broughton, Jack (University of Utah)

[293] *Late Holocene Resource Depression in San Francisco Bay: Recent Research with Tule Elk, Sturgeon, and Waterfowl*

Prehistoric resource depression has been widely documented in many late Holocene contexts characterized by expanding human population densities and some of the most detailed records of this phenomenon have been derived from the San Francisco Bay area of California. I summarize here recent analyses focusing on tule elk, waterfowl, and sturgeon from multiple regional sites using traditional zooarchaeological measures of resource depression but also those drawing on allometric size relationships, stable isotopes, and ancient DNA. These analyses suggest the late prehistoric faunal landscape of the region was fundamentally anthropogenic and have implications for a wide range of other significant changes in human behavior and biology as well as the modern management of California vertebrate faunas.

Brouwer Burg, Marieka, Eleanor Harrison-Buck (University of New Hampshire) and Astrid Runggaldier (University of Texas at Austin)

[244] *Preclassic Roots of Well-Trodden Routes in the Central Maya Lowlands of Belize*

Traditional approaches to ancient Maya territories focus on site hierarchies, which are defined by a capital with monumental architecture and an elite body that controls a hinterland population. In the central lowlands, E-Groups are among the earliest monumental architecture found and are almost always associated with sites that later develop into large Classic Maya capitals, such as Tikal and Naranjo. Thus, scholars suggest that E-Groups are in some way connected to early forms of Maya political authority and territorial control. Current scholarship emphasizes the desire to create distance between monumental centers with E-Groups as a means of demarcating territorial claims and resources. We cross-examine these politico-economic explanations and suggest an alternative model that emphasizes inclusion whereby such monumental constructions facilitated connections between communities through regular social gatherings, such as ceremonies involving agriculture, marriage, and feasting. We examine shared traditions in early monumental architecture in the mid-to-upper Belize Valley and the concomitant exchange of goods, namely high densities of groundstone, which point to female involvement and large-scale feasting activities associated with these

complexes. Examining both archaeological and geospatial data (least-cost and viewshed analyses), we explore the roots and routes of these connections among settlements in this area from Preclassic times onward.

Brown, Sarah (University of California, Davis), Christyann Darwent (University of California, Davis) and Ben Sacks (University of California, Davis)

[28] *Next-Generation Sequencing Unravels the Relationship of Paleoeskimo and Thule Dogs from the North American Arctic*

The peopling of the North American Arctic, occurred in two waves. First, the Paleoeskimo people migrated from Siberia roughly 4,000 BP, followed by the Thule people ca. 1,000 BP. The Thule people are known for their innovation and rapid colonization of the North American Arctic, compared to small population sizes of the Paleoeskimo. A distinguishing characteristic of Thule culture relative to previous Arctic cultures was increased use of dogs, particularly for dogsled traction. Use of dogs by the Thule is reflected in the archaeological record by a dramatic increase in dog remains in zooarchaeological assemblages. Here, we present results from an Arctic wide survey of over ~500 ancient dog samples and analysis of the temporal and spatial distribution of dog remains and their genetic characteristics. We compare diversity of both whole mitochondrial genomes and the D-loop region in Thule and Paleoeskimo dogs from Siberia, Alaska (interior as well as coastal), Canada, Greenland to assess origins, interchange, and changes through time. We show that, similar to their human companions, domestic dogs colonized the North American Arctic in two waves.

Brown, David [46] see Pratt, William

Brown, Thomas (Portland State University), Kevan Edinborough and Kenneth Ames (Portland State University)

[80] *Exploring Settlement and Mobility Pattern Changes Using Radiocarbon Databases*

Using data from a newly constructed regional ¹⁴C database for the Early and Middle-Holocene on the northern Northwest Coast of North America, a combination of Bayesian models, summed probability distributions and spatial analyses are used to evaluate hypotheses regarding the nature and timing for the development of collector strategies on the northern coast. Research and taphonomic biases are accounted for by binning the radiocarbon data, and by applying a general linear model to the data set. I then address the problems and limitations of these methods as they relate to understanding changing mobility patterns on the North Coast.

Brown, Alyson (McMaster University), Eduard Reinhardt (McMaster University) and Aubrey Cannon (McMaster University)

[112] *Sedimentary Evidence of Increasing River Discharge from Namu Lake, B.C. during a Period of Fluctuation in the Staple Pink Salmon Fishery*

Pacific salmon has been a vital resource to the people of British Columbia as far back as 9,700 years before present (BP). Sediment cores collected from Namu Lake, British Columbia provide evidence for paleoenvironmental conditions that may have led to the decline of the pink salmon population ~3400 cal years BP. Archaeological evidence obtained from the Namu shell midden reveal fluctuating pink salmon populations at this time. Particle size analysis of the lake sediment cores indicate fluctuations in river discharge as well as changes in erosional intensity. Particle size coupled with radiocarbon dating revealed low variability and high minimum grain size values during this interval. An increase in alkali earth elements; Mg, Na, and K during this time also indicate that erosional mechanisms had intensified throughout the interval 3400-2300 cal years BP, likely due to consistently wetter conditions along the coast. Increased discharge from the Namu River would have resulted in increased sediment entering Namu Lake and eventually the outflowing river; the spawning ground for the pink salmon. The results of this study help us to understand the sensitivity of salmon to fluctuating hydrological conditions and how future populations might respond to changes in climate.

Brown, James (Central Washington University), James Chatters (Applied Paleoscience), Patrick McCutcheon (Central Washington University), Jon Adler (DirectAMS) and James

Feathers (University of Washington)**[121] *Comparison of Radiometric Dating Techniques: Pacific Northwest***

Radiometric dating is problematic in non-midden sites of the Pacific Northwest. Charcoal is ubiquitous in the forest soils and unburned bone readily dissolves. This fact impedes development of a regional chronologies and understanding of the process of resource intensification that was so important to development of Northwest cultures. To alleviate this deficiency, DirectAMS and Central Washington University undertook research to demonstrate the validity of alternatives to traditional radiocarbon dating of charcoal and bone, by using radiocarbon dating of calcined bone and luminescence dating. Calcined bone (bone burned in excess of 600 °C) survives well in archaeological sites with acidic soils that are common to archaeological contexts along the Northwest Coast and has been found in the Old World to provide accurate radiocarbon dating. Luminescence dating can be applied to fire-cracked rock, which is common, particularly in food processing features. We developed a protocol for comparing calcined bone and luminescence dates with charcoal dates, taking all from the same features contexts. Results were compared for seven sites, demonstrating the validity of this approach to solving the region's dating dilemma.

Brown, Gloria (California State University, Sacramento), Daniel Reeves (Retired, United States Forest Service) and David Robinson (University of Central Lancashire)**[143] *Serrated Scapular Tools from Cache Cave***

Due to taphonomic processes at most open sites, bone tools are underrepresented in relation to stone tools. Tools made from modified artiodactyl scapulae are best known from protected sites (caves and rockshelters) in the Great Basin, such as Humboldt Cave and Lovelock Cave. These scapular tools vary in form and presumably function. Some are pointed and described as awls, but a second type is a serrated form, which we will discuss here. Many serrated forms are described as scapular saws, suited for cutting soft plant material, such as tules, but other forms are described as shaped for other uses, such as stripping seeds or as fleshers. In California, scapular tools have been recovered from the greater San Francisco Bay region as well as other areas. Here we will discuss serrated scapular tools recovered from the recent excavations of a cave at the Wind Wolves Preserve in Kern County, California. This site is located in the territory occupied ethnographically by the Emigdiano Chumash, a group for which little information existed until recently. The presence of these serrated scapular tools at this site provides insights about the lifeways of the people at this location.

Brown, Nicholas (Stanford University)**[250] *Material Perspectives on Canal Ceremonialism at Chavín de Huántar***

This work presents an interpretive revaluation of canal ceremonialism at the Andean Formative civic-ceremonial center of Chavín de Huántar. Focusing on a set of spaces within the subterranean stone-lined waterway "Canal 2," excavated in 2012 in an "Esplanade" area flanking the site's monumental core, this study explores the excavation hypothesis that canals acted as stages for the ritual-sacrificial deposition of artifacts. Through an analysis of stratigraphic and material patterning within these spaces, six distinct zones of canal deposition were identified. With the characterization of and comparison between each zone, prehistoric depositional activity was assessed and tested against theories of sacrificial deposition. Although contexts identified by excavators as "ritual" proved materially distinct from those occurring outside of canal contexts, it is concluded that there is insufficient evidence to substantiate claims of sacrificial deposition occurring prehistorically within Canal 2. The classification of depositional zones as "ritual" in the context of Canal 2 is suggested to be ineffective for such a structure that appears to have possessed spatially and temporally diverse functionality as reflected in its architectural and depositional history.

Brown, Leslie (University of Wyoming)**[264] *Isotopic examination of human remains associated with the Korell-Bordeaux site (48GO54), Goshen County, Wyoming: $\delta^{13}C$ and $\delta^{18}O$ from bone and enamel apatite***

Bone and enamel apatite from human remains (N=17) recovered at the Korell-Bordeaux (48GO54) site in Goshen County, Wyoming during the 1980 and 2009 field seasons was analyzed using stable

carbon and oxygen isotope methods. Patterns related to the geographic mobility and overall sustenance sourcing of the members of the population during their first and final decades of life are detailed. Remains stained with degraded copper alloys were examined through the same procedural methods and differences in data are explored. Avenues for additional research at this site and similar sites will be presented.

Brown, Andrew (University of North Texas), Lisa Nagaoka (University of North Texas), Feifei Pan (University of North Texas) and Steve Wolverton (University of North Texas)

[272] *Modeling Soil Moisture of Farmland near Mesa Verde Villages at Goodman Point, Southwestern Colorado*

The abandonment of the Mesa Verde region at the end of the Pueblo III (PIII) period (A.D. 1150 to 1300) represents a complex synergy of causal processes, such as inter-village conflict, drought induced water and food resource stress, and high population density. Decisions to abandon a place, however, occurred at the village level of human interaction. This study examines the location and properties of farm plots near villages, which would have been important in those decisions. Aggregation into large villages in defensive locations where water sources were easily accessed and more easily protected as well as regional and local data on animal exploitation indicate that food resource use became concentrated near villages during PIII. Farm plots near villages would have made a major contribution to subsistence. In this study, we pilot a hydrological model to evaluate the spatial distribution of the soil moisture in relation to the archaeological sites of the Goodman Point area in southwestern Colorado in order to determine the locations and agricultural potential of farm plots near villages. This local-scale study of farm plot potential provides the opportunity to examine an important aspect of subsistence near and within villages at Goodman Point.

Brown, M. Kathryn (The University of Texas at San Antonio)

[306] *The Coming of Kings in the Belize River Valley*

Twenty five years have passed since Linda Schele and David Friedel presented their thoughts on the origins and establishment of the institution of kingship in their book "A Forest of Kings." Their historical reconstruction of Cerros illustrates the steps taken by early rulers to establish and institutionalize a hierarchical social system. Through the empirical data from Cerros, they artfully illuminate how the construction and display of symbols of royal power on monumental buildings coupled with elaborate ritual displays, allowed emergent kings to solidify their newly defined role within the community. In this paper, we present data from the Belize River valley pertaining to the "Coming of Kings." We assess how emerging kings established and legitimized their authority through the construction of monumental architecture, public art, ritual deposits, elaborate burials, and symbolically charged portable objects. We then compare these data to the Cerros trajectory laid out in "A Forest of Kings."

[306] *Chair*

Brown, Kyle (University of Cape Town)

[356] *Discovering the Trick to Flaking Middle Stone Age Tools on Quartzite*

South African Middle Stone Age tool makers were skilled at the production of fine, symmetric points and blades on quartzite, a material that is known for its toughness and durability but not for its ease of flaking. The accurate replication of MSA tools on quartzite proved to be almost impossible during a replication and experimentation program that spanned over ten years. Heat treatment was the 'trick' that unlocked the potential of silcrete and it became clear that there must also be a trick with the South Coast quartzites for consistent and predictable success. Information gained from the systematic collection and preparation of raw material samples for the SACP4 Palaeoscope Project eventually provided clues that lead to the discovery of two key requirements for quartzite replication. The morphology of beach cobbles selected for flaking is the first critical step. Successful flaking of quartzite then requires an understanding of the internal structure of the stone and perhaps even rudimentary geometry. Identification of tricks or critical path steps in the stone tool production process provide insight into early modern human behavioral complexity and identifies definable raw material traits that lead to regional variation in the Middle Stone Age technology.

Brown, Ashley (Department of Anthropology, The University of Tulsa) and Miriam Belmaker (Department of Anthropology, The University of Tulsa)

[368] *Evidence for Climate Change During the 3rd – 5th Century CE: The Microvertebrate Evidence from Tel Huqoq, Israel*

The 3rd-5th century CE Levant is known as a time period in which climatic conditions of the southern part of region were wetter than today. The climatic system of the northern Levant differs from the south, which raises the question of whether or not there was climate change in the north. At present there is no paleoecological data from the northern Galilee. Thus, obtaining paleoecological data is vital for understanding how climate may have affected the local social and economic sphere. The archaeological site, Tel Huqoq (Northern Galilee), a 3rd-5th century CE village and synagogue, serves as a case study. Microvertebrates, derived from barn owl pellets, were used as a proxy for climate change. Preliminary results suggest the local area surrounding Tel Huqoq experienced higher levels of moisture than that of today; indicated by the presence of the species: *Crociodura leucodon* (Bicolored White-toothed shrew), *Crociodura russula* (Lesser White-toothed shrew), *Apodemus sylvaticus* (Common Field Mouse), and *Apodemus mystacinus* (Broad-toothed Field Mouse). These results support data obtained from the Dead Sea lake levels, which indicate a rise in moist conditions around the 4th-5th century CE; suggesting occurrence of climate change was widespread within the Levant at this time.

Brown, Gary (National Park Service)

[406] *What's in the Oven? Specialized Processing, or Mixed Food Preparation in the Chumash Kitchen*

The distinction between generalized hunter-gatherers and economic specialists has long interested archaeologists reliant on faunal and botanical remains. Resource-processing features provide another line of evidence to address the topic, though specialized facilities do not necessarily imply patterns of specialized subsistence. Chumash inhabitants of the Santa Monica Mountains provide a case in point. Earth ovens interpreted as specialized resource-processing facilities are commonly excavated, yet a mixed economy based on diverse marine and terrestrial wild plant and animal resources enabled a remarkably complex, sedentary non-agricultural society. Data from earth ovens and middens are employed to show how specialized technologies for resource processing can be coordinated within a broad subsistence base capable of supporting social systems that resemble agricultural societies in many respects.

Brughmans, Tom [84] see Graham, Shawn

Brughmans, Tom (Department of Computer and Information Science)

[200] *Off the Beaten Track: Exploring What Lies Outside Paths of Most Frequently Cited Publications in Citation Networks*

Most citation network analysis techniques are designed to identify the main paths of the 'flow of academic influence' through a citation network, or result in a ranking of publications with the highest scores for certain network measures. Although such results are interesting, they are not always particularly surprising. A recent application of citation network techniques to a network of archaeological literature concluded that a literature review will allow one to identify key works and the main paths of influence more rapidly, although intuitively (Brughmans 2013). Citation network techniques were considered particularly useful for their ability to identify communities of scientific practice in very large datasets.

This paper aims to evaluate the ability of citation network analysis techniques applied to large datasets to make non-trivial contributions to a close reading of a corpus of archaeological literature, without the common focus on a handful of well-known authors and publications. It will therefore explore the use of citation network analysis techniques for archaeological publications further, by reviewing methods that highlight features of publications in citation networks other than high citation counts, and evaluating how community detection methods can replace the focus from most-cited papers to the communities within which they emerge.

Bruhns, Tanachy**[85]** *An Examination of Spatial Relationships using GIS data from the Basketmaker Communities Project*

The Basketmaker Communities Project (B.C.P) is a multiyear investigation by Crow Canyon Archaeological Center in Cortez, Colorado of one of the largest Basketmaker III communities known in the central Mesa Verde region. This paper examines a combination of artifact, architectural, and spatial information from 97 sites collected by Woods Canyon Archaeological Consultants and Crow Canyon Archaeological Research Center. By using ESRI's GIS software to analyze (B.C.P) data this study applies exploratory data analysis, statistical spatial analysis, and network analysis to track the demographic and subsistence transformations of the community over the course of the seventh century.

Bruhy, Mark [280] see Egan-Bruhy, Kathryn

Brunclikova, Lenka [321] see Sosna, Daniel

Bruner, Emiliano (CENIEH (Spain))**[33]** *Visuospatial Integration: Perspective in Cognitive Archaeology*

Cognitive archaeology is based on the assumption that behaviors can reveal cognitive capacities, and that archaeology can provide inferences on behaviors. Additional information comes from the fossil record (paleoneurology) and from methods in neuroscience (neuroarchaeology). Visuospatial functions can be investigated from all these perspectives. In archaeology, visuospatial capacity can be investigated in terms of space and geometry according to information on tools, tool use, and space organization. In paleoneurology, changes at the parietal areas have been described in Neandertals and modern humans. In terms of functions, parietal areas have been associated with tool use, eye-hand coordination, simulation, and body-environment integration. Neandertals have been hypothesized to display a mismatch between their neurosomatic organization and their complex culture. The evolution of the modern human brain involved changes probably associated with the precuneus, a medial element integrating visual and body stimuli with memory, largely connected with the prefrontal areas and with the intra-parietal sulcus, which is decisive to coordinate the eye-hand system. Visuospatial functions represent a major interface between brain and environment, and hence are particularly interesting for theories in extended mind. Archaeology supplies different possibilities to investigate visuospatial behaviors, which makes these hypotheses partially testable.

Bruner, Kale [302] see Hatfield, Virginia

Bruner, Kale and Hannah Owens (University of Kansas, Biodiversity Institute)**[302]** *Where's the Cod? Toward a Predictive Model of Prehistoric Land-use and Migration in the Aleutian Islands*

This study explores human/environment interactions in the Aleutian archipelago by pairing eco-niche modeling of cod (*Gadus* sp.), a primary subsistence species, with prehistoric archaeological site distribution using a GIS platform. The distributions of site locations and cod habitat simulated using GARP software at multiple time slices through the Holocene show strong spatial and temporal correlation. Both site location and cod distribution are time transgressive with a pattern of westward expansion across the island chain through the Holocene. These data suggest that ecological resilience was an adaptive strategy practiced throughout the Holocene by hunter-gatherers in the Aleutian Islands. This study highlights the analytical potential of using eco-niches of subsistence species in conjunction with the geographic distribution of resources critical to survival such as fresh water and lithic material in developing predictive models of land-use and for formulating and testing hypotheses about the adaptive strategies of coastal hunter-gatherers.

Bruno, Maria [162] see West, Benjamin

Bruno, Maria (Dickinson College)

[350] *On the Origins of Raised-Field Farming in the Lake Titicaca Basin of the Andes*

One of the most dynamic debates in the archaeology of the Lake Titicaca Basin of the Andes surrounds the appearance and disappearance of raised-field farming. There is now a general consensus that raised-fields were a Formative period indigenous technology that was expanded upon by the Tiwanaku state and that fell out of use, except in small pockets, when the state declined. In this paper, I use ethnographic and archaeological data from the Taraco Peninsula, Bolivia to tackle the rather nebulous issue of how this technology first emerged in the Formative period. I do so by considering the practices associated with raised-field farming in the broader context of Formative period agropastoral taskscape and climatic fluctuations that resulted in frequent lake level changes. A clearer understanding of Formative period raised-field farming will shed new light on the subsequent history of their expansion and abandonment.

Brunson, Katherine [366] see Hartford, Alexis

Brunson, Katherine (UCLA Dept. of Anthropology), Alexis Hartford (Harvard Dept. of Anthropology), Barbara Fash (Harvard Peabody Museum of Archaeology and Ethnology), Hans Bernard (UCLA Cotsen Institute of Archaeology) and Kym Faull (UCLA Dept. of Chemistry and Biochemistry)

[366] *Residue Analysis of Ceramic Vessels from the Copan Sub-Stelae Cache Offerings*

Developing new ways to study collections of archaeological materials housed in storage facilities and museums is a key challenge for the future of archaeological research. Following the contextual re-identification of ceramic objects housed in Copan's Centro Regional de Investigaciones Arqueológicas in 2013-2014, our team performed residue analysis on several objects that were excavated from sub-stela and altar caches at Copan during the 1930s. With their contexts re-established, these vessels hold great potential for understanding the types of offerings made during stela dedicatory rituals. We present preliminary results from a residue analysis project to determine the types of offerings contained within the vessels. Our results provide insight into the various types of ancient Maya ritual drinks and liquids used in ceremonial contexts.

Brunswig, Robert (University of Northern Colorado), James Doerner (University of Northern Colorado) and David Diggs (University of Northern Colorado)

[300] *Multidisciplinary Reconstruction of Interactive Change in Holocene Treeline, Paleoclimate, and High Altitude Hunting Systems in Rocky Mountain National Park, Colorado*

More than eighty high altitude game drives are known along north central Colorado's continental divide, but until recently there has been limited understanding of the interactive effect of cyclical climate and ecosystem change on Holocene alpine tundra hunting systems. University of Northern Colorado researchers, after fifteen years of high altitude archaeological and paleoclimate research, have produced an early phase reconstruction of game drive use and elevation-specific environmental zone shifts from ca. 10,500-600 BP. The reconstruction is based on multidisciplinary data from a continental-divide centered research area of ~47 km² in Rocky Mountain National Park. The area has 70%+ archaeological surface survey coverage, paleoclimate and paleoecology evidence from multiple sediment-cored alpine and subalpine fens, and a tundra ice patch site with 4,300 BP radiocarbon-dated tree remains, the latter showing a 70+ m increase from modern-day treeline.

Bruxelles, Laurent [35] see Goldberg, Paul

Bruzek, Jaroslav (Laboratoire PACEA, UMR 5199, CNRS, Université de Bordeaux, Talence, France), Kevin Salesse (Laboratoire PACEA, UMR 5199, CNRS, Université de B), Petr Velemínský (Department of Anthropology, National Museum, Prague), Pascal Sellier (ArScAn, UMR7041, 21, Université de Paris 10, Nanterre) and Dominique Castex (Laboratoire PACEA, UMR

5199, CNRS, Université de B)**[207]** *Bioarchaeology of a Demographic Crisis in the Baroque Phase of the St. Benedict Cemetery in Prague: A Multidisciplinary Approach*

The new evaluation of the skeletal remains and the archaeological documentation from the Saint Benedict cemetery in Prague is a unique opportunity for a bioarchaeological analysis of past mortality crises. The rescue archaeological excavation (held in 1971) and the first osteological analysis (Hanakova et al., 1988) showed in the Baroque phase V (1635-1786) the presence of several multiple graves (approximately 30 with 190 individuals) and also many other simultaneous individual burials concerning all age classes (N= 272). The initial hypothesis of multiple graves connected to the plague epidemic in 1680 A.D., when the cemetery and the buildings belonged to the Premonstratensian order, has been refuted. This presentation discusses results of a multidisciplinary study of the identity of the people buried in multiple individual graves after 1635 A.D. More specifically, the investigation of historical events, the osteobiographic indicators from the skeletons, the stable isotope analysis and the direct radiocarbon dating are used to elucidate the origin of the buried individuals. The study highlights the pitfall of considering all buried individuals as one unit for further anthropological analysis as well as bioarchaeological interpretation. This contribution was supported by the project Barrande – Mobility, 7AMB13FR012.

Bryan, Adrienne (University of California, Los Angeles) and Lisl Schoepflin (University of California, Los Angeles)**[247]** *The Study of an Inca Huaca in a Modern Context*

What happens when two imperial ideologies collide? How and why do indigenous objects of worship continue to be sacred 500 years after that collision? After defeating the Inca, the Spaniards during the late sixteenth and seventeenth century attempted to eradicate Inca religion and its influences from the indigenous memory during the famous extirpation of idolatry. While conversion to Christianity was largely successful, it also initiated a process of fusion as Andean elements subtly integrated with Western religious art and ceremonies. Our paper aims to refine and understand the nature of Spanish and Andean syncretism by considering an unnamed huaca, or an Inca sacred object that is still worshipped inside Cuzco's cathedral in Peru as a case study. Through data from the Chronicles and other documents, we reconstruct the history of this Inca sacred stone and the dynamic process of Andean syncretism since the Spanish invasion. Overall, this poster will sharpen the idea of what a huaca is, how this definition changed over time, and shed necessary light on an important process of transition in Andean culture. As such, it will allow us to identify the emergence of a new heteroglossic identity in Spanish and modern Peru.

Bryson, Robert (National Park Service)**[29]** *Discussant***Brzezinski, Jeffrey (University of Colorado at Boulder), Arthur Joyce (University of Colorado at Boulder) and Sarah Barber (University of Central Florida)****[249]** *Embedded Rituals: Examining Caching Practices in Public Buildings at Cerro de la Virgen, Oaxaca, Mexico*

Examining the construction and use of public spaces in precolumbian Mesoamerica has been productive in revealing the ways in which people constituted local communities. As settings for activities such as feasting, cemetery burial, and caching ceremonies, public buildings brought together living people, ancestors, divinities and religious objects through practices that reproduced local histories and identities. Recent research on the Pacific coast of Oaxaca, Mexico has focused on the public, ceremonial precincts of several sites in the lower Río Verde Valley, where a complex polity emerged during the Terminal Formative period (150 B.C. – A.D. 250). In this paper, we examine variation in caching practices between two adjacent public building complexes at Cerro de la Virgen, a secondary political center in the region's hinterland. Excavations in a restricted public building exposed a bundled cache of elaborately carved stone objects as well as 75 ceramic vessels interred in successive layers of construction fill. In an adjacent, more accessible complex, people placed 260 ceramic vessels in stone slab compartments beneath the surface of a patio. We argue

that the contrast between the ritual assemblages indexes the social negotiations that occurred between people of varying status positions at the end of the Formative period.

Buchanan, Meghan [3] see Thomas, Jayne-Leigh

Buchanan, Briggs (University of Tulsa), Mark Collard (Simon Fraser University) and Michael O'Brien (University of Missouri)

[191] *Investigating Drivers of Technological Richness among Contact-Period Western North American Farmers*

Building on several previous studies we investigate the factors that influence technological richness in nonindustrial farming groups. A number of studies have shown that the factors that influence technological richness and complexity in hunter-gatherer groups differ from the factors that influence farming populations. Specifically, environmental risk is the primary driver in hunter-gatherer technological richness and complexity, whereas population size seems to be the main driver for farmers. Here, we focus on variation in technological richness (total number of material items and techniques) among 37 contact-period nonindustrial farming groups from western North America and test two hypotheses: (1) technological richness is affected by environmental risk (proxies include species richness, annual average precipitation, and average January temperature) and (2) population size is the primary determinant of technological richness. We found technological richness to be negatively correlated with population size and species richness. Additional analyses controlling for shared history confirm these results. Thus, in contrast to previous empirical findings, the primary driver of technological richness of farming groups in western North America is consistent with the environmental risk hypothesis and not consistent with the population size hypothesis.

Buchanan, Meghan (Indiana University)

[289] *Absences and Abandonments in the Mississippian Midwest*

Archaeological studies of hypothesized regional abandonments often perform what Tim Ingold (2008) refers to as "a logic of inversion;" by drawing lines around sites, regions, and spaces we create boundaries in which life is lived, and by extension, create spaces where life is not lived. In examples of abandonments, the absence of evidence related to human living spaces is taken as the absence of (human) life. In other words, when we demarcate "abandoned" or "unoccupied spaces" (noted as such by a lack of material culture), do we unnecessarily exclude spaces where life was lived? Drawing on Mississippian Period archaeological data (and lack of data) from portions of the Mississippi River valley, I discuss how identifying certain spaces as abandoned/vacant and others as occupied have an impact on our interpretations of regional interactions and the big histories of the midcontinental US.

Buck, Paul (Nevada State College/Desert Research Institute) and Donald Sabol (Desert Research Institute)

[8] *Sub-Pixel Detection of Obsidian at Glass Mountain Site Using NASA Satellite and Aircraft Data*

We examine the detectability of sub-pixel artifacts (i.e. site midden, obsidian artifacts, and pottery sherds) using airborne and spaceborne image data. This poster focuses on research conducted to date at the Glass Mountain Site in northern California. This large obsidian quarry area has been investigated winter 2014 and again during the height of vegetation growth 2014. Visible, SWIR, and TIR spectral characteristics of targets and background were measured in the field. A spectral library has been constructed from ~100 target and background samples. The average density of obsidian per m² has been calculated for ~10 8 x 8 m squares. Image data include: NASA's MODIS/ASTER airborne simulator (MASTER) imaging system, the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS), and the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER). Our objectives are to: 1) test the detection limits of obsidian artifacts at the sub-pixel scale; 2) examine the influence of background, seasonal vegetation change and other on-site changes have for the detectability of obsidian, 3) establish the instrumentation, spatial scale, and spectral bands needed to improve the detectability, and 4) test predictions of new locations for obsidian artifacts at specific (spatial) densities in other image scenes and ground truth these predictions.

Buck, Laura (Natural History Museum, London), J. Colette Berbesque (University of Roehampton, UK), Brian Wood (Yale University, USA) and Chris Stringer (Natural History Museum, London)

[415] *An Extant Example of Warm-Climate Forager Gastrophagy and Its Implications for Extinct Hominin Diets*

Accounts of gastrophagy (consumption of prey stomach material) are widespread in ethnography. The practice is recorded from different latitudes, subsistence strategies and with a wide variety of prey; however, many such reports are anecdotal. Conversely, where recent authors mention gastrophagy it is typically marginal to their main research. Little is therefore known about the frequency, seasonality, demographic factors, species composition, and relative dietary contribution of gastrophagy and the true importance of the behavior remains uncertain. Here we discuss the parameters of gastrophagy in a group of contemporary foragers (the Hadza of Tanzania) in order to put it into context. We then consider the implications of gastrophagy in hominin evolution. Given its obvious benefits to cold-adapted recent *H. sapiens*, gastrophagy may explain evidence of 'non-nutritional' plants found in Neanderthals calculus. As gastrophagy also occurs in warm climate foragers, such as the Hadza, we consider its practice in earlier hominins inhabiting tropical climates. If gastrophagy occurred at a significant level, plant remains from their (hunted or scavenged) prey could potentially confound hominin dietary interpretations based on tooth wear, calculus, lithic residues, and isotope analyses. A case in point could be the seemingly surprising evidence for bark consumption in *A. sediba*.

Buckberry, Jo [299] see Wilson, Andrew

Buckley-Yost, Gina

[136] *Noah's Ark: The Temptation of Media*

Genesis tells us a story about a man cast out by God to build an ark during a great storm sent to cleanse the earth of all that was corrupt. "Noah's Ark" is a biblical narrative that has captured the attention of people, both religious and agnostic, for hundreds of years. Hollywood producers, recognizing an enduring tale of destruction and rebirth, have spent decades recreating this story, most recently in the 2014 blockbuster "Noah" starring Russell Crowe. Additionally, renewed interest among the news media was cultivated in recent years concerning the findings of a deep-sea expedition led by archaeologist Robert Ballard. Here, Ballard recovered an ancient shoreline in the Black Sea along the coastline of Turkey, close to Mount Ararat where Noah's Ark is believed to have rested after the great flood. Focusing on Ballard's approach to the media attention derived from his research, alongside an analysis of several published works on the same topic, this article examines the ways in which the media has interpreted the work of archaeologists over several decades. Further, this article investigates the relationship between archaeologists and the media and comments on the reluctance that some professionals may feel towards the world of journalism.

Buckmaster, Marla [280] see Demel, Scott

Budar, Lourdes (Universidad Veracruzana)

[144] *Prehispanic Sculpture from Matacanela*

This presentation offers a historiographic review of investigations that have documented and interpreted the stone monuments from the archaeological site of Matacanela, located in the Tuxtlas Mountains of southern Veracruz, Mexico. This study is designed to reconstruct the possible spatial location of these sculptures in an effort to improve our understanding of their original on-site contexts. In addition, the Matacanela sculptural corpus will be compared with the monuments and stylistic traditions documented at other regional sites along the Mexican Gulf lowlands in order to understand better the site's temporal and cultural contexts. Ultimately, this paper seeks to generate additional lines of evidence that will complement other recent studies undertaken at the site.

Bueno, Lucas (Universidade Federal de Santa Catarina) and Myrtle Shock (Universidade Federal do oeste do Pará)

[157] *Technology, Subsistence and Territoriality: Changing Patterns in the Middle to Late Holocene on the Central Brazilian Plateau*

During the middle to late Holocene a series of archaeological sites in central-north Minas Gerais state, located in the southwest of the Central Brazilian Plateau, show contexts marked by the presence of an expedient lithic technology, no pottery, human burials and structures made of botanical remains. These structures contained domesticated plants, such as maize, manioc, cotton, bottle gourd, squash, peanut and native plants, such as palm nuts, passion fruit, jatobá, umbu and pequi. In this presentation we argue that this context is intimately related to a process of changing territoriality that took place in Central Brazil during the mid-Holocene, which is closely related to paleoenvironmental changes that marked the archaeological record during this period.

Bueno, Marilyn (California State University, Los Angeles), Ann Scott (ACI Consulting), Melanie Saldaña (California State University, Los Angeles) and Jocelyn Acosta (California State University, Los Angeles)

[355] *Some Methodological Problems with the Study of Non-Urban Caves in Northern Belize*

Cave archaeology in northern Belize is poorly developed because the soft dolomitic limestone does not permit the formation of large and impressive caves. Several studies of small caves associated with public architecture have been conducted within the Rio Bravo Conservation Management Area, Orange Walk District, Belize. These studies suggest that caves played much the same role in the sacred geography that has been documented elsewhere in the Maya area. Nevertheless, there are no systematic surveys analogous to those conducted in central Belize and the Peten. The California State University, Los Angeles Cave Research Project initiated a survey of several caves located considerable distance from site cores to fill the informational void on such features. The initial survey highlights a number of methodological problems in dealing with such caves and suggests how these problems might be addressed.

Buffington, Abigail [162] see Smith, Madeleine

Buhay, Bill [313] see Peros, Matthew

Buhay, Bill (University of Winnipeg), Yadira Chinique de Armas (University of Havana), Mirjana Roksandic (University of Winnipeg), Roberto Rodriguez Suarez (University of Havana) and David Smith (University of Toronto)

[313] *Bayesian Probability Weaning Age Estimates of Sub-Adults from Canimar Abajo, Cuba*

Bone collagen from thirty-two sub-adults (between 0 and 5 years old) and eighteen adult females, excavated from two cemeteries at Canimar Abajo, Cuba (occupied between 1130±110 B.C.E. and 580±120 CE) were analyzed for carbon and nitrogen isotopic compositions and then used in two open source Bayesian probability mixing models (Stable Isotope analysis in R, SIAR; Weaning Age Reconstruction with Nitrogen isotopes, WARN) to estimate weaning ages. The weaning age estimates are complimentary between the two models averaging approximately 2 years of age. This estimate is consistent with other pre-historic weaning age estimates in and around the Caribbean.

Buikstra, Jane (Arizona State University)

[384] *Paleopathology and the History of Tuberculosis: New Results from Ancient South America*

This paper will first examine skeletal evidence for disseminated TB in the Americas prior to the Era of Exploration. We then consider this American tuberculosis in the context of traditional models and more recent molecular evolutionary models based on contemporary Mycobacterium tuberculosis complex strain variation. The most parsimonious current global history for TB places its origin in Africa, then spreading to South and Southeast Asia. Subsequent dispersal to Europe and increased virulence characterized the pathogen carried around the globe in the 15th century, which continues to plague 21st century global health. Both the older and more recent models for the history and co-evolution of our species and Mycobacterium tuberculosis have, however, largely ignored the

American expression. In this comprehensive study of the Western Hemisphere examples of skeletal TB2, we screened 68 pre- and post-contact individuals for five genes. Three of the 68 samples, all from the Chiribaya culture of southern Perú, show convincing molecular evidence of TB. Surprisingly, these South American forms are most closely related to those affecting seals and sea lions. Still to be assessed is ancient North American TB, which may have originated in eastern Asia or South America or from an animal vector.

[299] *Discussant*

[384] *Chair*

Buikstra, Jane [331] see King, Jason

Builes, Alexander

[250] *Inferring the Functionality of Three Prehistoric Structures in Rio Blanco Ecuador*

The Manteño culture is associated with the integration period, which is the latest precolumbian phase in coastal Ecuador. Much of what is known about the Manteño is the U shaped seats that were used by the elites in ceremonies; however, there is a paucity of information on the function of Manteño structures. With the support of Florida Atlantic University I conducted a survey of sixteen structures in Rio Blanco, Ecuador. Of the sixteen sites I performed shovel tests on three of the sites that have been previously registered by Angelo Constantine, an Ecuadorian archaeologist. All of the structures had a rectangular design. After I tested the three structures, I analyzed the ceramics hoping to delineate the form and function of the vessels. The majority of my data was based on the ceramics that were recovered from the inside and the outside of the structures. Using a methodology established by Mester (1990), preliminary results indicate that the smaller structures contained considerably more ceramics than the larger structures, which may imply different uses for the different structures. With this data, we can shed more light on the functions of these structures and learn more about the political structure of the Manteño.

Bulbeck, David [407] see De Boer, Deanna

Bulger, Teresa (WSA Archaeological Consultants)

[416] *Poverty, Motherhood, and Childhood in 19th-Century San Francisco*

Popular images of the maritime industry in places like San Francisco's Yerba Buena Cove often focus on men — whether working on docks or ships, or on land at iron works and carpenter's shops. Less visible in the historical record of these spaces are the women and children also living, and often working, along the waterfront. Historical research on the neighborhood that bordered Yerba Buena Cove in the late-19th-century suggests that most residences were occupied by families, rather than by single men. This paper will examine the experiences of mothers and children within households along the 19th-century shoreline of Yerba Buena Cove where poverty, hard work, and poor living conditions were the reality of everyday life. Domestic assemblages from William Self Associates' 2013 excavations at Block 6 and 201 Folsom Street will be used to address these questions.

Bulhusen Munoz, Karim [156] see Feria Cuevas, Alfredo

Bullion, Elissa (Washington University in St. Louis) and Jason King (Center for American Archeology, Kampsville, IL)

[359] *Relatedness and Social Organization at the Ray Site (11BR104): Biological Distance Analysis of a Middle Woodland Ridge Top Cemetery*

A considerable number of biodistance studies have been conducted on archaeological populations from the Lower Illinois Valley. Many of these have included groups of remains dating to the Middle Woodland Period (50B.C.E. to 400CE), a period which has in the past gained attention for the elaboration of burial mound complexes, intensification of horticulture, as well as proliferation of "exotic" and intricately crafted artifacts. In the Lower Illinois Valley, this period is also characterized by the expansion of populations into previously uninhabited valleys. Questions of population

expansion and genetic diversity have been explored at many sites in this region and time period, most focusing on non-metric trait analyses. In this study, a cemetery population from the Ray Site is reanalyzed with regards to biological distance in order to explore how it compares to other sites in the region in terms of intra-site levels of genetic diversity, male vs. female genetic diversity, and diversity between spatial burial clusters. Our results suggest a distinct genetic identity for this population compared to other Lower Illinois Valley sites. By combining biological distance analyses with spatial and material analyses, we also explore questions of social organization and residency patterns.

Bullock, Seth [84] see Romanowska, Iza

Buonasera, Tammy (University of Arizona), Jelmer Eerkens (University of California, Davis), Dani Nadel (Zinman Institute of Archaeology, University of Hai), Amanda Castaneda (Texas State University) and Steve Black (Texas State University)

[342] *Residues of Ancient Food Preparation in Sheltered Bedrock Features*

Recent analysis of bedrock features located in several dry rock shelters across the arid western U.S. indicate that such settings provide favorable contexts for organic residue preservation. Residues extracted from these contexts can provide a unique window into past functions and resource use. Gas chromatography / mass spectrometry (GC/MS) was used to identify and quantify very small amounts of lipids absorbed and preserved in the various bedrock features. Though organic residue studies are increasingly used to identify the use and processing of various plant and animal products in prehistory, investigations of lipid preservation in ground stone artifacts remain scarce. One reason for this situation is the expectation of poor preservation in ground stone artifacts. Dry rock shelters in the arid western U.S. are known to provide exceptional preservation for a range of organic artifacts and ecofacts and offer likely settings to encounter lipid residues from ancient food processing. Bedrock features in these contexts may provide additional benefits by retaining products typically leached away in open sites. The interpretive potential of absorbed organic residues from these contexts will be discussed and methods for sampling these types of features in the field will be described.

Burant, Eric

[301] *What's in a Grave?: A Preliminary Analysis of Material Culture from the Milwaukee County Institution Grounds Cemetery*

The Milwaukee County Institution Grounds (MCIG) Cemetery is located in Wauwatosa, Wisconsin. This historic cemetery was in use from 1878 to 1974 and interred Milwaukee County's indigent. The individuals represented consist mostly of poor European immigrants, subsequent generations, institutionalized residents, and the unclaimed deceased. The material culture associated with the 2013 MCIG cemetery excavations recovered from 685 individual graves, was stabilized, inventoried and accessioned. Conservation techniques were implemented for various material and artifact types, including the use of electrolysis on metal objects. A general chronology based on artifact variation firmly anchors the population within the social and historical context of the cemetery. Moreover, material culture associated with the spatial interpretation represented by individual burials and variation within burial treatment when supplemented with historical documentation can provide temporally sensitive data that can be used to identify individual burials.

Burchard, Esteban [313] see Martinez-Cruzado, Juan

Burger, Richard (Yale University)

[78] *Discussant*

Burger, Paul [151] see Neff, Hector

Burgess, Hunter (University of California Santa Cruz) and Judith Habicht-Mauche (University of California Santa Cruz)**[274]** *Connecting Tijeras Pueblo: Identifying Utility Ware Communities of Practice*

This poster summarizes data on Southwestern utility wares from Tijeras Pueblo (LA 581), a fourteenth century village site in the Central Rio Grande region of New Mexico. Attributes such as paste color, vessel form, and surface modification were analyzed in order to characterize utility ware "communities of practice" at Tijeras Pueblo. Furthermore our research seeks to compare these aspects of utility ware form, style and production methods with those from adjacent areas of the Rio Grande as well as the Western Pueblo region, including the Zuni area, the Upper Little Colorado, and Mogollon Rim. These data show some unique characteristics and trends not seen in surrounding settlements, which raise questions regarding the identity and origin of utility ware potters at Tijeras and their relationship to other contemporary Southwestern populations.

Burgin, Leah [83] see Mudar, Karen

Burgos, Walter (USAC)**[183]** *Entorno a la sal y el agua: Los conjuntos residenciales en el sitio Salinas de los Nueve Cerros, Guatemala*

Salinas de los Nueve Cerros was a large Prehispanic center located at the edge of the Maya lowlands. It was founded atop the only non-coastal salt source in the lowlands and because of this was one of the most important cities during the Classic period. The site covered an area of over 30 km² with an occupation that spanned the Middle Preclassic (ca. 800 B.C.) through the Postclassic (ca. A.D. 1200). Previous archaeological projects focused on salt production in the site core, while the present investigation has been mapping and excavating multiple neighborhoods throughout the site since 2010. Excavations reveal a long history of occupation, production, and exchange of a variety of goods beyond salt, including greenstone, ceramics, and obsidian. This talk will focus on the excavation of three households in different neighborhoods of the city, which have augmented our understanding of site cohesion and the degree of involvement of diverse residents in varying economic activities.

[183] *Chair*

Burgos, Walter [183] see Barrios, Edy

Burham, Melissa (University of Arizona)**[266]** *Out With The Old and In With The New: The Termination and Reoccupation of Outlying Temples at Ceibal, Guatemala*

Recent research in outlying residential groups at Ceibal, Guatemala has contributed to our understanding of ritual practices carried out by different segments of society. More specifically, the termination of minor temples located in the peripheries of Ceibal reveals information about ritual destruction and reutilization of ceremonial buildings in the Maya area. At the end of the Protoclassic period (ca. A.D. 1-225), many temples in outlying residential groups were completely buried and the nearby domestic buildings were deserted. Following this apparent abandonment of the peripheries, the occupation of Ceibal was limited to the site core, and the city was abandoned at the end of the Early Classic (ca. A.D. 225-450). This practice of terminating the outlying temples appears to have been important to the process of abandonment of the site between A.D. 450 and A.D. 600. During the Late Classic (ca. A.D. 600-830) and Terminal Classic (ca. A.D. 830-950), many residential groups were reoccupied and the local temples were reused in a different manner, but often not rebuilt. More broadly, this research provides pertinent information about termination rites, the relationships between the cores and peripheries of lowland Maya centers, and settlement patterns in the Petexbatun region.

[266] *Chair*

Burjachs, Francesc [74] see Fernandez-Lopez De Pablo, Javier

Burke, Clare (University of Sheffield Department of Archaeology), Peter Day (University of Sheffield Department of Archaeology), Eva Alram-Stern (Institute for Oriental and European Archaeology, A) and Katie Demakopoulou (Hellenic Ministry of Culture and Sport, Greece)

[79] *Crafting Choices: Neolithic – Early Helladic II Ceramic Production and Distribution, Midea, Mainland Greece*

Forming part of a broader program of macroscopic, petrographic, SEM, and NAA analysis of ceramics from Mainland Greece, this paper focuses on the Late Neolithic to Early Bronze II sequence at the site of Midea in the Argolid. Through investigating the technological variability present at Midea, our results suggest significant differences, and continuity, in technological choices over time. Most notable is the decline of grog temper between the Final Neolithic and Early Bronze Age periods. This is accompanied by the increased dominance of a sandstone-low grade metamorphic fabric believed to originate in the area around Asine but which appears to have been widely distributed throughout the NE Peloponnese. These results indicate a fundamental shift in the way potters approached their craft between the end of the Neolithic and the early stages of the Bronze Age. Significant changes not only in specific technological choices but also in the scale of production and exchange, suggest the emergence of particular production areas and increased interaction between communities over time.

Burke, Chrissina (Northern Arizona University)

[87] *Bison Killsites and Carnivore Utilization: A Discussion of Prehistoric Human Impacts to Scavenging Carnivores and the Implications for Conservation Management*

Zooarchaeologists have commonly employed analyses concerning only site formation processes when studying carnivore modification and utilization to North American faunal assemblages. Yet, such processes are rarely discussed beyond descriptions of the presence of tooth marks or overall percentages of elements with modifications. Additionally, limited discussion has occurred with regards to the implications of these data on how humans and carnivores interacted in the past. In this paper, I address this deficit with the results of a study in which I analyzed eight bison bonebeds from Wyoming and Colorado for degree of carnivore utilization and identification of the carnivores responsible for utilization. These data are discussed in the context of human-carnivore relationships to explore how understanding the degree of carnivore utilization in zooarchaeological assemblages can assist with creating a holistic perspective on the connections between humans and the environment for future applications to conservation management.

[87] *Chair*

Burke, Adam

[185] *Determining the Provenance of Suwannee Chert: A PXRF and Microscopic Analyses Case Study from Northwest Florida*

This work presents results on the use of microscopic and PXRF analyses for determining Suwannee chert provenance. Traditionally, analysis of the diagnostic microfossils, fabric, and inclusions in Florida cherts has allowed for successful sourcing of lithic raw materials to a distinct quarry cluster within a specific limestone formation. Instrument analysis has not been pursued due to its prohibitive cost, and trace-elemental analysis has been discouraged because of the inherent difficulty associated with recognizing geochemical signatures across formations as a whole. Recent research has suggested that instrument analysis in combination with microscopic analysis may allow for more discrete provenance determinations for Florida cherts. A new multi-technique approach is proposed for Florida provenance studies, and new standards for microscopic analysis attributes, adequate sample size and harvesting strategies, and statistical and graphical analyses are presented. A PXRF and microscopic analysis of chert from the Wacissa quarry cluster in northwest Florida serves as a case study for developing and testing the benefits and drawbacks of a new methodology. The potential for narrowing the source ascriptions of Florida cherts is high, and by reevaluating the techniques equipped in current provenance studies, sourcing cherts to smaller geographic areas within the established quarry clusters may be possible.

Burke, Adrian [185] see Driscoll, Killian

Burkholder, Jo (University of Wisconsin - Whitewater)

[269] *Teaching on the Down-Low: Presenting Queer Theory to a Broad Audience*

Because we so often think about archaeological theory as something for "advanced" students, and gender and queer theory still regularly get little 'air-time' in most courses, it is unusual to introduce students to these perspectives at the level of general education and introductory course work. Personal experience in teaching Archaeology of Gender in two religiously conservative states - Kentucky and Wisconsin - over the last 15 years suggests that there are ways in which we can move students to a place where the construction of gender systems and heteronormativity can be actively, if not openly, critiqued. This paper will present two case studies that explore the ways in which presenting aspects Queer Theory in 'non-threatening' ways benefits students - regardless of sexual identity. In turn, it looks at examples of how this kind of teaching has had an impact on my own thinking about archaeological practice and interpretation.

[71] *Discussant*

Burley, David

[77] *Paleo-sea levels, Bill Dickinson, and Interpretive Modeling for the Lapita Settlement of Fanga 'Uta Lagoon, Kingdom of Tonga*

In the 1990's, and subsequently, Bill Dickinson carried out widespread survey of paleo-shoreline indicators throughout the Kingdom of Tonga, these providing context for initial Lapita settlement of the archipelago. His research on Fanga 'Uta lagoon on the island of Tongatapu has proven essential to interpretations of a 3000 BP landscape considerably different than the mangrove fringed shoreline existing today. Recent archaeological studies support and refine Dickinson's model, providing additional insight into the processes of Lapita colonization on the island of Tongatapu.

[77] *Chair*

Burnett, Paul [361] see Phillips, Scott

Burnett, Katherine (Fort Irwin), Armando Abeyta (Fort Irwin) and Amber Fankhauser (Fort Irwin)

[392] *Legacies of Movement and Land Use in the Mojave Desert: An Intensive Study of Two Multi-Component Sites at Fort Irwin, San Bernardino County, California*

Fort Irwin is a United States Army installation located approximately 37 miles northeast of Barstow in San Bernardino County, California. Covering an area of 1,193 square miles, Fort Irwin is roughly the size of Rhode Island. This large installation has a wide variety of archaeological resources, including two large, multi-component sites that were re-recorded by the Fort Irwin Cultural Resources Program in 2014. Bitter Spring (CA-SBR-2659/H) is a National Register of Historic Places (NRHP) listed site in the southeastern corner of Fort Irwin, and Drinkwater Spring (CA-SBR-3831/H) is an NRHP eligible site in the north-central portion of Fort Irwin. These sites have yielded evidence of extensive periods of use, yet they contain different archaeological resources, particularly in their historic components. Diverse uses of desert resources across the Mojave were influenced by several factors such as traditional Native American interaction networks, European migration routes, and mining activities. This paper will explore Bitter Spring and Drinkwater Spring as important stopping points for regional networks and will discuss variations between the assemblages as they relate to the different ways people moved across the landscape in these areas of Fort Irwin.

[392] *Chair*

Burnette, Benrita [239] see Ferguson, T. J.

Burnette-Egan, Polly (University of Michigan-Dearborn)

[54] *Middle Bronze Age Animal Economies: Transitions at Pecica Santul Mare (Romania)*

The Bronze Age is a period of fundamental social and technological changes in Europe, including the emergence of more complex political and economic systems. Pecica "Șanțul Mare," a large tell located in the Carpathian Basin (Romania), provides an ideal case study of economic reorganization throughout the course of the Middle Bronze Age (MBA), when it came to rise as a regional center. The Middle Bronze Age was an era of more centralized control over animal production and specialized horse breeding. This new study seeks to understand the period prior to its regional dominance. I analyze the faunal assemblage of the earliest settlement layers of the MBA occupation (1900-1850 B.C.E.). The animal economy from this transitional period forms the foundation for the suite of changes occurring the site's apex. The patterns that we see at Pecica can be used as a model for emerging economies in the greater Carpathian region.

Burns, Gregory (University of California, Davis) and Jelmer Eerkens (University of California, Davis)**[114]** *Stable Isotope Sourcing of Olivella Shell Beads from Central California*

Although a temporally diagnostic type artifact, the pre-contact cultural role of Olivella beads is poorly understood for Central California and the San Francisco Bay Area. While important as an item of trade and burial wealth, the nature of Olivella bead origin and conveyance is uncertain. Stable isotope sourcing, using oxygen and carbon from serial sampling shell carbonate, provides a potential to locate where shell was collected for bead production. We document developments in a technique for interpreting seasonal marine isotope signatures along the California coast, and compare sourcing results for beads from possible manufacture, domestic, and funerary assemblages from several Middle and Late Period sites.

[114] *Chair*

Burns, Jonathan [165] see Welker, Martin

Burrillo, Ralph (University of Utah), Michael Lewis (University of Utah) and Joan Coltrain (University of Utah)**[276]** *Oxygen Isotope Variability in Water Sources on the Colorado Plateau: Preliminaries to Stable Isotope Models of Prehistoric Irrigation*

For aboriginal agriculturalists, subsistence strategies are tightly constrained by ecological conditions. The primary carbohydrate staple of prehistoric communities in the American Southwest (*Zea mays*) derives from low-altitude, subtropical conditions in Mesoamerica and is at its environmental limit on the cooler, more arid Colorado Plateau. In areas like Cedar Mesa in southeastern Utah, environmental limitations were addressed by either of two strategies. Dry farming with summer monsoonal precipitation was possible in certain periods, but was subject to variation on a yearly to centennial timescale. Irrigation using local surface water (derived mostly from snowmelt) was also used in limited areas, but required investing in construction and maintenance of irrigation features. Recent experimental work suggests that oxygen isotopes in plant cellulose can be used to distinguish irrigated from dry-farmed cultivars when compared against the isotopic variability of rain- and groundwater in a given region. The purpose of this pilot study was to measure the oxygen isotope values of water sources on Cedar Mesa, and determine whether variability is significant enough that the analysis of cellulose from archaeological maize samples could reasonably identify them as having been irrigated or dry-farmed.

Burtenshaw, Paul (Sustainable Preservation Initiative)**[188]** *State, Local and Individual Perceptions of Archaeology as an Economic Asset*

The perception of archaeological resources as an economic asset is a large factor in the interaction of archaeologists with the public. This perception can pre-exist in the location and stakeholders that archaeologists work with, or alternatively archaeologists may seek to create this perception, seeking new value for cultural heritage in people who might otherwise be disengaged. There are certainly challenges to such perceptions, including the matching of hoped-for economic benefits with the realities and practicalities of the tourism industry, and the difficulties in communicating the 'economic

value' of archaeology. However opportunities also exist including increasing action and funding for preservation, engaging new audiences and bringing sustainable benefits to local communities. Drawing from research on community perceptions in Jordan, the history of 'value' debates in the United Kingdom, and the experiences of the Sustainable Preservation Initiative, this presentation will explore ideas of archaeology as an economic asset in the individual, community and state and how they interact with each other.

Burtenshaw, Julia, Diana Magaloni and Johannes Neurath

[379] *Researching LACMA's Colombian Ceramics*

The study of objects that are without context or provenience, as we most often find in museum collections, is challenging. Focusing on LACMA's collection of Colombian ceramics, this paper will present the results of research carried out by the Program for the Art of the Ancient Americas at LACMA, and examine procedures and outcomes of integrating historical, ethnographic, and archaeological data for interpreting museum objects. Colonial text sources convey a sense of the impression that 16th century Colombia and its inhabitants made on the conquistadors, and in many cases the objects appear to illustrate the same world that the Spaniards described. However the cultural gap was too great for them to appreciate more than a minimal element of indigenous culture, and many let their imaginations run away with them. On the other hand, ethnographic data can illustrate practices and allow us to interpret and consider the symbolic aspects of objects. Studying the collection using a multi-disciplinary approach reveals a story of diversity and time-depth that is not always apparent in each of these strands alone.

Burton, Margie (San Diego Archaeological Center), Patrick Quinn (Institute of Archaeology, University College Londo) and Rhiannon Byrne-Bowles (University of Sheffield)

[310] *Ceramic Distribution, Migration, and Social Interaction at Mine Wash, a Late Prehistoric (1300-200 BP) Seasonal Habitation Site in San Diego County, California*

We selected 40 pottery samples from different levels within three separate excavation units at the site of Mine Wash (CA-SDI-813, 1100-310 BP) in central Anza-Borrego Desert State Park. The composition of these small, undecorated sherds was characterized by a combination of thin section petrography and INAA. This was compared to a now extensive petrographic and geochemical database of ceramics and raw materials from the San Diego region. Our analysis reveals a compositionally diverse assemblage that contains material from several non-local sources in the Colorado Desert to the east and the nearby Peninsular Range mountains to the west. The movement of pottery to Mine Wash is likely to reflect seasonal migration of social groups between different landscape zones along ethnographically-known trails. We consider the correspondence of macroscopic, petrographic, and geochemical classification methods. Additionally, we propose possible explanations for intra-site compositional variation of ceramics across the three excavation units.

Burton, Margie [342] see Nadel, Dani

Burt, Amanda (Indiana University), Laura Scheiber (Indiana University) and Lindsey Simmons (Indiana University)

[361] *Mountain Shoshone Landscape Occupation of Caldwell Basin, Fremont County, Wyoming*

Interpreting the use of mountainous regions by prehistoric and historic hunter-gatherers has been hampered through the years by difficult access, excessive ground vegetation, and wilderness restrictions. Archaeologists have benefited, however, from the regular occurrence of forest fires that burn thousands of acres and expose hundreds of archaeological sites every summer, as our knowledge of campsite structure and landscape use has dramatically improved. We now know that remote campsites often contain tens of thousands of artifacts that represent a greater commitment to mountain resources and places than previously considered. New recording methodologies are now being employed to properly document these sites. In this paper, we describe a second field season's efforts to investigate the Caldwell Creek sites, which were exposed by the Norton Point fire in 2011. In addition to an overwhelming number of lithics, the fire also revealed numerous diagnostic

Mountain Shoshone artifacts, including ceramics, side-notched and un-notched projectile points, and a wide variety of Shoshone knives and bifaces. We discuss increased data sets as well as the results of specialized analyses of ceramic and obsidian sourcing that contribute to the growing knowledge of landscape use in high-altitude environments.

Bush, Dominic and Mark Schurr (University of Notre Dame)

[165] *Faunal Remains at Collier Lodge and Their Implications for Our Understanding of the Lodger Diet*

Since the Collier Lodge Project commenced in 2003, excavations from the Porter County, Indiana site have yielded substantial amounts of faunal remains. The goal of my research is to examine particular collections of remains, which date to the nineteenth century, and construct a clearer picture of life at Collier Lodge. The remains being analyzed offer a unique look at diet and the interaction between fauna and residents of the lodge. Specifically, I am comparing the amount of domesticated faunal remains found against the amount of wild faunal remains found. This comparison will hopefully shed light on how much of each category of fauna constituted the average lodger's diet. I aim to accomplish this through close examination of remains, for such things as cut marks and exposure to fire, as well as comparing remains to previously identified ones in order to decipher species. The wide array of remains from feature contexts will shed light on everyday aspects of life at the lodge and give us a better understanding of this relatively recent addition to the National Register of Historic Places.

Bush, Mark (Florida Institute of Technology)

[186] *Shifting Baselines: Tales of the Unexpected*

A shifted baseline is the intergenerational acceptance of the progressive degradation of a system as reflecting its natural state. Paleoecological analyses have revealed the long-term usage by humans of sites previously thought to be 'pristine'. Analysis of lake sediments in remote areas of Panama and Ecuador revealed unexpected histories of land usage. In Ecuador, Lake Ayauch provided a record of maize agriculture from 6000 years B.P. At Lake Wodehouse, in Panama, a 3300-year long record from an apparently mature forest setting yielded a long history of maize agriculture. In both cases the expectations of little human influence on the environment were falsified. Finding the pre-human baseline may require looking as far back as the early Holocene in the Andes, whereas it may be as recent as 1920 in the Galapagos Islands. Lake Junco, on the Galapagos Island of San Cristobal, was impacted by human activity in the late 1920s, and changes associated with the introduction of grazing animals were evident in the pollen record. What was unexpected in this study was the composition of the flora prior to that disturbance. Fossil pollen evidence pointed to a different natural baseline than was generally described for the highlands of the Galapagos Islands.

Bush, Jessica [230] see Boen, Renee

Bushozi, Pastory [174] see Cole, James

Bustamante, Carlos [116] see Fregel, Rosa

Bustard, Wendy and Dabney Ford (Chaco Culture National Historical Park)

[354] *Windes Was Here*

Documenting field work has been standard archaeological practice for over a century. Long-term preservation and continuing use of those records has been less standard. Tom Windes' documentary record of his work in Chaco Canyon is an example of what best practices can achieve. In particular, Windes developed a style of mapping archaeological sites that has proved invaluable in relocating, monitoring, and maintaining Chaco's World Heritage resources. Standards for archaeological site documentation have changed in the past 45 years, but Windes' keen sense of the cultural landscape and his ability to interpret surface remains has kept his records relevant. Working in a pre-digital era of hand-written and typed field notes, hand-drawn maps, and (mostly) black and

white photography, Windes' legacy is impressive. At least 50 linear feet of his records have been cataloged into the Chaco Museum Collection. Although paper records pose preservation and access challenges, one of their advantages is the personal touch. Handwritten annotations, comments, and artwork can provide information, insight, and sometimes humor. This personal touch can indelibly link archaeologists with their projects in a way that electronic files cannot.

Büster, Lindsey (University of Bradford, UK)

[177] *Broxmouth Biographies: Roundhouses as Mnemonic Devices in Iron Age Scotland*

Broxmouth hillfort in SE Scotland saw continued occupation for almost 800 years (c. cal. 600 B.C.-A.D. 200), during which around 30 generations of inhabitants shaped the settlement and its surroundings. Activity at Broxmouth can be broadly split into six (both enclosed and unenclosed) phases, the last of which (c. cal. 200 B.C.-A.D. 200) is characterized by re-enclosure, and well-preserved roundhouses of timber and stone. The form, fabric and development of the roundhouses over time suggest that these last inhabitants were well aware of the long biography of the site, and made conscious efforts to draw upon and engage with it. This paper will demonstrate how biographical and materiality approaches, coupled with Bayesian modelling of radiocarbon dates, have allowed for the biographies of the roundhouses to be more closely intertwined with those of their inhabitants. This has revealed the central role of roundhouses, and their associated deposits, in the negotiation of past and present at Broxmouth, and in the communication of both household and communal identities.

[177] *Chair*

Butcher, Cheyenne (University of California San Diego), Andrew D. Somerville (University of California San Diego), Ben A. Nelson (Arizona State University) and Margaret J. Schoeninger (University of California San Diego)

[166] *Environmental Reconstruction at La Quemada, Zacateca, Mexico Through Stable Isotope Analysis of Leporid Bones*

Reconstructing the interactions between past environments and the expansion and secession of complex societies plays an important role in our understanding of their social development. Stable isotope analysis of faunal bone is a useful tool in reconstructing past environments and can give insight into the social-environmental dynamics of past civilizations. In this poster we present results from the stable isotope analysis of leporid bones (N=79) excavated from stratified midden deposits in the archaeological site of La Quemada, Zacatecas, Mexico. The results of $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ in bone apatite and $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in collagen were used to create a profile of the local environment and to explore possible temporal changes. Our results suggest significant environmental changes taking place throughout the Epiclassic Period (600-900 A.D.). These results improve our understanding of the cultural history of La Quemada and increase our knowledge of social-environmental dynamics across the northern frontier of Mesoamerica.

Butler, Virginia [168] see Dick, Kristina

Butler, Virginia (Portland State University)

[168] *Use of Integrated Faunal Records from 10-Liter Bucket Samples to Explore Complex Human Ecodynamics at Tse-whit-zen*

On the northern Pacific Coast of North America, animals play an extremely important role in conceptual models related to hunter-gatherer evolution and social dynamics of household production and resource control. Our ability to rigorously apply faunal remains to these models is limited by substantial data requirements including well-documented contexts, high-resolution chronology, control over complex site formation processes and taphonomy, as well as large sample sizes. Unique circumstances led to the 2004 excavation and careful geoarchaeological documentation of the large Native American village of Tse-whit-zen, coastal Washington, USA, occupied from 2000 BP until the early 20th century. Faunal samples were obtained from micro-stratigraphic contexts, providing an opportunity to study fine-grained patterns in animal use in the context of complex environmental and social change. Research thus far has generated over 200,000 identified

specimens obtained from ~5 distinct chronological units and at least three households. The presentation highlights some of the findings thus far.

[168] *Chair*

Buvit, Ian [8] see Urban, Thomas

Buvit, Ian

[319] *Frozen Ground*

Remnants of perennially frozen ground can serve as indicators of past climate changes. Evidence of ground ice like pseudomorphs, or solifluction lobes, for example, has helped us identify cooling events such as the last glacial maximum or the Younger Dryas. Cryogenic activity can also have wide ranging affects on the behavioral context of archaeological sites displacing material from its original location a few millimeters to many meters. Here I illustrate some common types of cryogenic features and provide examples from archaeological sites in southern Siberia and Alaska.

[319] *Chair*

Buynevich, Ilya [387] see Gnivecki, Perry

Buzon, Michele [205] see Schrader, Sarah

Byambaa, Gunchinsuren [53] see Izuho, Masami

Byerly, Ryan [53] see Fitzgerald, Curran

Byerly, Heather (Western Kentucky University), Jean-Luc Houle (Western Kentucky University) and Cheryl Makarewicz (Stable Isotope Laboratory in the Institute for Pre)

[403] *Ritual and Mobility: $\delta^{18}O$ and $\delta^{13}C$ Analyses of Bronze Age Khirigsuur Horses from Khanuuy Valley, Mongolia*

Khirigsuurs are large stone burial and ritual monuments that served as stages for group activities and social negotiation during the Late Bronze Age (c.1300-700 B.C.) in Mongolia. Animal remains were routinely interred in satellite mounds associated with primary burial features, in particular the heads and extremities of horses, and often in great numbers. The question remains, however, whether horses selected for interment in khirigsuur satellites were from local or distant herds. Here, we examine the carbon and oxygen isotopes of incrementally sampled mandibular molars from horse heads ritually deposited in khirigsuur complexes located in Khanuuy Valley. Such isotopic data provide first insights into the complexity of social and political networks involved with khirigsuur construction and maintenance.

Byers, David [35] see Breslawski, Ryan

Byers, David (Utah State University) and Joan Coltrain (University of Utah)

[202] *Bone Carbonate Derived Stable Isotope Data and Aleut Diet Change*

In this poster, we build on an earlier study by using stable isotope data extracted from bone carbonate to evaluate the hypothesis that two behaviorally distinct groups of people, Paleo- and Neo-Aleut, occupied the eastern Aleutians after 1000 BP. This study focuses on directly dated burial assemblages from Chaluka midden, Ship Rock Island and Kagamil Island. We use the SISUS linear mixing model informed by isotopic data from Aleut faunal assemblages to address temporal and spatial variation in Aleut diet. The patterning we report illustrates a transition in both at ca. 1000 BP. Our results suggests that the Chaluka diet, dominated by Paleo-Aleut inhumations, differed in both trophic level and foraging location from the other two sites for much of the past 4000 years. Trends in our data also suggest that individuals from Ship Rock and Kagamil burial caves, primarily Neo-Aleuts, had enough access to higher trophic level foods to differentiate their bone chemistries from

those buried in Chaluka midden. These trends in diet, recently reported genetic differences, as well as the introduction of novel mortuary practices at ca. 1000 BP, suggest that Neo-Aleuts do represent a population new to the eastern Aleutians.

Byers, Patricia

[272] *Using the Anasazi Origins Project Faunal Remains to Determine Archaic Subsistence Patterns*

The purpose of this study is to prevent the loss of important archaeological information by examining a collection of faunal remains from the Anasazi Origins Project (AOP) that have been virtually untouched since their excavation. Re-evaluation of these collections will allow us to identify their research potential, as well as possible cultural significance that was not identified during initial investigations. The collection being examined for this study is the Anasazi Origins Project. Excavated in the 1970s by Cynthia Irwin-Williams, this collection comes from a series of sites in northern New Mexico dating from the Archaic to the Ancestral Pueblo Periods. Only the faunal remains will be analyzed for this study. Once collected, all the faunal data will be gathered and analyzed according to time period. The Archaic faunal data collected from the AOP collection will be analyzed in comparison with other faunal data gathered from the area to identify Archaic Period subsistence patterns. Lastly, all the information gathered during the study will be added to tDar so that it may be used for future research.

Byrd, Rachael [55] see Watson, James

Byrd, Brian (Far Western)

[82] *The Neolithic Houses of California – An Ethnohistoric Comparative Perspective on Household and Community Organization among Complex Hunter-Gatherers*

The talk addresses the built environment of complex hunter-gatherer villages of the contact period in California. Although not agriculturalists, they constitute one of the most diverse and well-documented amalgam of complex hunter-gatherers in the world. The study explores the interrelationship between vernacular architecture, households, community organization, and their socio-economic underpinnings. In doing so, highlighted case studies will include the Chumash of coastal southern California, the Patwin of central California, and the Wintu of northern California. Finally, consideration is given to the potential for ethnohistoric vernacular architecture of California hunter-gatherers to provide insight into fundamental variables in the development of Neolithic households worldwide.

Byrd, Rachael (University of Arizona, Arizona State Museum) and Alice Garcia (University of Arizona, Arizona State Museum)

[273] *Illuminating Identity with Mortuary Features at Slade Ruin (AZ Q:15:1 [ASM]), a Pueblo III Site in East-Central Arizona*

Aggregation characteristic of prehistoric east-central Arizona archaeological sites influenced residential and regional identities during the Pueblo III (1100-1300 A.D.) period. Some aspects of these identities can be explored by focusing on mortuary feature and osteological data. In 1991, a total of 101 burial features were mapped and excavated at Slade Ruin (AZ Q:15:1 [ASM]) located on private land in Eager, Arizona to avoid contamination from a nearby hydrocarbon spill. This cemetery sample provided representative data to test the hypothesis that mortuary behavior and health at Slade Ruin indicates multiple complex identities of adults and fewer identities of infants and children. A preliminary mortuary analysis was conducted by collecting feature variables including burial position, orientation, and artifact association as determined from feature records in addition to osteological variables including age, sex, pathology, and indications of trauma. Results from Spearman correlation and chi-square analyses reveal significant patterns related to the processes of constructing multi-faceted and fluctuating identities in the broader Mogollon region of the Southwest. Abundant ceramic associations, variable body positions and orientations, extensive spinal osteophytosis, and severe dental pathologies indicate developing and changing social and biological identities throughout the life course.

Byrne-Bowles, Rhiannon [310] see Burton, Margie

Byrnes, Allison (Mercyhurst University, Erie, PA), Allen Quinn (Mercyhurst University, Erie, PA) and David Pedler (Mercyhurst University, Erie, PA)

[331] *The Ripley Site Midden: Iroquoian Refuse Disposal in Chautauqua County, Western New York*

The Ripley Site is a Late Woodland through Historic period Iroquoian site overlooking Lake Erie, in the Eastern Lake section of the Central Lowlands physiographic province in western New York. In its continuing investigations of the bluff-top site, Mercyhurst University (Erie, PA) is focusing attention on a presumed refuse midden, where the village's inhabitants cast refuse downslope toward Young's Run, which lies to the east of the village, proper. Here, we define the boundaries of the midden, characterize the materials found therein, and, when possible, compare and contrast the assemblages from the midden and adjacent village.

Cabadas, Héctor [231] see Andrade, Israel

Caballero, Margarita (Lab. Paleolimnología, Instituto de Geofísica, UNAM), Socorro Lozano-Garza (Instituto de Geología, Universidad Nacional Autónoma) and Beatriz Ortega (Instituto de Geofísica, Universidad Nacional Autónoma)

[129] *Trends in Late Holocene Climate Change in Central Mexico*

Lakes in central Mexico are ideal sites for the study of late Holocene climatic trends. These lakes have high sedimentation rates and their sediments are rich in pollen, diatoms and other biological remains that allow reconstructions of past environmental, ecological and climatic changes. In these lakes, precipitation, concentrated during the summer months, is frequently more important than temperature as a long-term environmental control; however, both variables are connected by climatic mechanisms. We present a review of late Holocene lake records from central Mexico that show climatic variability, its impact on tropical ecosystems and document human impact in this culturally rich region. In these records the main climatic trends that can be identified are: 1) a trend to dry conditions during the Classic, particularly the late Classic (A.D. 600 to 900), 2) Relatively moist conditions during the late Post-Classic (Ad 1200-1400) and 3) colder Little Ice Age, with two dry phases that follow the Spörer and Mounder solar minima (1400 - 1560 and 1650 - 1750).

Cabana, Graciela [204] see Pack, Frankie

Cabanes, Dan [53] see Wroth, Kristen

Cabello, Erika [134] see Serrudo, Eberth

Cadeddu, Francesca

[417] *Settlement Strategies and Environmental Features in the Sardinian Bronze Age: a Remote Sensing Approach*

In this paper, we provide a remote sensing approach for the analysis of the settlement patterns of the Nuragic civilization, using data from Landsat 7 ETM+ in a sample area of Sardinia (Gallura). By evaluating archaeological and geological data through remote sensing imagery, we outline a territorial characterization to identify patterns in the settlement choices of the Bronze Age communities, through the use of Geographic Information Systems and Spatial Statistical Analysis. This method reveals new aspects in the settlement strategies and shows how, and to what extent, an integrated approach can shed new light on different facets of the Nuragic civilization, a long-lasting culture that existed in Sardinia (Italy) from the Middle Bronze Age (ca. 1600 B.C) to the early Iron age (ca. 800 B.C.). With the use of the Earth Observation (EO) methodologies and the GIS platform, we reconstruct, with a high level of precision, the geomorphology of the examined area and analyze the spatial statistical relationship between Nuragic settlements and environmental features. As a result we identify a different settlement strategy for the Nuragic civilization in Gallura, in spite of the

otherwise similar traits of this civilization throughout Sardinia.

Cadena, Bibiana and Meggan Bullock (Escuela Nacional de Antropología e Historia)

[393] *Indigenous Testimony to the Conquest of Mexico: An Osteological Analysis of Violence in Contact-period San Gregorio Atlapulco, Xochimilco*

While ethnohistoric documents offer insights into the physical and structural violence that accompanied the Spanish conquest of Mexico, these accounts are typically written from the perspective of the conquerors. Few native testimonies exist that provide an indigenous perspective of this period of social, economic, and political upheaval; however, human skeletal remains offer a means of directly evaluating the violence of the Conquest and its impact on the native population. The archaeological site of El Japón in San Gregorio Atlapulco, Xochimilco was the subject of an archaeological salvage project in the 1990s in which 389 burials were excavated. Archaeological data clearly date these skeletons to the decades following the Conquest. An osteological study of violence in the skeletal sample, which incorporated archaeological, paleodemographic, and paleopathological data, as well as detailed analyses of perimortem trauma, indicates that a large number of individuals of both sexes and all ages died in a massacre of the population. Cranial trauma and defensive wounds are frequent in the sample as is evidence of decapitation, dismemberment, and defleshing. The appearance and patterning of these traumatic lesions suggest that both Europeans and indigenous individuals participated in the violence against the inhabitants of San Gregorio Atlapulco.

Cagnato, Clarissa (Washington University in St. Louis), Olivia Navarro-Farr (The College of Wooster), Griselda Pérez (Proyecto Arqueológico El Perú-Waka') and Damaris Menéndez (Proyecto Arqueológico El Perú-Waka')

[338] *Feeding the Gods, Calling the Rains: Archaeobotanical Remains from a Monumental Fire Shrine at El Perú-Waka', Guatemala*

The discovery of a fire shrine atop the adosada of Structure M13-1 at El Perú-Waka' supports the archaeological and epigraphic records which have at various places in the Maya region (including Waka') made reference to the arrival in A.D. 378 of Siyaj K'ak'. This event resulted in the introduction of the fire shrine cult, glossed as Wite Naah in Mayan, from Teotihuacan to the Maya Lowlands. M13-1's cal A.D. 7th century fire shrine is the final phase of the main temple's fronting platform. Careful collection of soil samples and the subsequent archaeobotanical analysis makes this context unique as no other such fire shrines have been fully sampled for plant remains. These new data provide additional avenues for exploring rituals carried out at these fire shrines. The plant remains, understood as offerings to the gods, include wood, diverse types of seeds, flowers, and incense, and reflect a special concern with themes of fertility, water, and agricultural abundance. This unique deposit provides new insights into the ritual use of plants among the ancient Maya; activities that continue today.

Cai, Yan (University of Pittsburgh)

[52] *Socioeconomic Change in Tikopia Household under the Perspective of Ecological Change*

My analysis provides a picture how socioeconomic organization change in terms of changing ecology. Differences in aggregated artifact assemblages between households and sites in the KS phase have been taken to indicate participation in mutually exclusive economic activities (eg. Wood working, fishing, and animal processing), the products of which were then exchanged for those of other units. In contrast, a weak difference in the proportional composition of economic artifact assemblages between sites indicates that sites were not emphasizing different economic activities. Instead, the significant difference reflected on the social artifact assemblages (eg. Ceramic, ornaments and religious ornaments). This pattern indicates the economic exchange did not appear across the sites, but a growing social differentiation appeared on the island. The pattern of socioeconomic organization is related to the abundance and diversity of resources in the landscape. A declining aggregated artifacts between households and sites in the Tuakamali phase indicates that individual households were considered the central economic decision making, showing a high degree of autonomy among households and sites. The pattern of economic organization resulted in

a decreasing social differentiation. This process was associated with the ecology shift, from diversity of wild resources to concentration of domestic resources.

Cai, Linhai [345] see Wang, Shuzhi

Cail, Hannah [312] see Tifental, Emilia

Cain, Tiffany and Richard Leventhal (University of Pennsylvania)

[218] *Heritage Preservation, Community Development and Sustainability: Tihosuco, Mexico and the Caste War of the Yucatan*

International tourism is a powerful economic force in Mexico today, but usually provides little help to indigenous communities except through a long process of economic trickle-down. In addition, many ancient sites which are the focus of this tourism, are controlled by the nation-state with indigenous peoples often having little say about development or use of the economic benefits. Our recent project in Tihosuco, Quintana Roo is a collaboration between the town of Tihosuco, the Tihosuco Ejido, the local Museo de la Guerra de Castas, and the Penn Cultural Heritage Center. This project focuses upon the local heritage of the rebellion of the mid-19th century called the Caste War of the Yucatan – one of the most successful indigenous rebellions in the Americas. This project is focused upon the following: 1) the local identification of a Maya heritage and identity – tied to the Caste War; 2) the documentation and preservation of this heritage both in the jungle surrounding Tihosuco and in the town itself; 3) the identification and preservation of a series of additional important features including language, historical photographs, oral histories, and other things; 4) the gradual development of a sustainable tourism program, run by the local community.

Caine, Alyson (Durham University)

[380] *The Skeletal Findings from Excavations in the Batinah, Oman*

Background. The presence of limited settlements has limited the understanding of prehistoric occupation in the Arabian Peninsula (Potts 1990). Interest and research of Arabia during the Bronze (3200-1200 B.C.) and Iron Age (1200-400 B.C.) has increased producing a greater understanding of the people from the region and their culture.

Methods. A total of sixty-four tombs were excavated with twenty-seven yielding human remains. These twenty-seven tombs originated from various periods of the Bronze and Iron Age. Each tomb was analyzed independently for demographic information (age and sex) as well as pathological prevalence.

Results. Eight individuals were assessed for age, two non-adults and six adults. Twelve individuals were assessed for sex; six females, four males, and two ambiguous sex. Pathological conditions were identified in fourteen individuals with varying prevalence; dental diseases 9%, new bone formation 14%, osteophyte formation 21%, and metabolic disease 7%.

Discussion. Research on the health and demography of prehistoric Arabian populations can further illuminate the past stories of these regions that are not well understood. Any additional information on the peoples of the past will help with the understanding of health today as well as further elucidate our health history.

Cajigas, Rachel (University of Arizona) and James Watson (Arizona State Museum and the University of Arizona)

[155] *Determining Construction Materials and Soil Formation Processes at a Burial Mound in Northwest Mexico Using Soil Micromorphology*

El Cementerio [SON P:10:8] is a late Ceramic period (cal. A.D. 943-1481) burial mound in Central Sonora, Mexico. The mound was constructed within the floodplain about 300 meters from the eastern bank of the Rio Yaqui. We conducted micromorphology analysis (the microscopic analysis of undisturbed soils and sediments) in order to characterize the nature of the soils and sediments used

to construct the mound. Samples were collected in situ from excavation units across the mound, with their orientation preserved. Thin sections were made and then analyzed with a petrographic microscope. Twenty-one samples were collected from various soil horizons and contacts to determine the construction practices and whether natural soil forming processes have been occurring in the mound. Preliminary assessments suggest that the visible mound stratigraphy is a result of a combination of naturally occurring soil forming processes following the construction of the mound, and an artifact from the soils used to construct the mound. This is significant because certain soils and sediments may have been intentionally selected for construction of the mound.

Calaon, Diego (Marie Curie Fellow, Stanford, US - Ca' Forscari Venezia, I)

[116] *Gis, Heritage and Industrial Archaeology at Aapravasi Ghat*

Between 2010 and 2013 an archaeological excavation was carried out in the warehouse where the Beekrumsing Ramlallah Interpretation Center on Indenture Labour (BRIC) has been set up. In the 19th century, the warehouse was located in the proximity of the "Hospital Block" and nearby the "Immigrants' sheds" of the Immigration Depot. The excavation represented an exceptional opportunity to investigate the topography and the industrial development of a key area of Port Louis. The ceramic, glass and metal assemblages offer a fascinating picture of the material culture of the tropical colonial city between 18th and 20th century. The site was connected with the landing place of the indenture immigrants (as shown in the maps dated 1857) and with the Aapravasi Ghat as a former Immigration Depot. The excavation investigated one of the key area in the Indian Ocean World. The depot's role in social history was also recognized by UNESCO in 2006. The archaeological reconstruction proved that Trou Fanfaron, the area where the building complex is located, was also the landing point for the French East India Company: in the same area slaves were imported and traded from Africa and India.

Calás, Elisa [318] see Ballester, Benjamín

Calhoun, Sis [66] see Gaskell, Sandra

Calla, Sergio [247] see Warren, Matthew

Callaghan, Michael (Southern Methodist University) and Brigitte Kovacevich (Southern Methodist University)

[22] *Investigating the Development of Social Inequality through Preclassic-Period Maya Household Ritual*

In this paper we will discuss how ritual activities in both emergent elite and commoner Maya households contributed to the development of social complexity and hierarchy during the Preclassic period at the site of Holtun, Guatemala. Our working hypothesis at the site is that while certain households successfully manipulated traditional ritual practices and symbols related to political and religious authority, all households would have contributed to the cultural milieu in which the dominant households were able to develop in the Middle and Late Preclassic periods. Through time, non-dominant households may have been excluded from using primary symbols of power, or may have actively sought out new symbols to counteract emergent power. We identify this process through comparison of contexts of ritual activity, and artifacts found within them, in households identified by sub-surface and tunneling excavations. We hope to show that ritual contexts indicate household innovation, support, and active engagement with emergent symbols of power during the Middle Preclassic period. However, ritual activity may diverge during the Late Preclassic, indicating avoidance/independence or possibly even resistance in a movement from solidarity to autonomy among households at the site.

Callow, Christopher (University of Birmingham)

[18] *Diasporas and Identities in the Viking Age*

This paper briefly sets out and analyses recent terminological discussions among archaeologists and

other scholars working on regions influenced and settled by 'vikings' in the Viking Age, c.800-c.1050 CE. 'Diaspora' has, perhaps belatedly, been a term applied to the pattern of social and economic relationships linking some communities across Europe and the North Atlantic. The applicability of the term 'diaspora' or of seeing a series of diasporic communities will be considered alongside the more detailed papers in this session.

[18] *Chair*

Cambra, Rosemary [293] see Leventhal, Alan

Cameron, Catherine (University of Colorado) and Lindsay Johansson (University of Colorado)

[182] *The Biggest Losers: Gambling and Enslavement in Native North America*

This paper explores an apparently common outcome of gambling among the indigenous inhabitants of North America – the enslavement of individuals who wagered themselves (or their family members) and lost. Archaeologists are becoming increasingly aware that slavery was not a post-contact phenomenon, but existed prehistorically in societies operating at a variety of socio-political scales from bands to states (Cameron 2008, 2011, in prep., Kohler and Turner 2006, Koziol 2012). Most captives were taken during raids or warfare, but the ethnographic, ethnohistoric, and historic data we present suggests that gambling could also be a source of slaves. We present accounts of men gambling away children, wives, and eventually themselves, sometimes limb by limb. In some cases these unfortunate people became slaves for life. In others, they could be redeemed by their relatives who paid their debt or through their own efforts at repayment. Sometimes the winning gambler sold his newly acquired slave to another, often distant, group so he would not have to suffer disapproval for enslaving a fellow group member. We argue that these accounts provide evidence that enslavement through gambling also occurred prehistorically and then use oral histories to support our argument.

Cameron, Catherine [354] see Lekson, Stephen

Cameron, Asa (Cornell University)

[403] *Herding Strategies during the Xiongnu Period of Mongolia: A Comparison in the Diet of Domestic Fauna from the Egiin Gol Valley and Baga Gazaryn Chuluu*

During the Xiongnu Period (300 B.C.-A.D. 100), mobile agro-pastoralism constituted the primary form of subsistence. While this is supported by domesticated animal remains uncovered in mortuary and domestic contexts and historical and micro-botanical evidence for the use of agricultural products, a dearth of research exists concerning the variation of mobile agro-pastoralism among the Xiongnu. As such, this paper centers on regional differences in herding patterns and specifically does so through the use of $\delta^{13}\text{C}/\delta^{15}\text{N}$ bulk sampling of mandibular and maxillary teeth of domestic herd animals. The samples tested in this study were recovered from mortuary sites in two distinct ecotones of Mongolia: the Egiin Gol Valley in the north (EG) and Baga Gazaryn Chuluu (BGC), an area located within the desert steppe of the north Gobi. By comparing the $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of samples from EG and BGC, this study reveals intra-species and inter-regional trends in C3/C4 plant and water consumption during the Xiongnu Period. In addition, the $\delta^{13}\text{C}/\delta^{15}\text{N}$ data generated in this study is compared against existing $\delta^{13}\text{C}/\delta^{15}\text{N}$ data from Bronze Age and Xiongnu Period human remains recovered from EG as well as modern $\delta^{13}\text{C}/\delta^{15}\text{N}$ data generated from *Ovis* sp. and *Capra* sp. remains collected in BGC.

Camp, Anna (University of Nevada, Reno)

[87] *A Twist on Taphonomy: Catlow Twine Basketry in Archaeological Contexts*

This presentation is a first attempt to trace the taphonomic trajectory of specimens of Catlow Twine, an important kind of basketry technology. Catlow Twine basketry spans over ~9,000 cal B.P. years in the archaeological record of the Great Basin. The longevity of this artifact class and its appearance throughout the Northern and Western Great Basin allows for a thorough investigation of how it has been used. Catlow Twine is simple close twine technology; one of the oldest techniques in the Great

Basin. It was used to make mats, large trays, small bowls, hats, and burden baskets. The manufacturing techniques and materials of this type are extremely strong and flexible, allowing for the creation of versatile and long lasting objects in the archaeological record. Compiling data about this technology has revealed how the original form and use of some Catlow Twine baskets changed through time, indicating completely new final purpose and destination.

Camp, Stacey (University of Idaho)

[305] *The Archaeology of First Generation Japanese American Men at an Idaho WWII Internment Camp*

Amidst wartime xenophobia, the United States government unjustly imprisoned over 120,100 individuals of Japanese heritage during World War II. Despite being housed in dreary, tar-papered military barracks at sites that ranged from former racetracks to prisons, Japanese internees transformed their inhospitable living conditions into places that embodied some semblance of home and Japanese culture. These transformations were material in nature; internees creatively modified and consumed American-made goods, designed, built, and grew elaborate and ornate gardens, and composed expressive art work utilizing local materials gathered from the desolate camp landscapes and trash middens. As scholars are now recognizing, such activities expressed not only internee resistance to unjust imprisonment, but also communicated differences and transformations taking place within the Japanese American community itself. This paper examines how one group of first generation Japanese (also known as "Issei") men incarcerated in the remote wilderness of North Idaho coped with incarceration based upon two archaeological field seasons at the camp in which they were imprisoned.

Campan, Patricia [251] see Belardi, Juan

Campbell, Wade

[103] *A Predictive Model of Archaeological Site Location in the Hodh ech Chargui Region, Mauritania*

This paper presents a model to determine potential archaeological site locations in far southeastern Mauritania (known as the Hodh ech Chargui). Although sustained archaeological research has been carried out throughout West Africa since the 1940s, the 81,000 km² Hodh ech Chargui region has been poorly examined, with two regional surveys constituting the majority of the archaeological record for the area. It has been proposed that the Hodh ech Chargui served as a place of passage between the two Early to Late Iron Age population centers in the Hodh Depression and the Middle Niger Delta, rather than a place of settlement itself (MacDonald 2009: 45). The preliminary results of this model provide a foundation for testing this hypothesis, and more broadly illustrate the potential for GIS and remote-sensing based approaches to plan research in areas of interest throughout the ancient world.

Campbell, John (Memorial University of Newfoundland)

[110] *Transitional Archaic – "Mu Awsami Saqiwe'k" in the Maritime Provinces, Canada.*

The Transitional Archaic (4,100 -2,700 BP) is an often overlooked and underrepresented period in the Northeast; especially in the Maritime Provinces. To explain the origins of these "broadpoint using" cultures, archaeologists over the past few decades have embraced either a cultural diffusion or migration model. In this paper, I reopen the debate by examining existing collections from Maine and the Maritime Provinces, including the newly discovered Transitional Archaic component at the Boswell Site (BfDf-08) in Nova Scotia. In particular, this research aims to re-evaluate the migration theory through the study of lithic usage and subsistence strategies over this broad area.

Campbell, Timothy [124] see Selden, Robert

Campbell, Sarah (Western Washington University), William Damitio (Western Washington University) and Ryan Desrosiers (Western Washington University)

[168] *The Whale beneath the Barnacle: Rare Taxa in the Analysis of Marine Invertebrates from the Tse-Whitzen Village Site*

In faunal analysis, rare taxa can potentially provide valuable biogeographic or socioeconomic information, but are inherently difficult to interpret and to integrate with quantitative measures. Working with extremely large assemblages highlights these issues. Among the half million specimens of shell identified from the Tse-Whitzen village site are more than 20 taxa represented by less than 30 specimens. There is no single explanation for the presence of taxa in very low numbers, and the interpretive significance of their presence varies as well. In this assemblage, some taxa are present only as modified artifacts, i.e., ornaments (jingle shell, abalone, scallop), and others are non-food taxa which are likely to have been brought in by non-cultural processes (small chitons, gastropods). On the other hand, two taxa that have potentially large economic significance may be rare because of preservation and processing factors (*Coronula diadema*, an obligate whale barnacle, and geoduck). To what extent can these taxa be brought into discussions of past behavior otherwise dominated by measures of relative abundance?

Campbell, Rachel (Missouri Department of Transportation) and Michael Meyer (Missouri Department of Transportation)

[394] *Excavating St. Louis: French Colonial and Urban Archaeology*

The history of the city of St Louis, Missouri begins with the arrival of the French and spans over 250 years of development into the large urban center of today. The original settlement was thought to have been destroyed by the expansion of the city; however, recent excavations by the Missouri Department of Transportation at the Madame Haycraft Site (23SL2334) have discovered intact French colonial occupations in the heart of downtown. Work here has uncovered a large poteaux-en-terre French style structure built by Louis Dumot in 1795. Found within this structure was a relatively dense scatter of colonial-period French and English ceramics and an associated cellar feature containing significant quantity of food bone, a fragmented wine bottle, musket balls, and faience sherds. Continuing research plans to uncover more information about early settlement in St Louis as well as change the outlook of historic archaeology in large urban centers.

Campeau, Kathryn (MAX Lab, McMaster University), Tristan Carter (Department of Anthropology/ MAX Lab, McMaster Univ), Yosef Garfinkel (Institute of Archaeology, The Hebrew University of), Danny Rosenberg (The Zinman Institute of Archaeology, Haifa University) and Katharina Streit (Institute of Archaeology, The Hebrew University of)

[91] *Long-Term Perspectives from Obsidian Sourcing in the Southern Levant*

This poster details the elemental characterization of obsidian artifacts from three prehistoric sites in Israel: Beisamoun, Nahal Lavan 109 and Tel Tsaf. Raw material sourcing was achieved using the non-destructive technique of EDXRF spectroscopy, matching the chemical fingerprint of the artifacts' materials with those from known obsidian sources. With the assemblages spanning the Pre-Pottery Neolithic B to Chalcolithic (9th – 6th millennia B.C.), our aim was to generate a long durée view of supra regional connectivity. When integrated with techno-typological data, our results provide us with a deep-time perspective on not only raw material choice, but also cultural-technical traditions. Preliminary results suggest an initial conservative focus on Cappadocian (Göllü Dağ) obsidian, a habit that is radically reconfigured by the 6th millennium B.C. with evidence for the use of a wide array of raw materials from sources in Central, Eastern and North-Eastern Anatolia. These results are then located within a broader discussion of socio-economic changes in the southern Levant during these periods.

Campetti, Casey (Indiana University of Pennsylvania)

[269] *Out in the Field? Queer Archaeologists, Queer Archaeology, and CRM*

A perennial critique of cultural resources management (CRM) has been its perceived overemphasis on field methods and its dissociation from advancements in archaeological theory, particularly the integration of gendered archaeologies and feminist perspectives. Over the past two decades CRM has made considerable gains toward inclusivity of theory - however, the climate for queer practitioners in CRM working as field technicians, managers, and principal investigators does not

readily reflect these gains. In addition to very real issues in seeking employment and receiving fair promotions, the work environments (particularly the field) for CRM archaeologists can be willfully ignorant of LGBTQ issues or outwardly hostile. These considerations make the queer CRM community relatively invisible in comparison to queer academic archaeologists. What does a queer-safe CRM work environment look like, and why should this matter? This paper discusses the challenges, opportunities, and benefits involved in the creation of safe workspaces for queer CRM archaeologists through an examination of the invisibility of queer field practitioners, issues surrounding legislative and corporate discrimination, and the connections between queer archaeologists and the larger conversation of queer archaeology.

Campiani, Arianna [86] see Maestri, Nicoletta

Canaday, Timothy (Salmon-Challis National Forest), Bryan Hanks (University of Pittsburgh) and John Rose (Salmon-Challis National Forest)

[6] *Preliminary Results of Geophysical Surveys Along the Middle Fork Salmon River, Idaho*
The Frank Church – River of No Return Wilderness is the largest designated wilderness in the lower 48 states encompassing over two million acres and two wild and scenic rivers (Salmon River and Middle Fork Salmon River) in central Idaho. Cultural resources were identified as one of the main tenets of the establishing legislation, and the Central Idaho Wilderness Act of 1980 mandates “the protection of archaeological sites and interpretation of such sites for the public benefit and knowledge.” Over 10,000 visitors float the Middle Fork Salmon River every year and many of their recreation campsites coincide with prehistoric pithouse villages occupied over the last 3,000-4,000 years. At least 16 sites have been identified as being at-risk from recreational activity. This poster presents preliminary magnetometer results at four of the sites during the 2014 field season. Non-ground disturbing geophysical surveys were conducted to explore the potential for intact near-surface and subsurface cultural deposits. The magnetometer results suggest that subsurface deposits still exist and this information will help us focus our future fieldwork with the ultimate goal of protecting the resource while allowing the recreation to continue.

Canan, Adelso (Universidad de San Carlos de Guatemala (USAC)), Alexandre Tokovinine (Harvard University) and Barbara Fash (Harvard University)

[366] *Aplicación de la topometría digital en conservación e investigación de los monumentos mayas*

La documentación de los monumentos prehispánicos, ha sido uno de los objetivos principales de los investigadores de la cultura maya por la información que sus imágenes e inscripciones proveen sobre la historia, organización social y cosmovisión de los habitantes de las antiguas ciudades de Guatemala, México, Belice y Honduras. La documentación topométrica digital de alta resolución también conocida como escaneo en tres dimensiones (3D) representa una nueva fase en la investigación y conservación del patrimonio cultural. Esta ponencia se enfocará en el programa de escaneo en tres dimensiones de “Corpus de Inscripciones Jeroglíficas Mayas” y el componente de entrenamiento local del “Programa Santander” durante los últimos seis años. Presentaremos algunos resultados del programa, especialmente con respecto a los monumentos y edificios en el sitio arqueológico de Copán. También hablaremos de la experiencia del uso de los datos 3D en la conservación, reproducción, e investigación epigráfica y visual de los textos e imágenes mayas mencionando los logros y las dificultades en la aplicación de la tecnología.

Cannon, Kenneth [6] see Jones, Hillary

Cannon, Mike (SWCA Environmental Consultants) and David Meltzer (Southern Methodist University)

[135] *Forager Mobility, Landscape Learning, and the Colonization of the Americas*

Among the many important contributions that Robert Kelly has made to the archaeological and anthropological literature are 1) an elegant theoretical model of forager residential movement, presented in his book *The Foraging Spectrum*, 2) a very influential argument about the Paleoindian

colonization of the Americas, which he developed along with Lawrence Todd, and 3) insightful discussions of landscape learning by hunter-gatherers. Here, we explore these issues further by expanding Kelly's residential movement model to incorporate aspects of landscape learning. This provides a framework for addressing the question of when it is more economical for foragers in a new landscape to learn how to acquire novel resources rather than move in pursuit of resources with which they are already familiar, a question that is central to many discussions of the colonization of new regions. Implications of the model for the North American archaeological record are also considered.

Cannon, Kenneth (USU Archeological Services, Utah State University), William Eckerle (Western GeoArch Research), Molly CANNON (Utah State University), Jonathan Peart (USU Archeological Services) and Paul Santarone (USU Archeological Services)

[361] *Developing A Minimally Invasive Protocol For Assessing Site Eligibility on the North Training Area, Camp Guernsey, Wyoming*

The North Training Area of Camp Guernsey is located within the Hartville Uplift of eastern Wyoming, an area rich in archaeological resources particularly extensive formations of toolstone quality raw materials. Because of the potential for live training exercises to impact cultural resources, the Wyoming National Guard proposed the development of an experimental testing protocol of selected sites using minimally invasive methodologies that included geophysics and small diameter auger probes. Minimally invasive testing was proposed for sample areas within a range of site types from a variety of landforms to assess the National Register of Historic Places significance of these areas within a landscape framework. Results of the project assess the utility of nested geophysical survey methodologies and flighted, hollow stem and hand-bucket auger techniques to test linkages between geomorphic setting and archaeologically preserved materials in order to answer questions about past human behavior in this dynamic landscape.

Canter, Ronald (Maya Rivers)

[86] *The Upper Usumacinta Travel Corridor, A Game of Chutes and Ladders*

Like other major rivers the Usumacinta had parallel land routes. Unlike most rivers the Usumacinta lies bound within whitewater canyons below Yaxchilan, cut off from its flanking trails except at gaps dictated by the geography. In the Classic Period, the river and its trails formed a ladder-like grid offering great mobility, but requiring tradeoffs between speed and safety. For both the ancient Maya and modern boatmen the Usumacinta was a fast, efficient, and dangerous route to the lowlands. Two rapids, Chicozapote and El Porvenir were especially challenging. A long portage below El Porvenir avoided even worse downriver. Travel upriver was tedious but still efficient for bulk cargoes. The lightly loaded or faint-of-heart would have favored the trails. Documented use, geography, and ancient remains confirm river use and major trails. Rope grooves identify past harbors. On land, Yaxchilan fortified gaps in a cross ridge, restricting travel to only a few gated passes. Piedras Negras sat astride both river and trail where rugged hills pinched them together in a narrow pass. The cities fought over control of the Usumacinta corridor.

Cantley, Garry

[225] *Discussant*

Canuto, Marcello (M.A.R.I./Tulane University)

[306] *From "Star Wars" to Attack of the Kaan*

Over the past 25 years, epigraphic research on the Classic Maya has demonstrated that political alliances and warfare were not only widespread but also structured in such a manner to suggest a greater degree of political centralization than originally contemplated. Texts carved on ancient monuments suggest that lowland Maya society of the Classic period (A.D. 250-850) was characterized by a rivalry between two major capital cities, Calakmul and Tikal, who sought to dominate the Maya lowlands. This paper will focus on recent research at lowland Maya sites like La Corona, Uxul, and El Perú-Waka'. These projects are beginning to show how warfare, alliances, and marriages were some of the tools used by the kings of Calakmul in the 7th century to undermine

Tikal. In that process they developed a large regional kingdom extending as far south as Cancun. Consequently, the "star wars" of the 7th century are better understood as a concerted multi-generational strategy - "the attack of Kaan" - to dominate the southern Maya lowlands.

[244] *Discussant*

Cap, Bernadette (University of Wisconsin-Madison), Rachel Horowitz (Tulane), Jason Yaeger (University of Texas-San Antonio) and Mark Eli (University of Texas-San Antonio)

[399] *From Quarry to Household: The Economics of Limestone Bifaces among the Classic Maya of Buenavista del Cayo, Belize*

Limestone is one of the most abundant stone resources over much of the Maya lowlands and scholarly research has been focused on its use as a construction material. Limestone was also used to create a variety of portable items, such as manos, metates, bark beaters, and bifaces. In this paper we examine the evidence for production, exchange, and consumption of limestone general utility bifaces in the Buenavista del Cayo zone, Belize during the Classic period. Although chert bifaces are more abundant within the Buenavista zone, based on limestone biface breakage patterns we propose that limestone was chosen as a knappable material because of its durability and suggest these tools would have been well suited for agricultural activities. Based on the natural distribution of limestone in the Buenavista zone, the consumption rates of limestone bifaces in households within a 1 km radius of the site core, and evidence for limestone biface production in the Buenavista East Plaza we suggest that these items were distributed through a marketplace exchange network.

Capriata, Camila [46] see Zambrano, Raul

Capriata Estrada, Camila (Proyecto Qhapaq Ñan - Ministerio de Cultura del Perú)

[232] *The Inca occupation at Pampa de Flores: Continuity, changes and abandonment of public architecture in the Lurin Valley during the Late Horizon*

The Inca conquest of the Peruvian central coast brought a series of changes to the political and social landscape of the Lurin valley. At Pachacamac, the main religious center of this area, radical changes included, not only the resurgence of this sanctuary and expansion of its cult, but also a series of transformations in its architectural setting. In other settlements of the valley associated to the Ychsma polity, changes were less obvious, probably due to the different strategies followed by the conquerors. The continuity, change and abandonment of certain public architectural structures in sites such as Pampa de Flores, Panquilma and Huaycán de Cienenguilla, seem to be a reflection of these different control strategies. They would also imply variations in the socio-political landscape, where some populations gain importance and prestige, while others were partially abandoned. This presentation discusses the nature of the Inca occupation at the prehispanic site of Pampa de Flores, one of the main administrative centers of the valley, and what would have been the impact of this new occupation.

Capriles, Jose [414] see Marshall, Fiona

Carabias, Diego [243] see Cartajena, Isabel

Caramanica, Ari

[404] *Irrigation Systems as a Chronological Proxy? Continuous Occupation at the Valley Edge, Chicama Valley, Peru.*

The extension of irrigation systems from valley centers into the desert margins has been used by archaeologists in the Virú, Moche and Chicama valleys both as a form of relative dating and as a measure of societal complexity. Chronological periods in these valleys have become tied into uniform evolutionary sequences: the expansion of irrigation systems is correlated with population growth, technological advancement, and social hierarchy in the form of increased levels of bureaucracy and the emergence of a managerial elite. However, recent research in the agricultural landscape of the Pampa de Mocán in the Chicama Valley suggests that marginal landscapes were irrigated and occupied continuously from Preceramic periods through the Late Horizon. In order to

understand the nature of the occupation of landscapes at the distal ends of irrigation systems, this project carried out a full coverage survey of the area. In view of the results, I argue that the distance of irrigation systems from the river is not a reliable proxy for time or complexity. Instead, I suggest that its occupation was not due to any one prime-mover pushing populations into open areas at the valley edges, but rather the result of the long-term formation of landscape capital.

Carbajal, Laura [363] see Mt. Joy, Kristen

Carballo, Flavia [185] see Barrientos, Gustavo

Carballo Marina, Flavia [251] see Nuevo Delaunay, Amalia

Card, Jeb (Miami University) and Micayla Spiros (Miami University)

[124] *Three-Dimensional Scanning and Printing in Undergraduate Archaeology Education*

Three-dimensional imaging is a quickly growing part of archaeological documentation, investigation, education, and public outreach. Cost and expertise barriers to using 3D software and equipment continue to drop. Nonetheless, many efforts in 3D archaeology are driven by graduate students or focused undergraduates who become part of dedicated 3D laboratories or projects. Since 2013, we have been working with a different approach of incorporating three-dimensional imaging and printing at the general undergraduate level. Students in an Introduction to Archaeology course are utilizing 3D scanning and printing as a routine part of term papers, while students in a course on archaeology and art cooperated to document artifacts for planned online exhibits. Unsurprisingly, these efforts have generated interest in archaeology, though not uniformly. Faculty time to guide novice students through the use of the equipment and software is a drawback at this scale, though in many cases this leads to greater student engagement with their project and the course. The growing use of 3D technology in archaeology suggests that it must eventually become a part of undergraduate education, with the nature of that education becoming an important question.

Card, Jeb [393] see Fowler, William

Cárdenas, Macarena L. (Dep of Geography & Environmental Science, University of Reading, UK), Frank Mayle (Department of Geography & Environmental Science, U), José Iriarte (Department of Archaeology, University of Exeter, U) and Silvia Moehlecke Cope (Departamento de Historia, Universidade Federal do)

[157] *The Environmental Context of Prôto-Je culture at Pinhal da Serra, RS, Brazil – Insights from Paleoecology*

Understanding the purposes and associations of burial monuments and sacred built landscapes in the Formative period of the Americas is an important research goal among archaeologists. A key step that can help us to better understand the social and spatial organization of these cultures is determining the ecological and environmental characteristics of the landscapes within which these cultures lived and developed.

Created by the Je group in south-eastern Brazil, and with more than 30 pit houses and mortuary/ceremonial architectural structures discovered so far, Pinhal da Serra (PDS) has been key in helping to understand Formative cultures and the rise and dynamics of complex societies. Nevertheless, little is known about the relationship of this culture with its surrounding landscape.

We present paleoecological data from a peat bog core close to archaeological excavations at Pinhal da Serra. We use fossil pollen and charcoal data to reconstruct vegetation history, land use and past agricultural practices. The results of our analyses will improve understanding of the relationship between prôto-Je cultures and the surrounding vegetation over at least the last c. 2,000 years, and in turn provide new insights into the social patterns and organization of prôto-Je culture within the highly structured landscape of PDS.

Cardinal, J. Scott (New York State Museum) and Jennifer Loughmiller-Cardinal (University at Albany, SUNY)

[4] *Negative Results, Positive Contributions: Selection Biases and the Necessities of Looking to the Spaces Between...*

A recent study illuminated the bias toward publishing significantly positive results by researchers in the social sciences, raising substantive questions regarding the treatment and dissemination of null or statistically non-significant data. In archaeology, we also tend towards emphasizing the latest discovery, the big site, or the conclusive analysis. While it is satisfying to be able to present the latest and greatest in one's field, what then becomes of the rest of the data? Typically, these are relegated to summary tables, supplementary technical reports, or cursory discussions of miscellany that note how the rest of the data support or relate to the "big find". The preferential bias towards positive significance, however, generates both analytical and interpretive self-selection biases in our archaeological understandings. Null data sets play an absolutely critical role in the inferential methods of spatial, quantitative, and archaeometric analyses. In addition, null or negative results can provide epistemic boundaries on the evaluation of interpretation and theory.

Cardona, Augusto (Proyecto Arqueologico Misti), María Cecilia Lozada and Hans Barnard

[184] *Tiwanaku in Arequipa*

Although Tiwanaku expansion outside the Titicaca Basin has been documented extensively in southern Peru, specifically in Moquegua, the influence and/or presence of this highland state in the Arequipa region is not well known. In this paper, we evaluate work in Arequipa over the past 15 years regarding Tiwanaku in light of our work in the Vitor valley about 40 km from the city of Arequipa as part of the Vitor Archaeological Project. In Arequipa, we have identified relatively small Tiwanaku settlements characterized by a local ceramic tradition, which contrasts to the more direct and extensive contact seen in Moquegua. Furthermore, in the Vitor valley we have detected Tiwanaku fragments in Millo, an extensive administrative Wari node dated to 850 A.D. Although it would be tempting to suggest the co-existence of both Wari and Tiwanaku affiliated groups in Vitor, we propose that imported Tiwanaku ceramics reflect an horizontal axis linking the Millo complex to Moquegua, and not necessarily to Tiwanaku groups that inhabited in Arequipa after the collapse of Tiwanaku in the Titicaca basin.

Cardoso, Hugo F.V. [204] see Simon, Elizabeth

Carey, Chris [47] see Davis, Stephen

Carini, Claudio (CSU Dominguez Hills), Jerry Moore (CSU Dominguez Hills), Martha Ramos (CSU Dominguez Hills), Michelle Garcia (CSU Dominguez Hills) and Brandon Gay (CSU Dominguez Hills)

[11] *Integrated Geophysical Surveys at Archaic and Formative Archaeological Sites in Tumbes, Peru*

In this poster, we interpret data collected through nondestructive geophysical methods at the prehistoric sites of Santa Rosa and El Porvenir in the northern region of Tumbes, Peru. In late May and early June 2014, a program of integrated geophysical survey incorporating magnetometer and ground penetrating radar sought to identify subsurface archaeological features at the two sites. Previous excavations at these sites provided material data dating from 4750 B.C. and revealed architectural shifts and changes in settlement patterns in the Archaic and Formative periods. Geophysical mapping at Santa Rosa displays subsurface geological features and possibly, previously unknown anthropogenic features such as a circular structure similar to one found during excavations in 2007. El Porvenir, excavated in 2006, revealed an elliptical structure with a clay floor and hearth. Integrated survey at this site attempts to define features such as shell deposits, hearths, and floors. This integrated geophysical survey will aid future excavations at these prehistoric sites, furthering understanding of regional cultural variations during the Archaic and Formative periods in far northern Peru.

Carini, Claudio [327] see Stuck, Jennifer

Carleton, Chris [48] see Cheong, Kong

Carleton, William (Simon Fraser University), Mark Collard (Simon Fraser University) and Dave Campbell (Simon Fraser University)

[131] *Rainfall and Conflict among the Lowland Classic Maya*

Determining the causes of conflict in the Maya region during the Classic Period is an important undertaking. Conflict was a prominent feature of relationships among Classic Maya polities and has been implicated in the collapse of Classic Maya society. Recently, Kennett et al. (2012) have argued that reduced rainfall led to increased conflict in the Lowland Maya region between ca. 300 and 900 CE. They arrived at this conclusion after comparing epigraphic records of conflict and variation in $\delta^{18}O$, which they use as a proxy of past rainfall. While Kennett and colleagues' hypothesis is interesting, their study suffers from several shortcomings. Most importantly, they employed a subjective approach to finding correlations, namely visual comparison of curves. Here we report an attempt to rigorously evaluate Kennett et al.'s hypothesis. We collated epigraphic data on warfare intensity and then compared them to Kennett et al.'s rainfall proxy data with the aid of formal methods for assessing the strength of the association between time series. The results we obtained are not consistent with the predictions of Kennett et al.'s hypothesis. Thus, if rainfall impacted conflict intensity among the Classic Maya, it did not do so in the manner suggested by Kennett and colleagues.

Carlson, Justin (University of Kentucky) and George Crothers (University of Kentucky)

[35] *Anthropogenic Fire Management and Changing Land-Use Strategies in the Mammoth Cave Plateau and Sinkhole Plain, Central Kentucky, USA*

In the Mammoth Cave Plateau and the Sinkhole Plain of Central Kentucky, caves and rockshelters are the primary site type. The Plateau contains little arable bottom land, but cliff overhangs, caves, and perennial streams and springs are abundant. The Sinkhole Plain has abundant arable land, but surface water is quickly diverted to underground streams and permanent water sources are limited to caves and karst windows. We compare the archaeology of two important cave sites—Salts Cave in the Plateau and Crumps Cave in the Sinkhole Plain—with regard to their chronology of occupation, range of prehistoric activities, and evidence of anthropogenic forest impacts, especially by fire. In Central Kentucky, the Late Archaic-Early Woodland transition (ca. 3500-2500 BP) is a critical period for changes in land use, adoption of new subsistence technologies, and socio-economic reorganization. We hypothesize that human groups occupying the forested uplands and Sinkhole Plain asserted new forms of property relations that required greater socio-economic control and incentivized investment in landesque capital. Throughout this transition, caves and rockshelters remained the primary site type.

Carlson, Justin N. [144] see Crothers, George

Carlson, Kristen (University of Oklahoma)

[148] *Folsom Adaptations to Bison Hunting: A Comparison of Northern and Southern Plains Arroyo Trap Kills*

The purpose of this research is to compare and contrast Paleoindian arroyo trap bison kills on the Southern plains to analogous sites on the Northern plains to investigate the transition from opportunistic hunting to organized hunting under different environmental regimes. Analyses to address this problem include: Stable isotopes of bison bone to aid in environmental reconstruction; radiocarbon dates to determine the antiquity of the sites being compared; and the seasonality of the kill event to relate hunting organization to bison behavior and trace element analysis to reconstruct bison mobility patterns. This research provides new perspective on the transition from passive, opportunistic hunting of large game to active, organized hunting of bison herds that developed during the early Paleoindian period in North America.

Carlson, Jenna (College of William and Mary)**[165]** *Oxen at Oxon Hill Manor: Identifying Draught Cattle from the Archaeological Record of Colonial Maryland*

The methodologies for identifying and analyzing draught cattle from the archaeological record have been developed and refined over the past twenty years. However, little research has been done which applies these methodologies to faunal assemblages from the New World. This research identifies possible draught cattle from an eighteenth-century well and a possible smokehouse at Oxon Hill Manor in Prince George's County, Maryland, using pathological and osteometric analyses. Analysis of pathologies on metapodials and phalanges identifies which specimens most likely came from individuals used for draught labor. Osteometrics delineate the sex ratios of cattle in the archaeological record, thus providing a means for assessing the husbandry strategies in regions where draught cattle were used. As Oxon Hill Manor was home to an elite upper class planting family, the site provides a unique opportunity to explore the changing roles of draught oxen with the shift from tobacco to diversified agriculture in the last half of the eighteenth century. Additionally, the documentary record from Oxon Hill Manor provides a means to test the reliability of these methods for identifying draught cattle from British North American faunal assemblages.

Carlson, Eric (Historical Research Associates)**[312]** *Continuity and Change between Late Prehistoric and Early Historic Periods: Visually Reconstructing Two Successive Occupations of Housepit 54 at the Bridge River Village Site, Mid-Fraser Region, British Columbia, Canada*

The use of reconstruction illustrations, or artist's renderings of the past, offers a unique and informed method of communicating continuity and change between two successive occupations of Housepit 54 at the Bridge River Village site, located in the Mid-Fraser Region of British Columbia, Canada. Based on archaeological data and analysis from recent excavations of the large, multifamily housepit, visual representations can effectively integrate a variety of information and interpretation simultaneously. Spatial analysis, social dynamics, and other aspects of household archaeology can be expressed visually in the illustrations. Most importantly, the illustrative process fosters dialogue between the various archaeologists and members of the Xwisten Band of the St'at'imc Nation who, together, have a vested interest in the accurate portrayal and preservation of the past.

Carlson, Risa (University of Cambridge/US Forest Service) and James Baichtal (US Forest Service)**[320]** *Updates and New Discoveries of Early Holocene Predictive Model Sites in the Southern Alexander Archipelago of Southeast Alaska*

New Early Holocene sites were discovered during the 2014 field season using a predictive model based on the age and elevation of *Saxidomus giganteus* shells in relic raised marine deposits in the Alexander Archipelago of Southeast Alaska. Additionally, three new higher elevation sites were found inadvertently during road construction activities which fit the criteria of the predictive model. This paper presents the preliminary findings of latest discoveries and updates on the first Early Holocene predictive model sites under study, which were found beginning in 2009.

Carlson, David (University of Washington)**[381]** *The Intersection of Identity, Labor, and Racism in Washington State Company Towns*

This paper will propose research to address the intersection of identity, racism/racialization, and labor as manifested in the material and documentary remains of workers and administrators in Washington State company towns. From the mid-1800s to the Great Depression, logging and mining towns formed a critical part of state and regional economies. The archaeology of labor-related sites in this state and period has been historically under-researched, and the relationship between labor, racism, class consciousness, and the material culture of workers in industrial settings is a topic of interest to historical archaeology. Furthermore, as settlements whose existence is owed largely to market needs, they serve as an avenue for understanding how workers and other local inhabitants responded to the expansion of capitalism. Thus, investigating late 19th to early 20th century labor in Washington's peripheral settlements will improve our understanding of local history, the social

context of work, and the formation and maintenance of identity in the context of capitalism. Here I will review prior work on labor in Washington State, and then propose future avenues of research that will draw on multiple lines of data (geographic, remote sensing, archaeological, documentary) to address its social context and materiality in the region.

[381] *Chair*

Carlucci, Eric (Indiana University- Bloomington) and Ling-yu Hung (Indiana University- Bloomington)

[102] *Neolithic Northern China in the Context of Early Eurasian Interactions*

With a focus on painted pottery assemblages known as Yangshao, Majiayao, Banshan, and Machang from Neolithic Northern China, the present study explores early Eurasian interactions and exchanges indicated by ceramic assemblages and other kinds of archaeological records dated before 4000 years ago. Since the 1920s, scholars have noticed parallels between China's painted pottery and other collections in Central Asia and further west, prompting the "western origins" theory on painted pottery found in China. However, findings of the last several decades demonstrate that painted pottery followed a general east-to-west expansion from central China to modern-day Xinjiang from approximately 8000 to 2000 years ago. This trend leads to the emphasis on the local origins and independent development of China's painted pottery. While both hypotheses have their merits, many recent studies suggest intensified cross-regional connections between East Asia and other regions of the Eurasian Continent by 4000 years ago. Whether any external influence can be determined in the development of Neolithic Northern China's painted pottery remains an open question and demands further studies.

Carneiro, Gabriela [326] see Zimpel, Carlos

Caro, Jorge [48] see Miguel Quesada, Francisco J.

Caro, Jorge (BSC-CNS (Barcelona Supercomputing Center)), Maria Pereda (University of Burgos), Ivan Briz (CA.D.IC-CONICET), Myrian Álvarez (CA.D.IC-CONICET) and Debora Zurro (CaSEs, IMF-CSIC)

[73] *Cooperative Practices in Hunter-Fisher-Gatherers from Tierra Del Fuego: A Study on Resource Visibility and Social Sharing*

Cooperation studies have become an essential area of knowledge across different disciplines. Within the humanities and the social sciences, it has been used to explain human behavior as well as the maintenance of the social tissue itself. It has also given clues to explain the variability and the plasticity of human social organization at different levels.

In this presentation we focus on Yamana society a nomadic hunter-fisherer-gatherer group that inhabited the southernmost region of South America and who maintained this socio-economic organization approximately till the 30s of the last century. This society developed a range of cooperative practices (through production, distribution and consumption activities) that took place mostly during aggregation events caused by a great accumulation of resources. Through Agent Based Modelling we pretend to explore the role played by different variables that may influence the development of these cooperation practices.

The aim of this paper is to present some theoretical and methodological results of this study.

Caron-Laviolette, Elisa (Université de Paris 1/UMR 7041 ArScan)

[181] *From Palethnography to Paleohistory: Following a Magdalenian group through Three Successive Occupations at Etiolles*

Since the 1980s, spatially oriented techno-economical lithic studies of a few key open-air sites in the Paris basin have been essential to our comprehension of Upper Palaeolithic behavioral patterns. While these analyses have largely been synchronic in focus, and many others evaluate diachrony on the long-term, we hope to now bridge these two approaches through a study of the mid-term.

One of the only Palaeolithic contexts that allow for such an approach is the three-level sequence that constitutes the D71 domestic units at the Magdalenian site of Etiolles. Not only are these levels spatially well preserved, but they document three consecutive installations, within a few decades at most, in the exact same location. Through lithic refits and their spatial analysis we are able to reason on three different time-scales: each single short-term occupation, the greater long-term changes during the terminal Magdalenian (14 000 cal B.P.), and the rarely accessible historical time-scale, what we deem the intermediate, or mid-term. Here we present preliminary results of our comparative and palethnological analysis of these three successive installations, which will allow us to evaluate the stability or mutability of technical traditions from a "paleohistorical" perspective, and thus nuance our understanding of long-term cultural evolution.

Carpenter, John Philip [189] see Sanchez Miranda, Guadalupe

Carpenter, John (Centro INAH Sonora)

[257] *The Proyecto Arqueológico Río Sahuaripa: Interaction, Integration, and Cultural Dynamics in the Sonoran Serranía*

The characterization and descriptions of the Rio Sonora and Serrana (formerly known as the southern or Alamos branch of Rio Sonora) archaeological traditions exemplify Richard Pailles' contributions to the archaeology of Sonora (and northeastern Sinaloa as well) and our current understanding of the serranía region. The Proyecto Arqueológico Río Sahuaripa (PARS) represents the first systematic archaeological investigation of the Sahuaripa River basin, located in eastern Sonora. The primary objectives of this research are to 1) reconstruct the cultural-historical occupation of this region; 2) identify and define the cultural transitions manifest between the Río Sonora and Serrana archaeological traditions; 3) define the southwestern limits of the Casas Grandes interaction sphere; 4) examine the role this region played in regional and long distance exchange systems; 5) investigate the timing and nature of Opata-Pima interaction and/or intrusions; 6) document late prehispanic socio-political organization; and 7) confirm the possible routes of the earliest Spaniards to traverse northwestern Mexico. Many of these themes were pioneered by Richard Pailles, and to whom this research is indebted.

Carr, Erin (University of Nebraska - Lincoln)

[8] *Prospects for Detection of Ephemeral Historic Sod Structures Using Geophysical Techniques*

Sod houses represent one form of ephemeral historic structure that became common to portions of the Great Plains as a result of the Homestead Act of 1862. Since their construction in the late 1800s and early 1900s, sod house and out buildings have either been preserved, allowed to "melt," deliberately removed and put under cultivation. This poster examines the documentation of these structures under various post-occupation conditions through the use of surface level, non-destructive, geophysical techniques. I will report on the 2014 geophysical survey of these structure locations from Custer County, Nebraska.

Carr, Thomas (History Colorado)

[369] *Discussant*

Carrasco, Michael [259] see Englehardt, Joshua

Carrier, Sam (Oberlin College), Hillary Conley (National Park Service) and Susan Kane (Oberlin College)

[3] *Portable X-Ray Fluorescence Studies of Black-Gloss Pottery from Monte Pallano (Italy)*

This is an examination of a collection of 200 sherds of black-gloss pottery (a type of fineware that was used for dining and wine consumption from the 5th century B.C.E.-1st century B.C.E.) excavated from the Monte Pallano ridge in the Abruzzo region of eastern Italy. Customarily, pXRF has been used to identify and characterize clay sources for ancient pottery production. In this paper,

the elemental composition of the ceramics—measured with a Bruker Tracer III SD pXRF—is analyzed: 1) to characterize the composition of the sherds, 2) to describe the homogeneity/heterogeneity of individual sherds, 3) to compare sherds excavated from two nearby areas on Monte Pallano (a settlement and a sanctuary precinct), 4) to contrast local pottery to that made elsewhere, and 5) to relate these data to fabric groupings made using traditional ceramological techniques.

Carrion, Yolanda [155] see Aura Tortosa, J. Emili

Carrizosa, Fernando [298] see De Anda Rogel, Michelle Marlene

Carroll, Jon (Oakland University)

[4] *Computational Simulation Methods for Exploring Small Artifact Assemblages*

Archaeologists often decline to work with artifact assemblages considered too small to analyze in favor of working with larger assemblages that ostensibly allow for more confident statements about the past. This paper discusses the role of Agent Based Modeling (ABM) and the potential it holds as an important new analytic tool through which to explore small artifact assemblages in a meaningful way.

Carroll, Mary

[83] *25 Years of NAGPRA in the National Park Service*

The Native American Graves Protection and Repatriation Act (NAGPRA) became law on November 16, 1990, requiring Federal agencies and museums to repatriate Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony to lineal descendants and culturally affiliated Indian tribes or Native Hawaiian organizations. During the 25 years since its enactment, the National Park Service (NPS) has been responsible for both implementation of the Act and compliance with the Act. This paper will focus on NPS's servicewide compliance with NAGPRA over the last 25 years, discussing the evolution of how we respond to NAGPRA issues, and looking at where we go from here. Opportunities arising from, and challenges to, NAGPRA compliance will be addressed and specific projects, activities, and accomplishments will be highlighted.

Carroll, William (MTSU)

[128] *Shadows of Sand Creek: A Case Study of the Colorado War and Its Historical Legacy*

In 2013, a History Colorado Center presented an exhibit entitled "Collision: The Sand Creek Massacre 1860s to Today." It was soon closed due to a multitude of concerns from the Northern Cheyenne tribe including that fact was offensive to many tribal members, who believed the event was being portrayed as an inevitable clash of cultures rather than a isolated event. I intend to portray this event as the most recent case study in an ongoing clash over the portrayal of the event to the public and the place of Sand Creek in the American historical memory.

Carson, Mike (Micronesian Area Research Center (MARC))

[199] *De-coding Landscape Heritage through Cross-Disciplinary Studies in Pacific Oceania*

Landscapes can be appreciated as heritage resources with complex natural and cultural histories, potentially studied through diverse data-sets and intellectual approaches. Toward illustrating some of these prospects, examples are presented from research across the Pacific Oceanic region, drawing on digital elevation models, coding of land cover and other geographic attributes, site-specific geoarchaeological testing, georeferencing of historical maps and images, and traditional ethnohistories as contributing parts of landscape studies in the broadest sense.

[199] *Chair*

Carson, John [226] see Iriarte, Jose

Cartajena, Isabel (Departamento de Antropología, Universidad de Chile), Valentina Flores

(Departamento de Geología, Facultad de Ciencias Fís), Cristina Ortega (Departamento de Geología, Facultad de Ciencias Fís), Diego Carabias (ARKA – Maritime Archaeology) and Renato Simonetti (ARKA – Maritime Archaeology)

[243] *Geoarchaeological Approaches: Assessing the Formation and Preservation of a Late Pleistocene Drowned Terrestrial Site on the Pacific Coast of South America (Chile)*

GNL Quintero 1 (GNLQ1) is a Late Pleistocene paleontological submerged site located in Quintero Bay (32°46'S), ~50 km north of Valparaíso, on the Pacific coast of Central Chile. We describe the geoarchaeological approach applied by combining geomorphological, bathymetrical, sedimentological and paleontological data with a digital simulation model. The resulting evidence indicates that the unit containing the extinct bone assemblage (Unit 2) was deposited in a low-energy fluvial sedimentary environment, possibly a shallow floodplain where wetlands were formed in a semiarid climate. This Unit is interbedded between two coastal units related to a marine regression-transgression cycle. The underlying marine layer is much older than GNLQ1 site, while the overlaying layer corresponds to a postglacial transgressive unit. Digital simulation modelling considering regional uplift rates information suggests that a significant part of Quintero Bay was exposed and GNLQ1 site would have been located a few kilometers inland from the paleo-shoreline. The characteristics of the depositional environment and the geomorphological context favored the formation and survival of an extremely well preserved faunal assemblage. GNLQ1 provides the first unambiguous evidence for the Pacific coast of South America that this record can survive in situ and be located through underwater investigation.

Carter, Tristan [91] see Grant, Sarah

Carter, Benjamin (Muhlenberg College)

[99] *Archaeological Ceramics for Beginners: A Hands-On Activity for Introductory Classes*

This activity is designed for students who have little or no experience with archaeology and, in many ways, is a classic; archaeological ceramics activities or labs are offered at many institutions. So, why offer it up? For two reasons: first, as a well-proven option that new instructors can use in their classrooms that is explicitly connected to the Principles for Curricular Reform and, second, as a starter for conversations with experienced instructors. The activity engages students with a hands-on, experiential understanding of the properties of clay and temper, the identification and categorization of archaeological ceramics and the interpretation of geospatial ceramic data. Data analysis includes both how materials and artifacts were employed in the past, as well as, the effect of modern peoples on ancient sites. Because it is for beginners, this activity focuses upon Fundamental Archaeological Skills principle of the Principles for Curricular Reform, but also addresses Stewardship, Ethics and Values, and Real-World Problem Solving as well as touching upon the other principles.

[99] *Chair*

Carter, Tristan (McMaster University), Daniel Contreras (Institute for Ecosystem Research, Kiel University), Danica Mihailovic (Department of Archaeology, University of Belgrade), Theodora Moutsiou (Natural History Museum, England) and Sean Doyle (Department of Anthropology, McMaster University)

[260] *Neanderthals on Naxos? New Work at the Early Prehistoric Chert Source of Stélida*

A two-year geo-archaeological survey of the Stélida chert source on the island of Naxos (Cyclades) has documented Middle Palaeolithic activity across the site, both near the best quality chert outcrops and in front of two small rockshelters. The material is dominated by products from a discoidal core technology, followed by Levallois flake and blade industries. The assemblage part-relates to the Denticulate Mousterian, which in Greece – along with Levallois technologies – are exclusively related with Neanderthal populations. Stélida arguably provides the first evidence for Neanderthals in the Cyclades. A key research question is whether this material was the product of intense moments of exploitation or quarrying and knapping activity over the long-term, but precisely dating the material is difficult, with comparanda spanning 250–40 ka. Thus we currently do not know if early hominin visits to the source involved crossing glacial lowstands, or ‘modest seagoing’ from the mainland to the

'Cycladean' island mass. With recent Pleistocene sea-level reconstructions suggesting that a landbridge existed between Anatolia and the southern Greek mainland, the Stélida data is also helping us to reconfigure our view of Greece from being a Pleistocene cul-de-sac, or refugium, to potentially a major route in early hominin dispersal.

[412] *Discussant*

Carter, Alison (University of Wisconsin-Madison)

[349] *Angkorian Residential Patterns: A View from the Trenches*

One of the defining features of the great temples of Angkor is the pattern of enclosed space that surrounds many major monuments. The outer limits of these enclosures are frequently bounded by masonry walls and moats. Although more than a century of research has been devoted to understanding the temples that lie at the center of these enclosures, the structure and function of the vast rectilinear spaces that surround them remains very poorly understood. This paper draws on recent fieldwork by the Greater Angkor Project (GAP) at the walled temple enclosure sites of Angkor Wat and Ta Prohm in order to understand residential patterning within these enclosures. GAP excavations (2010-2014) suggest that the areas for habitation were constructed at the same time as planning and construction of the temples within the enclosures. However, a comparison of material evidence from Angkor Wat and Ta Prohm suggest that the nature and length of habitation within both these enclosures differed. Although preliminary, data from these excavations provide valuable insight into the nature and variability of Angkorian habitation, elucidate the transition into the post-Angkor period, and highlight the continuity and discontinuity in the use of space within these large enclosures.

[349] *Discussant*

[286] *Chair*

Carvalho, Milena (University of Louisville) and Jonathan Haws (University of Louisville)

[118] *The Taphonomic Study of Small Fauna Gruta da Nova Columbeira (Portugal)*

This poster presents the results of a taphonomic study of Gruta Nova da Columbeira, a cave site containing at least six separate Middle Paleolithic occupation levels in Vale do Roto, Portugal. The valley contains at least five other caves that have been occupied at different times. Gruta da Nova Columbeira, excavated in 1963, has well-preserved faunal remains rendering it a good site for studying Neanderthal subsistence behaviors. The excavation yielded larger fauna such as red deer, ibex, auroch, horse, rhinoceros and roe deer. Carnivores such as hyena, lynx, wild cat, bear and wolf compromise a significant portion of these remains. The site also yielded a large amount of smaller fauna that were not analyzed making it a good subject for this taphonomic analysis. This poster presents the taphonomic study of the small animal assemblage. Analyses include calculation of NISP and MNE for each taxon, as well as the recording of surface modifications, such as tooth scoring, tooth punctures, fractures patterns, cut marks, fracture patterns and skeletal element patterns. The results are then compared to published data from actualistic studies to help determine the agents responsible for the formation of the assemblage.

Casana, Jesse (University of Arkansas), Adam Wiewel (University of Arkansas) and Autumn Cool (University of Arkansas)

[409] *Archaeological Aerial Thermography in Theory and Practice*

Archaeologists have recognized since the 1970s that thermal images captured at an optimal time in the diurnal cycle have the potential to reveal surface artifacts, subtle topography, and even subsurface architectural remains. However, it is only with the recent development of reliable and stable unmanned aerial vehicles, small, uncooled, high-resolution thermal cameras, and powerful photogrammetric image processing software that archaeological aerial thermography has become practical. This paper discusses our recent efforts to deploy this emerging technology on a range of archaeological sites, with examples including an ancestral Puebloan community in New Mexico, a Mississippian mound center in Arkansas, a Late Bronze Age city in Cyprus, and an Iron Age metal production center in Dubai. Results provide a methodological blueprint for drone-based collection

and processing of thermal imagery, and illustrate some of the factors that affect the visibility of archaeological features under different environmental conditions. We also discuss a number of experimental approaches to processing thermal data that help highlight archaeological features even further, pointing to some of the many still unexplored possibilities for drone-based aerial thermography to aid in archaeological research.

Casanova Vasquez, Erick (Universidad Nacional Mayor de San Marcos), Rebecca E. Bria (Vanderbilt University) and Elizabeth K. Cruzado C. (University of Memphis)

[252] *A Study of Domestic Ceramics from Hualcayán, Ancash, Peru*

In the Peruvian Andes, archaeological analysis of prehistoric ceramics disproportionately focuses on materials recovered from ritual spaces compared to domestic areas. This bias limits our understanding of the role of ceramics in domestic contexts. To address the imbalance, this poster focuses on characteristics of ceramics recovered from survey and excavations at a residential sector of the Hualcayán site. This sector, called Panchocuchu, contains most of the site's domestic architecture that includes residential structures, open spaces, terraces and perimeter walls occupied between C.E. 200 to 950. The ceramics included in this analysis from excavation were recovered from the exterior and interior of a living space, and an adjacent patio speculated to function in cooking and as a cuyero (cuy or guinea pig pen based on coprolite and faunal remains). The ceramic analysis from this sector provides substantive information about the function and morphology of the ceramics based on their recovery context. The results of the study presented in this poster provide the basis for comparing the manufacture and use of ceramics between ritual and domestic contexts.

Cascalheira, Joao [53] see Goncalves, Celia

Cascalheira, Joao (Universidade do Algarve - Portugal) and Nuno Bicho (Universidade do Algarve - Portugal)

[389] *Lithic Technological Organization and Social Networks during the LGM in Southwestern Iberia*

Clusters of sites in particular regions of Southwestern Europe seem to reveal that the Last Glacial Maximum (LGM) settlement patterns form a scenario of relatively isolated refugia that may have contracted and expanded their cultural influence as climate fluctuated. Similarities between each of these niches have been long argued, based on the distribution of specific types of lithic weaponry. This paper will focus on a study of lithic technological organization during the LGM in Southwestern Iberia, using statistical procedures to demonstrate that similarity between regions is mainly visible in the size and type of the lithic blanks produced and, very rarely, in the specific technological attributes of their production. From a paleoanthropological standpoint, the results indicate that the human adaptive system to the LGM in this area worked at two different, but complementary, scales. One that is essentially local, formed by several eco-cultural niches where communities have shared techno-economic schemes that are best adapted to the particularities of each ecological context. The other, supraregional, related mainly with broad geographical social ties, maintained, most probably, as an extra factor of the adaptive response to the impact of climate and landscape modifications, functioning through sharing behaviors of stylistic concepts and typological elements.

[389] *Chair*

Casebolt, Dave [416] see Schlagheck, John

Caseldine, Christopher (Arizona State University)

[277] *Plain and Interesting: An Evaluation and Redefining of Non-Decorated Pottery from Nuvakwewtaqa, Chavez Pass, Central Arizona*

Long ago, Southwestern archaeologists realized the value of non-decorated pottery as a source of cultural information. The fundamental work of Colton and others (e.g., Pilles and Wood) have established the examination of non-decorated pottery as a key aspect for understanding the Sinagua Culture of central Arizona. This poster represents a continuation of the work began by Henderson

(1978, 1990) and later refined by Heness (1990) on the non-decorated pottery excavated from Chavez Pass Ruin (13th to 15th century A.D.). My work differs from these previous studies in that my goal is not to refine the chronology of Chavez Pass Ruin, but rather, to refine current typological definitions of non-decorated pottery from the site based on temper composition. I show that although some non-decorated pottery from Chavez Pass Ruin fall into the types Colton established for the Sinagua, many of the non-decorated pieces fail to securely fall within this typology. Using temper groups, instead of typology, intriguing patterns became apparent within Chavez Pass Ruin.

[277] *Chair*

Casias, Kellii (University of Montana) and Kelly Dixon (University of Montana)

[311] *Informal Economic Strategies during Alcohol Prohibition In Anaconda, Montana Alcohol Prohibition*

One of the many unintended consequences of the Prohibition Era was an unorganized but collective social resistance movement across the nation. Research in the town of Anaconda, Montana, focused on the years of 1923 through 1926, granted a unique opportunity to capture a snapshot of collective social resistance in a company town, and allowed a new, feminine narrative to emerge. The Prohibition years in Anaconda were put into historical, and sociocultural context by compiling lists of male and female liquor law offenders' experiences through the use of primary sources such as newspaper accounts, court records, and oral histories. Comparison of fines, jail terms, and property seizures of male and female home brewers and business owners indicated a systematic leniency towards women offenders when all crimes were equal. Socioeconomic status's revealed that overwhelmingly widowed women used the sale and production of illegal alcohol as an economic strategy to support their families. Unequal applications of the law on the part of city officials indicates a tolerance of illegal activity for the pragmatic financial exploitation of residents. The findings although general in nature can be used as a starting point for a more realistic discourse on how people collectively circumvented Federal Prohibition laws.

Castaneda, Francisco [306] see Navarro-Farr, Olivia

Castaneda, Amanda (Texas State University- San Marcos)

[342] *Methods for Examining and Creating a Typology of Bedrock Features in the Lower Pecos Canyonlands*

Bedrock features are a common archaeological occurrence in the Lower Pecos Canyonlands of southwest Texas. These occur in a wide range of forms, from polished "slicks", cupules, and small grinding facets to large, deep, well-developed mortar holes. Even though relatively common, bedrock features, and ground stone in general, have received very little directed research in the region. This paper discusses ongoing research which uses a multi-faceted approach to examine bedrock feature attributes at several sites across the region. Structure from Motion photogrammetry was employed to document and create accurate feature maps. On-site morphological attributes and macroscopic wear patterns targeting manufacture and use were recorded for each individual work station. These data create a large dataset that allows for statistical analyses to help identify the range of variation of Lower Pecos bedrock features. Results from on-site observations will be compared with residue samples from various features to determine if these varied lines of evidence provide complementary data. This project provides a baseline dataset for future studies, creates a preliminary bedrock feature typology, establishes viable methodological protocols, and contributes to our overall understanding of the roles that bedrock features played in Lower Pecos lifeways.

Castaneda , Amanda [342] see Crater Gershtein, Eli

Castex, Dominique [207] see Veleminsky, Petr

Castillejos González, Giovanni, Estela Martinez Mora and Daniel Valtierra Vega

[231] *Bioarchaeological Results of the Suchil River Valley Project, Zacatecas and Durango,*

Mexico

In this paper we present a synthesis of the osteological analysis of recovered individuals in this project, considering that social change can be studied on the basis of the biology of individuals in their social environment and lifestyle. Prehispanic social groups inhabited this region in northwest Mexico between 200 A.D. and 900 A.D. The analyzed sample originates from funerary contexts excavated in two sites of a second order and one first order site. The samples are dissimilar, but correspond with respect to the presence of common conditions as, for example, frequent infections.

Castillo, Nina [134] see Marcone, Giancarlo

Castillo, Cristina (Institute of Archaeology (UCL))

[286] *Archaeobotany in Southeast Asia: What Have We Learned So Far?*

Archaeobotany as a specialisation in Southeast Asia began in the late 1960s. Archaeobotanical methods (e.g. flotation, phytolith and pollen sampling) are still not routinely used in archaeological fieldwork in SEA, although in the past ten years, archaeobotany has gained momentum. For example, several sites in Thailand (Ban Non Wat, Khao Sam Kaeo, Khao Sek, Non Ban Jak, Phu Khao Thong), Vietnam (Lo Gach, Loch Giang, Rach Nui) and Cambodia (Ta Phrom) have included archaeobotanical analyses as part of the excavation agenda. This paper will present some of the latest research derived from macroremains analysis from sites in mainland SEA, with an emphasis on how the inhabitants made use of their habitats in their subsistence regime. Settled peoples have exploited their surroundings and adopted suitable crops for cultivation, but have also found limiting factors that constrained agriculture and cultivation practices. Discussions revolve around the crops and weeds found in the archaeobotanical assemblages, which help define diets, farming systems and habitats.

Castillo Butters, Luis Jaime [60] see Saldaña, Julio

Castillo Butters, Luis (Pontificia Univ Catolica del Peru)

[409] *Preserving Archaeology with Drones in Peru*

In an effort to protect our Cultural Patrimony UAVs or Drones are increasingly use to map and 3D Model archaeological sites. In Peru, the Ministerio de Cultura is leading efforts to systematically record sites using drones, produce orthophotography from the photos, and produce 3D models of the sites. Archaeologists and geographers hired by the MC are using more than 20 drones to cover the territory and register as many sites as possible. Orthophotos are used for registration and surveying, 3D models are produced with Photogrammetry software to develop detailed 3D models of the sites and all these product are processed with GIS software for analyses of volume, topo maps, etc.

Castro, Kevin, Nathan Goodale (Hamilton College), David Bailey (Hamilton College), Anna Prentiss (University of Montana) and Alissa Nauman (Hamilton College)

[312] *Linking Geochemistry and Geology in Interpreting Anthropogenic Sediments at Bridge River, British Columbia*

Previous research utilizing energy dispersive x-ray fluorescence (EDXRF) spectroscopy and isotope ratio mass spectroscopy (IRMS) identified geochemical patterns in Housepit 54 sediments that might be attributable to human occupation. In this study we conduct additional geological analysis of Housepit 54 sediments in order to more fully understand the observed geochemical variation. In addition to grain size analysis, detailed mineralogical analysis of fourteen sediment samples from a single occupation level was conducted using polarized light microscopy, scanning electron microscopy with energy dispersive x-ray spectroscopy (SEM / EDS), and x-ray diffraction (XRD). Our data indicate that the observed geochemical variation in Housepit 54 sediments is the result of the complex interaction of both natural geological and human processes.

Catacora, Andrea and Jo McDonald (University of Western Australia)

[138] *Digital Data Collection, D-Stretch And Databases: New Approaches to Recording Rock Art*

In Lincoln County

A BLM-funded rock art recordation project recently undertaken in Lincoln County, Southern Nevada has focused on three Areas of Environmental Concern: Mount Irish, Shooting Gallery and Pahroc. The overall Project was designed to be a comprehensive heritage inventory of all archaeological evidence in these Areas, and based on a systematic sample there are close to 700 recorded sites in these areas, of which around 200 contain rock art. Building on earlier work by the Nevada Rock Art Foundation and others, one of the BLM's project goals was to provide a comprehensive contemporary record of the Areas' heritage resources. Research goals included the characterization of rock art in its archaeological context and to better understand how the rock art in these three areas is related. Digital innovation has been achieved using hand held recording devices, detailed GPS, digital enhancement and photogrammetric software, and a GIS-based database to meet our goals. We are beginning a detailed stylistic analysis of the data recorded from over 1,200 panels and many thousands of recorded motifs to better understand the nature and extent of rock art production in this part of the Great Basin.

Catacora, Andrea [362] see Giambastiani, Dayna

Catella, Luciana [185] see Barrientos, Gustavo

Cattaneo, Roxana and Andres Dario Izeta (IDACOR-CONICET, Museo de Antropología, FFyH, Unive)

[35] *Rethinking Deodoro Roca Rockshelter (Ongamira, Córdoba, Argentina). Seventy Years of Archaeological Ideas*

The hunter-gatherer archaeology of the Ongamira Valley has been a landmark in the archaeology of Argentina's Central Region. The cultural sequence built in the 1950s is still used by many archaeologists to interpret regional peopling, subsistence, land use and mobility. However we believe it is time to review the use of rockshelter-generated data under a new approach that embraces landscape archaeology. Stable isotope-based paleo-environmental reconstructions create a baseline and permit insights into the role of rockshelters through time. Surveys looking for new sites, outcrops and lithic quarries, in addition to the study of the intervisibility between them are integrated into rockshelter data to improve understanding of the social use of space, peopling and mobility. The interconnection of data constructed through the analysis of technology and the acquisition and use of faunal and botanical resources leads to new ideas about social strategies and networks. We discuss how these theoretical changes were made and relate them to Argentinian archaeology.

Cattin, Marie-Isabelle

[181] *Nomadism in the Magdalenian Groups of Monruz and Champréveyres (Switzerland)*

Located in a region where flint is of mediocre quality, the Magdalenian sites of Monruz and Champréveyres (Neuchâtel, Switzerland) show the introduction of a high proportion of good quality flint from sometimes very distant (up to 200 km) regions. For this reason we can argue that flint was not a constraining factor on the selection of camp location. It is certain that favorable hunting grounds, as well as the proximity to water sources and combustible materials, were more important. The Magdalenian groups of Monruz and Champréveyres likely anticipated their needs and collected raw materials from regions they visited, or obtained them through exchange, when travelling to regions poor in lithic raw materials. Distant materials arrived at the sites in different forms, from tested nodules, to tools, to unworked blanks. The analysis of discarded cores and the different stages of the chaîne opératoire represented permit us to define the first activities realized on the campsite, as well as the "passage" (arrival, working and use, and departure) of tools and cores through the site. Here we present some examples that will illustrate situations (arrivals and departures) in the campsite linked to nomadism and group territories.

Catto, Lisa (Portland State University) and Virginia Butler (Portland State University)

[168] *Developing a "Good" Website for the Tse-whit-zen Project*

Websites have become a relatively common way to share findings from archaeological research with the public. They are easily adaptable, can reach a wide audience (e.g. location, age, education levels), and can supplement other outreach programs. What makes a "good" one? Answering this requires that one has established goals; and that one has developed ways to assess whether the goals have been met. In our background research, explicit goal-setting and assessment of archaeological-based websites has scarcely been attempted. We are currently creating a website for the Tse-whit-zen project to address these concerns. Working with project investigators and local stakeholders, we are defining the core themes and content we want visitors to "take away" from a website visit. Working within budgetary, skill and time constraints, we are defining the website scale and selecting software (e.g., Wordpress, Dreamweaver, Weebly). Drawing on previous social media and education research, we are developing instruments to assess whether our goals are met (e.g., visitor tracking, focus groups, and online surveys).

Caulk, Grady (Corps of Engineers), Daniel Hughes (Corps of Engineers) and Wendy Weaver (Corps of Engineers)

[243] *Locating and Identifying Submerged Prehistoric Sites as Part of CRM*

Section 106 of the National Historic Preservation Act requires Federal agencies like the US Army Corps of Engineers to make a reasonable good faith effort to consider the effects of their undertakings on historic properties. The Jacksonville District of the Corps of Engineers has been conducting underwater cultural resource surveys since the 1970's. While the potential for prehistoric sites has always been considered, technological advances have allowed us to improve our ability to evaluate the potential for underwater projects to impact prehistoric sites. This paper will discuss the methods that the Jacksonville District uses in searching for and identifying prehistoric sites. This will include discussions of the use of contractors, including contracting requirements and review. The interpretation of data, as well as using geotechnical cores to sample deeply buried surfaces.

Caval , Saša [116] see Haines, Julia

Cavallaro, Marc [106] see Pentney, Sandra

Cavero, Yuri [292] see Nesbitt, Jason

Cawthra, Hayley (Council for Geoscience, South Africa), John Compton (University of Cape Town, South Africa), Erich Fisher (Institute of Human Origins, School of Human Evolut), Zenobia Jacobs (Cente for Archaeological Science, University of Wo) and Curtis Marean (Institute of Human Origins, School of Human Evolut)

[294] *Marine Geophysics Reveals the Character of the Now Submerged Paleo-Agulhas Plain*

This work was undertaken to understand the evolution of the terrestrial landscape now submerged by high sea levels offshore of Mossel Bay. Two marine geophysical surveys and scuba diving were used to examine evidence of past sea-level fluctuations and interpret seafloor geological deposits. Eight seismic sequences characterize the shelf, extending from the Mid-Cretaceous to the Holocene time. Geological mapping dating by Optically Stimulated Luminescence (OSL) revealed that the most prominent Quaternary units are associated with the MIS 6 glacial to MIS 5 interglacial periods and include incised lowstand river channels and regressive aeolianites. MIS 5 transgressive beachrock and regressive beach and dune deposits on the shelf are associated with the subsequent fall in sea level. MIS 4 lowstand incised river channels were infilled with sediment truncated during rapid landward shoreface migration at the MIS 4 termination. Back-barrier MIS 4/3 sediments are preserved as a result of overstepping associated with meltwater pulses of the MIS 2 termination. Accommodation space for coastal deposits on the South Coast continental shelf is controlled by antecedent drainage pathways and shelf gradient. The geological deposits on the emergent shelf indicate an expanded glacial coastal plain dominated by low-gradient meandering rivers and wetland lakes.

Cawthra, Hayley [294] see Copeland, Sandi

Cecil, Leslie (Stephen F. Austin State University)**[248]** *Postclassic Peten Podophilia*

In 1996, Fredy Baldizon (a CUDEP student) brought a box of 87 Postclassic tripod plate supports that he collected from a single location on the Tayasal peninsula to the Proyecto Maya Colonial's laboratory. It was not until 2014 that I discovered that another large set (n=66) of tripod supports was associated with a single structure (2034) at Ixlú. Statistical analyses (based on height, form, and paste characteristics) indicate statistically-significant differences between the supports at the two sites. These two collections of tripod supports may represent fragment enchainments or hoards. In either case, the sets reflect social practice and interactions of the cultures that made and transported the pottery fragments as they do not represent pottery smashed in place. As such, the Postclassic Maya from Tayasal and Ixlú may have emphasized their social and/or political interactions, perhaps feasting events, with the deliberate collection and deposition of these tripod supports.

Cerezo-Román, Jessica (Harvard University)**[202]** *Deconstructing Multiple Intersecting Identities and Cremation Ritual among the Preclassic Hohokam of the Tucson Basin*

Hohokam cremation funerary customs are unraveled to acquire a deeper understanding of intersecting identity differences among seven Preclassic Period archaeological sites (A.D. 475-1150) of the Tucson Basin. This is done by analyzing the mortuary treatment of 477 individual remains using two primary datasets: (1) biological profile of the skeletal remains; and, (2) posthumous treatment of the body inferred from the analysis of the remains and archaeological contexts. Results indicate the existence of social differences in funerary practices related to age at death and sex identity intersections. However, there also were differences between sites in how individuals were treated related to different community social networks of interaction. The results provide a glimpse of the potential social variation and multiple social groups within Tucson Basin Preclassic Period Hohokam sites.

Cervantes Perez, Jose (Centro INAH-Oaxaca), Tito Mijangos (Centro INAH Oaxaca) and Agustin Andrade Cuautle (Centro INAH Oaxaca)**[410]** *Representación Bioarqueológica de la colectividad funeraria en San Sebastián Etla, Oaxaca.*

El estudio de los entierros colectivos es una de las vertientes que presentan las prácticas funerarias, y mediante el registro minucioso en campo y el análisis de los materiales arqueológicos en el laboratorio, es posible estudiar de manera integral y multidisciplinaria, un trabajo en conjunto entre la antropología física y la arqueología de dichas expresiones culturales. La investigación que será presentada se enfoca en la distribución y depósito de una serie de esqueletos humanos excavados en la comunidad de San Sebastián Etla, Oaxaca derivados de los rescates arqueológicos realizados por la sección de arqueología del Centro INAH Oaxaca. Este contexto funerario colectivo, por su forma, depósito y el número mínimo de individuos encontrados, muestra que se trata de un posible cementerio del periodo formativo temprano mesoamericano. Como resultado del análisis de los restos óseos en su contexto arqueológico, se presentará el número de eventos funerarios, a fin de contribuir al conocimiento de la práctica funeraria colectiva de las antiguas sociedades de mesoamericanas y en específico, los valles de Oaxaca durante el mencionado periodo.

Cesaretti, Rudolf (Arizona State University)**[167]** *Hydraulic Empire Revisited: Exploring the Sociopolitical Vulnerabilities of the Riverine Socio-Ecological System of Pharaonic Egypt*

Ever since the falsification of Wittfogel's thesis on the role of centralized irrigation construction and administration in ancient Near Eastern states, most scholars of Pharaonic Egypt have found it taboo to theorize a relationship between irrigation-based productive systems and the Pharaonic political economy. A wealth of geoarchaeological and paleoclimatological proxy data has enabled the reconstruction of long term trends in Nile flood levels, highlighting not only the considerable inter-annual variability of inundation, but also dramatic fluctuations at millennial scales. While it is now

rightly acknowledged that Egyptian artificial irrigation systems were normally constructed and administered at the household and local level – enabling a high level of robustness in a socio-ecological system dependent on the maximization of floodwater for arable land – the sociopolitical trade-offs of such a system remain undertheorized. Using a stylized demographic-structural model to study the impact of fluctuations in carrying capacity on the Pharaonic political economy, this poster explores how: (a) long-term flood trends were mechanisms for both state expansion and collapse, (b) regional geomorphological differences in the Nile River stimulated divergent socio-ecological systems, and (c) decentralized regional institutional (nomarch, temple) power over local irrigation networks produced a decentralized sociopolitical structure prone to devolutionary tipping points.

Chaity, Ifath [396] see Blackwell, Bonnie A.B.

Challis, Sam (Rock Art Research Institute, South Africa)

[149] *Medicine Dog; Medicine Baboon: Images of Horses Perceived by Contact Cultures in Rock Art*

Horses traveled when Europeans expanded across the globe and thereafter swiftly spread among indigenous groups on those continents colonized. The way they are portrayed in rock art can potentially tell us much about the nature of the entanglements of contact and the groups both bringing and adopting this hugely influential domestic animal. This paper draws on rock art evidence from South Africa, Australia, North and South America. Indigenous portrayals of the horse are sometimes conflated with other animals and, far from being the product of bewilderment or misunderstanding, it transpires that often the artists well understood the horse, but in terms that were familiar to them.

Chamblee, John (University of Georgia)

[26] *Long-Term Data versus Contemporary Crisis: Anthropological Archaeology in the U.S. / Mexico Borderlands*

Steve Kowalewski's work demonstrates the importance of long-term data and provides methods for synthesizing archaeological and other social science data to address problems of contemporary concern. This paper takes cues from that research and combines it with the social conscience for which Steve is known and respected. Instead of treating the deaths of undocumented border crossers in isolation, this phenomenon is contextualized by the long-term history of the U.S. Mexico Borderlands as a crossroads. In this light, current border control mechanisms fit into a cycle of intensifying effort to control the flow of goods and people through the region.

Chan, Benjamin (Faculty of Archaeology, Leiden University)

[211] *The Faces behind the Façade: Monuments and Their Associated Practices in Neolithic Britain*

Over the last 40 years the analysis of monuments has lain at the center of our understanding of Neolithic societies. Interpretative approaches toward monuments range in scale from the overarching view of Renfrew's emerging chiefdoms to embodied perspectives focusing on their materiality. Regardless of analytical scale, most accounts treat monuments as complete architectural forms and fail to grasp the significance of the wider activities that surrounded their construction and use. This paper will show how recent excavations at Durrington Walls, Wessex, and the Ness of Brodgar, Orkney, have revealed the milieu of activities that surrounded these sites. These involved both routine daily subsistence practices and also episodes of feasting and mass consumption. The manner in which eating, drinking, sleeping, stone working, wood working and other technical activities were interwoven in the use of ceremonial monuments questions the persistent notion of a dualism of ritual and domestic life. Moreover, it suggests that the wider practices surrounding the construction and use of monument complexes provided an arena for social reproduction, the transmission of skills and the negotiation of social identities and were one of the driving forces behind the spread of ideas and technological practices over large geographic areas.

[211] *Chair*

Chan, Evelyn [219] see Pugh, Timothy

Chandler, Susan (Alpine Arch Consultants Inc)

[43] *Public Outreach and Pipeline Archaeology in the Western United States*

Cultural resource companies are increasingly tasked with disseminating the results of their archaeological research to the public. Because the nature of the archaeological record differs for each compliance project and because there are many different "publics" who can be identified, archaeologists have taken several different approaches to public outreach. In the last decade, Alpine Archaeological Consultants, Inc. has created a variety of public outreach products that describe what was learned during the archaeological research for several interstate pipeline projects in the Intermountain West. Among the items created for public consumption were several types of publications, including books for school-age children, books for adults, brochures, and videos; the development of museum displays; the installation of interpretive signs in the field; and presentations to avocational archaeology groups. The challenges encountered in the process of creating and distributing the different types of public outreach products will be described. An attempt will be made to assess the effectiveness of these various approaches from the perspectives of historic preservation professionals, educators, and, insofar as is possible, members of the general public.

[236] *Discussant*

Chaney, Philip [103] see Ervin, Kelly

Chang, Aaron [205] see Steinbruchel, Amber Joliz

Chang, Nigel (James Cook University)

[407] *Archaeometallurgy, Environment, and Landscape in Upland Laos: Its Impact on 'World-Views' during the Transition from the Bronze Age to Early States in SE Asia*

Recent excavations have shown that mining for copper ore in upland Savannakhet Province, south-central Laos, began at least 2500 years ago. We suspect that it may have begun even earlier. This paper considers who might have been living in this area prior to the introduction of mining and smelting technology and how the relationship between these prior occupants and their environment might have changed with this new technology. The scale and nature of the impact would have differed, depending on whether already present populations borrowed and adapted the technology from other, larger and more structured, societies - or if the technology was brought into the area in a conscious exploration and colonisation process by those same larger societies. Finally, this paper considers if the introduction of metallurgy was a key factor in reorienting views of the landscape in the past; drawing the uplands into the consciousness of lowland floodplain-based agricultural societies? The archaeological work that this discussion is based on has been carried out over several years under an MOU between MMG-LXML (transnational mining company), the Department of National Heritage of Laos and James Cook University, Australia.

Chapman, Jessica (Humboldt State University)

[121] *Faux for Fact: An Experimental Ceramic Restoration Process*

This poster focuses on research conducted on experimental restoration processes on ceramic materials. The focus of this research is in determining a potentially ideal adhesive for use on ceramic cultural remains within the restoration process. The restoration process can be very invasive and destructive. Thus, to perform experiments with various chemicals on faux artifacts will ultimately help the archaeologist further understand the proper techniques that need to be carried out in order to preserve the actual fragile and irreplaceable artifacts for later studies. My process involved breaking ceramic plates with an objective of restoring these faux ceramic artifacts with different adhesives so I can better understand what is the most practical and ethical methods within the art of ceramic restoration.

Chapman, Bruce [199] see Comer, Douglas

Chapoulie , Remy [411] see Muro, Luis Armando

Chappell, Duncan (university of sydney, australia) and Damien Huffer (Smithsonian Institution Museum Conservation Instit)

[279] *Bones of Contention: Further Investigation into the Online Trade in Archaeological and Ethnographic Human Remains*

Within the global antiquities trade, especially that (significant) portion of it conducted online, the size and scope of the trade in archaeological and ethnographic human remains continues to be poorly known. In 2014, the authors researched and published the first comprehensive update of what is known about the online component of this trade c. 2013, conducting common search engine queries over two months to creating a database to record recent or ongoing sales, and then explore questions of supply and demand, categories of artifacts being sold, and who is buying and selling. This paper will present new results that expand on Huffer and Chappell (2014), re-assessing previous conclusions in light of a larger database, discussion of additional case studies, and further discussion of the motivations, legal loopholes, and ethical considerations that keep this aspect of the antiquities trade alive.

Charleaux, Michel [77] see Weisler, Marshall

Charles, Frances [168] see Phillips, Laura

Charles, Brianne (University of WI-Milwaukee) and Emily Epstein (University of Wisconsin-Milwaukee)

[301] *Expanding Juvenile Dental Age Assessments Using 2013 Recovered MCIG Subadult Dental Data*

Outstanding preservation of the juvenile dentition of individuals recovered during the 2013 Milwaukee County Institution Grounds (MCIG) Poor Farm Cemetery project allowed for the application of four separate dental age assessments. We present the results of a pilot study that attempts to broaden the utility of the Moorrees et al. (1963a, b) tooth formation stages through their application to maxillary dentition and mandibular incisors from a sample of sub-adults from the MCIG cemetery. Tooth formation stages are correlated with other dental and osteometric assessments of age to provide a preliminary, population-specific expansion of methods.

Charles, Douglas (Wesleyan University)

[372] *Burial Mound as Palimpsest*

Time perspectivism has been defined as “the belief that differing timescales bring into focus different features of behavior” or “or different sorts of processes.” These different behaviors and processes require different concepts and explanatory principles. Criticism of time perspectivism has ranged from seeing it as advocating environmental determinism to it simply being a version of Annales history. Research under the umbrella of time perspectivism has generally focused on processes involving long timescales and on viewing archaeological assemblages as palimpsests. One notable exception is a study of the Hochdorf “princely” grave assemblage, usually considered a closed find, but treated as a palimpsest. Woodland period burial mounds in the American Midwest and Southeast can also be viewed as palimpsests. This paper will evaluate the utility of a time perspectivist approach, refining the manner in which it is applied to closed finds, or more accurately, the assemblage of closed finds which comprises a Woodland burial mound and mound group. The Elizabeth site from the lower Illinois River valley serves as a case study.

Charlton, Michael (University College London)

[89] *Immanence, Configuration and the Bloomery Ironmaking Process: Identifying Behavioral Opportunities from Physical Constraints*

All metallurgical systems conform to the scientific laws defined for chemical, physical and thermodynamic interactions. These laws place clear limitations on the range of technological

possibility, but, more importantly, create technological opportunity. Some metallurgical opportunities will be better suited to particular socioeconomic and natural environments than others. Models derived jointly from materials science and geology on one hand and evolutionary sciences on the other can offer insights for identifying the exploitation of metallurgical opportunities in the archaeological record, predicting the kinds of environments in which particular forms of exploitation are likely to occur and hypothesizing the trajectories of metallurgical traditions.

Ternary phase diagrams have a long history of use in archaeometallurgy for inferring parameters of smelting processes from the primary chemical components of slag—a residuum of non-reduced compounds from the furnace charge. The structure of ternary phase diagrams also serve as simple models of technological possibility that, when combined with insights from evolutionary theory, become fitness landscape models. Application of one such model to slag from an Iron Age and Medieval bloomeries in northwest Wales reveals how the histories of ironmaking processes are shaped through the interplay between scientific law, culture and the environment.

[89] *Chair*

Charno, Michael [235] see Wright, Holly

Chase, Zachary (The University of Chicago)

[81] *The (Beginning and) End of the World As We Know It: The Multiple Makings and Un-makings of the Indigenous Past in Huarochirí, Peru*

Much scholarly understanding of the ancient Andes has been greatly influenced by the unique ca. 1608 Quechua manuscript of Huarochirí, Peru. For many archaeologists and historians the manuscript reveals an indigenous Andean cosmos otherwise hidden or lost. And indeed the text's manifest leitmotif is the superation of worlds past by worlds present—an historical etiology of its narrators' place in space and time. Here I present results from the first systematic archaeology in the central area of the manuscript's production, which clarify earlier historical reconstructions of Huarochirí's past and provide deeper insight into the material and narrative construction of these Andean worlds, both in the prehispanic and Spanish colonial eras.

Chase, Arlen [108] see Johnson, Lisa

Chase, Adrian (Arizona State University), Arlen Chase (University of Central Florida) and Diane Chase (University of Central Florida)

[183] *Residential Architecture at Caracol, Belize: Conjoined Buildings and Distributed Space*

During the Classic Period (A.D. 550-900), the ancient Maya inhabitants of Caracol resided in formally constructed residential groups comprised of a series of buildings. These residential groups are believed to have been occupied by extended families. Some of the structures constituted formal residences, but other structures served a variety of functions, ranging from cooking to storage. Additionally, over two-thirds of Caracol's residential groups had at least one eastern building that was utilized as a ritual locus associated with a cyclical deposition caches and burials. Residential groups were distributed over an anthropogenic landscape that had been modified for intensive terrace agriculture; each group appears to have had control of enough land to have been agriculturally self-sufficient. Most households at Caracol also produced one or more crafts that permitted the inhabitants of residential groups to obtain necessary items at the site's markets. The level of social well-being in the site's residential groups has been interpreted as a conscious management strategy called symbolic egalitarianism. Archaeological information exists for 134 residential groups at Caracol and three dozen of these groups have been intensively investigated. These data are useful for framing variable social practices that existed in the Classic Maya area.

Chase, Diane (University of Central Florida) and Arlen Chase (University of Central Florida)

[295] *Iconographic Portraiture and Political Implications: Peter Harrison's Contribution to Mayanists' Understanding of Site Q*

As a dirt archaeologist, Peter D. Harrison was both intrigued by and skeptical of hieroglyphic

interpretations about the ancient Maya, especially relating to Tikal, Guatemala and its political context. However, at the same time he was particularly interested in site emblem glyphs and their significance, centering first on Tikal and next on Tikal's political enemies. One of his published contributions to the field was a well-documented paper in which he critiqued the way in which epigraphers had lumped a number of different animal heads together as representative of a single polity. Harrison argued that a variety of animal representations were conflated within what was then called the Site Q emblem glyph and that what was being attributed to a single entity was actually the products of several polities. This paper revisits Peter's earlier contribution and, through doing this, also examines the role of what has been referred to as Site Q within broader Maya political history.

Chase, Arlen (University of Central Florida) and Diane Chase (University of Central Florida)

[344] *Seventh Century Star Wars: Reassessing the Role of Warfare in Shaping Classic Period Maya Society in the Southern Lowlands*

At the time that *Forest of Kings* was written, Mayanists were unsure of how impactful Maya warfare actually was. Did it serve symbolic and ritual purposes like the Aztec flower-wars? Or, was Maya warfare actually waged for territorial gain? *Forest of Kings* was one of the first books to situate Maya conflict as warfare for territorial control. But, the depth and nature of this control as well as the way in which warfare articulated with and affected broader Maya society could not be answered in the hieroglyphic record. While hieroglyphs were used to frame the situational dynamics of Maya politics in *Forest of Kings*, at the time of the book's publication only limited archaeological data existed that could be used to complement the epigraphy. Twenty-five years later, this situation has changed. This paper examines Maya warfare and political history from the perspective of Caracol, Belize, using archaeological and newer hieroglyphic data to supplement the history of the ancient Classic Period Maya so admirably documented by Schele and Freidel in 1990.

Chase-Dunn, Christopher [291] see Inoue, Hiroko

Chaterji, Katia (CyArk) and Alexander Reinhold (CyArk)

[385] *Applications of Cultural Heritage and Digital Preservation in Science, Technology, Engineering, and Mathematics (STEM) Education*

This paper discusses the application of innovative 3D heritage documentation methods to augment science, technology, engineering, and mathematics (STEM) education. A California-based nonprofit dedicated to the digital documentation and preservation of cultural heritage sites worldwide, CyArk is a leader in digital heritage preservation, archival, and technological advancement. CyArk practices a range of techniques, including 3D laser scanning, high definition photography, and photogrammetry, channeling the resulting data towards future site conservation, interpretation, and development of educational materials.

CyArk will present a case study analyzing the digital preservation of the 18th century Spanish missions along California's coast, which represent historic El Camino Real. Studied by 450,000 California 4th graders each year, the Missions serve as model classrooms to teach the importance of our shared history. Through interactive lesson plans, students participate in active learning while visiting a mission site, while also engaging in technology and math subjects. In this discussion of El Camino Real digital preservation collection, CyArk strives to demonstrate the interconnectivity between history, heritage, and digital technology. CyArk believes emphasis on archaeology, cultural heritage preservation, and documentation in the classroom is a strong asset to STEM education, and will support the next generation of cultural heritage and technology advocates.

Chatters, James [121] see Brown, James

Chatters, James (Applied Paleoscience)

[370] *An Overview of the Hoyo Negro Project and Its Findings*

Hoyo Negro is an immense, underwater collapse chamber deep within the Sac Aktun Cave system, Quintana Roo, Mexico. On its floor lie data-rich calcite raft deposits, bat guano piles, scatters of

wood and charcoal, skeletons of large animals, and the remains of one teen-age human female. These sediments and fossils lie in total darkness, >40 meters below sea level, creating major technical challenges for their study and recovery. Investigations by a team of divers and scientists from Mexico, the US, and Canada, which began in 2011 using in situ study and minimal sampling, have begun to unlock this trove of potential information about the terminal Pleistocene paleoecology and human occupation of the Yucatan Peninsula. Thus far we have mapped the site in detail, identified as many as five extinct species of megafauna (two perhaps new to science), conducted geochemical studies of the calcite raft deposits to elucidate patterns of climatic change, determined the age range of the site, and begun studies of the human remains. Overall, the site dates from ca 8000 to >40,000 BP. Naia, as the girl has been named, is as much as 12,900 years old and her mitochondrial DNA places her origin firmly in Beringia.

[370] *Chair*

Chavez, Roberto [370] see Nava, Alberto

Chávez Balderas, Ximena (Proyecto Templo Mayor/ Tulane University)

[158] *Fire, Transformation, and Bone Relics: Elite Funerals at the Great Temple of Tenochtitlan*

As described in historical sources, the Great Temple of Tenochtitlan was the final resting place for some elite individuals: their bodies were exposed to fire and cremated bones were deposited in funerary urns. However, archaeological findings suggest that funerary rituals were more complex, depending on the identity, social status and cause of death of the deceased, as well as body symbolism. Seven urns containing cremated bones from five individuals along with numerous burial goods were found in this building, proving the existence of an important diversity in funerary rituals. In this paper I will present the different types of cremation rituals, the symbolism of fire as a transforming element, as well as the symbolism of cremated remains and their possible use as bone relics for consecrating ritual spaces.

[298] *Chair*

Chávez Balderas, Ximena [298] see Robles Cortés, Erika

Chávez V., José Juan [317] see Murakami, Tatsuya

Chazan, Michael (University of Toronto)

[190] *The Earlier Stone Age Occupation of Wonderwerk Cave: Combining the Archaeology and Geology*

The archaeology and geology of the Earlier Stone Age of Wonderwerk Cave (Northern Cape Province, South Africa) present a paradoxical picture. On the one hand there is a record of hominin occupation spanning a period of at least one million year that includes multiple proxies indicating the use of fire. However, the micromorphological study of the sediment shows almost no anthropogenic signal and the density of artifacts is extraordinarily low. This paper presents an overview of the current state of research including the new excavations at the site that began in 2013 in collaboration with Liora Kolska Horwitz and Francesco Berna. Although many questions remain about site formation processes in the early phases of hominin occupation at Wonderwerk the evidence suggests that the nature of occupation during this early period was different from the cave occupations familiar from the Middle Stone Age and Middle Paleolithic. The research at Wonderwerk provides an example of the critical role that micromorphology plays in the archaeology of early hominins.

Chazin, Hannah (University of Chicago)

[258] *Crossing the Line (Part I): Making Taphonomy Work for Social Practices in Prehistory*

This paper is the first part of a two-part exploration of the use of taphonomy as an archaeological technique across prehistoric archaeology and the archaeology of the contemporary. Parts I and II are a dialogue, through which both authors have re-approached their own work on taphonomy as an

archaeological method and analytic. Part I is an exploration of how approaching taphonomy as history opens up the possibility of exploring the political ramifications of pastoral practices. The zooarchaeological analysis of faunal remains from pastoralist societies in the Late Bronze Age South Caucasus serves as a case study. This work suggests how treating taphonomy as history and analyzing pastoralism as acts of assembling can productively address the simultaneously economic and political stakes of the organization of pastoralist life. The paper suggests that the political stakes of pastoralist assemblings are two-fold: 1) they produce the background of everyday, unremarkable practices of production, consumption and exchange and 2) assembling is also key to producing prescriptive material, semiotic narratives (discourses of power). In doing so, the paper will address how dialogue with the use of taphonomy in the archaeology of the contemporary has productively influenced this approach to taphonomy in a prehistoric context.

[258] *Chair*

Chechushkov, Igor (University of Pittsburgh)

[131] *Is Fortification Always about Defense? The Case of Middle Bronze Age Fortified Settlements in Northern Eurasia*

There are 22 fortified settlements of the Middle Bronze Age discovered in Russia through the methods of aerial photography analysis and field excavations over the last 40 years. Together they are known as Sintashta archaeological culture of the Southern Urals. The typical Sintashta settlement is usually an enclosure consists of 1-4 meters deep ditch and a wall built of dirt and clay. Surprisingly, all the fortified settlements were placed in the lowest spots of landscape and the tops of surrounding hills were not occupied. The current analysis of the settlement patterning using GIS suggests that people chose the place of living without consideration of defensive goals

Chen, Fahu [37] see Ma, Minmin

Chen, Pochan (National Taiwan University)

[49] *Exploring the Social Structure of Kunming Yangfutou Cemetery, Yunnan, Southwestern China*

Dian is the most important polity from Warring States to Western Han period in the Dian Lake area of Yunnan, southwestern China. Except for sparse records in Shiji, Hanshu and Huayangguozhi, our understanding of Dian all comes from archaeological discoveries, especially those large and complex cemeteries. Since 1950', archaeologists excavated many important Dian cemeteries including Jinning Shizhaishan, Jiangchuan Lijiashan, Chenggong Tianzimiao, Qujing Batatai, Chengjiang Jinlianshan and Kunming Yangfutou. These cemeteries usually have several hundred burials with abundant burial goods; however, the complexities in burial goods also confuse researchers. Some scholars applied several statistic methods in the analyses of these Dian cemeteries for understanding their social structures, social hierarchies and gender relations but none of them pay attention on spatial relations among burials. This paper applies spatial autocorrelation techniques in GIS to explore the spatial distribution of burial goods and their relations with the social structure at Yangfutou cemetery. With Moran's I and Local G* autocorrelation analyses, I argue that the Yangfutou cemetery can divided into six groups possibly according to descent relations. The southern group might be an elite group compared to others. The other groups might be equal in social status but different in terms of economic situation.

Chen, Peiyu

[113] *Dwellings and Corporate Groups in Montegrande, Jequetepeque Valley, Peru: A Household Study of Social Differentiation*

This research takes two kinds of analytical unit, dwelling and hypothetical corporate group, to analyze and compare spatial relationship between the east and west sectors in Montegrande, a Early Formative site locates in Jequetepeque Valley, Peru.

The map-based analysis reveals different changing pattern during the two phases of occupation. The primary result shows that east sector went through a significant transition from phase 1 to phase 2 in

the configuration of corporate group and in the location of largest dwelling. On the other hand, the nature of west sector didn't change significantly, while the dispersed dwellings in phase 1 became better connected through patios in phase 2 occupation. The comparison of dwelling size shows that there was no significant difference between the two sectors in phase 1 and there is a tendency that east sector had larger dwelling area than west sector in the latter occupation.

The result of comparison not only depicts a possible social differentiation, but implies various social strategies taken by different households: the rich households tried to isolate themselves from others and regular households tended to incorporate themselves into a larger corporate group in the settlement.

Chen, Hong, Xiaoling Zhang (Key laboratory of Vertebrate Evolution and Human O) and Chen Shen (Royal Ontario Museum)

[179] *An Experimental Study of Lithic Use-wear Multi-stage Formation*

Use-wear analysis has become an essential method for the functional study of lithic artifacts from archaeological assemblages. However, research concerning multi-stage use-wear formation is poorly developed. In this paper, we report the results of an experimental study focusing on flake scar patterns, rounding and polish formation in multiple stages. For comparative data and interpretation, nine cases of single working tasks were undertaken on scraping bone with Onondaga chert from Ontario Lake. The resulting flake scars and abrasive wear were observed separately in each stage and photomicrograph were taken and compared to compare the changing trajectory of use-wear formation. This experiment clearly demonstrates that flake scar formation does not correspond to the rate of usage over time and we propose that the formation of scar patterns and rounding become diagnostic attributes for use-wear observation. Flake scar fractures occur most frequently in the early stages. During later stages, flake scars stopped developing while rounding and polish became more apparent. The study also examines the changing trajectory and rate of scar invasiveness and length of use. The results are informative as it is suggested that scar invasiveness grew as the use time increased at a given working angle.

Cheng, Zhijie [179] see Yang, Yuzhang

Chenoweth, John (University of Michigan-Dearborn)

[258] *Power and Nature: A Contemporary Archaeology of Yosemite National Park*

Parks are the creation of established power structures, and are themselves statements about power over nature. Visitors to these parks, however, negotiate these structures in their own ways. Often, historical archaeological analysis focuses on power struggles: domination and resistance between classes, races, and genders, for example. This paper analyzes how some of the tools of these more traditional archaeological analyses apply to the present. A contemporary archaeology of litter in Yosemite has explored the concepts of "nature" and "culture," carefully critiqued by anthropologists over the last few decades, but still at the forefront of the public debate over the environment. Visitors' actions make statements of power over nature but in ways that can defy our usual categories of domination and resistance.

Cheong, Kong (American University), Chris Carleton (Simon Fraser University), Dan Savage (Trent University), James Conolly (Trent University) and Gyles Iannone (Trent University)

[48] *Testing a Locally-Adaptive Model of Archaeological Potential (LAMAP) to Assess Ancient Maya Settlement Location and Density in Belize's North Vaca Plateau.*

In 2012, a settlement survey was conducted on the North Vaca Plateau in west-central Belize as part of the Social Archaeology Research Program (SARP). The survey was intended to test the predictions of a new archaeological potential assessment method called the Locally-Adaptive Model of Archaeological Potential (LAMAP). A LAMAP assessment was produced for Minanha, a Classic Maya civic-ceremonial center, which served as the first case study for the new method. When conducting the survey to test the LAMAP predictions, however, the survey team found that modern

forest cover made it impossible to complete a survey with sufficient coverage to adequately validate the model in a reasonable amount of time. Thus, a LiDAR survey was commissioned to supplement the field results. The LiDAR imagery proved useful for identifying cultural features beneath the canopy with much greater efficiency than could be accomplished using traditional methods. In this paper we report a comprehensive test of the LAMAP assessment using a combined LiDAR and traditional survey dataset. We find that our understandings of Maya settlement patterns, and our ability to assess locational models like LAMAP, are significantly improved with the use of the combined dataset.

Cherkinski, Alex [121] see Loftis, Kathy

Chesson, Meredith (University of Notre Dame) and Annmarie Lindzy (University of Notre Dame)

[315] *"Made to Grow Old": Dressers, Delph, and Island Homes in Western Ireland*

Archaeologists have described and discussed households for decades, yet only recently have they made the theoretical leap from residential structures and coresidential units to peoples' homes. Homes are built, embodied and enlivened by peoples' actions, thoughts, relationships, experiences and aspirations. This poster presents the results of an ethnoarchaeological analysis of homemaking on the islands of Inishbofin and Inishark (co. Galway) as well as Inishturk (co. Mayo) in western Ireland. Through the ethnographic lens of dressers and delph on Inishbofin and Inishturk, we investigate how people employed the material goods of everyday life to build and preserve a sense of home. In turn, we compare these ethnographic delph and dressers to the archaeological material remains of 19th century homes on Inishark. By holding delph and other objects, dressers protect and embrace memories of loved ones lost to death and emigration as well as mementoes of important life milestones like pilgrimages, births, deaths, and marriages. We argue that dressers and their contents transformed houses into home, working in tandem with the main hearth to anchor the home in a family, a community and island heritage.

Chevalier, Alexandre (Royal Belgian Institute of Natural Sciences), Danièle Lavallée (Archéologie des Amériques, UMR 8096, CNRS) and Michèle Julien (Archéologie et Sciences de l'Antiquité, UMR 7041,)

[309] *From foragers to Producers: Desert Gardening at the Archaic Peruvian Site of Quebrada de Burros*

Research at the Peruvian site of Quebrada de Burros (Dep. of Tacna, Peru) evidenced a very early settlement of fishermen and shell-gatherers on the desert Pacific littoral. The campsite has been occupied during the Early and Middle Holocene, between 10,000 and 6,000 B.P. The analysis of organic remains indicate that since the beginning, the different groups not only relied on ocean resources but also exploited the surrounding vegetation. In particular, phytolith analyses show that the settlers drastically changed their direct environment over the time. This is the first time that such a direct human impact on vegetation could be identified at a very local scale for the Central Andes. We could also put in evidence that these inhabitants already used some domesticated food plants whose respective presence are among the earliest for the Andes.

Chhay, Rachna [349] see Carter, Alison

Chi, Julio (Julio Chi), James C. Chatters (Applied Paleoscience and Direct AMS), Andrea Cucina (Laboratorio de Bioarqueología, Facultad de Ciencia), Pilar Luna Erreguerena3 (Subdirección de Arqueología Subacuática, Instituto) and Vera Tiesler (Laboratorio de Bioarqueología, Facultad de Ciencia)

[370] *Histomorphology and Metabolic History of a Submerged Pleistocene Skeleton from the Cenote of Hoyo Negro, Tulum, Quintana Roo, Mexico*

This paper explores the histological preservation, metabolic history and living conditions in rib sections of a submerged female youngster, macroscopically determined to have died during her mid teens. This partially preserved skeleton counts among the most ancient individuals securely dated in the Americas. For the purposes of the study, we studied an undecalcified mid-shaft section of the

twelfth rib and quantified osteo density (OPD), formation processed, cortical and total bone area and histological growth arrest, serializing analogous rib sections of a female control cohort from the Yucatecan peninsula. This study was financed by Subdirección de Arqueología Subacuática of the Instituto Nacional de Antropología e Historia, and conducted at the Universidad Autónoma de Yucatán, Mérida, financed by CONACYT Project no. 152105 (2012-2015).

Chi Kei, Lo (The Chinese University of Hong Kong)

[349] *Preliminary Study on Western Han Dynasty Settlements in the Lingnan Region*

Recent archaeological excavations in eastern and northern Guangdong and eastern Guangxi discovered palaces and administrative offices in the period of Nanyue Kingdom. Also, the characteristics of the palaces and the offices were Han-style and other facilities were installed defensive function as a military post. Based on the excavations, this paper studies how the elements of Han culture were integrated into Yue culture as reflected their settlement structures, architectures, and other material expressions in the Lingnan region, covering Guangdong and Guangxi on Western Han dynasty settlements. Firstly the paper examines the development of politics and economics from the early Western Han to the later Western Han. Second, it studies how Zhao Tuo, King of Nanyue, maintained Han culture but also combined with Yue culture to re-construct the new "kingdom" that presented architectural forms. Third, it discusses how Yue people under the control of Han authorities adapted external impacts on their culture in Lingnan region.

Chiang, Chihhua (Department of Anthropology, National Taiwan University)

[49] *Use-wear Analysis of the Stone Tools at the Wansan Site, a Neolithic Site in Taiwan*

This is a multi-stage project whose goals are to understand the possible uses of various stone tools excavated from the Neolithic Wansan site in Northern Taiwan. In this poster, I will demonstrate the preliminary results of this project that identify possible patterns of stone tool use-wear. There are abundant finely ground lithic tools recently excavated from the Wansan site. Previous research has categorized these tools based on their morphology, and classified these tools as projectile points, adzes, axes, hoes, knives. The terminology implies the functions of these tools based on ethnological analogy. However, no systematic analysis of the use-wear or residue has yet been conducted on this collection. I will employ both high and low power methods to observe the use-wear of these tools in order to examine possible patterns among different types of tools. Based on the results, I can further plan the next stage of research to conduct experimental archaeology and residue analysis on these tools.

Chiarulli, Beverly (Indiana University of Pennsylvania)

[185] *Patterns of Lithic Raw Material Exploitation and Use in Western Pennsylvania*

During the Late Prehistoric period, at least four major lithic raw material types were used for the manufacture of a limited variety of tool types. The major tool forms were small triangular projectile points and flake tools. The major raw material types used in this region include Onondaga, Loyalhanna, and Shriver cherts and Vanport Siliceous Shale. Workshops and quarries have been identified have been identified and are found on the north, south, east and west sides of this region. An analysis of the lithic assemblages from several villages has found that all of these raw materials were used throughout the area. Analysis of the raw material types used in the villages suggests that although the percentage of a raw material type used in any particular village generally reflects the distance to sources, there are some materials that are present in much greater than expected quantities. In some cases, the most commonly used material is from quarries that are twice as far from a site as closer quarries. Analysis of the assemblages suggests that the use of raw materials reflects not only proximity to source areas, but also either perceived qualitative differences in the materials or access to different cultural networks.

Chicoine, David [237] see Whitten, Ashley

Childress, William [333] see Gingerich, Joseph

Childs, Amanda [95] see Sharma Ogle, Mini

Childs, Terry (Department of the Interior)

[160] *Discussant*

Chilton, Elizabeth [281] see Doucette, Dianna

Chilton, Elizabeth (UMass Amherst)

[405] *The Role of Intangible Heritage Values in the Management of Places and Things*

One of the stated goals of decolonizing archaeological theory and practice is to redistribute power and authority in the creation and communication of cultural heritage, a laudable goal. However, achieving such a goal is only possible if archaeologists and historians relinquish their role as historiographical experts—as the ultimate authority on historical truths and significance. While in recent years there has been a trend towards increasing public outreach and engagement, in some cases such collaborations have actually strengthened the colonial power relationships in which archaeologists have participated. One way forward is to turn to a definition of materiality that acknowledges that tangible and intangible heritage are inextricable, and that meanings and values are continuously created and recreated in the present by a variety of memory communities (see, for example, the 2003 UNESCO Convention on the Safeguarding of the Intangible Cultural Heritage). In this paper I examine several case studies—including the Northeast U.S. and the Bahamas—as a means to demonstrate that collaborative praxis must foreground the intangible.

Chinchilla, Oswaldo (Yale University)

[39] *Epiclassic in Southern Mesoamerica? Tradition, Innovation, and Reaction in Pacific Guatemala*

The Early Classic ascendancy of Teotihuacan was felt strongly on the Pacific Coast of Guatemala, particularly at Montana and related sites on the coastal plain of Escuintla. The Teotihuacan downfall roughly coincided with the demise of those sites, and the rise of a new dominant center Cotzumalhuapa, around A.D. 650. The process seems to parallel the emergence of Epiclassic centers in highland Mexico, and differs in many respects from the Maya Highlands and Lowlands, where there are fewer indications of major changes in the political landscape in the wake of Teotihuacan's collapse. This paper examines two questions: How did Pacific coastal peoples respond to the demise of the highland Mexican metropolis? And how did local developments in Escuintla relate with broader Mesoamerican patterns? The archaeological record and the sculptural corpus of Cotzumalhuapa suggest adjustments that combined the maintenance and reinvigoration of coastal traditions, the adoption of innovations stimulated by Teotihuacan influence, and reactions against the former ascendancy of Teotihuacan culture in the region.

[242] *Discussant*

Chinique de Armas, Yadira [313] see Buhay, Bill

Chiotti, Laurent [181] see Nespoulet, Roland

Chiou, Katherine (University of California, Berkeley)

[347] *To Screen or to Float?: Methodological Considerations for Archaeobotanists in Coastal Peru*

In recent years, coastal Peru has seen an encouraging upwards trend in the number of archaeologists trained in the field of paleoethnobotany or archaeobotany. With growing numbers of practitioners in the field, it is crucial to remain vigilant of methodological concerns that are relevant not only to archaeobotanists as a whole, but particularly to those working in the unique environment of coastal Peru. In the interest of maximizing interpretative potential while maintaining the capability to run comparisons across multiple datasets, archaeobotanists need to be constantly mindful of ways

to improve the methods and techniques we utilize when conducting our research. Issues of concern include sampling protocols, processing techniques, identification and counting procedures, and quantification. Archaeobotanists working in the dry, coastal region of Peru, for example, employ a variety of techniques in the processing of sediment samples for botanical remains that fall under the general categories of screening/sieving and flotation. The choice of a certain processing method alone can have a profound effect on the quantity and quality of botanical remains as well as an effect on the actual taxa recovered. This paper will present recent research on these issues using data collected from the North and South Coast of Peru.

[117] *Moderator*

[347] *Chair*

Chiou-Peng, TzeHuey (Univ. Illinois UC)

[349] *Toward a Reconstruction of Early Settlements in Metal Age Yunnan*

Although research works on the Bronze Age burials in Yunnan in the past fifty years have expanded our knowledge on various aspects of ancient Yunnan societies, many questions pertaining to the earliest stages of human existence in Yunnan have remained to be answered for short of a well-defined chronological sequence from settlement archaeology. Recent findings of early habitation sites in the environs of the Lake Er are beginning to shed new lights on the exiting issues, including questions regarding the onset of metallurgy in Yunnan. Studied in conjunction with a newly established ceramic sequence, the typological, stratigraphic, metallographic, and phytolith analyses of materials taken from these sites can now be used to assist in characterizing the regional features of early Yunnan cultures, as well as in interpreting interactions occurring in and around western Yunnan during the 2nd millennium B.C.E. These studies appear to have dovetailed with the result from analyzing metal particles in sediment cores from Lake Er--a chronological table suggesting the transition between the Neolithic and Bronze Ages of Yunnan.

[234] *Chair*

Chiriboga, Carlos [413] see Freidel, David

Chiu, Scarlett (Academia Sinica, Taiwan), David Killick (School of Anthropology, University of Arizona, USA), William Dickinson (Department of Geosciences, University of Arizona,) and Christophe Sand (The Institute of Archaeology of New Caledonia and)

[77] *Connection and Competition: Some Early Insights Gained from Petrographic Studies of New Caledonian Lapita Pottery*

In this paper we will present the newest results gained from both petrographic and chemical compositional analyses of New Caledonian Lapita pottery samples in order to address issues concerning long-distance connections among several Lapita communities, as well as competition that might have happened between Northern and Southern Lapita communities. We have been able to develop an effective way of identifying pottery production areas within New Caledonia and our results suggest that there were possible social boundaries between two sides of the Grande Terre.

Chiykowski, Tanya (SUNY Binghamton)

[391] *Trade, Migration, and Movement at Cerro de Trincheras, Sonora, Mexico*

Archaeologists study the movement of potters, materials and techniques to understand migration and exchange on both a local and regional scale. Modern international divisions, such as the Mexican - US border, interrupt these research questions in the Greater Southwest culture area. In Sonora, archaeologists have clear evidence of population upheaval after A.D. 1300; Southern Arizona Hohokam groups migrated into the Altar Valley, bringing with them new ceramic technologies and displacing a resident Trincheras population to the Middle Magdalena valley. Whereas the presence of large amounts of Hohokam Sells Plain ceramics at Cerro de Trincheras in the Middle Magdalena valley suggests that Trincheras and Hohokam populations interacted, neither how the process occurred, nor the impact of those linkages are understood. What processes resulted in such a large percentage of 'foreign' plainware ceramics at Cerro de Trincheras? My paper

will use ceramic petrography and GIS analysis to address the likelihood of trade, community migration, and the movement of women as part of a wider question of population interaction and innovation in the late prehistoric Greater Southwest.

Chmilar, Jennifer [38] see Leonard, Daniel

Choi, Seonho (Seoul National University), Jangsuk Kim (Seoul National University), Jaeyong Lee (Seoul National University), Chuntaek Seong (Kyunghee University) and Jaehoon Hwang (Seoul National University)

[80] *On the Precision and Accuracy of Radiocarbon Dating*

Radiocarbon dating in the modern age is a precise experiment requiring an understanding of nuclear physics using accelerators. It requires measurements on the order of parts per trillion of carbon 14 nuclei in samples. Although most of the procedures of radiocarbon dating are standardized these days, the final results of the measurements have limitations on precision and accuracy that require careful verification before final acceptance. Recently, our group has carried out radiocarbon dating on samples of which the actual dates are approximately known. These samples were sent out for radiocarbon dating several times for a consistency check to confirm consistency of results. These experiments were performed over different accelerators in order to check for consistency. Based on reports for each radiocarbon date, we have worked to reconstruct the data collected during the measurements and applied standard nuclear physics analysis to the data. The preliminary results from this study will be presented with suggestions on how to refine the precision for radiocarbon dating.

Choi, Jeong-Heon [174] see Nightingale, Sheila

Christakos, Elena and Augusto Vásquez

[232] *Panquilma: Socio-politics in Household Archaeology*

An analysis and discussion contributing to previous research of the socio-political organization found at the Yschma site of Panquilma, located on the Lurin Valley, central Peruvian coast. Panquilma is a 13th–15th century site on the borders of one of the most important and influential religious centers in the Central Andean Coast – Pachacamac. The site of Panquilma is comprised of three sectors; Sector 1 is characterized as the public zone and includes monumental architecture in the form of pyramids with ramps, Sector 2 consists of multi-room domestic compounds, and Sector 3 encompasses a series of shallow, rounded tombs containing substantial amounts of human remains. This discourse will focus on the domestic confines of the site, highlighting any socio-political discrepancies found between the two existing groups of the domestic sector -- the peripheral and central household compounds. Ceramic analysis, as well as the complementary use of a pre-existing ceramic typology for Panquilma will be used to classify variation in ceramic types. In doing so, domestic activities that may have developed in the household compounds can be easily recognized. Subsequently, we will distinguish the differences in accessibility and identify the existence of any contrast in status between these two differing household compounds.

Christensen, Kim (University of California Berkeley)

[327] *'Authenticity, Repurposed': Mason Jars, Archaeology, and Contemporary Narratives*

From the satirical website The Onion to the venerable New York Times newspaper, mason jars are receiving attention due to their current resurgence in popularity for food preparation, décor, and do-it-yourself projects. These contemporary examinations of the mason jar's popularity tend to contrast the frivolity of today's use with a singular utilitarian historical view. In this paper, I examine the varied discourses that they have been placed within historically and by archaeologists in order to complicate the static view promoted by contemporary discussions. I argue that while their use for food preservation may have indeed been a matter of survival in many cases, the promotion of mason jars by the late 19th/early 20th century domestic science movement and issues of gender, race, class, and rural/urban location add important texture to this seemingly bland and ubiquitous food container. In complicating their history by drawing attention to issues of inequality implicated in their

historical use, I critique the notions of authenticity and nostalgia attached to mason jars in the present moment as continuing to overlook the same, ongoing issues of inequality.

Christianson, Ashley [265] see Okray, Jillian

Christie, Jessica (East Carolina University)

[46] *Inka Border Negotiations in the North: The Canari Case in the Province of Azuay, Ecuador*
This paper will reassess relationships between the Inka and the Canari in the northern frontier zones of the Inka empire through local archaeological data. So far, scholarly knowledge about the Canari has been based upon ethnographic descriptions provided in various Spanish sources. The Canari have been characterized as a strong-willed independent people who offered fierce resistance to Inka domination. They were entrenched in the civil war between Waskhar and Atawallpa and eventually their resistance was broken by means of the mitmaq policy. Inka presence in Ecuador is commonly evaluated through archaeological information obtained from Tomebamba and Ingapirca. Tomebamba functioned as Wayna Qhapaq's capital and Ingapirca was a tambo outpost about 40 kilometers to the north.

I will discuss Canari material from Ingapirca and from the nearby sites of Coyoctor recently excavated by Ecuadorian archaeologists and Cojitambo. All three evidence original Canari settlements with Inka overlays. The paper analyzes Canari-Inka relations from the perspectives of origin narratives, stone ideology, and landscape construction. Coyoctor emerges as a complex case study of all three. The results show a new nuanced understanding of Canari-Inka dynamics which carry over into the present by reinterpretation of local toponyms and associated ritual practices.

[46] *Chair*

Christie, Heather (University of Glasgow)

[101] *Got Swag? Investigating Beads and Bead Trade in Scotland during the First Millennium A.D.*
The most prevalent theory concerning intercultural interaction demands a dominant-subordinate relationship in which the subordinate group passively accepts the culture imposed on them by the dominant population. This argument is often applied to Scotland in the first millennium A.D., where the transferred cultures are the Irish, Anglo-Saxons, Romans, Norse, and others from continental Europe. Studies of beads in Scotland are particularly affected by these theories: very few beads are seen as uniquely Scottish objects, and very little agency is accorded to local, Scottish groups for this period. Yet, until now, there has been no systematic study of Scottish beads during the first millennium A.D. from which to draw such conclusions. This study records and analyses the distribution of beads found in Scottish contexts dating to the first millennium A.D., and argues instead that the distribution patterns of these beads demonstrate clear agency on the part of local populations. Thus, rather than blindly accepting imported cultural practices, local groups in Scotland are actively selecting the beads they wish to use/import and are re-appropriating the materials they have to fit their own needs.

Chu, Alejandro

[134] *Archaeological Data vs Historical Accounts. The Inca Occupation of Incahuasi, the New Cusco, Cañete, Peru*

This paper presents the results of recent research at the archaeological Inca site of Incahuasi located at the Cañete valley, Peru. Although Incahuasi is frequently mentioned in the archaeological literature and by Spanish chronicles (it is considered a New Cusco) little research has been done at the site. New data from archaeological excavations allows us to compare historical accounts about the nature of Inca's occupation of the site, showing significant differences and challenging the picture that the historical accounts present us about Incahuasi.

Chu, SeiMi [396] see Blackwell, Bonnie A.B.

Chuipka, Jason (PaleoWest Archaeology)

[229] *Absent or Overlooked: Addressing the Early Athapaskan Presence in the San Juan Basin of Northwest New Mexico*

The San Juan Basin of New Mexico is one of the most archaeologically rich areas of the American Southwest. Three years in, the Navajo-Gallup Water Supply Project is the latest in a long history of infrastructure projects that provides the opportunity to conduct archaeological research and expand our understanding of the past. One question being addressed is when the Southern Athapaskans moved into the upper San Juan Basin and how long they occupied it before Navajo culture emerged. At the present time, archaeological evidence for the earliest emergence of Navajo culture (forked stick hogans, sweat lodges, characteristic ceramic and lithic technologies, maize agriculture) points to the A.D. 1500s. Archaeological evidence for an earlier Athapaskan presence has proven elusive, and interpretation of data has been prejudiced by hypotheses regarding the timing of migrations. Further complicating this issue is that most aceramic artifact scatters and camp sites encountered on large data recovery projects that may shed light on this issue have not been selected for investigation as they are considered to have minimum research potential. The current project seeks to devote more attention to defining and dating sites that may contribute to understanding the early Athapaskan occupation of the region.

[229] *Chair*

Chunag, Amartuvshin [234] see Wright, Joshua

Church, Robert [4] see Damour, Melanie

Church, Warren (Columbus State University, GA)

[78] *Where Was Chachapoyas? A View from the South*

To answer the query "what was Chachapoyas?" we must think in terms of time, space and identity. Chachapoyas scholars have encountered documentary and/or archaeological evidence of a mosaic of social identities, all undergoing transformations during successive pre-Inca, Inca, and Colonial times within a truly vast Andean region. In this paper, I consider notions of Chachapoyas internal and external boundaries as they have been conceived in the southern area where I conduct my research. Chachapoyas scholars usually make reference to ethnohistorian Waldemar Espinoza's 1967 map of "Grupos Étnicos" and/or the map drawn by Langlois ca. 1940. Neither scholar provides detailed justifications for border placements. Scholars concur that differences in material patterning indicate the existence of a poorly understood boundary that once separated Chachapoyas into northern and southern sub-regions, and perhaps justified the Inca's creation of northern and southern Inca administrative units (or hunos). The meanings underlying these differences require explanation, as these "halves" do share material attributes. My research suggests that wholesale inclusion of the southern area under the "Chachapoyas" label inhibits understanding of cultural developments at important sites like Gran Pajatén. Here I examine when, where, and perhaps why some boundaries may, or may not have functioned in southern Chachapoyas.

[78] *Chair*

Church, Michael (HDR)

[228] *Renaissance Florentine Palaces, Costly Signaling, and Lineage Survival*

The elites of Florence, Italy built a huge number of palaces during the city state's period of republican government between 1282 and 1532. Intuitively, these palaces seem like a perfect fit with the predictions of costly signaling theory: they were expensive, highly visible, and vast, and the families that commissioned their construction viewed them as ways of reflecting and producing status. But were these structures costly signals, or did elites spend money on lavish houses simply because they could afford to do so? This research uses the material record of 174 extant palaces built between 1282 and 1532 and demographic and political data extracted from the city's republic-era election records to evaluate whether palaces are consistent with the predictions of costly signaling theory. My findings indicate that palace owners had more offspring and more political

success than their non-palace owning peers, but they obtained these advantages before they commissioned their palaces, not after. In addition, palaces' fit with the predictions of costly signaling varies over time. My results indicate that costly signaling can operate in complex ways, offer new insight into Florentine elites' consumer choices, and reveal parallels with modern American decision-making regarding residential real estate and other spending.

Chykerda, C. Myles [368] see Kontonickolas, MaryAnn

Cinquino, Michael [352] see Hayward, Michele

Cioffi-Revilla, Claudio (George Mason University - Center for Social Complexity) and Thomas Dover (George Mason University)

[377] *Implementing Politogenesis by Canonical Cycling in an Agent-Based Model with Circumscribed Environment*

"Politogenesis" is a fundamental social process for understanding how and why early societies increased or decreased their social and political complexity. Agent-based models (ABM) of archaeologically recorded processes of early polity formation and regional dynamics are beginning to show promising results for advancing theory and research on politogenesis, especially when ABM results can be compared with empirical patterns, such as cycling. This study investigates politogenesis in a geographically circumscribed region by implementing an ABM. The model uses a decision-making process enabling agents with bounded-rational adaptive capacity for managing significant changes in subsistence or living conditions. Qualitative analyses of simulation results demonstrate how the model generates regional polities with detailed narratives of politogenesis with face validity. Significantly, model outputs are validated by "peaks and valleys" of political and social complexity similar to those proposed by earlier models of polity cycling, such as the Dynamic Model of J. Marcus and related theory and research. Interestingly, the model identifies a period of time in regional politogenesis that exhibits a phase transition from polities with low complexity to polities with higher complexity. Increased population densities that enabled production beyond subsistence, with regional territorial limits imposed by circumscription, can account for this shift.

Ciravolo, Amber [294] see Smith, Eugene

Cirillo, Laura (California State University, Chico), Alexandra McGough (University of California, Berkeley), Julie Ding (University of California, Berkeley), Rebecca Jabbour (Saint Mary's College of California) and Gary Richards (A.A. Dugoni School of Dentistry, University of the)

[132] *Geometric Morphometric Assessment of Cranial Shape Change in Trigonocephaly*

Investigating the only known prehistoric example of trigonocephaly, a condition thought to result from premature sutura frontalis fusion, we address cranial shape changes in this condition that have been previously limited in scope and based on living individuals. The individual derives from a prehistoric context on Santa Rosa Island (CA-SRI-24), dates to 1500-1650 A.D., and is housed at the PHMA, UC Berkeley. Ninety-three 3D landmarks were collected from normal skulls for comparison (n=43, range from 6.0-8.0 years) with a Microscribe 3D digitizer and from a CT scan of the trigonocephalic (8.0 years \pm 24 months) using Amira 5.5. Skull shape was explored using Principle Components Analysis (PCA) on Procrustes-aligned shape variables. Principle components of the face and vault separated provide more of an insight into the overall shape change and potential cause. The PCA reveals major shape change in the face and anterior cranial base. These changes are coupled with cranial shortening and supramastoid-level broadening. Maximum cranial breadth is displaced anteroinferiorly. The degree of shape change occurring in virtually all regions of the skull in this malformation is well beyond that currently documented and has potential implications for understanding suture closure, skull growth, brain development, and modern surgical intervention practices.

Civitello, Jamie (Valles Caldera Trust)

[93] *Earthwatch at the Valles Caldera National Preserve: Building a Successful Volunteer Research Partnership with Obsidian, Quarries, Soil, and More!*

Since 2012, the Valles Caldera National Preserve has partnered with Earthwatch Institute to bring volunteer-scientists into the field to participate in archaeological research. Volunteers stay overnight on the Preserve for 11 days and work side-by-side with Preserve archaeologists to excavate a large obsidian quarry in the heart of the caldera. The volunteers gain skills in applying archaeological methods, while living and working in one of the most spectacular landscapes of northern New Mexico. Each person feels personally invested in the research that will help Preserve managers interpret and protect a poorly understood resource. Outcomes from excavations so far include insight into site formation processes and ongoing research and analysis aims to explore quarry site use over time as compared to a nearby habitation site. Beyond the research aspects of our partnership, connecting our constituency (the American people) to the archaeological resources under our stewardship is the transcendent goal of the partnership between the Preserve and Earthwatch.

Claesson, Stefan (SEARCH, Inc.)

[192] *Pleistocene Megafauna Finds from the Merrimack River Delta*

In 2013, two Pleistocene mega-faunal remains, a single mammoth tooth and a partial juvenile mastodon mandible with teeth, from two separate locations, were recovered by a scallop-fisherman in the Merrimack River embayment off the coast of New Hampshire and Massachusetts. These well-preserved finds follow on previous finds by fishermen in the same locale over the last two decades, as well as numerous other offshore finds that have occurred in the Gulf of Maine for more than 50 years. This presentation will broadly discuss the provenience and scientific sampling potential of previously recovered mammoth and mastodon specimens in the Gulf of Maine, the seafloor and sub-seafloor characteristics at the approximate locations of the 2013 recovery sites, and the potential coexistence of late Pleistocene – early Holocene mega-fauna with the initial Paleoindian occupation in the region.

Clardy, Kelsey (The University of Tulsa)

[66] *The Muscogee (Creek) Nation Council House: A Continuation of Architectural Traditions*

Public architecture is reflective of society. Council houses were an important example of public architecture during both prehistoric and pre-removal times and were prevalent across the Southeast. The original purpose of these council houses was to provide a place for the people to conduct official meetings in the winter months. The purpose of this research is to demonstrate that the Muscogee (Creek) Nation Council House in Okmulgee, OK is an example of post-removal public architecture that was a continuation of past architectural traditions, as well as a cultural adaptation to a new situation. This council house was constructed as a meeting place for a nation attempting to retain sovereignty in the wake of removal and war. Life was significantly altered by removal. The construction of the council house in Okmulgee, although not identical to pre-removal council houses, was a way to maintain a connection to the pre-removal world and demonstrates cultural continuity in its use as an important meeting place for the nation in Indian Territory.

[66] *Chair*

Clare, Lee (German Archaeological Institute), Oliver Dietrich (German Archaeological Institute), Jens Notroff (German Archaeological Institute) and Joris Peters (Ludwig Maximilian University of Munich)

[16] *Establishing Identities in the Protoneolithic: History Making at Göbekli Tepe in the Late Tenth Millennium cal B.C.*

Processes of early sedentism are associated with the agglomeration of complex hunter-gatherer populations within the 'confines' of spatially limited permanent settlement systems, possibly with 'fixed' territorial claims, and with an economy based on stored harvests of wild cereals and pulses, and broad-spectrum hunting. Against this background, the emergence of social hierarchies and identities has long been an area of discussion among archaeologists. Be this as it may, we still find it extremely challenging to describe the different paths which social evolution may have taken in the Early Neolithic, let alone backing up any assumptions with empirical or physical evidence. In this

paper, we turn our attention to the PPNA ritual enclosures at Göbekli Tepe. We will discuss the role of these structures in the genesis of Early Neolithic group identities. In doing so, we posit that the monumental architecture at this site was used as a means to express and substantiate long-term (historical) social relationships in the Early Holocene.

Clark, Jamie [7] see Phillips, Cassidy

Clark, Bonnie (University of Denver)

[34] *The Good, the Bad, and the Awkward: The Archaeology Open House as Heritage Process*

The open house has long been a tool employed by archaeologists who wish to engage or at least inform the public about their field work. Projects that have a strong community mandate would seem tailor-made for this type of activity. Yet if these events are to meet their promise, they need to move from mere "show and tell" to more thoughtful and theoretical interventions. That is particularly true for sites with difficult or contested histories. This presentation draws on four seasons of open houses held by the University of Denver Amache field school at the site of Colorado's WWII-era Japanese American internment camp. Ranging from 400 person tours, to museum exhibits, to one-on-one tours, activities at these open houses have often, but not always, been successful. Framed by critical heritage studies, especially Laurajane Smith's contention that heritage is a process, this presentation will highlight some ways archaeologists can enable or hinder engagement through the open house. Voices of visitors, community volunteers, and students are woven through this reflection.

Clark, Brian (Rice University)

[47] *Problems of Archaeological Site Preservation and Identification in the Highland Mountains of Ethiopia*

This paper will discuss how historical, environmental, and social changes have effected archaeological site preservation in the mountains of the central Ethiopian Highlands, with implications for improving archaeological research in the region. Over the past decade, archaeological and historical research in the central highlands of Ethiopia has seen a growing interest to move beyond prominent Aksumite and Pre-Aksumite monumental sites to more ephemeral sites like medieval settlements and royal camps. The mountainous terrain of the highlands and its settlement history, however, has posed a number of challenges to good site preservation and effective reconnaissance. Based on fieldwork conducted around the mountains of Lasta, Amhara Region, this paper will review some of the human and environmental impacts on archaeological site preservation. These include conditions such as deforestation, the erosion patterns of intensively cultivated vertisol soils and the unintended consequences of locally organized environmental remediation efforts. The results of this research can help to better assess the archaeological potential of an area in the Highlands prior to invasive fieldwork and devise research strategies appropriate to the expected conditions. They may also contribute to better land-management practices that protect both the environment and its tangible cultural heritage.

Clark, Tiffany

[69] *Discussant*

Clark, John (Brigham Young University)

[82] *The Transition to Home Living in Middle America*

In Middle America the transition from the Archaic to Early Formative period (ca. 2000-1400 B.C.) was marked by the first use of pottery and the construction of durable dwellings clustered in small hamlets or villages. These markers of year-round dwelling in one place represent a major transition in Early Formative times to neolithic lifeways and presumably lifeworlds. I review the evidence of the earliest houses known from highland and lowland regions of Middle America, with an emphasis on the Pacific coastal lowlands of Chiapas, Mexico. The evidence of Late Archaic dwellings is extremely sparse for all of Middle America, so the full nature of the transition in domestic architecture and structures cannot be reconstructed. One is left mostly to conjecture based on the earliest structures

built in the Early Formative period. I review the evidence of early domestic structures known for proto-Mesoamerica here and speculate on how the transition from living in caves or ephemeral shelters to durable houses may have been experienced. At a minimum, the transition must have involved a shift from living in sheltered areas to dwelling in one's own home.

[151] *Discussant*

Clark, Meagan (University of Oregon), Scott Fitzpatrick (University of Oregon), Frances White (University of Oregon) and Christina Giovas (University of Oregon)

[164] *Precolumbian Vertebrate Remains from the Coconut Walk Site, Nevis, West Indies*

Archaeological investigation of the Precolumbian site of Coconut Walk on the island of Nevis (northern Lesser Antilles) revealed midden deposits dating between ca. A.D. 850-1440. While the site had been previously excavated by the British Time Team television show in 1998, only cursory examination of faunal remains was conducted (NISP=451). We report on the complete analysis of more than 18,000 recovered vertebrate remains from a 5x5m trench in the core midden area, providing enhanced understanding of the relative importance of various taxa and methodological issues associated with site recovery techniques. Analysis indicates that the assemblage consists largely of herbivorous reef parrotfish species along with several species of pelagic fish, birds, lizards, and rodents such as the indigenous rice rat (*Oryzomyini*) and the introduced agouti (*Dasyprocta* sp.). When coupled with the invertebrate assemblage, the vertebrates constitute a complementary and extensive dataset to help examine human diet and site use on Nevis that provides a framework for understanding numerous issues related to Caribbean island adaptations during the Late Ceramic Age .

Clark, Barbara

[188] *The Pros and Cons of "Public Archaeology Days"*

The Florida Public Archaeology Network is tasked with educating Florida's public about the state's rich archaeological heritage. One method that has been used to do so is what we call "Public Archaeology Days". These days mainly consist of identifying artifacts that the public has legally collected on private land, usually their own backyards or farms. There has been much debate surrounding this method of public outreach and much discussion on how to properly host these events. Often we partner with other educational venues to host these events. We strive to make them educational for the public and attempt to provide them with not only information about the artifacts they bring us, but also teach them about the laws, the importance of archaeological site context, the Florida Master Site File and also the ethics involved with collecting. Of course, this must be done in such a way as to not deter the public from approaching archaeologists with their finds or information about potential sites. Through trial and error, we are constantly working to enhance this program and ensure that it meets our goal of public education while remaining a positive experience for both the archaeologists and the public.

Clark, Andrew (SUNY-Albany)

[230] *Boots on the Ground and Planes in the Air: Assessing Damage to Archaeological Sites Caused by the 2011 Missouri River Floods*

In the spring of 2011, the Missouri River Mainstem received unprecedented combination of snow melt and rain causing widespread flooding unseen since the construction of the Missouri River Dams. One of the consequences of the flooding was damage to archaeological sites located on the lands surrounding the reservoirs. As a result, South Dakota State Historical Society (SDSHS) partnered with the University of Arkansas Center for Advanced Spatial Technologies (CAST) to assess potential damages related to the flooding for the US Army Corps of Engineers (USACE). The SDSHS/CAST team developed a program that combined on-site erosion monitoring with the collection and orthorectification of historic aerial imagery, ground based geophysics, low level aerial photography, and high altitude remote sensing. This integrated approach incorporates a time-series of GPS data and aerial imagery with recently collected geophysical data providing a surface and

near subsurface view of many sites damaged by the recent floods, providing assistance to the USACE in the management of these finite resources.

[230] *Chair*

Clark, Jeffery (Archaeology Southwest)

[278] *Twenty Years of Studying the Salado*

Archaeology Southwest (formerly the Center for Desert Archaeology) has been heavily engaged in studying the Salado Phenomenon through the lens of migration for nearly twenty years. Our research has been both intensive and extensive in scope: gathering new data from sites on public and private lands, reanalyzing existing collections, and scrutinizing published and unpublished reports from nearly every valley and basin in southern Arizona and southwestern New Mexico. Here we summarize this research and the salient empirical facts that any model of Salado must accommodate. We then present our conception of Salado, consistent with these facts, as an inclusive ideology that was developed by a spatially dispersed, but culturally connected, immigrant minority from northeastern Arizona. This ideology was ultimately adopted by many local groups in an attempt to ease tensions in the wake of migration and integrate multi-cultural coalescent communities. Many of these communities failed prior to the arrival of Europeans for reasons that remain obscure.

[278] *Chair*

Clark, Amy (University of Arizona)

[289] *Analyzing Activity Areas When Only One Material Remains: The Interpretation of Low Density, "Empty" Spaces in Open-Air Middle Paleolithic Sites*

It is common for open air sites dating to the Pleistocene to lack organic preservation, including bone. Many of these sites also do not contain features such as hearths. Therefore, the dominant signal that remains is the result of lithic reduction. Because knapping is a reductive process, it creates a large amount of waste material and this debris dominates the artifact count numerically and volumetrically. Lithic pieces associated with other types of activities, such as wood working or butchering, can easily be overlooked when dealing with such a quantitative bias. Furthermore, most archaeologists would be hesitant to identify an "activity area" based on the presence of only one artifact, even if that artifact has been associated with a particular activity through use wear analysis. The lack of organic debris makes such a conclusion unwarranted. This presentation will focus on a method that highlights these so-called "empty" areas and places them on equal footing with the high density concentrations of material. It is argued that these low density/blank zones are as important to the site's structure as the dense clusters of debris, particularly for sites with limited preservation.

Clark, Dylan (New Mexico State University)

[307] *Believing Is Seeing*

Humans use an array of senses to experience the world, vision being how we primarily characterize most experiences. Color, contrast, and brilliance are all factors that are both consciously and unconsciously considered when visually interacting with the material world. These are not passive factors that are simply filed away by the brain, but active communicators that trigger responses in the mind of the viewer. This influence on human behavior has a direct impact on material culture. Since archaeological study seeks to make cultural inferences from material objects, consideration of these elements' agency on a viewer makes it desirable to understand how visual attributes guide behavior. The area I will focus on is the American Southwest, which has a long history of ethnographic and archaeological study, allowing examination of the importance of color in Pueblo ritual behavior and material culture, both present and past. I will use artifact and architectural examples from the Mogollon and Anasazi regions as well as existing anthropological research to identify and analyze elements of visual perception and their relationship to past cultures and the archaeological record. Though this study focuses on the Southwest, the aim is to explore a workable methodology applicable to general archaeological research.

Clarke, Mary (Boston University)**[193]** *The Role of the Sweatbath in Classic Maya Ritual Performance*

This paper reviews the scholarship regarding Mesoamerican sweatbaths and their role in performance, specifically choreographing locations for transformation and sympathetic transition in supernatural space. The recently discovered sweatbath at the site of Xultun in Guatemala, known as Los Sapos, will be inserted into this dialogue in conjunction with that regarding plazas and Maya theatricality more broadly. After both contextualizing Los Sapos and presenting interpretations regarding its site-specific function, this paper will propose conclusions that will add to the knowledge of these unique structures within the known corpus of Mesoamerican architecture.

Clarkson, Chris [33] see Shipton, Ceri

Clauter, Jody (Office of the Wyoming State Archaeologist)**[201]** *The Results of Using Associated Records to Facilitate New Research: Recent Excavations at the Elk Mountain Site (48CR301)*

The Elk Mountain site (48CR301), also known as the Garrett Allen site, is located in south-central Wyoming in the Carbon Basin along Halleck Ridge. The site was excavated every year from 1969 until 1978, and a University of Wyoming field school was held at the site in 1979 and 1980. The excavations were highly productive and recovered artifacts included ceramics, manos and metates, large amounts of lithic debris, tools, and faunal remains. Despite its productivity, a site report, site map showing the extent of all excavations, and artifact analyses were never completed. In 2014, personnel from the Office of the Wyoming State Archaeologist began field investigations at 48CR301 in order to relocate the previous excavations, generate a topographic site map, determine the feasibility of future research at the location, and explore a collections-based approach to excavation through information housed in the associated records on file at the University of Wyoming Archaeological Repository. Along with detailing the results of the 2014 excavations, this presentation discusses how useful and important associated records like catalog cards, candid photographs taken by crew members, and field notes are for facilitating new excavations at previously investigated sites.

[201] *Chair***Clayton Martinez, Lucia (University of Western Australia)****[137]** *Patterns Through Space: A Spatial Analysis of Murujuga Rock Art, Northwest Australia*

Spatial analysis is a methodology that has been widely used for researching rock art. It has had a wide-ranging focus, varying from informed methods (using ethnographic information), to formal, and experiential methods. Rock art perceived as communication is a structured form of transmitting information to a specific audience. This allows us to look for conventions of representation, grammatical rules that determine the form that rock art should take according to its location within the site. Spatial analyses undertaken on Murujuga, the Burrup Peninsula in northwest Australia, have primarily focused on establishing chronologies, the clustering of rock art motifs at a broad landscape scale, and the relationship with resource foci. My research has focused on formal methods, using spatial information to identify patterns in the rock art assemblage at the Happy Valley site, an engraved site complex in southern Murujuga. I have sampled the rock art assemblage at Happy Valley to look for these conventions and identify the cultural choices made by the artists in the production of rock art. In this paper I will identify patterns in the rock art that provide an insight into the nature of the site's occupation and how the occupants perceived the landscape.

Cleghorn, Naomi (University of Texas Arlington)**[356]** *The Blind Spot: An Early Later Stone Age perspective on the Agulhas Bank from Knysna Eastern Heads Cave 1, South Africa*

The exposure of the wide continental shelf of the Agulhas Bank during the gradual regression of the shoreline from 45,000 years ago, culminating in the Last Glacial Maximum (LGM), opened up a vast new area for foragers. Humans with well-established coastal resource exploitation strategies would have naturally shifted their foraging range to the south, following the regressing shoreline. During this

period, the South African technological record underwent a critical transition from the prepared core and flake-based technologies of the Late Middle Stone Age (MSA) to the bladelet-rich Later Stone Age (LSA). Unfortunately both the nature of the Agulhas Bank habitat and this transition from MSA to LSA are not well documented in the southern South African archaeological or paleoecological record. Here, we examine new data from KEH-1 at Knysna - the only site with dates throughout this period to face out onto the now drowned Agulhas Bank. We consider the potential relationship between KEH-1 and the overlapping sequences of Nelson Bay Cave and Boomplaas, and discuss the importance of current coastal sites for understanding human population movement and strategies during the Last Glacial.

[356] *Chair*

Clifton, Breanne

[309] *Phytolith Processing Methods and the Effects upon Results*

Biological microremains such as pollen, diatoms, starches, and phytoliths are invaluable data sources for reconstructing paleoenvironments and subsistence practices among human populations during times of technological transition. A primary goal of archaeological research is to use these remains to reconstruct the relationship between environment and technology. Phytoliths in particular allow us to reconstruct the specific flora that comprises the biome in a particular place and time. Currently, no standardized method of phytolith extraction exists. Researchers operating in a variety of geographical and chronological locales employ individual methods to achieve the same basic processes in sediment samples: the removal of clays, carbonates, and organics in order to isolate phytoliths for analysis. The effect that these differences in methodology may have upon the results when comparing samples has not yet been studied. The goal of this paper is to quantify the variance in results between three different processing methods. Thirty sediment samples from three diverse geographic regions and time periods were processed (Olduvai Gorge Plio-Pleistocene/Oldowan; Kapthurin Formation Pleistocene/MSA; northern Tunisia, Iron Age; Goytepe, Neolithic. Additional testing is necessary for an accurate understanding of these methodologies and their effects upon results in phytolith analysis.

[309] *Discussant*

[309] *Chair*

Cline, Emily (Cranfield University)

[132] *St Bees Man: A Cold Case Review*

St Bees Man was discovered in 1981 during an archaeological excavation of the south chancel aisle of St Bees Priory in Cumbria, England. His body was extremely well-preserved with pink tissue, blood present, and intact organs all observed during a forensic autopsy. This 'cold case' review shows the importance of balancing both archaeological and forensic techniques. In forensic archaeology, the handling of potential evidence, overall sampling strategy, and opportunity for further analysis are significant factors in the re-examination of archaeological cold cases. After providing background information on this case and analyzing previous research involving St Bees Man, new evidence is given for the mechanism of preservation in the burial environment using analytical techniques including XRF/EDS, textile analysis, and soil analysis. While efforts were made to preserve St Bees Man at the time of his death, many other factors influenced the remains, most significantly the inter-relationship of the lead, resin, shroud, soil, geology, and moisture in the burial environment. This presentation will consider the burial environment, preservation methods, adipocere formation, issues with exhumation, and the opportunity for interviews and further forensic analysis in an archaeological cold case along with the burden of proof for establishing an identity for St Bees Man.

Clinnick, David and James Walker (Durham University)

[396] *The Forgotten King*

One hundred and fifty years ago, a letter of correspondence was read aloud at a meeting of scientists in Newcastle, UK, boldly claiming for the first time that humans had not always been alone

in their genus. William King, the Anglo-Irish geologist, was the first person to recognize Neanderthals as a separate species of *Homo*, and one of the first people to substantiate claims regarding the antiquity of man. He did not live long enough to see his proposition or name (*Homo neanderthalensis*) become accepted, and even now, with his foresight on the matter widely recognized, he is rarely afforded much more than a cursory description as a footnote in the history of Neanderthal research. This presentation provides a timely celebration of King and his contribution to Neanderthal studies.

Close, Hilary [191] see Popp, Brian

Cobb, Allan and Jeremy Coltman (California State University Los Angeles)

[355] *A Wind from the Depths of the Earth*

Among the hundreds of caves I have observed in the Maya area a number stand out in possessing relatively large tunnel systems with restrictions near the entrances. When air is driven from the caves due to atmospheric pressure, the restrictions create a fast moving flow of air that is quite noticeable around the entrance to the cave. Ethnographic evidence suggests that modern Maya are quite aware of such air movements. Because rain was closely associated with caves among the ancient Maya and wind was closely associated with rain, there can be little doubt that the presence of cave wind held significance prehistorically. Iconographically, the IK or wind sign can also indicate a cave. On Chenes monster-mask façades, the mouth, which is recognized as a cave symbol, takes the form of the IK sign. This paper argues that recording the presence of air currents should be considered an indispensable part of recording any cave.

Coben, Lawrence [134] see Serrudo, Eberth

Coben, Lawrence (UPENN and the Sustainable Preservation Initiative) and Eberth Serrudo T. (Quelcay)

[134] *The Inca Incorporation of the Canete Valley, Part 1: Conquest or Incanization*

Field research by the Canete Archaeological Project has begun to unveil rich data regarding the Inca incorporation of the Middle and Lower Canete Valley. Utilizing both systematic survey and excavations, our work suggests a complex and intensive interaction between the Inca and those who occupied the valley before them. In this paper, we begin to tease out the imperial strategies of incorporation and local responses to them.

[188] *Discussant*

Cobos, Rafael [130] see Zimmermann, Mario

Cobos, Rafael (Universidad Autónoma de Yucatán)

[413] *Chichén Itzá and Its Maritime Ports during the Terminal Classic Period*

The ancient city of Chichén Itzá reached its apogee as a regional capital in the tenth century. Part of this apogee included the territorial hegemony that Chichén Itzá exerted over a vast area of the maritime coasts of the Yucatán peninsula and Belize. By controlling the coasts, Chichén Itzá maintained strict authority over the different objects and merchandise that were distributed and exchanged throughout the Maya lowlands in the Terminal Classic period. In order to control the distribution and exchange of objects and merchandise, Chichén Itzá developed a complex and efficient seaport infrastructure, which resulted in the establishment of at least two contemporary types of seaports along the Gulf of México and the Caribbean seas. The morphological differences between seaports founded in those two areas suggest that Chichén Itzá faced distinctive economic as well as political challenges. However, the ancient city successfully acquired objects and merchandise from other regions of the Maya area and beyond.

Cochran, Lindsey [284] see Britt, Tad

Cochrane, Ethan [52] see Golitko, Mark

Cochrane, Ethan (University of Auckland) and Timothy Rieth (International Archaeological Research Institute, I)

[77] *Petrographic and Geochemical Evidence Reveals the Local Focus of Interaction throughout Samoa's Prehistory*

Bill Dickinson's extensive and unequaled ceramic petrographic research has identified spatial patterns of artifact production and population interaction across the Pacific Islands. In Samoa, his work on ceramic collections suggests a largely local focus of production and distribution. We combine Dickinson's ceramic petrography with all available geochemical analyses of ceramics, basalt and obsidian artifacts, and demonstrate local-scale production and movement for all of these artifact classes. Additionally, local artifact production and distribution is the dominant pattern for Samoa's prehistory. We argue these patterns are explained by Samoa's demographic history and environment.

Cockram, James [345] see Przelomska, Natalia

Cockrell, Bryan (UC Berkeley, Anthropology)

[117] *Moderator*

Codding, Brian (University of Utah)

[296] *Martu Ethnoarchaeology: Foraging, Site Structure and the Scales of Constraint on Human Behavior*

In his watershed 1995 publication, O'Connell outlined the utility of approaching ethnoarchaeology through a general theory of behavior by noting the disparity between studies examining faunal remains and those attempting to explain site structure. While the former was finding great success by drawing on models from behavioral ecology, the later was stagnant and lacking a general theory of behavior. Drawing on ethnoarchaeological data collected with Martu Aboriginal foragers, we highlight a possible explanation for this pattern. At large spatial extents, human behavior is constrained by patterned environmental variability, as such, a general theory of behavior is likely to characterize key aspects of human decisions. At small spatial extents, human behavior is not constrained by patterned environmental variability, as such, any general theory is unlikely to explain human decisions that produce site structure. While studies of site structure will likely remain descriptive, ethnoarchaeological analyses examining variability at larger scalar extents can provide archaeologists with key insights into the interpretation of prehistoric human behavior.

[1] *Discussant*

Codding, Brian [119] see Mohlenhoff, Kathryn

Coffey, Grant [85] see Schleher, Kari

Coffey, Grant (Crow Canyon Archaeological Center) and Susan Ryan (Crow Canyon Archaeological Center)

[85] *The Changing Scale of Integrative Pueblo Communities in the Northern San Juan Region: Basketmaker III through Pueblo III*

Most studies of ancestral Pueblo communities in the northern San Juan region of southwestern Colorado use clusters of roughly contemporary habitations, often associated with public architecture, to define the spatial extent of residential communities. The term "community" has also been used to define important social groupings at both larger and smaller spatial scales depending on the focus of study and the type of social connection suggested. This study uses the locations of great kivas, one of the most persistent forms of Pueblo civic architecture, to analyze the spatial extent of integrative communities in the central Mesa Verde region from A.D. 500 to A.D. 1280. Analyses of data using

different GIS techniques suggests that changing spatial relationships between great kivas, as architectural symbols coordinated community effort, reflect accompanying changes in the scale and composition of the associated integrative communities. This study uses data developed by the Village Ecodynamics Project and provides an empirical means of delineating approximate community boundaries while also discussing accompanying changes in social structure over time. Finally, this study addresses how the definition of integrative communities can complement previous community studies spanning a range of scales.

Cohen, Rachel (University of Pennsylvania)

[7] *Sites and Sight Lines: An Investigation of Intervisibility Among Hilltop Sites in Azerbaijan*
Most archaeology takes as its primary unit of focus the archaeological site. Yet sites did not exist in isolation: interactions between sites, and between people and the surrounding landscape, were also an important component of ancient societies. These interactions were social, political, military, and/or ritual, and investigating the use of landscape provides archaeologists with a means to understand larger-scale processes such as growth and expansion of urban centers. One way of looking at interactions between sites involves an examination of intervisibility. In open regions such as the Near East, sites were often located on natural or man-made hills with a commanding view of the landscape and of other sites. This high visibility could be used for defense against approaching enemies, to facilitate communication, and to create social unity. This project examines a group of eight Early Iron Age hilltop sites in the Naxçivan region of Azerbaijan. Using GIS analysis, I demonstrate the role that visibility played in the location of these sites and in their interaction with the surrounding landscape. This information, in turn, can be combined with survey and excavation data to provide a better understanding of urban development in this region.

Cohen, Anna S. [21] see Solinis-Casparius, Rodrigo

Cohen, Anna (University of Washington)

[253] *Toward a Comparative Approach: Postclassic (A.D. 900-1521) Ceramics from the Pátzcuaro and Zacapu Basins, Michoacán, Mexico*

Research on the Purépecha Empire (A.D. 1350-1521) in western Mexico has traditionally focused on elite activities after imperial formation. Consequently, there is limited information about the mechanisms for imperial development and changes in internal social, political, and economic structures that must have occurred in pre-imperial contexts. Study of artifact production is particularly important for understanding political reorganization strategies because producers and consumers may have been susceptible to state directives. This presentation compares recently excavated ceramic material from Angamuco in the Pátzcuaro Basin and the Malpaís Prieto in the Zacapu Basin, Michoacán dating to the Middle to Late Postclassic periods (A.D. 1200-1521). Comparison of changes in pottery form and style highlight similarities and differences in manufacturing, decoration, and consumption practices at these two important urban centers before and during the formation of the Purépecha Empire. Ultimately we seek to establish a comparative approach for studying ceramics in the Pátzcuaro and Zacapu Basins, two regions with a long history of occupation in western Mexico.

[253] *Chair*

Colaninno, Carol (Center for American Archeology)

[152] *The Fisherfolk of the Two Late Archaic Shell Rings on St. Catherines Island: Similarities and Differences in Contemporaneous Coastal Economies*

Late Archaic (2250-1800 cal B.C.) shell rings, found along the Atlantic coast of the southeastern United States, are large, ring-like structures composed of shell. Sometimes shell rings are complexes with two or more rings in close proximity, while others are singular rings. Rarely are two rings found on an island system without the rings forming a complex. Two shell rings on St. Catherines Island, GA, have been documented and excavated on opposite sides of the island and do not form a complex. Large, systemically analyzed archaeofaunal collections from these rings provide the opportunity to make inferences about Late Archaic coastal economies. In this paper, collections

from these roughly contemporaneous shell rings located on opposite sides of the same island are compared. Overall, fishes comprise the vast majority of individuals in these collections. Assemblages from each ring, however, reflect the different localities of the two rings. Further differences are noted in the densities of vertebrate remains from these two sites. Vertebrate remains, particularly fish remains, are far denser in the McQueen Shell Ring compared to the St. Catherine's Shell Ring. This preference for fishes can be interpreted as control and access to resources.

Cole, Matthew (California State University, Long Beach), Matt Becker (California State University, Long Beach) and Carl Lipo (California State University, Long Beach)

[52] *Coastal Groundwater Seeps on Rapa Nui*

Rapa Nui (Easter Island, Chile) is a remarkably resource-poor volcanic island. Significantly, it lacks surface streams found on more tropical Polynesian islands, other than several remote access volcanic crater lakes. Due to the island's highly permeable, volcanic subsurface, rainwater infiltrates rapidly and becomes groundwater. Only along the coast does the water table intersect the topography to form seeps or springs. We hypothesize these seeps and springs were a primary source of fresh water for the prehistoric inhabitants of the island. In this study, we measured salinity and temperature just below the ocean surface in transects along the coast. Our findings show a marked decrease in salinity and temperature, indicating the proximity to freshwater seeps. Significant groundwater discharge was detected in the areas of La Perouse, Anakena, and Vaihu. These findings provide a foundation of spatial constraints to test hypotheses about settlement patterns and prehistoric land use.

Cole, Sara (Yale University)

[101] *Curating Ancient Glass in the 21st Century Museum: The Case of the Yale University Art Gallery*

The Yale University Art Gallery's ancient glass collection has never been the subject of a dedicated exhibition, despite being one of the most extensive of its kind in the United States. As a YUAG Graduate Curatorial Intern (2012-2014), I curated a future exhibition of this collection. Numerous pieces will be available for public view for the first time, drawing together examples covering a timespan of over 2,000 years and a geographical range from the Levant to the western Roman provinces. The objects illustrate the evolution of an industry and the artistic and social factors that impacted the aesthetics and functional use of glass in antiquity. This project allowed me to examine the role of the museum in collecting, conserving, and displaying ancient glass. For instance, I explored ways to use glass from Yale's archaeological excavations to contextualize unprovenanced objects. I also curated plans to integrate more of the YUAG's ancient glass collection into the permanent gallery, so as to make this resource more widely accessible. This talk employs the YUAG's forthcoming exhibition as a case study to investigate how museums can best utilize their ancient glass collections to the benefit of specialized scholars, students, and the general public.

Cole, James (University of Brighton), Pastory Bushozi (University of Dar es Salaam), John McNabb (University of Southampton), Martin Bates (University of Wales Trinity Saint David) and Phillip Toms (University of Gloucestershire)

[174] *Dating the Early Stone Age Site of Isimila, Tanzania*

The Early Stone Age (ESA) site of Isimila is located on the Iringa plateau, Tanzania, close to the East African Rift Valley. Due to the abundance of handaxes present at the site in both primary and secondary contexts, Isimila has long been recognized as a key site of international importance for understanding the behavioral complexity of our hominin ancestors often compared to major East African sites (e.g. Kalambo Falls, Olduvai Gorge and Olorgesailie). Despite the international significance of Isimila, the chronology, taphonomy and geomorphology of the site remain poorly understood, and are in urgent need of re-examination using modern analytical techniques and theoretical perspectives. Previous dating efforts (a single U-series date from a bone sample) gave an age estimate of 260 kya for the site (Howell et al. 1972). However, this date is problematic due to methodological inadequacies and therefore it is timely to undertake a re-characterization of Isimila. The subject of this paper is to therefore give details of a new OSL dating programme undertaken at Isimila in 2014 that allows, for the first time, a chronological contextualization of this unique and

important ESA site within the broader setting of the East African Palaeolithic.

Cole, Kasey (Dept. of Anthropology, California State University, Chico; Chico, CA 95929-0400), Heather MacInnes (Dept. of Anthropology, California State University), Eric Bartelink (Dept. of Anthropology, California State University) and Gary Breschini (Archaeological Consulting, Salinas, CA 93912-3377)

[373] *Late Holocene Dietary Variation along the Central California Coast: Isotopic Evidence for Marine Dependence*

Reconstructing dietary variation among earlier human populations remains a major goal of archaeological research. Along the central California coast, archaeological reconstructions of hunter-gatherer subsistence have primarily focused on data gleaned from archaeofaunal remains and lithic assemblages. In this study, we examine paleodiets in Late Holocene (ca. 3430-660 B.P.) humans and animals from the Monterey Bay area of the California coast. Using stable carbon and nitrogen isotopes of collagen and stable carbon isotopes of bioapatite, we track the relative importance of marine versus terrestrial resources in the diet. Our sample includes radiocarbon dated human burials from 13 coastal archaeological sites, excavated over the past three decades through cultural resource management efforts. In addition, stable isotope data from Monterey Bay hunter-gatherers are compared with previously published data on coastal groups from the Santa Barbara Channel to the south and Drakes Bay and Tomales Bay to the north. Variation in human paleodiets is examined in light of latitudinal differences in terrestrial versus marine resource productivity and time period. This data contributes to the sparse isotopic literature on human foragers from the California coast.

Coleman, Drew [380] see Parker, Kathryn

Colin, Bradley [192] see Mackie, Quentin

Collard, Mark [57] see Raffield, Ben

Collard, Mark (Simon Fraser University)

[296] *A Cross-Cultural Analysis of the Impact of Diet Breadth on Subsistence Toolkit Richness and Complexity*

Identifying the causes of spatiotemporal variation in technological richness and complexity is an important task for archaeology. James O'Connell has proposed that diet breadth can be expected to affect investment in subsistence technology and therefore the number and intricacy of subsistence tools. Narrower diets, he suggests, will be associated with lower investment and therefore fewer and/or less complex tools, while broader diets will be associated with higher investment and therefore more tools and/or tools of greater complexity. This relationship can be expected to exist, according to O'Connell, because technology affects the time devoted to capture and processing, and investment in reducing capture and processing time should be low when diet is narrow and only increase if return rates fall and diet becomes broader. Here, I report the first empirical test of O'Connell's diet-breadth hypothesis. I used data for a large sample of historically-documented nonindustrial populations to examine the relationship between diet breadth and food-getting toolkit richness and complexity. I did so while controlling for several factors that have been found to affect toolkit structure in previous studies. The results I obtained indicate that we need to be cautious when invoking the hypothesis to explain patterns in the archaeological record.

Colledge, Sue [288] see Manning, Katie

Collins, Joe (University of Texas at El Paso), Richard Langford (University of Texas at El Paso) and Thomas Gill (University of Texas at El Paso)

[6] *Application of End-Member Mixing Analysis (EMMA) of Grain-Size Distributions to Characterize Site Formation Processes of Rimrock Draw Rockshelter (35HA3855), Harney Basin, Eastern Oregon*

Sedimentological investigations were conducted on Unit 2 of Rimrock Draw Rockshelter (35HA3855), a deeply stratified, multi-component Paleoindian site located in the Harney Basin, eastern Oregon. Field descriptions and end-member mixing analysis (EMMA) of grain-size distributions of 13 sediment samples identified six stages of site formation: three stratigraphic units (SU), two unconformities, and a Bt soil horizon. EMMA resulted in the characterization of three end-members (EM) that correlate with field descriptions. EM's 1 and 2 represent 88.4% of the total variance among samples and are present within SU1 and SU3. EM 1 correlates well with the bottom stratigraphic unit, SU1, a well-sorted fluvial deposit. EM 2 correlates well with the upper stratigraphic unit, SU3, a poorly sorted aeolian deposit punctuated by colluvium derived from a nearby colluvial wedge and the brow of the rockshelter. EM 3 correlates well with the poorly developed Bt horizon that overprints an eolian deposit within the middle stratigraphic unit, SU2. These results demonstrate the applicability of EMMA to distinguish between depositional units within an archaeological context and provide geologically meaningful interpretations of paleoenvironments for the development of hypotheses related to human-environment interactions.

Collins, Benjamin [35] see Ames, Christopher

Collins, Lori (University of South Florida), Travis Doering (University of South Florida, Alliance for Integrat) and Margo Schwadron (National Park Service, Southeast Archeological Cen)

[83] *Progressive Partnerships for Heritage Preservation: 3D Immersive Learning, Documentation and Research Tools in our Nation's Park System*

Today, much of the world's cultural heritage is at risk from natural and human-induced causes. New technologies such as terrestrial laser scanning, advances in imaging and photography, 3D printing, and other spatial and visualization techniques are greatly advancing capabilities for heritage preservation and research. These technologies are democratizing data access, and improving the ability to share and interpret archaeological information globally. The ability to rapidly and accurately document the world around us is revolutionizing fields of archaeology and museum sciences, and is creating new areas of research integration. Using case study examples from collaborative work in our nation's National Park Service (NPS) System, we will demonstrate the latest in research involving heritage and archaeological documentation and to emphasize effective workflows and approaches for the heritage management. These projects are bringing National Parks to the classroom and are enhancing and improving the way we teach, learn and interact with our past, offering educators and the NPS immersive and interactive methods for interpretation and instructional experiences.

Collins, Shawn, Sarah Payne (Crow Canyon Archaeological Center) and Erica Olsen (Crow Canyon Archaeological Center)

[188] *There's No App for This: The Value of Archaeology and Experiential Education in a Digital Universe*

The Crow Canyon Archaeological Center, a not-for-profit organization located in southwestern Colorado, has used archaeological research to teach multiple audiences about the human experience for more than 30 years. Changing educational standards and transportation needs have affected Crow Canyon's student program attendance, and an aging demographic increasingly limits our adult program attendance, with ramifications felt in our membership and donor support. We face the challenge of communicating the relevance of archaeology in the modern world to our varied audiences, and help them appreciate the value of experiential programs though abundant digital media are accessible from afar.

Collins, Ryan (Brandeis University)

[263] *At Yaxuna X Marks the Spot: Centering across in a Middle Formative Maya Landscape*

From the placement of objects in household offerings, to monumental works of art and architecture, it is well known that the ancient Maya commemorated their cosmological center in a variety of ways. Even at the settlement level, quadripartite divisions of space are observed branching out from a central core giving modern researchers insight into the way ancient Maya peoples may have

understood their world. At the Maya site of Yaxuná, Yucatan, Mexico investigations have made it apparent that traditions of marking the center were taking place as early as the Middle Formative. Yet, evidence from recent excavations in the E-group plaza reveal that the center was not marked in the same way, or even in the same space, over time. This paper has two purposes. The first purpose of this paper is not only to explore the implications of change evident in practice, performances, and political displays once held within the central plaza of the ancient site but how such changes were reflected within the greater settlement. The second is to explore how the data from Yaxuná suggest the exchange of ideas with contemporaneous sites in the central lowland Petén, and how such an exchange likely changed over time.

Collins, Shawn (McMaster University), Eduard Reinhardt (McMaster University) and Dominique Rissolo (Waitt Foundation)

[370] *Reconstructing Water Levels and Access to Hoyo Negro*

"Hoyo Negro" was discovered in the Sac Actun Cave system in the Yucatan Peninsula; Mexico which contained abundant fossil remains of Pleistocene animals including the remains of a young PaleoIndian woman. There are several cenotes of varying size and age which may have been used by Paleoamericans to access Hoyo Negro. The two closest cenotes are "Ich Balam" and "Oasis". To determine if these cenotes provided access to Hoyo Negro during occupation of the area, the paleoenvironmental evolution of Ich Balam and Cenote Oasis were investigated. Measurements of cave conduit morphology were taken from Cenote Oasis to Hoyo Negro. Additionally, 9 sediment cores were acquired directly in, and around the cenotes. Radiocarbon dating, identification and abundances of foraminifera, thecamoebians and ostracods were determined for each core to reconstruct the flooding history of the pit and cave passages. Microfossil assemblages, along with sedimentary markers, indicated that Ich Balam was open by at least 8170 Cal BP and the Hoyo Negro Pit was isolated from the surface around 8000 Cal BP due to the flooded cave passage. These results provide constraints on the access and use of Hoyo Negro, and provide important information for interpreting the taphonomic history of the skeletal material.

Colman, Arlene (New World Archaeological Foundation)

[242] *La Venta's Offering 4: Representation of Olmec Ritual Practices*

Offering 4 at La Venta consists of one brownstone and 15 greenstone human figurines arranged in front of six jade celts set on end. This unique offering was placed north of the pyramid in the Ceremonial Court of Complex A as part of a ritual activity that dedicated a new building phase in the court around 600 B.C. It was associated with a massive serpentine pavement and a cruciform axe offering. About a century later, Offering 4 was reopened and checked. Offering 4 at La Venta conveys a story in media res. The vertical celts, apparently representing stelae, appear to reference the six stelae, which were positioned on the south base of the pyramid that flanked the stairway. The scene created in Offering 4 commemorated an event performed against the backdrop of the pyramid and the stelae. I explore this inference and possible roles and meanings that these stone stelae once played at La Venta.

Colocho, Connie "Destiny" [310] see Garrison, Andrew

Colocho, Connie "Destiny", Andrew Garrison (Scientific Resource Surveys, Inc.) and Nancy "Anastasia" Wiley (Scientific Resource Surveys, Inc)

[310] *Identifying Ground Stone Production at Bolsa Chica through Hammerstone Analysis*

Debris attributed to the manufacture of groundstone implements are not always identified or collected. This can make groundstone production difficult to quantify through debitage analysis. Therefore, the identification of groundstone production often rests on the analysis of hammerstones. Recently Scientific Resource Surveys, Inc., conducted an intensive technological analysis on the lithic assemblage from a well-known Millingstone Horizon site, located on the Bolsa Chica mesa, in Orange County, California. During the analysis, SRSinc identified hundreds of beveled shaped hammerstones thought to have been instrumental in the manufacture and maintenance of utilitarian and ceremonial groundstone artifacts. Previous studies have shown that beveled hammerstones are

used for the initial shaping, modification and rejuvenation of ground stone implements. Similar methods of manufacture would also be attributed to ambiguous artifacts like coggled stones and charmstones. This poster discusses the manufacture of utilitarian and ceremonial ground stone artifacts at Bolsa Chica and how the analysis of hammerstones has aided in the interpretation of this industry.

Colombo, Leah (University of Miami)

[192] *Finding the Needle in the Haystack: Submerged Prehistoric Archaeological Sites in Everglades National Park*

Many attempts have been made to consistently locate submerged and inundated prehistoric archaeological sites offshore the state of Florida. In many instances these attempts have not been successful in some respects but beneficial in others. This paper will identify the issues of studying such sites and the results of past and recent studies. However, the main topic of the paper will focus on a recent study exercised within the Florida Bay region of Everglades National Park. Working in conjunction with RSMAS, a project was developed by the National Park Service to identify the parameters necessary to build a predictive model for prehistoric site locations in Florida Bay. While focusing on the model, the potential effects of climate change and sea level rise on Florida Bay since the initial flooding will also be discussed.

Colón, Justin, Jimmy Daniels, Lana Ruck and Clifford T. Brown

[246] *Obsidian Exchange Patterns among the Coastal Plains of Northwest Nicaragua*

We performed morphotechnical and trace element analysis of 2871 obsidian artifacts recovered during survey and excavation from 12 archaeological sites in the Department of Chinandega, northwest Nicaragua. The elemental analysis was conducted using the Bruker Tracer III-V portable X-Ray Fluorescence (pXRF) spectrometer. The pXRF spectra and elemental concentrations of artifacts were compared with those of known source provenience. The results show 98 percent of the specimens match the geochemistry of the Güinope obsidian source in Honduras. The remaining specimens are sourced to La Esperanza in Honduras and the Ixtepeque source in Guatemala with one specimen from El Chayal in Guatemala. Most specimens arise from a core-flake industry consistent with the small size of the obsidian nodules at Güinope. Some prismatic blades and flakes were made of Güinope obsidian. We show that there were small but significant differences in the rate of consumption of prismatic blades among the sites. The overall regional pattern appears to be that sites in the Pacific coastal plains were engaged in more robust trade with the more distant sources of La Esperanza and Ixtepeque, while inland sites used Güinope obsidian almost exclusively.

Coltman, Jeremy [355] see Cobb, Allan

Coltrain, Joan (University of Utah) and Joel Janetski (Brigham Young University, Emeritus)

[85] *Radiocarbon and the Stable Isotope Chemistry of Grand Gulch Basketmaker II Burials: Age-Based Dietary Patterning and Geolocation.*

The stable isotope chemistry of 149 directly dated Basketmaker II burials from the Four Corners region of the American Southwest indicates relatively heavy reliance on maize and low animal protein intake. Sex and age patterning reveals differences in adult male versus female diets and distinguishes adolescent diets from those of adult males. Hydroxyapatite oxygen isotope values effectively sort individuals relative to the latitude and elevation of burial sites and are further used to clarify the origins of a subset of poorly provenienced remains, thought to be from Chaco Canyon. Grand Gulch Basketmaker II burials date to a two sigma range of 415 B.C.-A.D. 322, contemporary with Black Mesa Lolomai Phase occupations and post-dating the March Pass, AZ, White Dog Phase.

Coltrain, Joan [202] see Byers, David

Colvin, Alex [103] see Ervin, Kelly

Colvin, Matthew**[177]** *Emergence of Place: The Great Circle of Fort Center, Glades County, Florida*

In South Florida, earthen enclosures represent some of the earliest and largest communal monuments. At around 300 meters in diameter, Fort Center in Glades County, Florida contains one of the largest enclosures in the entire Southeast. As the earliest recorded earthwork at Fort Center, I argue the construction of the Great Circle acts as a trigger and anchor for coalescence and the establishment of place. Since this event occurs during a period of long term fisher-hunter-gatherer practices, examining the life cycle of this monumental enclosure offers insight into emergent institutions within these communities. Although contemporaneous and comparable earth moving occurred among northern Woodland Period communities, the Great Circle of Fort Center may have persisted as the creation of communal memory rather than developing as a result.

Colwell, Chip (Denver Museum of Nature & Science)**[116]** *Makak: Between History and Heritage*

This paper examines a “mythic” settlement named Makak, located at the edge of Le Morne Cultural Landscape, a World Heritage Site, in Mauritius. A recent ethnohistoric study, conducted in collaboration with Mauritian colleagues used an array of oral, written, and material evidence to show that Makak is an informal place name for an area first settled by French colonists in the 1700s, then by several prominent “Free Colored” families in the 1800s, and finally depopulated as residents were forcibly removed in the 1940s. The investigation suggests that Makak is a serial settlement, which apparently long thrived as a multicultural community, tapped into global trade networks. As a key historical site adjacent to Le Morne Cultural Landscape, a World Heritage Site, Makak also plays a vital role in the Mauritian sense of identity and belonging. This presentation will thus also explore how Makak lives on not just as history, but as a place of heritage in Mauritian collective memory.

[160] *Discussant***Comer, Douglas (Cultural Site Research and Management (CSRM))****[199]** *Searching for Evidence of Early Human Occupation of the New World with Aerial and Satellite Imagery*

The pluvial lakes in the Mojave Desert, which are today simply expanses of sand in nine years out of ten, were once large bodies of water, many of them linked together by streams and large rivers. Several were fed by the Mojave River, which introduced aquatic life. Fresh water clams were common along the beaches on lakes fed by the Mojave River, which were also places frequented by human groups that were attracted to the resources to be found there, among which were now extinct mega-fauna. Both Clovis and Western Stemmed tools have been found in the area that we are investigating, which includes the playas known as Coyote Lake and Silver Lake. We are using synthetic aperture radar imagery produced from data collected from the NASA UAVSAR platform, Lidar, and multispectral and hyperspectral imagery to search for the shorelines of the pluvial lakes as they existed 13,000 to 20,000 years ago, with the objective of finding material altered by human activity on association with fresh water clam shells or other datable materials.

[218] *Discussant***[199]** *Chair*

Comer, Douglas [199] see Megarry, Will

Commendador, Amy [233] see Dudgeon, John

Commendador, Amy (Idaho Museum of Natural History), John Dudgeon (Idaho State University) and Bruce Finney (Idaho State University)**[233]** *Prehistoric Diet on Rapa Nui via Stable Isotope Analyses of Bone Collagen and Carbonate*

Previous analyses of carbon and nitrogen stable isotopes in dentin collagen from prehistoric individuals on Rapa Nui suggested a predominately terrestrial diet in the early phase of occupation,

followed by a slight expansion into marine-based subsistence post-A.D. 1650. This was unexpected as the documented pattern across Polynesia is a marine-dominated strategy in the early phases of occupation with terrestrial resources incorporated later, as agricultural systems supplant foraging behaviors. To examine this further, we conducted carbonate analyses (for C and O stable isotopes) on 28 of the same individual tooth samples used in the collagen study. These combined analyses provide a more accurate understanding of prehistoric diet, as collagen represents primarily the protein portion of the diet while carbonates have been shown to record whole diet (including non- or low-protein sources). Our results are similar to those of the collagen analysis, providing additional support for a primarily terrestrial-based subsistence system throughout the prehistory of the island.

Compton, Mary (University of Western Ontario)

[95] *Taking Tech on the Road: Mobile Makerspaces and Archaeological Engagement*

This poster introduces a London, Ontario-based initiative called the Digital Humanities MakerBus, a school bus converted into an innovative classroom, laboratory, and creative play space. The purpose of the project is to provide access to digital technologies and other hands-on resources to community groups wherever they may be located. Although the project has been wildly interdisciplinary since its inception and was not conceived of with any specific disciplinary purpose in mind, our team believes that there is enormous potential for mobile makerspaces to democratize access to technologies and inspire new forms of archaeological engagement. The MakerBus provides a means for individuals and groups to develop community-driven projects in their own meaningful spaces. Potential projects include archaeological, historical, and heritage based projects, which, heretofore, have not been a common focus of other established "maker" projects. Along with an introduction to the "maker movement," this poster will present a short outline of several maker technologies and demonstrate how they have already been utilized toward the aims of archaeological and heritage engagement by our project. Ultimately this poster aims to inspire dialogue about the implications of democratizing technologies and about what it means to change the locus for archaeological exploration and engagement.

[42] *Discussant*

Compton, John [294] see Cawthra, Hayley

Comptour, Marion [350] see McKey, Doyle

Conard, Nicholas (University of Tübingen) and Britt Starkovich (University of Tübingen)

[135] *Explaining Diachronic Trends in Paleolithic Subsistence in Central Europe*

This paper examines changing patterns of subsistence during the Lower, Middle and Upper Paleolithic of Central Europe. We present data on faunal assemblages from our excavations in Germany and look at the extent to which the selection and exploitation of prey reflects expectations from behavioral ecological models. We also consider how these faunal assemblages inform us about the evolution of social and economic behavior during the Middle and Late Pleistocene.

[190] *Discussant*

Conger, Megan [273] see Watson, Adam

Conger, Megan (University of Georgia) and Adam Watson (American Museum of Natural History)

[382] *Ornaments, Pigments, and Household Production: Spatial Patterning and Residue Analysis of Ground Stone Artifacts from Pueblo Bonito, Chaco Canyon, New Mexico (A.D. 800-1200)*

Previous investigations of craft industries at Chacoan great houses have focused largely on finished objects (e.g., ceramics, turquoise, and shell). This study explores an often overlooked but ubiquitous and highly diverse class of artifacts – ground stone abraders – in an effort to better understand the organization of production at Pueblo Bonito great house. Analysis of variation in form of these versatile implements provides insight into the range of craft items manufactured. Drawing on the

recent results of a comprehensive radiocarbon dating project, GIS and pXRF analysis reveals the spatial patterning of and temporal trends in craft production, pigment processing, and subsistence activity. Discrete clusters of heavily-used lapidary and mealing tools confirm that both craft manufacture and food processing occurred at Pueblo Bonito and that, over the long-term, these activities were spatially associated with specific areas of the pueblo. We further contend that these spatial clusters reflect individual households or working groups of craft laborers in Pueblo Bonito.

Conkey, Margaret (UC-Berkeley)

[297] *Out on the Ice with Ruth: Taking Chances Together*

Although we had previously been colleagues at different institutions, it was when we were both on the faculty at Berkeley (starting in 1987) that we elaborated our mutual “you go first” relationship in our research and teaching. I had once corralled Ruth into participating in a Women in Anthropology kind of seminar while still at Binghamton (1977), but it was with her now famous “kicking and screaming” foray to the Wedge for the conference that became the volume, *Engendering Archaeology*, that we first began to bait each other to try new ideas, issues, and practices. I will discuss some of our collaborative and “out on the ice” adventures and the impacts that such a relationship can have and how it has been integral to the flourishing of the feminist practice of archaeology.

[353] *Discussant*

Conlee, Christina (Texas State University)

[31] *Early Maize on the South Coast?*

Presently evidence for the earliest domesticated maize in the Central Andes comes from the north coast of Peru. Dating to the Middle Preceramic this early maize consists of Proto-Confite Morocho and Confite Chavinense, which were primitive types of popcorn. In contrast, little is known about the early use of maize on the south coast. A cob of Confite Chavinense was found in a Preceramic context at the site of La Tiza in southern Nasca. Surrounding contexts, including a hearth, date the context to ca. 3640-3365 B.C. in the Middle Preceramic. However, the uncharred corn cob was radiocarbon dated to the Late Intermediate Period, a time long after Confite Chavinense is known to have been cultivated. Researchers at the north coast sites also had dating problems with uncharred corn cobs that produced dates that were far too young and propose that they were contaminated. It is possible that the La Tiza cob may have been similarly contaminated and that it too dates to the Middle Preceramic. Conversely, the cob may have been intrusive from a Late Intermediate Period occupation and reveal a long history of the use of ancient types of maize on the south coast.

Conley, Hillary [3] see Carrier, Sam

Conlin, Dave [29] see Morgan, David

Conlogue, Gerald (Quinnipiac University), Mark Viner (Inforce Foundation, Cranfield Forensic Institute,), Ronald Beckett (Bioanthropology Research Institute, Quinnipiac Uni) and Jelena Bekvalac (Center for Human Bioarchaeology, Museum of London,)

[299] *A Post-Mortem Evaluation of the Degree of Mobility in an Individual with Severe Kyphoscoliosis Using Direct Digital Radiography (DR) and Multi-Detector Computed Tomography (MDCT)*

Since 2010, the Bioanthropology Research Institute at Quinnipiac University, in collaboration with the Inforce Foundation, Cranfield Forensic Institute at Cranfield University and the Center for Human Bioarchaeology, Museum of London, has established a temporary field radiographic facility under St. Bride's Church, Fleet Street, London in order to conduct a radiographic survey of the skeletal remains of 227 individuals from the 18th and 19th centuries interred in the crypt and retained in the church. The collection constitutes a unique assemblage of skeletal remains covering a date range of 1676–1852/3, with biographical data and detailed parish records. One of the skeletons demonstrated not only severe kyphoscoliosis, but also an uncharacteristic robustness of the femora and humeri for such a severe spinal deformity. Based on initial radiographs, it was determined the remains were

stable enough to be transported to St Bartholomew's Hospital for additional examination using multi-detector computed tomography to better visualize the internal structure of the skeleton. The presentation considers the different diagnoses derived from the radiographic studies and the analysis in attempting to establish the individual's degree of mobility and impairment, placed in conjunction with the social conditions for the parish at this time.

Connaughton, Sean P. [336] see Herbert, James

Connell, Samuel [411] see Anderson, Amber

Conner, Clare

[275] *The Hoecake Site: Marking the Woodland-Mississippian Transition in Southeast Missouri.*

The Hoecake site is a Late Woodland to Early Mississippian (A.D. 500-1100) site, located in the Cairo Lowland in southeast Missouri. This mound site contained as many as thirty to fifty mounds at one time, some of which contained burials. Multiple excavations were done at the site in the 1960s as part of the land leveling salvage archaeological work done in the area at the time. Other than an initial report of the excavations, no major analysis has been done on the site until now. The ceramic assemblage will be the focus of this analysis, in order to gain a better understanding of the transition from the Woodland period to the Mississippian period in southeast Missouri.

Conner, Michael [365] see O'Gorman, Jodie

Conner, Michael (Illinois State Museum-Dickson Mounds), Jodie O'Gorman (Michigan State University) and Nicole Silva (Michigan State University)

[365] *Introduction to the DMM-MSU Morton Village Project*

Morton Village and Norris Farms #36 cemetery, located in the central Illinois River valley in Fulton County, Illinois, offer a rare opportunity to investigate migration and conflict with multiple data sets. The cemetery was excavated in the 1980s for highway improvements. Archaeologists from the Dickson Mounds Museum branch of the Illinois State Museum recovered 264 apparent Oneota burials dating to ca. A.D. 1300, and the cemetery is well known for the high level of violence evidenced. The Morton Village site is about 400 m from the cemetery on the same valley-edge ridge complex. Limited excavations in the 1980s provided evidence of both Oneota and Mississippian use of the site. In 2007 DMM and Michigan State University began a long-term effort to more fully understand the village, its relationship to the cemetery, and the nature of Mississippian and Oneota interactions at the site and in the region. Data from excavations, remote sensing, and radiocarbon assays suggest co-habitation by Oneota and Mississippian people at the village in the 1300s, engendered preliminary interpretations of site organization, and fostered questions about the role of ritual and stress in this multicultural population.

Connolly, Robert (University of Memphis)

[223] *Discussant*

Connor, Simon (Monash University), Shawn Ross (University of New South Wales), Adela Sobotkova (University of New South Wales) and Ilia Iliev (Yambol District Historical Museum)

[40] *Early Holocene Aridity and the First Farmers of Europe*

The spread of agriculture into Europe from its Near Eastern heartland was an important cultural event, the causes of which have been debated for many decades. DNA analyses are increasingly providing insights into the genetic inheritance of Europe's first farmers, yet the triggers for their initial migration remain elusive. The earliest agricultural sites in Europe appear to be those situated in coastal Greece, while more fertile inland areas, such as the Thracian Plain, were settled centuries to millennia later. In this presentation we interrogate the paleoenvironmental record from Thrace to elucidate the environmental factors that may have affected the timing and distribution of the earliest European agricultural settlements.

Conolly, James [48] see Cheong, Kong

Conrad, Cyler [163] see Jones, Emily Lena

Conrad, Cyler (University of New Mexico)

[407] *Forager Efficiency, Demographic Shift and Environmental Change: Re-evaluating the Broad Spectrum Revolution in Mainland Southeast Asia*

On the Thai-Malay Peninsula the Pleistocene to Holocene transition was accompanied by significant post-glacial sea level rise, new environmental conditions, and increased human population densities. How did foragers adapt to these changes? In this region, the BSR has been the primary framework for understanding forager response to these conditions since Gorman's analysis of the fauna from Spirit Cave (1971). Gorman suggested, following Flannery's in the Near East, that at the Pleistocene-Holocene transition a broadening of the diet occurred to include resources previously ignored by Southeast Asian hunter-gatherer groups because of the environmental change and human demographic shifts that occurred. This paper reexamines the BSR in this region by quantifying zooarchaeological data from a series of Pleistocene-Holocene sites in Thailand and Malaysia, guided by the theoretical predictions of the prey-choice model in foraging theory. Results suggest that a 'true' BSR did not occur during the Pleistocene-Holocene transition; instead forager efficiency remained high during periods of environmental change and human demographic increase.

[407] *Chair*

Constan, Connie [90] see Kneifel, Rebekah

Contreras, Daniel [186] see Sayre, Matthew

Contreras, Daniel (Kiel University)

[287] *Reflections on Digital Data Acquisition and Analysis at Chavín de Huántar, Peru*

The monumental center of Chavín de Huántar in the Peruvian Central Andes has been the subject of mapping efforts for more than a century, and of digital mapping efforts since the mid-1990s. Spatial technology has been fundamental to significant revision of the site's construction sequence, definition and extent, and ultimately interpretation. This results from the site's complex, three-dimensional, and often-observed architecture, mapping which has only become practical – and perhaps even possible – with digital tools. The array of technologies brought to bear over the last 15+ years includes total station, high-precision GPS, satellite imagery, laser scanning, photogrammetry, near-surface geophysics, and kite aerial photography; data have been managed with both CA.D. and GIS. That rare duality resulted from the need to simultaneously manage complex, three-dimensional data and extensive, attribute-rich data, as well as distinct sets of research questions. This paper reflects on the respective contributions of these two strategies to the analysis of complex architecture, teasing apart the relative contributions of different strategies of digital data acquisition and considering what analyses they have enabled, before contemplating the risks of digital representation becoming an end unto itself.

Contreras Barragán, Blanca Eréndira [257] see Hernandez Espinoza, Patricia

Contreras Hernández, Mashelli A. [376] see Venegas De La Torre, Luis Joaquín

Contreras-Barragán, Blanca E. [257] see Hinojo-Hinojo, Adriana

Conway, Meagan (University of South Carolina) and Ian Kuijt (University of Notre Dame)

[315] *Dynamic Households on the Irish Frontier: An Archaeology of the 18th -19th Century West Coast*

This research explores colonial transformation of households and communities on the fringes of empire - the frontier. Often overlooked, these fluid spaces have revelatory potential regarding deeply situated cultural change and social dynamics in the face of catastrophic adjustment. This project focuses on the local processes as embodied by these individual households and rural communities on the coast of western Ireland in order to understand larger regional and national social and cultural transformations. Contextual variability and social change are examined through the lens of material activity and change in the 18th and 19th centuries. The material remains from Inishark and Inishbofin, two islands off the coast of Co. Galway, demonstrate the presence and connection to broader global networks of economic trade and access. This evidence counters the pre-existing academic narrative of colonialism by framing these areas as frontier zones in order to better understand the degrees of complexity and nuances of change. Through examination of ceramic material and architectural remains from excavations of several different households on these islands, the data reveals dynamic and complex economic interactions between communities off the coast, on the mainland and abroad.

Coochyouma, Brett [225] see Loendorf, Chris

Coogan, Alan [187] see Smith, Michele

Cook, Lauren (Department of Anthropology, Texas A&M University)

[92] *Spatial and Temporal Analyses of Redeposited Projectile Points from McFaddin Beach, Texas*

McFaddin Beach (41JF50), in Jefferson County, Texas is a 32 kilometer-long beach, stretching from High Island in the west to Sea Rim State Park (next to the mouth of the Sabine River) in the east. Since the 1950s, artifacts from almost all periods of Texas prehistory have been recovered on this beach. The projectile points found on McFaddin Beach are redeposited material from an offshore, submerged location. Results indicate that projectile point distribution is significantly correlated to longshore drift and hurricane activity in the Gulf of Mexico. These redeposited artifacts inform us about the mobility patterns of Paleoindians who lived on the Texas continental shelf. Further, typological variability in projectile points throughout the Holocene transgression inform us about mobility patterns and resource allocation of later groups on the Texas continental shelf.

Cook, Duncan (Australian Catholic University), Timothy Beach (The University of Texas at Austin), Sheryl Luzzadder-Beach (The University of Texas at Austin) and Thomas Guderjan (The University of Texas at Tyler)

[176] *Mercury Pollution and the Ancient Maya: Where, Why and How*

Multi-element inorganic geochemical studies across the Maya lowlands have revealed elevated levels of mercury (Hg) in soils and sediments that date mainly from the Classic period (c. 250-900 A.D.). Mercury pollution has now been recorded at a range of archaeological sites despite the absence of metallurgy until the Postclassic Period (after 1000 A.D.), or any other industry capable of significant heavy metal pollution of the environment. This paper presents the first detailed analysis of the extent and magnitude of anthropogenic Hg in the natural environment of the ancient Maya. Given the scarcity of mercury sources in the Maya world, and the importance of liquid (native) and solid forms of mercury (cinnabar) to the Maya, we examine the possible sources and idea of mercury as a prestige commodity, and the implications of this for our understanding of the trade of high-value natural resources in antiquity.

Cook, Jessica (University of Georgia) and Ervan Garrison (University of Georgia)

[192] *These Are the Pearls that Were His Eyes: Interpretive Frameworks for Submerged Middle Archaic Sites in the Big Bend of Florida and the Georgia Bight, U.S.A.*

Sedentary occupations and monumental architecture first appear during the Middle Archaic (8,000 BP to 5,000 BP) in Florida at sites where marine, estuarine, and riverine resources were exploited, spreading to the coast of Georgia by the Late Archaic, around 4,500 BP. However, the coastline did not reach its modern position until around 5,000 BP, leaving many sites submerged. Fieldwork was

initiated in June of 2014 in order to relocate, excavate, and interpret Middle Archaic sites submerged in Apalachee Bay, Florida, that were initially documented during the 1980s and 1990s. Concurrent synthesis of extant datasets gathered off the Georgia coast is also ongoing. Our results highlight issues commonly encountered when working with submerged prehistoric sites: the difficulty in locating/relocating them in an open water context; the need to implement appropriate protocols for recognizing sites as such when encountered; and the need to develop a useful interpretive framework for understanding highly reworked deposits. None of these issues are insurmountable and even disturbed marine sites have potential to elucidate the behaviors of sedentary foragers of the coastal southeastern U.S., and earlier groups. These sites also add to the body of knowledge around site formation processes, a critical need as sea levels rise today.

Cook, Robert A. [331] see Pazan, Kyra

Cook, Della (Indiana University)

[410] *Discussant*

Cook, Duncan [350] see Beach, Timothy

Cooke, Richard [170] see Martin, Juan

Cool, Autumn [230] see Wiewel, Adam

Coolidge, Frederick (University of Colorado, Colorado Springs)

[33] *Higher Cognitive Sequelae of the Recently Expanded Parietal Lobes in Homo sapiens*
Bruner and his colleagues (Bruner et al. 2013) have demonstrated that the parietal lobes in *Homo sapiens* are expanded in comparison to Neandertals and *Homo heidelbergensis*. The traditional parietal lobe function of the brain, somatosensory integration, is thought to be among the phylogenetically oldest functions of the brain. However, recent research has shown that the parietal lobes may be critical to many of the higher cognitive functions of modern *Homo sapiens*. There are two regions appear to be the epicenter of parietal expansion: the intraparietal sulcus (IPS) and the precuneus. The IPS has been well documented by fMRI research to have topographically dedicated neurons for the appreciation of numbers, known as numerosity. Numerosity has been shown to have two core functions: subitization, which is the ability to distinguish between one, two, and three things, an ability present in human infants and monkeys. The second is the ability to distinguish between small sets from large sets of things, known as fuzzy set comparison or analog comparison. The precuneus has been shown to be critical to autobiographical memory and future simulations. The present paper will discuss the implications of these functions as a feral basis for abstraction and modern symbolic thinking.

Cooney, Gabriel (UCD School of Archaeology)

[30] *Encountering the Sacred in the Everyday: From Prehistory to the Present*

A notable feature of the Irish prehistory is the recurrence of activity over long periods of time in specific areas. These persistent places or landscapes are also a feature of the wider world of prehistoric Atlantic Europe. This pattern of human activity has been long debated. Depending on the point of view of the researcher it can be explained for example as indicating foci of long-term settlement, as the repeated but unrelated use of areas improved by human modification in the context of technological constraints on land use or as special places, sacred landscapes. Not only does the understanding of such landscapes require explanation in terms of how they articulated with everyday life in the past, but they also pose problems of recognition and sustainability in today's world. Globally significant cultural landscapes, for example as indicated by World Heritage status, are recognized as requiring specific protection, but there are problems relating to the wider recognition of prehistoric landscapes. The protective focus tends to be placed on visible monuments; dots on a map. In the context of modern development pressures, competing land uses and social

change can we retain an ability to recognize and retain what was sacred in prehistory?

Cooney, Gabriel [199] see Megarry, Will

Coons, Aaron (University of Alberta) and Kisha Supernant (University of Alberta)

[394] *Remote Sensing at the Buffalo Lake Métis Wintering Site (FdPe-1): Preliminary Results*

The Buffalo Lake Métis Wintering Site (FdPe-1), located in central Alberta, Canada, presents one of the most extensively studied examples of overwintering practices amongst the Fur Trade-era Métis. With historical records accounting for approximately four hundred cabins being present at the site in 1876, this site has the potential to have been the largest settlement west of the Red River at the time of its occupation. However, surficial evidence of these cabins is now scarce as a result of modern agricultural practices. Geophysical surveys were conducted at the site during the 2014 field season, with a focus upon magnetometry, conductivity and resistivity. The preliminary results of these surveys are presented, with the goal of determining more accurately any spatial patterning amongst the cabins and the total extent of the site.

Cooper, Martin [182] see Williamson, Ronald

Cooper, Jago (British Museum) and Alice Samson (McDonald Institute of Archaeological Research, Uni)

[288] *Small Island Water Security: considering how the past can help secure a safer future*

Water security is the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods. Small islands can often face particularly problematic issues surrounding water security with the impacts of precipitation variability and relative sea level change keenly felt on islands with limited rain catchment and fast draining hydrological systems. This paper explores some archaeological case studies on small islands from the Caribbean and the Pacific that have studied long-term human-water relationships to consider how findings can inform current debates surrounding improved water management systems, sustainable island population capacities, early warning systems for water insecurity and the management of island abandonment.

[351] *Discussant*

Copeland, Toni J. [220] see Mathena, Sarah

Copeland, Sandi (University of Colorado Boulder), Hayley Cawthra (Council for Geoscience, South Africa), Richard Cowling (Nelson Mandela Metropolitan University), Julia Lee-Thorp (Oxford University) and Petrus LeRoux (University of Cape Town)

[294] *Testing the Paleo-Agulhas Plain Migration Ecosystem Hypothesis with Serial Isotope Analysis of Fossil Fauna*

In contrast to Holocene sites, late Pleistocene sites along the South African south coast are dominated by large and medium-sized ungulates, many of which are typical of open-habitat grasslands and migration ecosystems. During much of the late Pleistocene, sea levels were substantially lower, exposing the Paleo-Agulhas Plain up to 100 km south of the modern coastline. The Migration Ecosystem hypothesis proposes that the Paleo-Agulhas Plain supported a migration ecosystem driven by summer rainfall producing fresh green grass during summer in the east, and winter rainfall producing fresh green grass during winter in the west. We tested the migration hypothesis with serial samples of strontium, carbon, and oxygen isotopes in fossil fauna enamel from Pinnacle Point sites PP13B and PP30. We also created a bioavailable strontium isoscape for the region. Results indicate that bioavailable strontium is strongly influenced by marine sources, as well as bedrock geology. Strontium isotopes of the fauna vary by less than 0.0005 within each individual, and suggest that most animals spent their time on or near the Paleo-Agulhas plain, not further inland. Carbon and oxygen isotopes of potentially migratory individuals are consistent with east-west movements, showing evidence for consumption of C3 and C4 grasses in varying proportions.

Corbett, Debra [7] see Hornbeck, Bobbi

Corbett, Debra (Nanutset Heritage), Edward DeCleva (US Fish and Wildlife Service), Dara Glass (Cook Inlet Region, Inc), Alexandra Lindgren and Sherry Keim (Chugach National Forest)

[336] *Federal Agency and Alaska Native Co-Management of the Sqilantnu Archaeological District, Alaska*

One of the more unusual provisions of the 1971 Alaska Native Claims Settlement Act allowed the 12 newly formed Alaska Regional Native Corporations to select significant historic and cemetery sites as part of their settlement. Cook Inlet Region, Inc. (CIRI), selected three sites at the confluence of the Russian River with the Kenai River. The two federal agencies managing the area protested the claims. Among many complications was the fact that the area is one of the most popular sport fisheries in Alaska. Twenty-seven years after the claims were filed, facing drawn out legal action, the major parties sat down and negotiated a co-management agreement that was signed into law as the Russian River Lands Act in October 2002. The result is a unique partnership for managing archaeological and cultural resources and public use. The fundamental agreement could be a strong positive template for co-management of other significant heritage resources.

Corcione, Maria

[107] *Health Conditions Between the Muisca-Tibanica Society: Bioarchaeological Analysis of Phenomena in Porous Skull*

The doctoral research I drive seeks to understand whether there is relationship between nutrition and the appearance of porosity in the skull within the Late Muisca society Tibanica located in the Soacha Colombia. From the macroscopic, histological and radiological analysis is to perform a differential diagnosis to understand the true involvement anemic trait. According to the etiology presented for porous phenomena, its causes is the high consumption of maize, which inhibits the absorption of iron, resulting in iron deficiency anemia; if true, a high maize consumption among the non elite group of Tibanica, reveal high frequencies of porotic hyperostosis and cribra orbitalia. The designed to answer questions about the relationship feeding disease bioarchaeological analyzes have not been carried out to the country with a large sample of Late Muisca period, which is an opportunity to conduct research that attempts to approach the phenomena porous in the skull from a not only paleopathologica but biocultural perspective.

Corcoran-Tadd, Noa (Harvard University)

[108] *Slow Thinking: Beyond the Entangled List*

Several theorists under the broad umbrella of a new materialism have argued that our accounts of the social-natural world proceed too quickly, skating over rich complexities and contradictions in favor of simple ontological impressions. In response, they suggest, we need to slow down our analytical movements in order to track the complex articulations of a world that becomes difficult to resolve at higher speeds. Here I argue that this issue is particularly relevant for archaeologists for whom issues like temporal compression and interpretive gaps are often highly explicit. I seek to use archaeological materials to both slow down historical accounts of the silver economy in the colonial Andes and to move beyond the descriptive list stage of analysis often encountered in . Faced with a list that might include llamas, mules, alfalfa, altitude, hemoglobin, capital, and adobe walls, I deploy this heterogeneous assemblage to trace specific questions of animal labor, bioplasticity, and precarity in the colonial Andes.

Cordell, Ann (Florida Museum of Natural History), Neill Wallis (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)

[79] *Ceramic Petrography and Woodland Period Social Interactions in Florida and the Southeastern United States*

Swift Creek Complicated Stamped pottery found throughout much of the lower Southeastern U.S. is arguably the premier material for the systematic study of Woodland interactions. The unique

impressions of individual carved wooden paddles are often found on pottery at multiple sites, lending an unparalleled level of detail and spatial resolution to social connections. Furthermore, the distribution of vessels potentially reflects a broad range of interactive practices among a large proportion of past populations rather than only the occasional practices of a few individuals. Petrographic analysis of Swift Creek pottery has been undertaken as part of an ongoing research program that uses integrated materials analyses of pottery, including Neutron Activation Analysis, digital imaging of paddle stamp designs, technological analysis, and absolute dating, to identify patterns of social interaction. This paper focuses on petrographic data obtained thus far. Several hundred samples have been taken from more than two dozen sites distributed across Florida and Georgia and dating between A.D. 200 and 800. Preliminary integrative results indicate that interactions were geographically extensive, but clearly most intensive along particular corridors.

Cordell, Ann [166] see Walker, Karen

Cordero, Maria-Auxiliadora (University of Pittsburgh), Esteban Acosta and Paulina Rosero

[367] *Settlement Patterns Study in the Lake San Pablo Area, Northern Highland Ecuador: Preliminary Results*

The project "Cultural and Technological Principles Associated with Occupation Modalities during the Integration Period: Value and Use in Present Day Ecuador", carried out by the INPC (National Institute of Cultural Heritage of Ecuador) and funded by SENESCYT (Ecuador's Department of Science and Technology) has researched five areas of the country, including in the Otavalo Canton. This paper presents the preliminary results of a survey, conducted with the collaboration of community members, from three parishes next to Lake San Pablo. We report on earthen mounds, raised fields, and areas of dispersion of cultural materials in a 30 square kilometer area. Mounds close to the raised fields in the low-lying areas near the lake may represent chiefly control of these agricultural works, while habitation sites of the regular population seem to have been mostly located on the slopes around the lake. Complementing information from the archaeological survey will be data gathered by historians, geographers, and cultural anthropologists (among other professionals) in this multidisciplinary project.

Cordova, Guillermo (Guillermo Cordova)

[231] *The River Suchil Valley project, Zacatecas and Durango 10 years of its inception*

This project aims to understand social complexity in prehispanic Mexico by studying the strategies of landscape use and resource management throughout the first millennium A.D. in a territory occupied today by the municipalities of Sombrerete and Chalchihuites in the state of Zacatecas, as well as Suchil in the state of Durango. In our presentation, we will evaluate and present the results of multiple lines of research, such as bioarchaeology of the ancient inhabitants, hierarchy and complexity of settlements, mining, the importance of the lapidary industry, funerary patterns over time, etc. The information generated so far allows us to consider the dynamic social developments of the Chalchihuites culture. For example, the establishment of settlements with public areas for the performance of agricultural and funeral rituals required the importation of turquoise from the American Southwest for the production of jewelry, which was also used by elites as grave goods and perhaps exported to western and central Mexico as well.

Cordova Tello, Guillermo [217] see Fiehling, Benno

Córdova Tello, Mario [249] see Sereno-Urbe, Juan

Corl, Kristin (New Mexico State University)

[110] *Faunal Evidence for Subsistence Strategies at Cottonwood Spring Pueblo*

The zooarchaeological assemblage from Cottonwood Spring Pueblo (LA 175), an El Paso Phase (A.D. 1275-1450) horticultural village in southern New Mexico, is dominated by small game. What explains this pattern? The high relative percentage of rabbit to deer follows a general trend

associated with aggregated populations, growing agriculture dependence, and less seasonal mobility. Additional variables possibly contributing to this trend include shifts to small game in response to droughts, over exploitation of larger game, niche creation by human modification, and preferential hunting strategies, all of which influence the faunal ratios regardless of dependence on agriculture. My hypothesis is that hunting of small game is a direct result of the intensification of farming. The expansion of cultivated fields creates a niche that attracts rabbits that would otherwise live in grassland environments, which are then targeted for hunting. To assess this hypothesis I examine archaeological evidence of field expansion, environmental evidence of precipitation and temperature, and faunal data including game species (lagomorphs, deer, antelope) as well as proxy species of microenvironments (e.g. rodents). I also examine stable carbon and nitrogen isotope patterning in a sample of lagomorphs to assess whether they were consuming grassland plants (C4) or domesticated plants (C3).

Corl, Kristen [273] see Sartin, Sunnie

Cormier, Aviva (Boston University)

[206] *A Combined Bioarchaeological and Isotopic Approach to Understanding the Regional Diversity and Population Mobility within the Holmul Region, Guatemala*

The northeastern Petén of Guatemala is an ideal area for applying stable isotope analysis to reconstruct past population histories and to explore the interplay of migration and social complexity throughout the rise of the Maya. The strontium and oxygen isotope analysis of dental enamel is a productive alternative when bone collagen is not available or is severely altered by taphonomic processes or conditions of preservation. These isotopic analyses of dental enamel can be combined with biological profiles of interred individuals in order to address questions of regional identity, differing mobility, and changing complexity of the Maya in the Holmul Region. This poster presents the preliminary osteological analysis and biological profiles of individuals excavated from Homul, La Sufricaya, Cival, and Hamontun, emphasizing burial treatment, estimated age, biological sex, perimortem trauma, cultural modification, pathology, and/or dental health. Further, this poster presents the methodology of a combined bioarchaeological and isotopic approach to understanding regional diversity and population mobility. An application of this method would encourage the use of these bioarchaeological and isotopic analyses at sites in the greater Maya region and throughout the world, especially where the difficulties of excavating and the poor preservation of human remains may have previously dissuaded scholars.

Cornwell, Kelsey (University College London)

[120] *Theoretical and Practical Advances in Underwater Regional Survey*

To contend with expensive and invasive 'big dig' excavations, archaeologists have trended towards using regional surveys to examine and interpret distribution patterns across a given area. Regional surveys offer an effective and efficient way of analyzing the long-term use and wide scale development of variably occupied spaces. With the introduction of Geographic Information Systems and other new technologies, archaeologists have been able to capitalize on the insights gained from statistical analyses, such as regression and predictive models, to further our understanding of pre-modern societies.

Underwater archaeology, however, has not enjoyed the range of theoretical and methodological developments that terrestrial archaeology has over the past 50 years. Until recently, conducting regional surveys underwater was too costly in both time and finances. In the past twenty years, though, archaeologists have begun to utilize oceanographic tools to inspect large expanses in both shallow and deep water, revealing a great deal of submerged cultural material. This project examines if, where, and how theories established to investigate land sites and regions could be applied to underwater environments, with particular focus on the Mediterranean, and offers a case study from Eratosthenes Seamount as a practical application.

Coronado, Anabella (The University of Texas at Austin) and Adriana Linares (The University

of Texas at Austin)**[261]** *Arqueología Comunitaria en la Región Ixil de Guatemala*

Esta ponencia detalla la reciente investigación participativa en las comunidades de Santa María Nebaj, San Juan Cotzal y San Gaspar Chajul, localizadas en el Departamento de El Quiché, Guatemala. La investigación socialmente comprometida comienza con la elaboración de un atlas regional que reconozca y actualice el listado "oficial" de sitios arqueológicos para su protección. Entre las herramientas metodológicas más valiosas destacan los datos provenientes de historias orales que sobreviven varias generaciones de migraciones, exilios, destierros y repoblaciones en la región, así como la participación activa de autoridades indígenas, arqueólogos, etnohistoriadores, antropólogos, y conservadores expertos en patrimonio. Inclusivamente, se propone realizar el cambio de los nombres ya institucionalizados de los sitios arqueológicos para que sean más acordes a las realidades locales. Se presenta también, la parte correspondiente a la excavación que se ha discutido con las autoridades y localidades para la elaboración de mapas culturales. El alcance final del proyecto es que dichos mapas abarquen y proyecten las distintas etapas históricas y la sobrevivencia autónoma de éstas comunidades.

[261] *Chair*

Corona-M., Eduardo [141] see Ulloa-Montemayor, Ximena

Corpuz, Monica**[27]** *Unearthing the Mysteries of the Frank Palmer Archaeology Collections*

The Frank Palmer collections were the founding collections of the first museum in Los Angeles, the Southwest Museum, opened in 1914, and also for the Southwest Society's exhibit in the Pacific Electric Building in downtown Los Angeles of 1907. Their profound importance to the individual founders of the museum, the Southwest Society and to the general populace of Los Angeles is well documented in meeting minutes, newspaper clippings and articles in magazines. The artifacts assembled by Frank Palmer came from all over southern California from sites such as Redondo Beach and the southern Channel Islands. However, the origins of the collections are murky as are many of their current locations. Additionally, very little research has been conducted on the collections and so they are poorly understood. Collections such as the Frank Palmer collections represent an important resource for research into early collecting practices and the aims of early museums and archaeologists. I plan on discussing my research on the Frank Palmer collections that I have conducted at the Autry National Center of the American West on the Southwest Museum Collection.

Corrales-Ulloa, Francisco (Museo Nacional de Costa Rica) and Adrián Badilla-Cambronero (Museo Nacional de Costa Rica)**[170]** *Exchange, production and consumption of exotic and exclusive goods in the delta of Diquís, Costa Rica.*

Exchange and consumption of various goods in late prehistoric period chiefdom societies of the Diquís Delta, southern Costa Rica is discussed. Because of its geographical position and socio-economic development the Diquís region had a major role in exchange and regional relations, in Greater Chiriquí (southeastern Costa Rica and western Panama), and at the extra regional level (southern Central America). Various goods (metal objects, statuary, polychrome and biscuit pottery, polished axes, stone spheres, etc.) had different areas of distribution and consumption within Greater Chiriquí that have been related to manufacturing sites and centers of power. At the same time, in major sites like Finca 6 and Caño Island, fragments and whole pottery vessels from Guanacaste (NW Costa Rica) have been found, suggesting trade routes along the Pacific coast. This pottery has been found in contexts along with other polychrome types and anthropo- and zoomorphic statuary with a restricted area in the Diquís delta, suggesting the acquisition of exotic goods and production of exclusive goods by the delta's chiefdom societies.

Corteletti, Rafael (Rafael Corteletti)

[157] *Chair*

Cortes-Rincon, Marisol [248] see Kieffer, C. L.

Cortes-Rincon, Marisol (Humboldt State University), Adam Forbis (Humboldt State University), Erik Marinkovich (Humboldt State University), Kyle Ports (Texas Tech University) and Robert Foster, Jr. (Humboldt State University)

[316] *Geospatial Analysis of Material Procurement and Distribution in the Hinterlands of Northwestern Belize*

The ancient Maya employed a wide variety of lithic raw materials for tool manufacture, such as strategies that combined local production of flaked stone tools with the import of some finished tools from distant sources. Over time, variable stone tool acquisition, manufacture, and use are reflected in the comparative differences in the formal versus expedient technologies and raw material types from a variety of contexts, including ceremonial, non-domestic, and domestic. The authors will present an overview of the dataset from excavations in northwestern Belize and the lithic raw materials available from sources within and adjacent to the research area. Geospatial analysis of raw material procurement and distribution during the Late and Terminal Classic periods will be examined through the use of a Geographic Information System. The spatial distribution of materials will provide insights into the regional and localized circulation of goods. Indicators of greater diversification and intensification are expected to appear in productive households to confirm that the local economy was focusing on supplying and procuring materials for commodity and non-commodity production to support administrative structures and guarantee integration in the local and regional economy.

Cossin, Zev**[394]** *Indigenous Labor and the Hacienda System: Examining Everyday Micropolitics and Global Capitalism at the Historic Hacienda Guachalá, Ecuador*

Scholarship in a variety of disciplines pertaining to global flows of people, goods and ideas have begun to emphasize the mediating effects of local communities and cultural logics on and against broader transformations and structural conditions. This topic is of particular importance to an anthropological understanding of both contemporary capitalist processes globally as well as their historical precedents. Recent theoretical approaches to contemporary capitalism, specifically, approach capitalism as performative, as highly adaptive yet premised on stable repetition, and as a relational series of networks that compose an ongoing project rather than a fixed total system. More than an economic system, it is a medium for intercultural entanglements that consist of dynamic social formations, networks of production and circulations. In this paper I synthesize archaeological and documentary evidence pertaining to the colonial and post-independence occupations of the historic Hacienda Guachalá in the highlands of Ecuador. In so doing, I reflect on the ways that this literature usefully intersects with archaeological work and the capacity of material analysis to contribute to such discussions.

Costa, Benilde [9] see Wagner, Ursel

Coster, Adelle [186] see Kealhofer, Lisa

Costin, Cathy (California State University, Northridge)**[398]** *Crafting Identity and Wealth on the North Coast of Peru*

The "organization of production" is not a monolithic, homogeneous entity in complex empires, and the production of different types of goods will be organized commensurate with the role they play in sociopolitical processes. In this paper, I investigate the ways in which craft production was reorganized after the Inka conquest of the Chimú polity of Peru to control the creation and deployment of wealth and to manipulate the construction of social identity in the changing sociopolitical landscape. Some ceramic production became more centralized under the auspices of the state than it had been under the prior regime, because heretofore most ceramics had not been

politically charged. In the case of textiles, authority over production was decentralized. The greater centralization and establishment of attached ceramic production served to consolidate control over symbolic content and the distribution of objects used in political feasting and ritual. In contrast, the decentralization of textile production both precluded provincial administrators from monopolistic control over the production of wealth items and supported state ideological ends. Overall, by assuming control over elite textile production and instituting state-sponsored ceramic production, the Inka co-opted the production and display of social identity and established control over the visual discourses of power.

Costion, Kirk (Oglala Lakota College), David John Goldstein (National Park Service) and Lizette Muñoz Rojas (University of Pittsburgh)

[347] *Social Implications of a Maize-Free Botanical Assemblage in Early Middle Horizon Contexts at the Huaracane Site of Yahuay Alta, Middle Moquegua Valley, Peru*

Analysis of the micro and macrobotanical remains from the Huaracane settlement of Yahuay Alta's early Middle Horizon (A.D. 550 – 800) contexts revealed no recorded signature of maize use at this site, but the presence of a variety of other agricultural remains. We know that the Tiwanaku and Wari states established colonial settlements in the Moquegua Valley in this period, and that the Tiwanaku colonial project in the middle valley focused on its excellent potential for maize agriculture.

Regardless of Yahuay Alta's close proximity to Tiwanaku maize fields, the site's maize signature was silent. Importantly, sampling on living surface and midden contexts recovered no indicators of other Andean crops, typical of the Middle Horizon, e.g., potatoes, quinoa, or aji peppers. Instead, the remains of weedy greens and the root crop arracacha (*Arracacia xanthorrhiza*, Ban. APIACEAE) dominated the botanical assemblages from domestic contexts. We consider the presence of the evidence together with the rest of the material culture remains to discuss Yahuay Alta's early Middle Horizon agricultural and political economy. We argue that this apparently maize-free diet was at the root of a complex Huaracane strategy that avoided cultivating and/or consuming maize to remain inconspicuous in a potentially contentious political landscape.

Costosa, Jen-I (Graduate School and University Center CUNY)

[290] *Digging the Past- Creating New Pathways for the Future: Graduate Student Perspective from the Field*

As local communities are trying to adapt to the challenges of the anthropocene they are being faced not just with the loss of archaeological sites but also their livelihoods, identity and home. When living in a small island developing state (SIDS), the partnership of cultural heritage investigations with citizen science, transcends theory and provides the local participants with the tools to conserve and preserve the stories of the past while making empowered solutions towards challenges of the future. Teamwork and collaboration has always been key in archaeological fieldwork but it was mostly driven from the outside in. This new bottom up approach assists junior researchers in building cultural sensitivity and awareness while generating the colleagues of tomorrow from the very communities they have the privilege of working in. An archaeological understanding that values and is inclusive of local stakeholders is necessary to foster heritage and pride to combat paralysis in the face of climate change and create resilience for the future. Citizen science is not only life changing for the local citizens but a new way of training the scientists of tomorrow.

Côté-Landry, Maude [121] see Gardner, Chelsea

Coudart, Anick (Arizona State University)

[82] *European Neolithic Houses & New-Guinean Contemporary Houses: Toward a Material Culture Theory*

The archaeological and ethnographical study of domestic dwellings gives us the opportunity to grasp the logical structure that underlies the transformation of any architectural tradition, then the process of reproduction-transformation of a cultural group, and ultimately the evaluation of its sustainability. A comparative architectural approach between Bandkeramik Neolithic and New-Guinean Anga groups allows us to extract the structure inherent in architectural traditions; i.e. the articulation between cultural rules, variations between households or settlements, and contingent differentiations. Since

there is a structural correspondence between the dwelling and the collective representations that underpin each culture, it becomes possible (through domestic architecture) to measure the relative importance of the terms that describe this structuration. As each of these terms relates to a greater or lesser degree of stability, this allows us to measure, at the level of the cultural 'system', the relationship between the factors contributing to stability (cultural norms) and those relating to instability (individual expressions and contingent adaptations). In other words, this allows us to investigate the relationship between sustainability and resilience, and presents us with one avenue to evaluate the logic that is responsible for the reproduction of a cultural system, as well as the potential life-span of its identity.

Couey, Lauren (University of Denver), Ian Kuijt (University of Notre Dame), Liam Murphy (Coastways, Ireland) and Max Lopez (Hamilton College)

[315] *Illuminating Invisible Houses: Using Ground-penetrating Radar and Three-Dimensional Geospatial Modeling to Reconstruct 19th-Century Irish Homes, Inishark, Co. Galway, Ireland*

This poster examines the use of ground-penetrating radar in combination with three-dimensional modeling to identify, examine, and virtually reconstruct the subsurface material remains of nineteenth century homes on the islands of Inishark and Inishbofin, Co. Galway, Ireland. In this research we employ a multi-stage research program starting with a ground-penetrating radar survey of multiple house sites and a digital scanning of the ground surface to develop a high-resolution topographical map, followed by the archaeological excavation of houses. This allows for a more nuanced understanding of the interconnections between different data sets and the changing nature of architectural remains on the island. The spatial arrangement and layout of sod and stone buildings, as well as the extent of their preservation, can provide valuable insight into the daily lives and shifting residential practices and social customs of the nineteenth and early twentieth century villagers of Inishark and Inishbofin.

Couplin, Shawna [391] see Delaney, Colleen

Coutu, Ashley (University of Cape Town/University of York)

[391] *ON THE TRAIL OF IVORY: MAPPING TRA.D.E IN IRON AGE SOUTHERN AFRICA*

Our current knowledge of the pre-colonial ivory trade in southern Africa consists of evidence from a number of archaeological sites dating from the 7-11th centuries A.D., such as Schroda, K2, Ndondonwane, and KwaGandaGanda. These sites have yielded large caches of ivory debris, suggesting that these places were centers for ivory carving/production. However, it is unknown whether raw ivory was obtained locally or brought from further afield, whether there was a standardised mode of production, and which markets drove the demand for its manufacture.

In order to investigate these questions, a combination of bioarchaeological techniques has been utilized to determine the species of the ivory (Zooarchaeology by Mass Spectrometry), as well as isotope analysis to determine possible source regions. This paper will present the ZooMS and isotope data ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$ and $87\text{Sr}/86\text{Sr}$) from the analysis of ivory artifacts and working waste from Iron Age sites in southern Africa. Isotope measurements from the ivory have been mapped onto environmental variables to reconstruct the catchment areas. Ultimately, this data will be combined with evidence for other trade goods (cattle, metal, glass beads) to better understand the movement of commodities across southern Africa from the first millennium A.D. onwards.

Covert, Alexandra (Hobart and William Smith Colleges/Archaeology Southwest) and Leslie Aragon (University of Arizona/Archaeology Southwest)

[278] *True Facts About the Dinwiddie Site: Surprising Results from Limited Testing in a Disturbed Site*

Archaeology Southwest and the University of Arizona's 2014 Upper Gila Preservation Archaeology (UGPA) field school excavations at the Dinwiddie Site (LA106003) produced interesting and somewhat unexpected results. Dinwiddie is a Cliff Phase (A.D. 1300 – 1450) Salado site located along Duck Creek, a tributary of the Gila River, in southwestern New Mexico. It was partially excavated by avocational archaeologists in the 1960s and the remaining deposits have faced

multiple sources of disturbance. Despite this history, test excavations in small areas of intact deposits at risk for future disturbance revealed unanticipated variability in architecture and ceramics between roomblocks. Spatial variation in pottery types represented in different parts of the site may be linked to temporal differences or to variability in social connections. Evidence of intensive remodeling and rebuilding in some rooms indicates a longer period of occupation than has commonly been attributed to Cliff Phase sites.

Covey, R. Alan [398] see Aland, Amanda

Coward, Fiona (Bournemouth University)

[210] *Using Networks to Investigate Material Identities in the Epipaleolithic and Early Neolithic of the Near East*

This paper will illustrate the potential of methods derived from network science and especially social network analysis can be used to investigate the social interactions and relationships within and between the earliest village sites in the Near East across the shift from a mobile hunting-and-gathering way of life to a more sedentary, village-based and ultimately agricultural lifestyles. This approach provides a new perspective on the question of social change at the time as it views social groupings as dynamic, emergent networks of relations, rather than as discrete, static and homogeneous entities. The fundamental significance of material culture to personal and group identity is used as the basis for social network analyses of a database of material culture from more than 500 sites across the region; This paper thus challenges accepted 'cultural' and temporal groupings but also points to some potentially significant temporal trends in the data over the course of this period, and goes on to consider ways in which the use of SNA might be developed and enhanced to address these issues in more sophisticated ways in future.

[210] *Chair*

Cowie, Sarah [90] see Laluk, Nicholas

Cowling, Richard [294] see Potts, Alastair

Cox, Eric

[97] *To Retest or Not To Retest: A Case Study at Wide Ruins*

To conduct an archaeological data recovery project using another's testing results as your guide can be problematic, especially when those results are over a decade old. In 2014 Northland Research, Inc. undertook a large data recovery project at two sites located at the Wide Ruins Community on the Navajo Nation. Both of these sites had been previously tested by a company other than Northland. One of these sites AZ P-37-42(NN) was an obvious habitation with the remnants of a room block and an associated great kiva located just outside of the right-of-way. For this reason a less than robust testing strategy was utilized on this site. As a result of testing, a total of 80 cultural features were projected to be within the right-of-way. In reality Northland located well over 350 archaeological features within this site. This poster presents the results of the archaeological testing and subsequent data recovery at AZ P-37-42(NN) and examines if an alteration of testing methodology would have made a significant difference in the archaeological feature projections. Additionally this poster seeks to provide some insight on the lessons learned from the Wide Ruins excavations.

Cox, Jim (Oklahoma Anthropological Society)

[223] *Discussant*

Cox, Jeffrey [284] see Rowe, Marvin

Cox, Alexandra (Humboldt State University)

[310] *The UseWear Analysis of the Blue Lake Museum Lithic Collection*

This paper examines the usewear related modifications on an assemblage of North American lithic artifacts that is held by the Blue lake Museum. The collection consists of a variety of material and tool types. There are a number of flaked projectile points and scrapers, as well as groundstone tools. All pieces were acquired by the Blue Lake museum through donation by private individuals and not all of the pieces have a known context. There has not been any intensive analysis carried out on this collection. Usewear analysis will be used to determine whether or not a given artifact was utilized and, if possible, to determine the work action the tool was engaged in as well as what material the tool was used on. Microscopic analysis will be used to examine usewear and coupled with ethnoarchaeological research to determine origins of the pieces. This paper will provide the Blue Lake Museum with a greater understanding of their lithic assemblage as well as guidelines for doing usewear analysis on museum lithics collections with no archaeological context.

Crabtree, Pam (New York University)

[28] *Beyond Bones: Non-Faunal Evidence for the Role of Dogs in Anglo-Saxon Society*

Zooarchaeological data have provided much new information on Anglo-Saxon dogs including information on animal sizes, ages at death, paleopathology, and evidence for the treatment/mistreatment of dogs. However, many aspects of the relationship between humans and dogs in the Anglo-Saxon period cannot be understood on the basis of animal bones alone. This paper will explore the non-archaeozoological evidence for human-dog relationships in the Anglo-Saxon period drawing on evidence from literature and art history. The paper will focus specifically on the role of dogs in hunting and falconry.

Crabtree, Stefani (Washington State University)

[84] *Alliances, Coalitions, Hierarchies and Conflict in the Ancestral Pueblo World*

Using the experimental testbed of the Village Ecodynamics Project's agent-based simulation "Village," we examine how population growth and resource depletion in the Central Mesa Verde landscape between A.D. 600 and A.D. 1280 set the stage for territorial conflict, and how lineage and clan membership likely affected the structure of coalitions. We take a three-pronged approach, combining models for the evolution of leadership, models for the formation of coalitions and alliances, and models for conflict. In our model, groups may choose to fight offending groups or offer a merger with those groups when territories are contested. As time goes on, conflict may arise over productive agricultural land and a structure of hierarchical relations between groups may develop, forming what we call "complex groups." These hierarchies may be more or less stable due to many internal dynamics, including the productivity of the environment, the ability of dominant groups to retain dominance, and the ability of subordinate groups to leave hierarchies. This paper thus directly examines how networks of relationships among groups emerge through time, and how those networks (in the form of coalitions or alliances) ameliorate conflict or help groups win in conflict.

[84] *Chair*

Crabtree, Stefani [348] see Kohler, Tim

Craft, Sarah

[398] *Going Where the Job Takes You: Itinerant Producers in the Eastern Roman Empire*

Architectural relationships between the eastern Roman imperial capital at Constantinople and its provinces have traditionally been understood as derivative. In the province of Isauria on the southern coast of Anatolia, however, distinctive remains have led to the conceptualization of a group of native stonemasons known as 'Isaurian builders,' who traveled through provinces across Anatolia and northern Syria, leaving in their wake an identifiably Isaurian style of early Christian churches. At the same time, brick masons from the capital were exported to the provincial capital at Seleukeia, whose workshop in turn exported its product even further afield. This paper addresses the movement of craftpersons to, from and within Isauria, questioning traditional understandings of innovations and developments in construction materials and techniques between a province and its capital, as well as relationships between provinces within the same empire. This has ramifications for understanding

these workmen as itinerant specialists, matching the quality of the regional limestone in the caliber of its stonemasons, or as seasonal workmen, driven by economic circumstances to ply their skills and labor outside their native province. More broadly, it illuminates our understanding of the inter-provincial movement of productive knowledge and technologies, facilitated by the very fabric of empire.

Craig, Oliver [17] see Little, Aimee

Craig, Douglas (Northland Research), John Marshall (Northland Research) and Brent Kober (Northland Research)

[304] *From La Villa to Pueblo Grande: Corporate Descent Groups and Property Rights Along Canal System 2*

Most studies of the organization of Canal System 2 have taken a “top-down” approach and focused on the degree to which a centralized management structure was required to operate and maintain the canal system. In this paper, we take a “bottom-up” approach and focus on the interests and concerns of the irrigators themselves. Architectural data from several pre-Classic sites along the canal system are examined in an attempt to reconstruct the organizational strategies of multi-household, corporate descent groups. We argue that corporate descent groups often contained a core set of high-ranking households and affiliated households of lesser rank. It is further suggested that high-ranking households were able to maintain a position at or near the top of the social hierarchy for several generations, similar to “house” societies in many parts of world. The implications of the emergence of house-like social formations in early Hohokam society are discussed. The implications for our understanding of the pre-Classic to Classic period transition are also considered.

Craig, Lorena (University of Montana)

[312] *Lithic Raw Materials Procurement and Exchange at Housepit 54, Bridge River Site, British Columbia: What a Diachronic Perspective Reveals*

While the Bridge River settlement in the Middle Fraser Canyon of British Columbia is located in one of the richest salmon producing areas on the Fraser River, occupants of the site had limited direct access to many sources of raw material critical for production of chipped stone tools. Current excavations by Dr. Anna Prentiss at Bridge River Housepit 54 focus on an estimated 15 housepit occupation floors dating in the range of 1000 to 1500 cal. B.P. This allows for a unique study of intergenerational adaptations. This poster presents results of analysis of lithic raw materials acquired from known sources with a focus on defining relationships between the organization of lithic raw material acquisition and use and variation in subsistence pursuits. More specifically, this study seeks to test hypotheses linking patterns of land use to strategies of lithic procurement. For example, it can be hypothesized that periods of subsistence diversification and “search” oriented foraging strategies led to more frequent use of distant lithic raw material sources. However, access to toolstone through trade also remains an important alternative hypothesis for lithic raw material procurement, especially in light of Bridge River’s highly productive fisheries and proximity to trade routes.

Cramb, Justin [77] see Jones, Sharyn

Crandall, James (University of Florida)

[78] *The Development of ‘Peripheral Communities’ in the Eastern Andes*

The Chachapoya have come to be seen as a peripheral cultural entity in relation to the broader Precolumbian Andes, yet little work has addressed how these ‘peripheral’ communities developed in relation to each other. While it is clear that the material culture that is manifestly associated with the Chachapoya developed prior to A.D. 1000, it is unclear how uniform this process was on a regional level. In the Precolumbian Andes the development of centralized and partitioned monumental architecture has been commonly used as evidence for social and political transformations. This paper utilizes a scalar perspective to position the social and political changes of the Chachapoya on a regional level. Further, in order to better understand the development of Chachapoya communities,

this paper addresses the significance of centrality for one such community, Purumllaca de Soloco, and the role that the construction of its monumental architecture and the accretional changes of the surrounding settlement played in the social and political development of its community.

Crandall, John [202] see Martin, Debra

Cranford, David (UNC-Chapel Hill) and Mary Elizabeth Fitts (UNC-Chapel Hill)

[311] *Trends in Catawba Architecture, ca. 1750-1820*

Recent archaeological investigations have documented a series of sites associated with the historic Catawba Nation in South Carolina dating from 1750-1820. During this period Catawba communities underwent dramatic and abrupt changes associated with population loss from epidemic disease, settlement relocation, and the development of new economic strategies. Among the most striking of these, were changes in domestic architecture. In this poster, we define various types of Catawba structures present on late eighteenth-century sites and identify chronological shifts that demonstrate a transition from the construction of post-in-ground houses to log cabin architecture. Finally, we address what these changes in architectural modes tell us about shifts in community organization through time.

Crass, Barbara [360] see Holmes, Charles

Crater Gershtein, Eli, Steve Black , Amanda Castaneda , Tammy Boanasera and Daniel Nadel

[342] *Shiny Grooved Surfaces: The Case Study of the Skiles Rockshelter, Lower Pecos, Texas*

Shiny grooved surfaces are common in rock shelters and cave sites in the Lower Pecos region, Texas. They are found on horizontal as well as vertical exposures, usually in close association with mortars and/or rock art. The shiny appearance has been interpreted as the result of human traffic, hand touching, animal sacrifice, etc. In many cases these surfaces are densely grooved and incised by a variety of shallow and deep marks which are not found outside the shiny surface. Such phenomena have scarcely been analyzed in detail, in spite of their central location within many sites and their assumed social/ceremonial importance. The aim of this paper is to present a new analytical protocol based on Structure from Motion photogrammetry, high-resolution 3D models and spatial analysis. We use one case study from the Lower Pecos (Texas) and focus on the location, context and characteristics of the shiny surface, background noise, associated features (mortars), microscopic residues, and especially the grooves and incisions. These are characterized in terms of dimensions, cross-section, location, orientation, production and use signs. Their spatial clustering and super-imposition are studied in detail. The results provide new insights into the utilization history of the surface and suggest possible interpretations.

Crawford, George [150] see Kilby, David

Crawford, Laura (The Ohio State University)

[333] *Thule Response to Climate Change at Cape Espenberg, Alaska, CE 1500-1700*

Food plant remains and wood charcoal provide insight into how prehistoric Arctic peoples may have adapted to climate change. This study addresses Thule plant and fuel use at Cape Espenberg, Alaska from CE 1500-1700. Plant macrofossil and charcoal remains were sampled from occupation layers of three Thule semi-subterranean houses. Macrofossil and charcoal counts were analyzed using ANOVA, T-test, and Tukey Post-Hoc tests. Results indicate that plant foods contributed vitamins and fiber to Thule's primarily meat diet. Wood was an important fuel, but was supplemented by bone and blubber. Conservation of woody fuel may reflect a decline in local driftwood availability due to climate change. These results underscore the importance of plants as food and fuel to prehistoric Arctic peoples, and demonstrate how these variables can be interpreted as proxies for climate change. Furthermore, these data suggest how modern Inupiat subsistence strategies may change in a warming Arctic.

Crawford, Gary (University of Toronto)**[414]** *Niche Construction and Early Agriculture in Northeastern North America*

Agriculture in the Northeast is a secondary development with research focusing on migration as a result of population growth in agricultural centers and the introduction of maize, bean, squash, sunflower and tobacco and the subsequent consequences of their introduction. Unlike pristine/primary origins whose explanations are couched in complex ecological considerations, be they interactive (ecological engineering, niche construction) or based in HBE (human behavioral ecology), ecological considerations are rarely considered in secondary origins. This paper explores varying modes of human-environment (particularly plant) interaction before and after the onset of maize production in Ontario. Human decisions and activities in Ontario before and after the introduction of maize appear to have played a significant role in agricultural development in the region, including the evolution of crops and the local landscape.

[345] *Discussant***Creager, Brooke (University of Minnesota)****[332]** *Problematizing Religious Transformation: Burial Evidence for the Transition to Christianity*

The identification of religion through the examination of burials faces many problems, mainly the different avenues of interpretation. This paper will examine the conflicting evidence for religious belief used to identify religious practice in burials. The use of a few key features, or lack of features, to designate a burial of one religion or another does not take into account variation or coincidental practices, which only resemble a particular religion. Mixed burials present another problem of interpretation, as they are often described as transitional, marking the period between a traditional polytheistic and Christian society or as a hybrid religion attributed to the catchall of polytheism. Religious theory allows for multiple interpretations of any one burial assemblage. My thesis developed using a case study of conversion in early medieval Britain will be considered at such sites as Spong Hill and Sutton Hoo.

Crebbin, Kyle (Southern Oregon University), Chelsea Rose (Southern Oregon University) and Shana Sador (Southern Oregon University)**[12]** *The Jim Rock Historic Can Collection Online Database at Southern Oregon University, Ashland*

Jim Rock was an historical archaeologist known for his passion for the humble 'Tin Can.' Prior to his death in 2010, Rock spend much of his lengthy career with the Forest Service focusing on education and outreach. Rock amassed a large comparative collection of bottles and cans, which he housed in suitcases and carted around teaching both the public and the professional archaeological community about the importance of often overlooked and undervalued artifacts, particularly cans. Rock's 1987 volume "A Brief Commentary on Cans" remains instrumental in historical archaeology in the American West. Upon his death, the collection was given to the Southern Oregon University Laboratory of Anthropology (SOULA), who continues to use it as a teaching aid. In the interest of honoring Rock's legacy and sharing his collection with a wider audience, SOULA collaborated with the Southern Oregon University Hannon Library in the digitization of the collection within a searchable database available to the public.

Creger, Cliff (Nevada Department of Transportation) and Beth P. Smith (Nevada Department of Transportation)**[6]** *Spatial and Small-scale Geoarchaeological Analysis of a Middle Archaic Antelope Trap in Northeastern Nevada, U.S.A.*

Great Basin Antelope Traps are ideal laboratories due to their feature system level focus on one set of subsistence behaviors (antelope hunting). By combining data collected using LiDAR, GPS and GIS, our analysis in the Liza Jane Trap focused on the spatial patterning of lithic artifacts and the location of small-scale landforms.

The geoarchaeological analysis indicates relatively stable landforms modified by cultural-transforms.

Analysis to locate small-scale landforms was performed to locate remnant landforms that might bely the location of the trap wall.

The spatial analysis of the site lithics indicates that the breakage pattern and distribution of the projectile points is concentrated along specific trajectories. Both dart and arrow points are present at the site. The spatial analysis of the projectile point accumulations show trajectories that stem from one location and repetitively use the same trajectories based on the range of points, although distances covered by each technical projectile system are different.

The results of the geoarchaeology and the lithic spatial analysis indicate that the harvest zone is spatially patterned and stable even though the technology shifted from dart points to arrow points over time.

Crema, Enrico [73] see Rubio-Campillo, Xavier

Crema, Enrico (UCL -Institute of Archaeology-)

[84] *Empirical Validation and Model Selection in Archaeological Simulation*

Empirical validation is a key stage of any model development process and should provide an objective and quantitative account of the model performance. Yet, too often this stage plays a marginal role in the inferential exercise, with many discussions almost exclusively dedicated on the model building process. This paper discusses this neglected aspect of archaeological simulation, distinguishing two approaches drawn from epistemological parallels with statistical modelling. The first utilizes simulations as some sort of null templates; observed summary statistics are compared against simulation generated data, and significant deviations often becomes the basis for the development of more complex models. The second approach, which is the main focus of this paper, is centered on the theoretical framework of multi-model inference. Multiple competing models are formalized as computer simulations and compared against each other on the basis of their complexity, knowledge of the parameters, and goodness-of-fit to the observed data. The result is a probabilistic evaluation of whether one model is “better” than another, a solution that can overcome the problem of equifinality through its quantification. Examples from Neolithic and Bronze Age Europe will showcase the pros and the cons of this latter approach.

Cressler, Alan [353] see Simek, Jan

Crèvecoeur, Isabelle [190] see Mallol, Carolina

Crisp, Molly [356] see Penkman, Kirsty

Critchley, Zachary (Binghamton University)

[232] *Explorations of Public Space at the Site of Panquilma*

This work discusses and explores the results of excavations performed in the public sector of the site of Panquilma, located in the Lurin Valley on the central coast of Peru. It was a complex multicomponent community dating to the Late Intermediate Period, which has been divided into three sectors based on use. The first sector, containing three ramped pyramids, was used for ritual and administrative purposes. This work provides an examination of what is known about the uses of the public areas, as shown through the lenses of different literatures and theories of public archaeology.

Crites, Gary [373] see Baumann, Timothy

Crock, John (University of Vermont)

[43] *Levels of Public Engagement in Vermont Archaeology and Striving to Match Outreach with Outcomes*

A review of the last 15 years of the University of Vermont Consulting Archaeology Program's public outreach activities suggests that projects with experiential learning components and strong community partnerships have had the greatest impact. Efforts that combine visits by school groups to the field, excavations open to the public and field work opportunities for volunteers generate the greatest participation and public interest and yield the most positive feedback. Handbook style publications in print and online also have been well-received by both general readers and teachers tied to a standards-based curriculum. Due to common issues such as project size and accessibility, however, it is difficult to regularly replicate the grand successes and often challenging to link specific project areas and results to specific outreach efforts. It is even more difficult to measure the long-term, lasting impacts of any efforts, especially for desired outcomes such as engaging an all-inclusive public, promoting archaeological awareness and stewardship, and maintaining support for compliance-related legislation.

Crock, John [287] see Dorshow, Wetherbee

Croft, Shannon [17] see Little, Aimee

Cromartie, Amy

[12] *Shared Ritual Ideologies: Long Spouted Vessels on the Iranian Plateau in the Third and Second Millennium B.C.E.*

Interactions between Mesopotamia, Iran, and Central Asia during the third and second millennium B.C.E. are well documented with much written on this topic. I will expand on this scholarship by tracing long spouted Iranian vessels across these regions to investigate possible shared ideologies. These vessels are often associated with Iron Age context in northern Iran, but this characteristic trough spout has been present on vessels on the plateau since at least the 4th millennium B.C.E. This unique design forces the user to confront the vessel's shape making it an ideal object for transmission of cultural ideas. Depictions in cylinder seals and figural art suggest a possible ritualistic function and grave analysis suggest their inclusion in a ritual set. For this poster, I combine these data with spatial and network analysis to illustrate how these vessels may represent a shared ritual ideology that persisted across the Iranian plateau and Central Asia during the third and second millennium B.C.E.

Crombé, Philippe (Ghent University, Department of Archaeology) and Erick Robinson (Ghent University)

[40] *The Impact of the 9.3 Cooling Event on the Human Environment in the Southern North Sea Basin*

In a recent paper Robinson et al. (2013) could synchronize major changes in Mesolithic armatures and the development of the Rhine-Meuse-Scheldt Culture with the abrupt cooling event of 9.3 cal BP. It is suggested that this climatic event led to environmental stress which triggered the development of inter-regional social networks, e.g. by expanding long-distance raw material exchange and creating particular socially symbolic artifact types. Yet, the impact of the 9.3 cooling event on the landscape, in particular the vegetation, still remain poorly understood due to a lack of sedimentary deposits. Today, new evidence has become available which points to a marked increase of forest fires at the onset of this particular cooling event. In this contribution we will investigate whether there is a causal relationship between both and which impact these forest fires may have had on contemporaneous hunter-gatherers. One possible explanation is that the colder and drier conditions connected to the 9.3 event induced the burning of large stands of trees. Alternatively the increase in forest fires may reflect a response of hunter-gatherers to abrupt cooling. Controlled burning of the forest may have been applied in view of stimulating particular plant species (e.g. hazel) and/or optimizing the hunting.

Cronin, Joseph (PIARA) and Rebecca E. Bria (Vanderbilt University and PIARA)

[252] *Not Incised, but Well-Burnished: A Typology of Undecorated Early Horizon Feasting Wares from Hualcayán, Highland Ancash, Peru*

Feasting has long been recognized as one of the most widespread and significant political and ritual activities in the prehispanic Andes. In spite of this deep significance, the undecorated ceramics that undoubtedly played important roles in these ritual events are often overlooked for analysis in favor of their more elaborate, decorated counterparts. Here, we present a quantitatively constructed typology for undecorated ceramic vessels recovered from an Early Horizon ceremonial mound at the site of Hualcayán in the highlands of Ancash, Peru. Examining functional characteristics like vessel form alongside a suite of technological variables including firing, temper selection, and surface finish technique, we explore evidence for multiple production processes and consider their implications for reconstructing the social organization of feasting events in the Ancash highlands. More broadly, we examine Hualcayán's parallels with and departures from other models of feasting organization during the Early Horizon, taking into consideration the reported ceramic assemblages from contemporary sites on the north-central coast as well as those throughout the neighboring highlands.

Cross, John (Bowdoin College)

[281] *Lives as Lived in the Archaic: A Human Agency Perspective*

Archaeological fieldwork in the Northeast over the last 20 years has resulted in a significant increase in the number of known pre-Contact sites with radiocarbon-dated components; we no longer speculate on whether or not people occupied the region during the Early and Middle Archaic periods. However, the emphasis has largely been on fitting new data into an existing framework of anthropological and evolutionary generality, rather than on exploring the historical specificity of the archaeological record. In an effort to re-cast the discussion, I draw on insights from human agency to frame research questions that are appropriate for the social, spatial, and temporal scales at which people lived their lives in the past. Excavations at the multicomponent Simpson-Stewart site in Maine illustrate several promising avenues for research and also examples of the challenges and biases introduced by preservation, field methods, and in the ways in which variation in the archaeological record has been aggregated into broad-scale units of time, space, and culture. Future syntheses of the Archaic Period in the Northeast will necessarily involve a critical re-examination of the assumptions that underlie the culture history that we think we know, and a recognition of the historically-contingent nature of the archaeological record.

Cross, Michelle (Cardno)

[416] *A Freeway Through the Past: The Replacement of Doyle Drive through the Presidio of San Francisco National Historic Landmark*

The historic south access road to the iconic Golden Gate Bridge, was known as Doyle Drive. It was identified as structurally and seismically deficient in the early 2000's and construction on its replacement began in 2009 by the California Department of Transportation (Caltrans). The Doyle Drive Project was unique in that it spanned the Presidio of San Francisco, a National Historical Landmark District, and that it involved several agency landholdings and stakeholders including the Presidio Trust, National Park Service, San Francisco County Transportation Authority, Federal Highway Administration, and Caltrans. This presentation will address the archaeological and mitigative approaches undertaken for this multi-year project, unexpected archaeological finds, and review the unique history that the "freeway" crossed through. The presentation will present the results of archaeological and historical research associated with the Doyle Drive Project through 2012 and how these finds shed light on the history and development of the Presidio of San Francisco, as well as the growth and development of the City of San Francisco at large.

Crothers, George [35] see Carlson, Justin

Crothers, George (University of Kentucky), Justin N. Carlson (University of Kentucky), David Gárate (Universidad Veracruzana) and Matthew Litteral (Eastern Kentucky University)

[144] *Electromagnetic Induction Survey at Matacanela to Detect Off-Mound Structures and Landscape Features*

Approximately 2.28 ha of Matacanela were surveyed using an electromagnetic induction meter to measure near-surface variations in magnetic susceptibility and/or conductivity. Eight distinct areas were selected for survey deemed most likely to reveal Late Classic or Postclassic occupation or landscape features based on topographical features, LiDAR imagery, and surface finds. The primary areas of interest were off-mound and plaza areas containing domestic or non-elite contexts. The largest contiguous survey block, measuring 1.1 ha, encompasses two U-shaped plazas with intervening low mounds. Despite some limitations in data collection due to field crops, survey results indicate several subsurface anomalies that can be tested in the second field season or further explored with more detailed or alternate prospection techniques, including ground penetrating radar.

Croucher, Karina [299] see Wilson, Andrew

Crowell, Aron (Smithsonian Institution)

[374] *The Intensification of Indigenous Sealing in Southeast Alaska: A 19th Century Camp Complex at Yakutat Bay*

Late 19th century harbor seal hunting among the glacial ice floes at the head of Yakutat Bay attracted hundreds of Tlingit, Eyak, and Tsimshian participants who harvested thousands of seals, an annual congregation of indigenous peoples that exceeded any other in southeast Alaska. The extraordinary scale of this communal, clan-mediated enterprise by the 1870s derived in part from the abundance of seals at Yakutat and subsistence demand (especially for seal oil) but appears to have been increased by the availability of guns and a new commercial market for seal products. Extensive archaeological data from the Smithsonian Institution's NSF-funded Yakutat Seal Camps Project (2011-2014) are joined with Yakutat oral narratives, indigenous knowledge of seal ecology, archival sources, and camp photographs from the 1899 Harriman Alaska Expedition to reconstruct this post-contact trade and hunting pattern.

Crown, Patricia (University of New Mexico)

[276] *Possible Images of Theobroma cacao in the Prehispanic American Southwest*

The discovery of cacao residues in southwestern pottery raises questions about how much southwestern populations knew about Theobroma cacao. A number of possible images of cacao trees and pods suggest that some southwestern people were either familiar with the tree and the fruit that held cacao beans. Comparisons of Mesoamerican and southwestern imagery offer possible parallels in depiction of trees and fruit, and the southwestern material provides potential iconographic models that may be sought in other media.

Crown, Patricia [287] see Dorshow, Wetherbee

Crowther, Benjamin (The University of Texas at Austin) and Eric Poehler (The University of Massachusetts Amherst)

[59] *The Impact of Low-Cost, Low-Tech DIY Approaches at the Pompeii Quadriporticus Project*

Born a paperless research project, the Pompeii Quadriporticus Project (PQP) employed multiple digital approaches to archaeology in its first three field seasons (2010-2012), including 3D modeling, ground penetrating radar, and a host of iPad applications. By the PQP's final season (2013), the availability of a number of low-tech, user-accessible digital techniques tempted us to consider if these DIY approaches could produce data sets of commensurate quality to those recorded using expensive and/or complicated equipment. Therefore, in our final season, the PQP evaluated several low-cost, low-tech DIY approaches to supplement our extant collection procedures and data sets. This paper focuses on the impact of three of these approaches: 1. DIY spectrometry, 2. in-field archival documentation, and 3. DIY aerial photography. In terms of results, some techniques proved more useful than others, but the process of implementation for each - including failures - offers insight for crafting successful future DIY approaches. Therefore, this paper also considers larger issues concerning DIY approaches to archaeology through the lens of the PQP's experience. These include the role of specialists in the implementation of DIY techniques, collaboration with a variety of fields outside of archaeology, and the combination of low-tech, DIY with high-tech, specialist

approaches.

Crowther, Alison [105] see Faulkner, Patrick

Crumbley, Norma [361] see Phillips, Scott

Crumley, Carole (Dept of Archaeology and Ancient History, Uppsala University, Sweden)

[340] *Whose Ancestors, les Gaulois?*

Four decades ago this summer, newly arrived in a country where we barely spoke the language, our field crew began excavation of an Iron Age hill fort. First encounters quickly taught us that local identity was grounded in the tradition of the Iron Age Celts, not the later arriving Romans, Franks, or the region's powerful medieval dukes. My intention was to see how indigenous peoples had fared before and after the Roman conquest; I planned a colonization framework. But the site was a surprise, yielding evidence for repetitive utilization over three millennia as a sacred precinct, a place of feasting and the exercise of power, and a fortification against marauders. No familiar narrative could cover the site's complex history. We constructed a "meta-narrative" that could fit the site into a more encompassing framework. Landscape archaeology was in its infancy and did not yet include a regional perspective. Using a comprehensive understanding of archaeological "best practice," we assembled a new toolkit for interpretation. Our project was among the first to integrate ethnography, remote sensing, and regional- and continental-scale paleo-environmental and documentary evidence. Burgundy's complex and well-preserved history of settlement and environmental change taught us historical ecology.

[290] *Discussant*

Cruz, José Alberto [141] see Ulloa-Montemayor, Ximena

Cruz Alvarado, Wilberth [344] see Masson, Marilyn

Cruzado C., Elizabeth K. [252] see Casanova Vasquez, Erick

Cruzado Carranza, Elizabeth (University of Memphis)

[95] *Archaeology Not Only for Archaeologists: Examples of Integration of Archaeology and Rural Communities in Perú*

Many people in our society misunderstand the nature of archaeological fieldwork. The misunderstanding often results from a lack of open access with the public by professionals in our discipline. An aggressive shift to providing the public with information and education about archaeological research and the value of cultural heritage will address this concern.

In the highlands of Ancash, Perú, a central objective of PIARA (Proyecto de Investigación Arqueológico Regional Ancash) promotes co-created projects with members of rural communities to explore their prehistory. PIARA designs programs in which the host community discovers the value of their heritage and cultural identity, and archaeologists realize the value of the modern host community.

This poster focuses on PIARA's 2014 projects including the creation of a small museum in the Hualcayán community, an oral history project on the early history of the community, and fine arts projects that allow students to use the prehistoric material culture to link their past and present. PIARA's co-creative approach successfully meets both community needs and those of the professional archaeological community

Cruzado Carranza, Elizabeth Katherine [250] see Granley, Elisabeth

Cubley, Joel [155] see Grooms, Michael

Cucchi, Thomas [28] see Larson, Greger

Cucina, Andrea [370] see Chi, Julio

Cucina, Andrea (Universidad Autonoma de Yucatan)

[410] *Oaxaca and its Eastern Neighbors in Prehispanic Times: Population Movements from the Perspective of Dental Morphological Traits*

The dynamic interaction among human groups in Prehispanic Mesoamerica led to population exchange and migrations that have begun to be untangled from a bioarchaeological perspective. Still, little is known about the demic biological exchange between Southern Sierra Madre populations and their coeval Eastern neighbors along the isthmus and Maya corridors. The present paper focuses on dental morphology and affinities among Prehispanic settlers that inhabited the present state of Oaxaca (Mexico) during the Classic and Postclassic periods, and their relationships with coeval groups from the East. Three dental collections dated to the Classic (Monte Alban) and the Postclassic periods (Zaachila and Cerro Guacamaya) are compared with coeval collections from the Eastern territories. When the three samples are compared to Postclassic Maya ones, they cluster together, showing expected differences with the Maya coastal sites. However, when the Classic period samples are included, the collections from Oaxaca are distributed in different clusters witnessing heterogeneity within the Oaxaca region, indicating some level of morphological affinities with an isthmus sample and with Southern Lowland Maya groups, triggering broader questions regarding affinity-by-distance and population movement in Prehispanic Mesoamerica. The study has been funded by CONACyT grants CB-2010-154750 and I0010-2014-02-232831.

Cuenca-Solana, David [185] see Risetto, John

Cuevas, Mauricio (Universidad Veracruzana) and Carl Shields (Kentucky Transportation Cabinet)

[144] *Mapping Matacanela - the complementary work of topographical survey and LiDAR.*

This talk compares methods used for the topographical mapping of the archaeological site of Matacanela. Specifically, we compare the results of the GIS processing of LiDAR data collected and distributed for no charge by the Instituto Nacional de Estadística y Geografía with the results of traditional topographical mapping, undertaken using a Sokkia total station. For the purposes of project planning, the LiDAR data was processed, and maps were generated using GIS. These LiDAR-based data enabled the first topographical map of Matacanela and its environs to be generated, the project area to be defined, and for cost and time assessments to be estimated for the purposes of budget preparation. Because of the uncertainty of the quality and resolution of the LiDAR data, topographical mapping of the site area was considered an important step to “ground-truth” the LiDAR, and to collect more fine-grained measurements from small-scale architectural features, artifact concentrations, and other cultural and natural features that may have been missed during the fly-overs. Here, we consider the two approaches and the type and quality of data achieved by each, as well as the benefits and drawbacks of using either approach alone.

Cui, Jianfeng [102] see Hung, Ling-yu

Cui, Qi-Long, Juzhong Zhang (Dept. of History of Sci. & Tech. and Archaeometry, US) and Yuzhang Yang (Dept. of History of Sci. & Tech. and Archaeometry, US)

[179] *Use-wear Analysis of Ground Stone Tools from the Jiahu Site*

Jiahu is one of the most important settlement sites of the Chinese Middle Neolithic Age (ca. 7000-5500 B.C.) and is located in the upper Huai River Valley, China. During excavations, a number of ground stone tools were uncovered. Use-wear analysis and replication experiments were conducted in order to understand the functionality, usage and contact materials of these tools. Our experiments

involved stone shovels, axes, adzes, gouges and other common stone tools from Jiahu site. Experimental results indicate that shovels at the Jiahu site were the primary digging tools. Axes and adzes were used to process wood, animal bones and fur. In addition, we found that gouges were used to process wood, meat and animal furs. Based on these findings, we propose that quite a few ground stone stools at the Jiahu site were multifunctional composite tools and there is no direct corresponding relationship between the tool morphology and function.

Cullen, Sara [95] see Johansson, Lindsay

Cullen, Sara (University of Colorado Boulder)

[260] *"Where the Mountains Meet the Plains": Plains-Pueblo Connections on the Park and Chaquaqua Plateaus During the Diversification Period, A.D. 1050-1450*

The Park and Chaquaqua Plateaus—politically bisected by the Colorado-New Mexico state line—are distinctive geographical features that demarcate the transition from the Rocky Mountains to the Llano Estacado and High Plains. Regional archaeology has emphasized interpretation of sites as part of a cultural demarcator between the Northern Rio Grande Pueblos and residents of the Southern and Central Plains. Yet there has been limited work to examine local, between-household interactions and the effects of increasing trade, conflict, and movement in those regions during the Late Pre-Colombian Period. Utilizing decades of archaeological undertakings in southeastern Colorado and northeastern New Mexico, this paper will focus on Sopris, Apishapa, and Cimarron sites of the Diversification Period (A.D. 1050-1450) and their material record as a case study for questions surrounding the concept of a "cultural frontier."

Culley, Elisabeth (Arizona State University)

[377] *Operationalizing Semiotic Theory as an Archaeological Research Method: A Levantine Case Study*

Archaeology has long flirted with Peircean semiotics as an heuristic for interpreting prehistoric behaviors and the cognitive processes that support them. Yet beyond the widespread adoption of Peircean terminology (icon, index, symbol), the discipline has been unable to operationalize the approach as a viable research method. This paper introduces Peircean Semiotics as a means of re-classifying non-utilitarian artifacts in terms of their target audiences and concomitant social consequences. Preliminary results from an analysis of Levantine deposits dating from 200ky to the Pleistocene/Holocene boundary reveal different symboling behaviors across the region and with implications for the evolution of 'modern' human cognition. As a case study, this research highlights the potential for identifying the shared cognitive substrate and social implications of seemingly diverse artifact types and for articulating multiple theoretical perspectives for more holistic analyses in a range of research contexts.

Cunnar, Geoffrey (WCRM)

[179] *Interpretation of Burial M33 at the Longshan Site of Liangchengzhen*

A relatively rich burial, M33, was excavated in 2000 at the late prehistoric, Longshan period center of Liangchengzhen by a collaborative team from Shandong University, The Field Museum, and Yale University. The most unusual grave good was a turquoise artifact located on the left arm of the interred. This presentation provides a description of contextual, use-wear, comparative and replication analyses in order to better understand the nature of the turquoise artifact and the burial ritual for the deceased.

[179] *Chair*

Cunningham, Jerimy [153] see McGeough, Kevin

Cunningham, Jerimy (The University of Lethbridge)

[245] *Power before Paquimé? Hypotheses on Political Economies in Casas Grandes.*

In this paper, I outline alternative hypotheses on the nature of the late-Viejo and early-Medio Period

political economies in the Casas Grandes Regional System from what is now Chihuahua, Mexico. Recent research has described in impressive detail the productive base and the ideology that may have emerged at Paquimé during its late-Medio Period (A.D. 1350-1450) florescence. However, little is known about power in the Casas Grandes region either prior to Paquimé's brief 14th Century expansion into a primate center or outside of its immediate hinterland. Drawing on recent research from the Santa Clara Valley, I offer some alternative hypotheses for the political economies of the late-Viejo and early-Medio Periods. I emphasize the role that ritual performance may have had in local modes of production and consider its implications for the emergence of inequality in the Casas Grandes Regional System.

Cunningham-Bryant, Alicia (Temple University)

[240] *Living on the Edge: Syncretism, Acculturation, and the Meroitic Kingdom*

Although Greco-Roman Egypt has received more scholarly attention, the contemporaneous Meroitic civilization of Nubia deserves recognition as an important culture in the history of North Africa and the Eastern Mediterranean world. Examination of the archaeological evidence from the Meroitic civilization of Sudan (ca. 400 B.C.E. to ca. 400 C.E.) presents the opportunity to further current understandings of evolving cultural interaction on the fringes of several distinct world powers (namely Egypt, the Hellenistic World, and Rome).

While previous discussions of Meroitic funerary religion have attempted to address the nature of Meroitic cultural and religious integration, the small data sets, geographic specificity, and narrow scope of the attempts has meant that the entirety of Meroitic funerary religion as currently understood, is in essence based on limited archaeological evidence. This has led to skewed and incomplete presentation of the culture as a monolithic unit. Through the inclusion and analysis of significantly more archaeological evidence, taking the form of Meroitic offering tables, a more nuanced and dynamic view of the Meroitic kingdom emerged, one which demonstrates a diversity of cultural processes due to varying levels of interaction and exchange, and which presents an entirely new view of the structure of the Meroitic kingdom.

Cunningham-Smith, Petra (University of Florida) and Elizabeth Graham (Institute of Archaeology, University College London)

[248] *Invertebrate Zooarchaeology of Marco Gonzalez, Belize as One Aspect of an Investigation of Trade and Environment*

The zooarchaeological remains associated with ancient coastal communities are an important source of information on how past societies used their natural resources. They reflect people's interaction with their environment and can yield information on how these interactions affected culture, economy and—not least—the ecology of such areas. The research presented here is an analysis of large invertebrate remains, primarily conch but also other large mollusks found at the ancient Maya site of Marco Gonzalez on the island of Ambergris Caye, Belize. Large invertebrates have been hypothesized as an important commodity, traded to inland Maya sites as complete shells, as raw material “blanks,” and as finished artifacts. Shell artifacts are ubiquitous in elite and ritual deposits at inland sites, although the distances from these sites to the coast is often great. This study explores the possible uses of large invertebrates as construction material, food, and raw material for artifact production and trade, and considers the impact of mollusk exploitation on the local environment.

Curbelo-Canabal, Francez [313] see Martinez-Cruzado, Juan

Curet, L. (National Museum of the American Indian, Smithsonian Institution)

[387] *Exchange and Interaction in the Caribbean: The View from Two Collections of the Smithsonian*

Recent research in the Caribbean has produced strong evidence of long distance interaction throughout the Circum-Caribbean region, including possible direct exchange between Central America and the Greater Antilles across the Caribbean Sea. A recent casual survey of the Caribbean

collections in the Smithsonian's National Museum of the American Indian and the National Museum of Natural History has identified two objects that may add information on this topic. The first one is a three-pointer found near the Lake Valencia region of Venezuela and the second a "condor" amulet from the early Ceramic Age found in Trinidad. This paper discusses the artifacts, the collection information, background on the collectors, and how these objects fit within the models suggested for long-distance interactions in the Caribbean.

Curran, Robert [362] see Stirn, Matthew

Curry, Ben [90] see Laluk, Nicholas

Curtis, Jason [130] see Lohse, Jon

Curtis, Caitlin (University at Buffalo) and Peter Biehl (University at Buffalo)

[218] *Çatalhöyük and Localized Universality: The Challenge of Sustaining Heritage Post-UNESCO*

UNESCO has long set the example for heritage practice, with site practitioners worldwide motivated to achieve the nearly universally desired World Heritage Site (WHS) status to help preserve and sustain their sites. However, the idealized goals espoused by UNESCO, a global organization, are inherently universalizing, which can render them incompatible with the particularities of each local setting. One illustrative example is Çatalhöyük, Turkey. Since being granted UNESCO WHS status in 2012, more constrictive government regulations have been enacted, in what seems to be a proactive measure by local bureaucracy to ensure it maintains WHS status. Though sustainability has become a priority in UNESCO policy recently, these increasingly strict local regulations have actively hindered archaeologists from trying to institute sustainability measures locally--such as making changes on the site that would benefit the nearby community--as every modification to the site is now being strictly monitored. It is important, therefore, to consider this cautionary tale of the inherent dichotomy between global UNESCO and each unique local situation. Despite how it is widely conceived, UNESCO designation is not always the ideal answer for sustainable preservation.

Cuthrell, Rob (UC Berkeley)

[41] *Archaeobotanical Evidence and Diachronic Changes in Foodways of Indigenous Groups in the Central Coast and San Francisco Bay Regions, California*

The Central Coast and San Francisco Bay regions of California are areas of high climatic, ecological, and indigenous cultural heterogeneity. During the last two decades, archaeobotanical research in these regions has begun to document the contributions of botanical resources in indigenous foodways systems through time. In the San Francisco Bay Area, a large number of anthropogenic shell mounds were population aggregation sites used for thousands of years, and, for the period after ca. 1050 CE, archaeological evidence indicates increased sedentism and sociopolitical complexity among Bay Area groups. Elsewhere on the Central Coast, these attributes are not as apparent. By the onset of Spanish colonization in the late 18th century, indigenous peoples in both of these regions employed fire-based landscape management practices that transformed vegetation structure over large areas. This paper presents an overview of the current state of archaeobotanical research in the two regions, describes how archaeobotanical data contributes to research on changing foodways and sociopolitical systems, and considers how archaeobotanical data may make greater contributions to these topics through future research.

Cuthrell, Rob [268] see DeAntoni, GeorgeAnn

Cutrone, Daniel (California State University Los Angeles)

[355] *The Montezuma Canyon Citadel Complex: A Major Prehistoric Religious Shrine*

Spirit Bird Cave created a new model to evaluate Southwestern caves and earth openings in relation to prehistoric Native American beliefs about religion and sacred landscape. This model suggests that such concepts were major considerations in the choosing of settlement locations and foremost in the

ideology of the prehistoric peoples. Site 42SA2120 in Montezuma Canyon, which fits this new paradigm, has not been formally described to this point. A survey of the site found evidence that the site was a place of prime importance and perhaps served as a major religious location for the surrounding area through at least the Pueblo II period. A rock art panel associated with the complex documents an origin extending back to at least the Basketmaker III Period. It was given the name "Montezuma Canyon Citadel" during the 2013 Pecos Conference.

Cutts, Russell (University of Georgia) and Sarah Hlubik (Rutgers University)

[174] *Thermal Curve Fracture (TCF) as a Diagnostic Tool for the Identification of Anthropogenic Fire*

Recognizing fire evidence in the record can be challenging and contentious. Aside from baked earth features – hearths, daub, etc. – a widely reported associated artifact is fire-cracked rock (FCR). Unlike flaked stone assemblages, FCR lacks a standardized description, criteria, test or model; archaeologists often learn identification 'in the field.' Recent actualistic studies have demonstrated that a previously undescribed type of FCR has likely been unknowingly lumped with other 'angular fragments'—another widely reported, but not usually fire associated, artifact class. Termed thermal-curve fracture (TCF), these pieces tend to be proportionally uniform in thickness and width with a curve angle between 173° and 176°. This report details experiments testing three hypotheses: that thermal curve fractures are 1) a distinct angular fragment type, describable and clearly associated with fire; 2) produced in fires that are anthropogenic, as suggested by temperature and duration; and 3) produced primarily when knapped materials are exposed to fire. A cursory survey of 1.5 Ma collections from FxJ20, Koobi Fora, Kenya, revealed a number of potential TCF classed as 'angular fragments', suggesting the possibility that fire evidence is present on ESA sites.

Cyr, Howard [120] see Hacker, Stephanie

Cyr, Howard (University of Tennessee), Scott Meeks (Tennessee Valley Archaeological Research), Rocco de Gregory (Tennessee Valley Archaeological Research) and Hunter Johnson (Tennessee Valley Archaeological Research)

[173] *Location, Location, Location: Multi-scalar Investigations into the Unexpected Timing and Length of Occupation of a Late Woodland and Early Mississippian Site in the Lower Mississippi Valley*

Site 22HO626 is a multicomponent site located along an abandoned meander loop of the Yazoo River, Holmes County, Mississippi. Due to the presence of surface collected exotic lithic materials and a close proximity to the Poverty Point center of Jaketown, 22HO626 was expected to represent a Late Archaic settlement within the lower Mississippi Valley. However, work by the University of Tennessee's Archaeological Research Laboratory and Tennessee Valley Archaeological Research indicates a more recent period of occupation for this riverside location, beginning during the Late Woodland period and continuing only into the Early Mississippian. This multidisciplinary study, which incorporates site-level artifact, feature, and stratigraphic analyses with a landscape-scale remote sensing investigation, provides an explanation for the unexpectedly late period of occupation and for its relatively short duration. This case study illustrates the importance of multi-scalar approaches in examinations of cultural resources and settlement strategies within dynamic environments such as those found within the complex fluvial landscape of the Mississippi Alluvial Plain.

Czaplicki, Jon [90] see Slaughter, Mark

Czerniak, Lech

[211] *Is Length Significant? LBK Longhouses and Their Social Context in Central-Eastern Europe*

In studies of LBK societies, one of the categories of feature which are potentially indicative of differences in social status are longhouses that are notable for their substantial length (e.g. over 33 m). The author examines this issue based on examples of LBK longhouses in Poland. Rescue excavations carried out during the past decade along the routes of planned motorways have led to the discovery of over 100 new longhouses together with their broader settlement contexts. This has

provided a fresh insight into the social significance of very long longhouses based on analysis of their construction details and interior layout, evidence of extensions and repairs, the composition and distribution of refuse, as well as spatial relationships with other houses and changes over time. The author believes that the longest of longhouses was not the seat of an individual of exceptional status, but rather home to the most numerous (and most important?) household.

Daehnke, Jon (University of California, Santa Cruz)

[146] *Turning Privilege into "Common-Sense": Truth-Claims and Control of Cultural Heritage*

Over the course of the last few decades Indigenous and descendant communities have increasingly made calls for control of their own heritage, both in terms of material objects and historical narratives. While these efforts have resulted in at least some measure of success, these communities continue to occasionally face challenges from researchers, scholars, and other agents who are in positions of power that allow them to control and define what heritage consist of. In my paper I interrogate the ways that those in positions of power use language and other mechanisms to normalize and universalize what are actually very culturally dependent views on the ownership, forms, and purposes of heritage. In effect, their position of privilege gets transformed into "common sense," and culturally contingent truth claims become reasonable and shared, while the views of others are denigrated as outside of the norm, irrational, and therefore subject to skepticism. I explore this topic by looking at ongoing debates over the issue of cultural continuity, especially as it applies to repatriations, as well as recent calls for the celebration of a "shared" heritage.

Daggett, Adrienne (Michigan State University)

[140] *Chair*

Dahlstedt, Allisen (Arizona State University)

[203] *Infectious Diseases within the Tiwanaku Periphery*

Today, infectious diseases, such as tuberculosis, devastate millions of lives annually. The prehistoric prevalence and distribution of such infectious diseases provide context for their modern (re-)emergence, spread, and associated social perceptions, as well as inform the experiences of individuals in the past. Here I examine the expression and distribution of pathological lesions on the skeletal remains of 143 individuals from Omo M10, a Tiwanaku migrant community in Moquegua, Peru. The Middle Horizon (500-1000A.D.) was a time of population growth and early state expansion in the south-central Andes. During this period, individuals moved between the Tiwanaku capital in Bolivia and peripheral sites in southern Peru, likely to gain access to fertile agricultural land. Infectious diseases often appear and spread with such population growth and increased human interaction, among other environmental and behavioral factors. Differential diagnoses reveal several probable cases of infectious diseases, including human treponematoses and tuberculosis. The presence of Pott's disease supports the relatively early presence of tuberculosis in southern Peru. These results encourage future research examining social perceptions of these illnesses expressed in mortuary contexts. The integration of future isotopic analyses can additionally inform the potential spread of these diseases through the residential mobility of infected individuals.

Dai, Xiangming

[283] *Backgrounds of Emergence of the Early States in Central and Northern China*

Traditionally Erlitou was considered the capital city of the first kingdom—the Xia dynasty, in Chinese history. However, an increasing amount of archaeological data in the past decades has suggested that Taosi was the first state-level society earlier than Erlitou emerging in central China. With the amazing discoveries of the Shimao walled site in north Shaanxi province in the past several years, I offered that Shimao was another early state appearing in northern China, which was approximately simultaneous with late Taosi and early Erlitou. In this paper I will demonstrate some common circumstances of the emergence of these three early states, including the similar economic activities, control and monopoly of prestige goods by elite, competition and warfare among different regional social groups, and so on. I will also attempt to demonstrate some differences for the causal

factors resulting in the rise of the three states, and further discuss the similar and different dynamics of the formation of these early states.

Dal Martello, Rita (Peking University, School of Archaeology and Museology)

[37] *Rethinking Burial Practice in Qijia Culture*

Mortuary data is one of the few now available tools we have to understand Chinese late neolithic culture of Qijia. With the exception of Lajia site, the most famous and best investigated sites are cemeteries, scattered throughout the regions of Gansu, Qinghai and Ningxia in Northwest China. The data they revealed has been a long time source for Chinese archaeologists in the attempt of reconstructing the social organization of the time, often putting too much emphasis on only certain type of burial (e.g., the so-called "suttee" burials) and neglecting the wide range of possibilities present within the same cemetery. New insight on this data can help us review the theories and assumptions made in the past. In this paper I attempt to evaluate the rate and pattern of change over time of some aspects of mortuary practice, such as presence and quantity of prestigious and ritual goods, tomb architecture, arrangement of burials within one cemetery and so on. Although a secure chronology has yet to be established for Qijia Culture, its significance on the overall context of pre-imperial China is increasingly recognized by scholars, and therefore its studying is of primary importance to get a better understanding of the time.

Dalan, Rinita [220] see Greenlee, Diana

Dalan, Rinita (Minnesota State Univ-Moorhead)

[284] *Development of Magnetic Susceptibility Instrumentation and Applications*

A 1997 NCPTT grant to develop a prototype down-hole magnetic susceptibility instrument arose out of frustration with existing technology and a desire to expand archaeological field studies of magnetic susceptibility. This instrument allowed high-resolution vertical investigations of susceptibility within a small diameter (ca. 2.5 cm) hole made with a push-tube corer. An NSF grant supported improvement of the prototype via robust laboratory and field testing, resulting in a final engineered product (the MS2H) in partnership with Bartington Instruments, and also established an archaeological soil magnetic laboratory to improve research and training. A second NSF grant extended equipment and software, allowing increased integration of field and laboratory geophysical studies. Two additional NCPTT grants addressed the last crucial step in the advancement of down-hole susceptibility technology, namely application within archaeological practice. The first advanced the instrument's use in the detection of buried archaeological sites, and the second focused on the identification of unmarked graves. Due to its broad applicability, use of magnetic susceptibility technology has steadily grown. Integrating down-hole and laboratory techniques with surface geophysical surveys has produced a more mature magnetic susceptibility method that is much more widely employed than it was in 1997.

Dale, Emily (University of Nevada-Reno)

[128] *Give Me a Y-Beam: Architecture and Agency at Rural Chinese Woodchopping Camps, Mineral County, Nevada*

For the turn-of-the-century rural Chinese woodchoppers of Mineral County, Nevada, the construction of cabins, dugouts, corrals, and fences served myriad functions. Yet, architecture, even in its simplest forms, consistently goes beyond the functional. The orientation of and relationships between structures, material preferences, and diverse construction techniques demonstrate the choices made by the Chinese as they strove to make a living supplying firewood to nearby mining boomtowns. This paper will discuss the ways the Chinese adapted their construction methods to the rural environment, their various needs, and lack of traditional architectural materials and how the architecture informs on the builders' ethnicity, masculinity, and sense of community.

[128] *Chair*

DAlpoim Guedes, Jade (Washington State University)

[283] *Modeling a Rapid Transition in Subsistence Regimes in Highland Western China*

The highlands of western Sichuan (or Eastern Tibet) experienced a profound change in both settlement patterns and in subsistence regimes when a shift from a millet-based agriculture to wheat and barley based agro-pastoralism took place c. 2000 cal. B.C. Using a model that predicts the changing possible distribution of crops across the area, we examine the role that changes in ancient climate could have played in the reversal of subsistence practices in this area.

Dalpra, Cody, Linda Scott Cummings (PaleoResearch Institute), R. A Varney (PaleoResearch Institute), Peter Kovácik (PaleoResearch Institute) and Jennifer Milligan (PaleoResearch Institute)

[309] *Micro Analyses of 17th Century Adobe Bricks from the "New" Church at Pecos, New Mexico*

The clash of Pueblo farmers and Spanish missionaries in central New Mexico marks the transition from prehistoric maize farming to the modern era along the Rio Grande River. The interaction between Native Americans and Spanish was not totally either peaceful or confrontational. The first church, built in the 1620s, was later burned during the Pueblo Revolt when Spanish were forced to leave, then rebuilt when relations improved. Four bricks from the new church (Mission de Nuestra Senora de los Angeles) were examined for microscopic, chemical, elemental, and structural information. Combining pollen, phytoliths, starch, macrofloral remains, charcoal, XRF and XRD signatures with petrographic analysis yields a record of both native (maize) and introduced (Old World cereal) crops. Sporormiella dung fungal spores indicate presence of grazing draft animals and possibly use of dung making adobe. Evidence for treating stems used to make the adobe was sought in the phytolith record and thin sections. Quantities of charcoal varied between the lower bricks (more charcoal) and the upper bricks. This study examines evidence for porosity, mineral composition, and other factors that affect structure, as well as economic and behavioral evidence of life at Pecos, New Mexico during this period of alternating strife and peace.

Dalton, Jordan and Colin Quinn (University of Michigan)

[54] *Agropastoralism in Bronze Age Transylvania: An Analysis of Faunal Assemblages from the Geoagiu and Mureş Valleys*

The Bronze Age was a period of dynamic social transformations in Transylvania. Unfortunately, there have been no systematic archaeological studies of the subsistence economy that funded, and was affected by, the social transformations of emergent inequality. In this poster, I present the first analysis of faunal assemblages from Bronze Age contexts in Transylvania. The faunal assemblages, collected during the 2012-2014 surveys of the Geoagiu and Mureş Valleys, provide the first opportunity to understand the diet and ecology of the communities living in southwest Transylvania. By monitoring similarities and differences in the use of animals across space and through time, and situating these practices within the broader regional context of the Carpathians, it is possible to shed new light onto the role of agropastoral economies in the dynamic social transformations of the Transylvanian Bronze Age.

Dalton-Carriger, Jessica and Elliot Blair (University of California, Berkeley)

[140] *Answering Chronological and Regional Interaction Questions via pXRF and LA-ICP-MS Analyses in the Interior Southeast*

Native American inhabitants in the interior Southeast did not experience direct and prolonged European contact until the late 1600s, however European trade goods still managed to filter their way into the area. While trade goods are present, site chronology has not been clearly defined in many areas. Both pXRF and LA-ICP-MS testing on glass trade beads from East Tennessee and surrounding states has revealed trends in their chemical composition which can be correlated to date ranges. This method of analysis allows us to answer questions about Native American habitation in East Tennessee and regional interaction with Europeans in the interior.

Daly, Niamh (University College Cork)

[332] *Till Death Do Us Part: A Bioarchaeological Investigation of Female Kinship Ties in Early Medieval Ireland*

The introduction of Christianity in the 5th century A.D. had far reaching effects in Ireland. The first few centuries of the early medieval period (c. 400-1200 A.D.) is considered a time of dramatic cultural transformation. The documentary record that emerged in the wake of this process was created by male clergy in a rural, hierarchical, patrilineal society where the position of women was complex. This research uses archaeologically-recovered human remains from the immediate post-conversion period to assess the changing culture of female kinship ties and post-marital residence patterns. An essential strategy for this research is the application of biogeochemical techniques, namely stable isotopic analysis, to assess if the chemical analysis of the human skeletal remains negates or validates historically-derived narratives regarding female kinship ties. The results of this research increase the visibility of the lives of the female cohort in early historic Irish society.

Damick, Alison (Columbia University) and Severin Fowles (Barnard College)

[342] *Ground Stone Landscapes of the Ancestral Pueblo World*

The lives of precolumbian communities in New Mexico were anchored and shaped by stone features in the landscape. Stones were pecked, ground, and piled into cairns or circles; ethnographic evidence from descendant communities suggest certain stones received offerings of corn pollen, antlers, or prayer sticks; in other cases, parts of stones were removed as potent medicine, either as stone powder or flakes; elsewhere, it was the abrasive contact between fixed bedrock and tools that appears to have been significant. To call such features “shrines” is to focus on how they were bound up in indigenous understandings of the points of access to worldly powers. Here, we examine the logics of ground stone shrines (slicks and cupules) associated with ancestral Pueblo sites of the northern Rio Grande, paying special attention to their mode of construction, spatial distribution, and relationship to natural features of the landscape.

Damitio, William [168] see Campbell, Sarah

Damour, Melanie (Bureau of Ocean Energy Management), Robert Church (C&C Technologies, Inc.) and Daniel Warren (C&C Technologies, Inc.)

[4] *Using 3D Laser and 3D Sonar as Tools for Mapping, Analyzing Site Formation Processes, and Long Term Monitoring of Shipwrecks*

3D imaging creates a permanent digital record that allows scientists to study minute site details and also serves an important outreach role by allowing the public to virtually explore archaeological resources. While 3D imaging of archaeological sites using laser and lidar is a growing trend in terrestrial archaeology, its application in marine archaeology has only recently emerged. Marine archaeologists are now beginning to use 3D laser- and sonar-derived models as new tools for interpreting shipwreck sites and analyzing site formation processes in the marine environment. Using the sub-centimeter accurate 3D laser/sonar data collected repeatedly at the same site over time in conjunction with traditional diver collected or remotely sensed data, archaeologists can better quantitatively analyze the changes occurring on a site. Collectively, these datasets can provide important information to archaeologists and submerged cultural resource managers about site stability versus continual degradation as well as changes in sediment deposition. As an example, discussions of the results of a Bureau of Ocean Energy Management-funded study employing 3D imaging of deepwater shipwrecks in the Gulf of Mexico to study anthropogenic impacts will demonstrate how this technology can assist with long term monitoring efforts.

Damour-Horrell, Melanie [170] see Hanselmann, Frederick

Daniel, Salazar [242] see Barrientos, Isaac

Daniels, Megan (Stanford University)

[20] *The Queen of Heaven in Iron Age Greece: Analyzing Religious Ideology and Symbolism on Multiple Scales*

In this paper, I approach religion and ideology in the archaeological record through an analysis of iconographic symbols, one that centers on the dialectic between longstanding meanings of symbols

as they are transmitted across space and time and the local social, political, and intellectual contexts in which they appear. I situate my analysis within recent models from cultural evolutionary psychology, which see religion, along with its attendant rituals and symbolisms, as an adaptive mechanism for human groups that both reflects and enables growing social complexity in human societies. My paper will move forward on two levels: I will first analyze the meanings behind the broadly shared mythical, literary, and iconographic motif of the Queen of Heaven as she was transmitted between the Near Eastern and Mediterranean worlds across the Bronze and Iron Ages, particularly in terms of her socio-political connotations. I will then consider the appearance of her symbolism within several sites on mainland Greece in the Iron Age. In particular, I will interpret the meanings behind these symbols against the longstanding tradition of the Queen of Heaven as a deity connected to divine kingship as well as the novel socio-political and intellectual contexts developing in the Iron Age.

Daniels, James (University of California, San Diego and ASM Affiliates, Inc.) and Paul Goldstein (University of California, San Diego)

[184] *Establishing Chemical Signatures for Cabuza Style Pottery and the Tiwanaku Tradition Using Portable X-Ray Fluorescence (pXRF)*

Portable X-ray Fluorescence (pXRF) was used to analyze the chemical composition of 60 Tiwanaku and derived style ceramic sherds from different locations in the south central Andes. The results indicate that there are four distinct geochemical groups and that the local Cabuza style pottery from survey collections in the Azapa Valley in Chile has a distinct chemical composition from all other Tiwanaku tradition ceramics. The results also indicate that pXRF is a viable technique for distinguishing between local and imported ceramics and, when considered in tandem with contextual and stylistic data, can provide important information on Tiwanaku ceramic sourcing, technology and exchange.

Daniels, Jimmy [246] see Colón, Justin

Daniels, Brian (University of Pennsylvania)

[254] *Community Archaeology and Emergency Responses to Heritage in Crisis*

How are we to respond to the current intentional destruction of heritage occurring in Syria and Iraq? The international regime of heritage protection rests upon the consensus of actors within the modern system of nation-states. But in the present crisis, one actor, the Islamic State of Iraq and the Levant, rejects that system. Furthermore, in the case of Syria, UNESCO and other international preservation organizations find themselves locked into a structural situation where they are obliged to interact with the Assad government, which has been responsible for so much of the damage to historic sites. What alternatives might exist? Using the work of the Safeguarding the Heritage of Syria and Iraq Project as an example, this paper articulates an alternative model of intervention. While there may yet be hope under customary international law to address ultimate criminal culpability, in terms of practical interventions, focusing efforts on community activists and other heritage professionals outside of formal government structures may prove to be one of the few viable strategies available for effective emergency actions in ethnonationalist and sectarian conflict.

[254] *Chair*

Danis, Ann (Barnard College)

[330] *Moderator*

[117] *Discussant*

Daradich, Amy [313] see Peros, Matthew

Darby, Melissa

[153] *Zelia Nuttall and the Vexed Question: Between the Devil and the Deep Blue Sea*

It's been almost two score and four hundred years since Francis Drake and his company in two ships, the Golden Hinde and a small ship only known as Tello's Bark, landed somewhere on the west coast of American. This interlude was during what became known as 'The Famous Voyage' (1577-1580). Seventy to eighty men-- and a pregnant black woman named Maria—disembarked, built a rough fort, and remained for five or six weeks. The geographical location of this landing has been the subject of much archaeological investigation and debate in California, but no evidence of the landing has ever been found. In 1908 Archaeologist Zelia Nuttall found a trove of contemporary documents relating to the voyage. The Hakluyt Society published her 'New Light on Drake' in 1914 to great acclaim. She promised a subsequent publication addressing the location of the landing, which she theorized was on the Northwest Coast. Editors rejected that manuscript: to take Drake out of California would be like uprooting the redwoods. I discuss the evidence that lead her to the Northwest Coast, and I will introduce ethnographic, cartographic and new linguistic information that support her theory.

Darby, Connie [304] see Lindeman, Michael

Darling, J Andrew (Southwest Heritage Research, LLC) and Barnaby V Lewis (THPO, Gila River Indian Community)

[225] *Place, Place Name and Property in the Identification of O'odham and Pee Posh TCPs*

Ethnogeography considers the ways in which human beings invest places, spaces, or points on the land with names and information that render them culturally meaningful. Many places in a culture's ethnogeography are also Traditional Cultural Properties or TCPs. TCPs are eligible for the National Register of Historic Places and by definition are significant to the perpetuation of traditional worldview and living indigenous cultures. This presentation reports on recent advances in O'odham and Pee Posh TCP investigation and documentation. O'odham and Pee Posh ethnogeography and place names are examined in relation to archaeological data and site location in order to underscore the importance of indigenous systems of geographic knowledge for recognizing TCPs. It also explores the inherent difficulties encountered in the translation of traditional, multi-dimensional concepts of place into western concepts of property based largely on two-dimensional locational systems for mapping and visualization.

Darling, J. Andrew [409] see Eiselt, B. Sunday

Darwent, Christyann [28] see Brown, Sarah

Darwent, Christyann (University of California, Davis)

[302] *Chair*

Darwent, John (University of California, Davis)

[302] *Chair*

Daryl, Fedje [192] see Mackie, Quentin

Daughtrey, Cannon (University of Arizona (BARA)), Jesse Ballenger (Statistical Research, Inc.), Matthew Pailles (University of Arizona) and Francois Lanoe (University of Arizona)

[92] *A Place to Pause: Investigations at the St. Mary Bridge Site (24GL203), Glacier County, Montana*

Two field seasons of archaeological excavations along the banks of the St. Mary River in Glacier National Park, Montana have resulted in the recovery of artifacts ranging in age from late Paleoindian to historic times. In partnership with the National Park Service, archaeologists from the University of Arizona and tribal students, preliminarily interpret this site as an area for temporary winter encampments as well as a staging area for residentially mobile groups in the past. Staging areas are transitional places on the landscape where people evaluate the resource potential of their

surrounding environment as they move, leaving behind a variety of tools and materials. The significance of staging area sites across a vast and altitudinally rugged landscape is evidenced in the consistent return of groups to these areas, even into the ethnographic present. A continuous record of archaeological activity is now documented at the St. Mary Bridge Site. What remains to be explicated is the nature of activities at the site specifically. Drawing from our analyses of artifacts, namely a number of projectile points, and site formation processes, we build a site chronology and document those behaviors associated with the transient populations that occupied the St. Mary Bridge Site.

Davenport, Bryce (Brandeis University), Douglas Comer (Cultural Site Research and Management), Will Megarry (Cultural Site Research and Management, Johns Hopki), Alexandru Popa (National Museum of the Eastern Carpathians) and Sergiu Musteata (Ion Creanga State University)

[199] *Terrain Modeling at Orheiul Vechi, Moldova*

The Moldovan site of Orheiul Vechi has been continuously occupied since the Late Paleolithic due in part to its commanding position over the local landscape and its strategic situation on the nexus of Eurasian cultural flows and population movements. From the Iron Age onward, the inhabitants of Orheiul Vechi took advantage of natural fortifications, tributary access to the Dniester River, and nearby chernozem soils to consolidate a long-term power base. Using data from ongoing archaeological studies and newly acquired Lidar and geophysical datasets, we present terrain models of the features that contributed to the diachronic significance of Orheiul Vechi in the local and regional landscape.

Davenport, Bryce [199] see Megarry, Will

David, Robert (University of California, Berkeley)

[30] *The Landscape of Klamath Basin Rock Art*

For the past three decades, efforts to interpret Klamath Basin rock art symbols using ethnographic literature and concepts of sacred landscapes have advanced our understanding of the art. This approach, however, is limited by the assumption that the rock art symbols meant the same thing in every social and land use context. From my research of the past decade I have inferred that rock art designs are not distributed randomly across the landscape. Instead, rock art displays appear to vary predicatively across three archaeologically-defined contexts that I have identified as settlement sites, frequently used areas and special use areas. In the research presented here, I use this apparent pattern to propose a context model for the rock art of the Klamath Basin and suggest that Klamath Basin shamans situated their varied repertoire of sacred symbols within these distinctive contexts in order to structure the way people encountered and experienced them. Understanding how rock art is patterned on the landscape has led to refined interpretations in an area where relatively little rock art research has been done.

Davies, Benjamin (The University of Auckland)

[84] *Simulating Late Holocene Landscape Use and the Distribution of Stone Artifacts in Arid Western New South Wales, Australia*

The archaeological landscapes of arid environments often feature surface scatters of stone artifacts, which are used to infer past human activity and organization. For hunter-gatherer groups this typically involves some interpretation of mobility; however, the scales of activity inferred from these assemblages usually extend beyond the boundaries of study areas. Understanding what these assemblages mean in terms of human mobility requires assessment of how samples fit within a wider landscape distribution. This study uses computer simulation to evaluate interpretations of mobility and place use from the ratio of cortical to non-cortical stone in surface assemblages from arid western New South Wales, Australia. First, the cortex ratio concept is investigated using an agent-based model coupled with an experimental dataset. These initial model outcomes are found to be consistent with expectations from the distribution of cortex, and the influence of core reduction intensity and selection intensity on assemblage variation is demonstrated. Second, a measure called

the cumulative cortex ratio is proposed for evaluating the dispersal of cortex over a continuous surface. Finally, the differential distribution of cortex within the Rutherford's Creek study area is assessed by simulating different scenarios of place use and computing the cumulative cortex ratio on simulated data.

Davis, Stephen (University College Dublin), Knut Rassman (RGK, Frankfurt), Hans-Ullrich Voss (RGK Frankfurt), Chris Carey (University of Brighton) and Christine Markussen

[47] *Landscape-Scale Survey at the Brú na Bóinne World Heritage Site, Ireland*

The Brú na Bóinne World Heritage Site in Ireland is one of Europe's most significant Neolithic landscapes, and has been the focus of significant effort as regards remote sensing for the last 20 years. Until recently this focused on relatively low-resolution lidar survey and small-scale geophysical prospection, often 'monument-centric' in approach. In 2014 much higher resolution lidar data were obtained for part of the WHS alongside the first landscape-scale geomagnetic surveys within the area, covering in excess of 60 hectares. These surveys have redefined our understanding of the landscape of Brú na Bóinne, and have led to the identification of a number of new monuments within the wider Boyne complex. This presentation firstly outlines these new discoveries and their place within the archaeology of Brú na Bóinne, and secondly discusses their significance more broadly within the context of Neolithic Ireland and Great Britain.

[47] *Chair*

Davis, David (Central Washington University), Patrick Lewis (Central Washington University) and Patrick McCutcheon (Central Washington University)

[92] *The Effects of Sampling by Size Class on the Organization of Technology at the Sunrise Ridge Borrow Pit Site (45PI408), Mt. Rainier National Park, Washington*

Prior lithic paradigmatic classification at the Sunrise Ridge Borrow Pit site (45PI408) has shown significant intra-site variation in chipped-stone technology and function. Recent fieldwork recovered an additional sample of artifacts bringing the total chipped stone assemblage to a sample size of $n = 13036$. Size grading, or mass analysis, was done for all lithic artifacts before cataloging. Recent attribute analysis of all lithic artifacts > 0.635 cm mesh size ($n = 3681$) demonstrates that significant technological variation is present, but the results of an analysis of lithic artifacts < 0.635 cm mesh size ($n = 3543$) reveals meaningful frequency changes across multiple dimensions suggesting that some of the intra-site variation resides in the < 0.635 cm mesh size lithics. Dimensions affected significantly, both diachronically and synchronically, include fragment type, cortex, wear, raw material type, platform type, thermal alteration, and reduction class. Analysis of the < 0.635 cm mesh size lithics revealed a 13 percent increase in obsidian raw material type and a 14 percent increase in the pressure flake platform type. Although the sampling of lithic assemblages by size class is performed for a variety of reasons, the significance should be carefully assessed before interpretations of the organization of technology.

Davis, Kaitlyn [95] see Johansson, Lindsay

Davis, Richard (Bryn Mawr College)

[112] *Aleutian Microtechnology in Anangula Times (9000 - 4000 BP)*

Since its discovery more than 50 years ago, the Anangula phase has been recognized as the first known occupation in the eastern Aleutian Islands. The initial discovery of the Anangula Blade Site near Umnak Island, and the more recent find of Hog Island in the Unalaska District revealed assemblages in many ways characteristic of highly mobile terrestrial hunter-gatherers with only minimal evidence of a maritime economy. This seeming paradox of island dwellers heavily invested in terrestrial resources may be explained by seasonal land fast ice which provided a route for caribou access onto the archipelago. Microblades, most likely hafted to arrow shafts, are abundant during Anangula times. Bows are best used for terrestrial, not maritime, game. The Anangula sites are extensive but shallow, without middens, have ephemeral structural remains, and have a limited repertoire of tools. Individual tool types including microblades, blades, burins and scrapers, however, are numerous. This pattern suggests specialized extractive activity. Anangula most likely represents

an off shoot of the interior Paleoarctic tradition, and it developed toward the end of the phase into a populous and sedentary adaptation to the rich marine environment.

[112] *Chair*

Davis, Jacob (University Of Queensland), Shiela Nightingale (City University Of New York), Jessica Thompson (Emory University) and Elizabeth Gomani-Chindebvu (Malawi Ministry of Tourism, Wildlife, and Culture)

[118] *Quantifying the Effects of Erosional Processes on Stone Artifact Concentrations: Implications for Site Formation at Open-Air Paleolithic Sites*

An essential part of archaeological site management and interpretation is determining how recent landscape modifications affect artifact distributions. Stone artifact scatters can be an initial indicator of subsurface concentrations, yet little scholarship has focused on quantifying the nature and rate of the erosional processes that affect them. The archaeological record of northern Malawi demonstrates that despite abundant surface scatters, subsurface distributions may vary considerably in density and integrity. This study uses GIS to examine the processes by which a large concentration of stone artifacts has eroded over multiple monsoonal cycles, and how artifact attributes vary and potentially contribute to site erosion and/or preservation. In 2012, total station data and complete collection of surface finds at the "Bruce" site in Karonga, Malawi, yielded an assemblage of over 3000 artifacts. In 2014, over 2300 newly exposed artifacts were plotted and collected from the same area, resulting in high-resolution provenience data and two complementary lithic assemblages. Artifact attributes such as size class and weathering stage are combined with the spatial data to quantify how the surfaces of archaeological sites can change over even brief periods of time. This highlights the need for modern analogues in assessing the depositional histories of open-air Paleolithic sites.

Davis, Kaitlyn (University of Colorado, Boulder) and Scott Ortman (University of Colorado, Boulder)

[229] *Transformation in Daily Activity at Tsama Pueblo, New Mexico*

This paper analyzes the artifact assemblage from Tsama, an ancestral Tewa community along the Rio Chama in north-central New Mexico. This site was excavated by Florence Hawley-Ellis during a field school in 1970, but basic analyses of the resulting collections were only completed recently by the laboratory at the Crow Canyon Archaeological Center as part of a project investigating Tewa origins. We present the results of these analyses and compare the artifact assemblage from Tsama with that of Sand Canyon Pueblo, a 13th century site in southwest Colorado, to examine the continuities and changes in daily practice that accompanied migration from the Four Corners region to the northern Rio Grande. We also examine the degree to which differences in artifact assemblages reflect changes in social organization, as expressed in the differing community plans of these two sites.

Davis, Mary (UW-Madison)

[292] *Urban Lithics -- The Role of Stone Tools in the Indus and at Harappa*

Lithics are one of the most common artifact classes encountered at nearly every site of the urbanized landscape of the Indus Civilization of Pakistan and Northwest India. This paper examines the lithic assemblage at the urban center of Harappa (3300-1900 B.C.E.), one of the type-sites of the Indus, focusing on the chipped stone assemblage collected by the HARP excavations from 1986-2001. This assemblage is contextualized within the specialized production and the complex inter-regional distribution system of chert prismatic blades in the Indus. This assemblage illuminates that the lithic use at Harappa was not limited to agricultural or domestic tasks but was integral to many specialized craft productions. Intra-site analysis of these tools was used to address fundamental questions of the political, economic and social organization at the urban center. This paper highlights the utility of lithic analysis, moving beyond inferences about subsistence, mobility, and the limited role that lithics often play in archaeology of complex societies.

Dawson, Peter (University of Calgary)

[42] *Discussant*

Day, Peter [25] see Tenconi, Marta

Day, Peter (University of Sheffield)

[411] *Revealing the Common Ground: Technological Practice, Intrusive Shapes and Hybrid Pastes in the Kampos Group Pottery of Crete*

The dawn of the Early Bronze Age in the Aegean is of undoubted importance. Whether we emphasise the crafting and consumption of copper or the appearance of whole assemblages of pottery outside of their stylistic "homeland" in the Central Cyclades, Early Bronze I (c. 3100-2600 B.C.E.) has always been characterized as a time of change, featuring the movement of people, goods and ideas. In our haste to categorise, label and seek identities, we have perhaps lost some of the complexity and creativity involved in this web of contacts and transactions, of acceptance, resistance and the emergence of new practices.

The distinctive material culture set which we label the Kampos Group has caused interest by its appearance in specific settlements and contexts, mainly on the north coast Crete. Aided by an integrated programme of ceramic analysis, involving minero-petrographic, chemical and microstructural studies the apparently intrusive pottery is characterized, contextualising its operational sequence within Cretan ceramic practice. Through raw material choice, tempering practice, surface modification and firing, we consider aspects of itinerancy, hybridity of technological practice and identity in a ceramic world which is totally transformed by the time of Renfrew's phase of 'International Spirit' in Early Bronze II.

[25] *Chair*

Day, Zachary (University of Nebraska-Lincoln), LuAnn Wandsnider (University of Nebraska-Lincoln) and Matthew Douglass (University of Nebraska-Lincoln)

[361] *Sourcing Interactions: X-Ray Diffraction of Central Plains Tradition Ceramics during the Medieval Climatic Anomaly*

Recent research by Roper (1995 and 2007) questions the long-held perspective that the various phases of the Central Plains tradition (CPt) consisted of small village dwelling populations with distinct borders. New evidence suggests a more fluid distribution of autonomous farmsteads following major stream systems throughout the Central Plains (USA). This debate has led to various questions surrounding the interaction amongst communities and individuals in the CPt populations with an emphasis on the scale, degree and nature of the interaction. To begin examining this issue of interaction, our research has focused on developing procedures using X-Ray Diffraction (XRD) to obtain detailed compositional data on CPt ceramic deposits and thereby determine the source of these deposits in the Nebraska Sand Hills during the Medieval Climatic Anomaly. We compare these compositional data sets with those reported by Roper (2007) for CPt deposits elsewhere. By comparing the composition of CPt ceramics with clay from surrounding sources, this research aims to understand more about the movement and spatial distribution of the pottery and, in addition to, the people within the broader CPt system during this time period.

De Anda Rogel, Michelle [298] see Matadamas Gómora, Diego

De Anda Rogel, Michelle Marlene (Proyecto Templo Mayor), Fernando Carrizosa (Proyecto Templo Mayor) and Valeria Hernández (Proyecto Templo Mayor)

[298] *Graphic Documentation of the Mural Painting in the Sacred Precinct of Tenochtitlan*

From historical sources we know that the religious buildings of Tenochtitlan (1325–1521 CE) were richly polychromed. Architectural remains of the sacred precinct corroborate this information, as they still contain important remnants of the mural painting on their façades and interiors. Unfortunately, their state of conservation is quite poor, owing, on the one hand, to the particular pictorial materials and techniques utilized by the Mexica during the fourteenth, fifteenth, and sixteenth centuries, and, on the other, to the aggressive deteriorating agents that currently characterize the archaeological

contexts of the Historic Center of Mexico City. In this paper, we propose a methodology of digital graphic documentation specifically developed to recover and store the most information possible about the Great Temple archaeological zone's mural paintings, whose long-term conservation is seriously threatened. This methodology is based on the combined application of topographic surveying with total station and GPS, the imaging and digitization of the mural paintings, computer-generated chromatic reconstruction, digital photography, vector modeling, and virtual reality. The result is the generation of three-dimensional reconstructive models of the most important religious buildings of Tenochtitlan and an exhaustive catalogue of their mural paintings.

de Angelis, Hernán [251] see Nuevo Delaunay, Amalia

De Boer, Deanna (University of Washington), Zara Steinhart (University of Washington), Ben Marwick (University of Washington), David Bulbeck (Australian National University) and Sue O'Connor (Australian National University)

[407] *Stone Artifacts from Southeast Sulawesi: Technology beyond the Toalean*

We report on the stone artifact assemblages and geoarchaeological contexts from two recently excavated rockshelters in southeast Sulawesi, Indonesia. Human occupation starts at 19,000 BP. We find low density occupation during the Pleistocene, followed by a major increase in discard and change in local environmental conditions in the early Holocene. Striking changes in artifact discard rates occur during the middle Holocene, and distinctive retouched forms appear. We discuss the implications for human colonization of large islands such as Sulawesi and the interpretation of spatially discrete technologies such as the Toalean in south Sulawesi.

De Carteret, Alyce (Brown University)

[22] *A Good, Old-Fashioned Patio-Group Raising: Domestic Architecture as Ritual among the Classic-Period Maya*

As anthropological and archaeological scholarship attests, household ritual has a potent role in forging and maintaining sociopolitical relationships both within the household as well as with the communities, cities, and states of which it forms a part. Archaeological research in the Classic Maya area has revealed evidence of feasts, ancestor veneration, dedication and termination caches, and other ritual practices taking part within the limits of the house. The most substantial remnant of Classic Maya domestic ritual, however, may be the patio group itself, whose construction and renovation--much like the barn raisings of nineteenth-century North America--united households and communities in ritual activity. This paper will consider domestic architecture as ritual among the ancient Maya, and how the ritualized aspects of homebuilding may have changed over the course of the Classic period (ca. 200 - 900 CE). As its driving question, this paper asks, "How did the Classic Maya build their homes, and how did homebuilding build the Maya?" Evidence will be drawn from both archaeological excavation, consisting primarily of non-elite residences in the Central Peten, as well as ethnographic data from modern Maya communities.

de Gregory, Rocco [173] see Cyr, Howard

de la Torre, Ignacio [33] see Morgan, Thomas

De La Torre Vázquez, Jesús (Gibrán de la Torre) and Víctor Joel Santos Ramírez (Joel Santos)

[156] *La industria lítica precerámica del sitio La Flor del Océano, Sinaloa*

El hallazgo en el año 2010 de puntas de proyectil del tipo foliáceo manufacturadas casi en su totalidad en cantos rodados de riolita, así como la gran cantidad de desecho de talla asociado a ellas, en el sitio La Flor del Océano en Sinaloa; cuyas excavaciones continúan hasta el día de hoy, ha propiciado una serie de debates académicos acerca de su antigüedad y tecnología aplicada a ellas. En la presente ponencia, expondremos los resultados de las últimas temporadas de campo del Proyecto Arqueológico Las Labradas y las propuestas entorno a la aparición de dicha industria lítica en un contexto precerámico.

De Leon, Jason (University of Michigan)

[146] *The Edge of Humanity: Why Commonsensical Notions about Nature Impede our Understandings of Structural Violence in the Arizona Desert*

Since the 1990's Border Patrol has employed a strategy known as "Prevention Through Deterrence." This policy emphasizes heightened security around urban ports of entry so that undocumented migrants will attempt to cross the border in more remote areas that are difficult to traverse but easy for law enforcement to patrol. Rather than deterring migration, hundreds of thousands of people each year now spend days in the desert attempting to walk across one of the most extreme environments in North America. Moreover, hundreds die annually during this process. In 2012 and 2013, the Undocumented Migration Project conducted a series of experiments in the desert that used pig carcasses as proxies for the human body. The goals were to understand how unburied bodies decomposed and the political implications of this form of death. Drawing on these data and a historical review of burial treatment, I argue that humans have long employed nature to construct forms of post-mortem violence that I term "necroviolence." I posit that anthropologists working in all time periods can gain new insight by rethinking long-held notions about the nature/culture divide in taphonomic studies and that "natural" post-mortem treatment can be productively added to current anthropological frameworks of violence.

[258] *Discussant*

De Leon, Sandy (University of Illinois at Chicago/National Museum of the Philippines)

[238] *Investigating Social Practices, Community and Interaction in the Philippine Islands during the Metal Age*

Investigations of social interaction and notions of community among island societies of Southeast Asia during the Metal Age (500 B.C.-A.D. 800) are very limited, especially in the Philippines. This general lack of well-documented settlement, household and burial data, and underdeveloped theoretical frameworks interpreting the archaeological remains, impede our understanding of social organization in the period and fail to contextualize the appearance socially stratified and politically centralized island societies during the late prehistoric and early historic period. This paper presents a proposed multi-scalar research plan to utilize mortuary remains and examine similarities and variation in mortuary styles, pottery composition, trade goods and mortuary landscape features to investigate how Metal Age societies may have maintained ideas of community and group identity, as well as how they may have structured social relations. It presents preliminary findings of micro-regional analysis of jar burial remains from the Bacong Region of the central Philippines that will be expanded to include jar burial sites from the greater Philippine macro-region, and discusses some of the challenges of settlement archaeology. The research findings query the notion that late prehistoric island societies were necessarily simplified hierarchical and politically centralizing antecedents to the more complex societies of the Early Historic period.

De León, Jason [93] see Forringer-Beal, Anna

De Loera, Alexia [273] see Fernandez, Andrew

De Loney, Marguerite (Stanford University)

[117] *Discussant*

de Miranda Chaves, Sérgio [415] see Dos Santos, Isabel

De Smet, Timothy, Tanya M. Peres (Middle Tennessee State University) and Jesse W. Tune (Texas A&M University)

[8] *Near-Surface Geophysical Investigations at the Multicomponent Magnolia Valley Site (40RD314) in Rutherford County, Tennessee*

In May 2014 we collected magnetic gradiometry, frequency-domain electromagnetic-induction (EMI),

and ground-penetrating radar (GPR) data at the Magnolia Valley site (40RD314) in Rutherford County, Tennessee with the Middle Tennessee State University 2014 Field School, a component of the MTSU Rutherford County Archaeology Research Project (RCARP). We collected data using Geometrics G-858 cesium vapor magnetometer, GSSI's Profiler EMP-400 multifrequency electromagnetic conductivity meter, and Sensor's & Software's pulseEKKO PRO GPR with 500 MHz antennas at a line spacing of 0.5 m and station spacing of 0.1, 0.25, and 0.025 m, respectively. The use of multiple methods was necessary to characterize feature type. Negative apparent conductivity paired with strong dipolar magnetic responses were indicative of historic metal artifacts. High magnetic susceptibility and strong magnetic gradient contrasts indicated probable Archaic pit and habitation features. A historic two track wagon road was identified approximately 25 cm below the surface with both GPR and magnetometry. Ground-truthing the results proved the efficacy of this multi-method survey strategy and resulted in the identification of a rock-lined earth oven, several large (over 1 m in diameter and 1 m in depth) pits, and a possible Archaic structure/living space footprint along with the historic two-track road and metal artifacts.

de Smet, Timothy S. [310] see Everett, Mark

De Vynck, Jan (Arizona State University), Kim Hill (Arizona State University), Robert Anderson (University of Cape Town), Richard Cowling (Nelson Mandela University) and Curtis Marean (Arizona State University)

[294] *Foraging for Shellfish in a Predictable and Productive Inter-Tidal Environment, the South Coast of South Africa*

The south coast of South Africa has the oldest and best studied evidence for early use of coastal resources, and various researchers have argued that coastal resource use was significant for cognition, social complexity, and the maintenance of population refugia. To date there has been little consensus on the foraging returns and sustainability for inter-tidal resources in this coastal environment. Here we present the first net return and regeneration rate estimates for inter-tidal foraging in the varied south coast of South Africa. Foraging experiments were conducted with Khoesan descendants in the area and hourly caloric net return rates were recorded over 35 low tides and through the seasons. Net return rates varied as a function of gender, tidal range, marine habitat types and weather conditions. The mean net return rate (kcal/hour) in some instances equals or exceeds that recorded for hunting of large mammals, and shows that under the right conditions the south coast provides an extraordinarily rich protein resource. Our results show that strategic coastal foraging along the south coast could have been a highly predictable and productive foraging strategy for emerging modern humans. We relate these results to recent analyses and discussions of Middle Stone Age coastal foraging.

de Vynck, Jan [294] see Atwater, Chloe

Deagan-Harris, Kathleen

[178] *Spanish Mission Archaeology in the Southeast. 1974-2014 A.D. (After Dave)*

The archaeological study of Spanish missions among the American Indians has been underway in the Southeastern and Western regions of the United States for more than 70 years. This paper considers the directions and contributions of that body of work in the Southeast, with particular attention to the interdisciplinary impacts of the Santa Catalina Mission program, carried out by Dave Thomas between 1974 and today on St. Catherine's Island, Georgia.

Deal, Michael (Memorial University of Newfoundland)

[268] *Site Formation and Paleoenvironmental Reconstruction at a Terminal Archaic/Woodland Period Site in Central Nova Scotia, Canada.*

Despite being the area of earliest European occupation in Canada, with ample Contact period ethnohistorical evidence, very little is known about Pre-Contact occupation along the Annapolis River drainage system, in central Nova Scotia. At present there are less than 50 recorded Pre-Contact sites and virtually no private collections. This has long puzzled local archaeologists, as the Annapolis

River is an obvious travel route to the interior, and a large (2130 km²) watershed rich in plant and animal resources. The recently discovered Boswell site has revealed a complex history of site development. Continual vertical accretion of river sediments at the site during the Terminal Archaic and Woodland periods has created a deeply stratified deposit. Current research at the site suggests new strategies for the survey and excavation of sites along the Annapolis river system. The authors will also present the results from ongoing paleoethnobotanical and paleoenvironmental analyses and discuss their significance for interpreting aboriginal lifeways at the Boswell site over the last 4000 years.

Dean, Jeffrey [110] see Guiterman, Christopher

Dean, Jeffrey (University of Arizona) and Ronald Towner

[354] *Tom Windes and Southwestern Dendroarchaeology*

Tom Windes is virtually unique among archaeologists for his appreciation of the range of dendrochronology's contribution to archaeology and of the preservation crisis that afflicts the integrity of wooden elements in Southwestern archaeological sites of all ages. Tom's interest in dendrochronology as more than dating led him to develop sampling tools, techniques, and protocols that maximize the behavioral and chronological information in dendroarchaeological wood. His recognition of the accelerated rate of deterioration of archaeological wood, due to both natural and human causes, persuaded him that as many as possible wooden elements should be recorded and sampled before their scientific potential was irreversibly compromised. Beginning his decades-long effort to sample archaeological wood with National Park Service sites, Tom scoured the Southwest, from the Rio Pecos to the Grand Canyon, for suitable material. Adhering to LTRR's dictum to collect one sample from every wooden element and to his conviction that valuable chronological and behavioral information is in peril, Tom and his volunteers collected and documented thousands of samples that otherwise would have gone unstudied. The scale of this contribution is exemplified by the numbers of samples available before and after his activities and by numerous sophisticated analyses of these dendroarchaeological data.

Dean, Emily (Southern Utah University) and Amelia Perez Trujillo (Ministerio de Cultura, Cusco, Peru)

[393] *The Archaeology of Rebellion and Resistance: Archaeological Investigations of the Neo-Inca State of Vilcabamba, Peru*

In 1536 Manco Inca, the 'puppet' ruler installed by Pizarro, threw off the shackles of colonial rule and led a rebellion against the Spanish. After failing to retake the former imperial capital of Cusco, Manco Inca and his followers established a Neo-Inca state in Vilcabamba, the remote region east of Cusco. Vilcabamba functioned as the seat of Inca resistance against the Spanish from A.D. 1536 to 1572. While the historic record from the 1600s and 1700s is rich, few records exist for the period of 'first contact.' Those accounts that do exist are mostly slanted towards the Spanish point of view. The daily lives of the Inca who defiantly rejected Spanish rule during this time of intense culture contact remain obscure. This paper draws upon original survey and excavation data from Vitcos and the surrounding Vilcabamba region collected from 2008-2011 to investigate the lives of the Inca during this time of upheaval. More specifically, we address the degree to which these 'rebel' Incas adopted and/or rejected Spanish material culture in their architecture, ceramic technology, religious life, and food-ways. We hope that our analyses will illuminate the material forms of resistance taken by the inhabitants of this 16th c. Neo-Inca state.

Dean, Randall (City and County of San Francisco Planning Department)

[416] *Use of Archaeological Districts in San Francisco*

It is very probably the case that more archaeology is done in San Francisco than in any other major city in the U.S. Yet this archaeological work is done without the benefit of any archaeological ordinance or adopted archaeological guidance but rather through the City's implementation of State environmental laws. To overcome the vagueness and generality of these regulations, the City Planning Department has initiated an Archaeological District Project (A.D.P), with the aim

of creating codified theme-based archaeological districts. The archaeological districts are to be designed so as to enhance potential archaeological site identification, provide theme/period-specific historic contexts, identify significant related property types and research issues, and will actuate archaeological investigation and treatment procedures and protocols for archaeological consultants for resources related to the specific district theme. This paper will discuss the problem-basis, design, mechanics, and anticipated operational nature of the codified theme-based archaeological districts in San Francisco, and the development of its first archaeological district, thus far, for the Hispanic Period.

[416] *Discussant*

Deane-Drummond, Celia [53] see Kissel, Marc

DeAngelis, Joseph

[166] *Between Party Lines: A Bipartisan Reevaluation of the Early Paleoindian Zooarchaeological Record*

The debate regarding early Paleoindians as megafaunal specialists or subsistence generalists has had a long and contentious history in Americanist archaeology. A quantitative reanalysis of the early Paleoindian zooarchaeological record in the continental United States is presented. Previous analyses of the faunal record focused only on taxonomic richness and have not utilized other measurements of taxonomic diversity. My analyses of the faunal record include measurements of taxonomic richness, evenness and heterogeneity. Evenness and heterogeneity indices of fauna are also based on body size class. Indices are calculated based on two different methodologies used by previous authors. The first is a conservative method that includes only fauna with strong evidence of subsistence use while the other is a liberal method that includes all fauna found on an early Paleoindian sites. Analyses produce results that are opposite of what the original authors concluded with the conservative method indicating that the early Paleoindians were megafaunal specialists while the liberal method indicates the early Paleoindians were subsistence generalists. This poses more questions regarding early Paleoindian subsistence patterns and poses implications of what faunal remains can tell archaeologists about prehistoric human diets.

DeAntoni, GeorgeAnn (University of California, Berkeley), Peter Nelson (University of California, Berkeley) and Rob Cuthrell (University of California, Berkeley)

[268] *Charcoal Identification as Means of Central California Landscape Reconstruction*

The purpose of my paper is to present a paleoethnobotanical study of a late prehistoric Central California site (located in Sonoma County) that reconstructs the pre-contact landscape via the identification of wood charcoal remains. The analysis of charcoal and the low-impact paleoethnobotanical methodologies utilized in this study provide the basis for generating hypotheses about how Native peoples interacted with the local environment while also considering how the landscape may have changed over time through anthropogenic management. By identifying the representative tree taxa of the site through wood charcoal analysis and identification, this study will provide critical information for future environmental restoration projects initiated by local tribes and resource managers. With the completion of this project, a better understanding of human interactions with the pre-Contact Bay Area landscape may be reached and plans for the restoration of native plants can be initiated.

Deats, Jennifer (University of Colorado)

[230] *Occupation Lengths in Middle Missouri Sites*

Collections and reports from Middle Missouri salvage archaeology, conducted primarily in the 1950s, hold a wealth of information about Plains Village farming communities, much of which is still being studied. In this paper, I provide a basis for the assessment of occupation lengths in the Middle Missouri utilizing data culled from site reports on several Middle Missouri sites, spanning time and space. This study utilizes evidence of repair of housing structures, overlapping storage pits, and artifact counts to build a statistical model for the examination of occupation length. A unique aspect of this study is the incorporation of potsherd counts for each site. Due to the general approach of

Plains Archaeologists to the study of ceramics, the potential for ceramic potsherds and vessels in a study of this kind is largely overlooked. Though they are usually resigned to taxonomic purposes, I attempt to incorporate sherd counts into an analysis of site occupation lengths, utilizing accumulations research that has been conducted in other areas of North America.

DeBlasis, Paulo (Museu de Arqueologia-USP)

[157] *Chair*

DeCleva, Edward [336] see Corbett, Debra

Dedrick, Maia (University of North Carolina at Chapel Hill), Patricia McNany (University of North Carolina at Chapel Hill), Sarah Rowe (University of North Carolina at Chapel Hill) and Ivan Batun-Alpuche (Archivo General del Estado de Yucatán)

[188] *Learning heritage while teaching archaeology at Tahcabo, Yucatán: archaeologists' perspectives on the opportunities and risks of local community engagement*

While a great deal of archaeological research in the Maya area has been conducted with the interests of the academic community and tourism industry in mind, there are fewer examples of archaeology conducted with the needs of local "publics" foregrounded. We propose greater dialogue between archaeologists and the people who live near (and within) places where archaeologists conduct research, and consider the dissemination of archaeological information to communities involved in archaeological projects to be an important principle of best practices within the discipline. Drawing from ongoing community-engaged archaeology at Tahcabo, Yucatán, we explore the opportunities and risks inherent in intensified dialogue and dissemination. In particular, we consider the challenges of balancing epistemologies within a co-learning project in which community members share their perceptions of archaeology and knowledge of cultural heritage and we propose archaeological techniques as beneficial ways to learn about local pasts and present-day issues. Reaching a rapprochement requires commitment to collaboration on both sides. Co-learning projects to be considered in this light include a field trip for middle school students and their parents to a nearby archaeological site, a youth photography project that addressed strengths and problems within the community, and a heritage day at the primary school.

Deffebach, Nancy

[303] *Beyond Surrealism: The Anthropological Sources of Leonora Carrington's "El mundo mágico de los mayas" (1964)*

In 1963 Leonora Carrington was invited to create a mural-sized painting for the highland Maya ethnography room at the Museo Nacional de Antropología in Mexico City. *El mundo mágico de los mayas* (1964) portrays the humans, gods, and spirits that inhabit the sacred space of the modern Maya. Carrington's debt to surrealism is immediately apparent. Her greater debt to anthropology is less obvious.

Carrington made several research trips to Chiapas and read extensively about the Maya before she designed the painting. She always acknowledged the profound influence of the "Popol Vuh" but was intentionally vague about her other written sources.

I interpret Carrington's imagery in relation to publications about modern Maya ethnography and the ancient Maya that were available in the early 1960s. Carrington made numerous preparatory sketches that contain brief notations. The notes and imagery of the drawings indicate that she drew heavily on Calixta Guiteras-Holmes's "Perils of the Soul" and Sylvanus Morley's "The Ancient Maya." I discuss the significance of Carrington's notations and the major shift in subject matter that took place between the creation of the drawings and the completion of the monumental painting.

deFrance, Susan [250] see Lofaro, Ellen

Dega, Michael (Naga Research Group) and Kyle Latinis (Director of Social Science

Directorate, HTS)**[407]** *The Social and Ecological Characteristics of Prehistoric Cambodian Earthworks*

This paper moves discussion of prehistoric earthworks in Cambodia from normative archaeology into an ecological landscape structure, based on archaeological datasets. Discussions provide a synthesis of archaeological and newly borne out ecological explanations for original site construction, occupation, landscape use, sustainability of occupation for the earthwork culture over a c. 2000 year period, and terminal use of the sites. The paper moves discussion of the earthworks in the direction of landscape archaeology cum historical ecology to add more elements to explain this unique social system.

DeGayner, Jacob (National Park Service)**[358]** *Advanced Spatial Documentation of Cultural Resources at Southern Arizona National Parks*

This poster presents the experiences to date associated with the execution and development of an advanced spatial documentation program at the National Park Service Southern Arizona Office, including sample products, case studies, success metrics and challenges associated with development and implementation. In late 2013, resource managers and support staff of the NPS Southern Arizona group decided to invest in the capacity to complete 3D digital documentation projects in-house. The goals of this effort were to reduce project management overhead expenses associated with the contract process, control costs, standardize products, foster a workflow where the NPS retained control of products and data, and ultimately expand the scope of spatial resource documentation at park units. This effort has been assisted by recent advances in spatial documentation technology such as close-range photogrammetry and the enhanced speed and portability of phase-based terrestrial laser scanners. These advances allow the efficient documentation of backcountry archaeological sites that would previously have required significant time and expense. Additionally, rapid data capture capabilities facilitate the spatial documentation of multiple preservation project phases, increasing the temporal as well as spatial resolution of documentation products.

DeGeorgey, Alex (Alta Archaeological Consulting)**[293]** *Use of Faunal Resources as Trade Commodities During the Late Period - Evidence from a Stege Mound (CA-CCO-297)*

Site CA-CCO-297 (a Stege Mound) is a prehistoric shell mound located on the northeastern margin of the San Francisco Bay. Recent archaeological investigations at CA-CCO-297 suggest that fish, waterfowl and sea otters were exploited as commodities for exchange rather than purely subsistence items. Emphasized production of locally available resources for participation in inter-regional exchange systems appears linked to demographic pressures and reduced foraging efficiency. This paper explores the dynamics of economic behaviors and commodification of natural resources in Central California as manifested in the Late Period archaeology of a Stege Mound.

[293] *Chair*

DeGeorgey, Alex [293] see Simons, Dwight

Del Cid Castillo, David Ricardo (David Del Cid)**[193]** *The Pyramid 12H3 Xultun Archaeological Site, Peten: Transition from the Preclassic to Classic*

The pyramid 12H3 is located on the east of the B group and is the largest pyramid at the site of Xultun, measuring 50.0 x 20.0 m, and approximately 26.0 m tall, with a north-south axis orientation. The pyramid has at least five construction phases. The early work on the structure and documentation consisted of cleaning looter's tunnels with the intention of understanding the phases of construction and obtaining relevant data on the early occupation of Xultun. Research conducted within Sub-1 revealed the first settlement of Xultun, dating to the Middle Preclassic period characterized by the presence of the ceramic type Savana Youth Red Orange Red Rejolla.

Del Giudice, Caroline (Kenyon College), Patricia Urban (Kenyon College) and Edward Schortman (Kenyon College)

[314] *Is It Hot Enough Yet? Reconstructing Firing Temperatures for Prehistoric Honduran Ceramics through Re-Firing Experiments*

Investigations conducted in the Naco valley and its environs within NW Honduras from 1975-2008 have revealed multiple facilities in which ceramic containers were fired. The vast majority of these date to the Late (A.D. 600-800) and Terminal Classic periods (A.D. 800-1000). Their diverse forms and dimensions hint at variations in aspects of production including the temperatures at which the vessels were heated and the degree of control artisans exercised over the manufacturing process. One line of evidence that we have pursued in trying to describe this variability involves re-firing a sample of over 200 pottery sherds that span a wide range of domestic and decorated Late and Terminal Classic taxa derived from settlements that fashioned, and those that consumed, ceramic containers. The results of these tests are used to reconstruct the varied ways craftworkers who fabricated different classes of vessels in diverse facilities at sundry locations might have participated in the area's political economy and to infer how their roles in those relations changed over time.

Del Solar, Nino [411] see Muro, Luis Armando

Delacorte, Michael and Mark E. Basgall (California State University, Sacramento)

[341] *More than a Bivouac, Less than a Village: Middle Archaic Use of Great Basin Alpine and Other Uplands*

The role of Great Basin alpine/upland habitats within broader land-use strategies has long been debated. We explore upland and lowland data from either side of the White Mountain highlands to reconstruct late Middle Archaic (~1350-2500 B.P.) use of regional landscapes. This information suggests that regionally wide-ranging, logistically organized patrilineal groups made seasonal use of alpine and other uplands for late summer/fall hunting and gathering prior to winter encampment in valley lowlands on either side of the mountain range.

DeLance, Lisa (University of California, Riverside)

[133] *From Rags to Riches: The Class, Status, and Power of Clothing Among Ancient Maya Women*

Analysis of Maya female imagery has generally centered on the role of women as depicted on monumental architecture. While we understand these depictions to be tools of propaganda, they are often used to make assertions about the lived experience of ancient Maya women. In contrast to the analysis of highly politicized and highly public imagery depicted on monumental architecture, this paper examines depictions of feminine performance on a personalized medium: Maya painted vases. More specifically, this paper will focus on the juxtaposition of clothing design and performativity, including gesture, pose and activity, among Maya women.

An examination of vessel imagery through the comparative lens of performance and clothing challenges the idea of Maya social organization as a dichotomized system in which individuals are classed as either elite or commoners, but not both, never somewhere in-between. Although primarily an analysis of vessel imagery, these inferences can be extended to other forms of representation including ceramic figurines and mural paintings to form a more complete, and more complicated, picture of ancient Maya social relations. When clothing design and performative action are analyzed in tandem, the elite/commoner dichotomy collapses, revealing the highly meaningful intersection of ancient Maya social, political, and economic identity.

Delaney, Colleen (Cal State Channel Islands), Shawna Couplin (California State University-Northridge), Charles Fazzone (California State University- Channel Islands) and Kathleen M Marsaglia (California State University Northridge)

[391] *They Sent Sandstone Across the Sea? A Preliminary Petrographic Study of Stone Bowls and Mortars*

The Spanish chroniclers of the 18th century document extensive and intensive long distance regional trade networks among indigenous peoples throughout southern California (and beyond).

Archaeologists are currently reevaluating these long held interpretations of Chumash regional exchange networks in the southern California region during the late prehistoric period. We report a pilot study focused the determination of the lithology/mineralogy of stone bowls/mortars collected from various sites in the Channel islands on the mainland using thin-section petrographic techniques. Our project documents the range of lithologies for a sample set of groundstone bowls and mortars, and compares them to the range of lithologies of potential natural outcrop sources of these groundstone tool types on the various northern Channel Islands of California, and the adjacent mainland. The rock types include sandstone, volcanoclastics, and volcanic rocks. Our study has implications for interpretations of archaeological materials specifically from the southern California Bight region, as well as broader studies focused on regional trade and exchange.

[391] *Chair*

Delgado, Florencio [119] see Stahl, Peter

Delgado, James (NOAA)

[416] *Archaeology of the Gold Rush Waterfront*

Archaeological research conducted in the former, now land-filled Gold Rush waterfront of San Francisco has defined a rapidly developed port infrastructure and substantial remains of discarded material culture that comprises a several block wide and deep macro-site. Buried ships, collapsed buildings, pilings from wharves and piers, and discarded cargoes buried by urban expansion and the filling of the area have emerged periodically due to redevelopment since 1907 and discoveries continue well into the early 21st century. These discoveries should not be looked at as single sites but rather as part of a more extensive buried maritime cultural landscape. As well, the material culture and features of this massive site define an "instant port" in an "instant city" reliant not only on intense capitalization by entrepreneurial maritime interests, but also reliant on global maritime trade diverted in response to the Gold Rush.

Delgado Ku, Pedro [344] see Masson, Marilyn

Dell'Anna, Rossana [185] see Risetto, John

Dellopoulos, Emma (University of Iowa) and Shelby Putt (University of Iowa)

[122] *Performativity and Pedagogy: the Effect of Verbal and Nonverbal Instruction on Experimental Acheulian Handaxe Symmetry*

The Acheulian techno-complex is comprised mostly of bifacial handaxes, which became increasingly symmetrical through time, especially after 400kya. Symmetry has recently been considered a highly significant aspect of the Acheulian toolkit. It has many potential opportunities for a better understanding of the evolution of cognition in early Homo; however, little is known about how this complex skill was transmitted. Could the increasing symmetry of handaxes in the archaeological record be evidence for the introduction of language instruction? We conducted an experiment with novice flintknappers to investigate whether spoken language instruction has any effect on symmetry. Using the Flip Test, we acquired the index of asymmetry for 172 bifaces made by 28 individuals. These individuals learned the skill either through verbal instruction or nonverbal observation. Overall, we found no significant difference in symmetry scores between the verbal and nonverbal groups; however, only the bifaces produced by the nonverbal group became significantly more symmetrical over time. These results indicate that not only is language instruction unnecessary for the transmission of this complex skill, but language may actually be a hindrance. Thus, the introduction of linguistic instruction was probably not the variable responsible for the increased symmetry of handaxes in the archaeological record.

DeLong, Richard [90] see McMurtry, Sean

Demakopoulou, Katie [79] see Burke, Clare

Demarchi, Beatrice [356] see Penkman, Kirsty

Demarest, Arthur [338] see Thornton, Erin

Demarest, Arthur (Vanderbilt University)

[413] *Transformations in Political Economy and Routes of Exchange on the Eve of the Classic Maya Collapse: New Evidence from the Port Kingdom of Cancun and the Classic Maya Frontier*

The Classic period archaeology and history of the Pasión River “highway” and its connecting land routes demonstrate the vital role of riverine exchange systems and also register major changes in routes, agents, and economies. The riverine port city of Cancun held a critical position at the intersection of both river and land routes that connected the southwest Classic Maya cities to other Peten centers, to southern highland trading partners, and to the more distant realms of Tabasco and Veracruz. Recent evidence from excavations at Cancun and in the Verapaz highlands, as well as from compositional analyses, demonstrate that in the late eighth century there were dramatic shifts in both river and land routes of exchange connecting the southern lowlands with other areas of Mesoamerica. These shifts also involved changes in political economy, port control, commodities and market exchange, and the agents involved – as well as the impact of specific historical events. Taken together this interregional pattern reveals a change in both economic modes and routes as part of a general transformation (at times violent) in the political economy of eastern Mesoamerica near the end of the Classic period.

[413] *Chair*

DeMarrais, Elizabeth (University of Cambridge)

[307] *The Materiality of Emotion: Steps toward Understanding Affective Experience in the South Andes*

Anthropologists routinely acknowledge the affective significance of things. Display and use of objects (in rituals and performances) can evoke strong emotions. Elaborate objects may be used to forge consensus, to evoke memory, or to foster solidarity and express shared interests. Alternatively, displays may divide opinion, generating a diverse response. Understanding the role of emotions in the past is crucial, both for creating rich and nuanced pictures of past societies, as well as for explaining their trajectories of change. In this paper, I set out initial steps for thinking about past emotions using archaeological evidence. First, I consider the visibility, scale, and permanence of different categories of objects, suggesting how their varied materialities afforded distinct potentials for materializing affective experience. I discuss how specific objects may have sustained particular types of affective experience, taking audiences and scale into account. Through a case study from the Andes of northwest Argentina, I show how objects were used in creative and idiosyncratic ways (1) to evoke a sense of place and locale, (2) to sustain memory of events in the life of a household, and (3) to forge personal networks within the wider South Andean region.

Demel, Scott (NORTHERN MICHIGAN UNIVERSITY), Marla Buckmaster (Marquette Regional History Center), Terrance Martin (Illinois State Museum), James Paquette (Marquette Regional History Center) and Kathryn Parker (Kathryn Parker Archaeobotany)

[280] *A Proto-Historic Site in the Western Great Lakes*

The discovery of several early iconographic/Jesuit rings in 1996 in Marquette County, Michigan led to the subsequent discovery of a proto-historic locus within a larger multi-component site. Professional archaeologists and volunteers spent two summers excavating 34 square meters near this discovery, and eventually identified the area as Location A at the Goose Lake Outlet #3 site. The excavated area is a single component occupation located in an ecologically diverse region that has been used from the Late Paleo Indian period to present. This region is immediately adjacent to the Lake Superior basin, but is located on Goose Lake Outlet which is part of the Lake Michigan drainage system. Preliminary evidence including numerous glass trade beads suggest the area was

a winter encampment dating between A.D. 1630-1640. The recovery of abundant large animal remains will aid insights to subsistence and seasonality, and botanical analysis will help establish the habitat and potential plant resources. This locus represents a unique opportunity to investigate the Proto-Historic, a poorly defined occupation in the Western Great Lakes.

Demoule, Jean-Paul (Université de Paris I - Sorbonne)

[82] *The Neolithic House, from Anatolia to Central Europe*

It is accepted with good reason that the appearance of the Neolithic in Europe results from a phenomenon of diffusion, notably demic, from the Near East and more particularly Anatolia. At first sight, there are considerable differences between the Near Eastern houses, which are often small and stone-built with white plaster floors, and the large wood and earth houses of Central Europe. In fact a more detailed analysis of the situation in intermediate regions, especially the north-west Anatolian forest and the south-east Balkans (Kovacevo excavations), shows a gradual development, also linked to available building materials. Thus wood and earth construction is well attested in Anatolia (Ilipinar), while stone is used in Greece (Sesklo). This paper will thus examine the respective contribution of environmental constraints and cultural choices, including the social organization that can be deduced from architecture. Comparisons will be made with other regions of Eurasia at the same period (Russia, Japan, etc).

[13] *Discussant*

Dempsey, Erin (National Park Service, Midwest Archeological Center)

[29] *Losing Ground but Gaining Data: Erosion and Archaeology in Badlands Parks*

In 2013, the Midwest Archeological Center initiated a five-year project to study the impacts of erosion on archaeological sites in Great Plains parks, specifically those parks with badlands geography. The project is designed to provide information on erosion rates in a variety of environmental contexts, as well as erosion's effect on different features and artifact types. In the future, these data will be used to predict which sites or potential site locations may be most vulnerable to climate change and attendant erosion. Parks included in the study are Scotts Bluff National Monument in Nebraska, Badlands National Park in South Dakota, and Theodore Roosevelt National Park in North Dakota. This presentation will share the results of the first two field seasons, which took place at Scotts Bluff and Badlands.

DeMuth, R. Carl [125] see Noack Myers, Kelsey

DeMuth, R. Carl (Indiana University - Bloomington), Kelsey Noack Myers (Indiana University - Bloomington) and Stephen J. Yerka (University of Tennessee, Knoxville)

[125] *The Modern United States of Historical Archaeology Site Reporting: A Multi-State Analysis of Reported Historical Archaeological Sites Archived in the Digital Index of North American Archaeology*

It is recognized that certain biases exist in the archaeological recording of historic sites and contexts in comparison to those from prehistory. Typically, these studies deal only with one state or a discrete region of interest due to the legacy limitations of archaeological record keeping in research and cultural resource management settings. This study demonstrates a first step toward providing historical archaeologists with greater insights into the larger effects of the many discrete choices made during historic site reporting. The advent of the Digital Index of North American Archaeology (DINAA) affords historical archaeologists an important opportunity to categorically and quantitatively assess how site recording is accomplished at a massive level. DINAA is a growing, open access system that provides research definitions for archaeological sites and can make interoperable multiple archaeological databases (currently covering 15 states and over 500,000 sites), through a linked open data strategy that correlates site descriptive ontologies to more standardized vocabularies. This poster provides an assessment of archaeological site definitions and other recording trends through multiple queries of the publicly available DINAA structure, and highlights potential patterns that emerge from disciplinary interests in reporting of cultural components, activity types, or material culture types.

Deng, Lingling [67] see Wolin, Daniela

Denham, Tim (Australian National University)

[414] *Early Cultivation Practices and Plant Domestication in New Guinea and Island Southeast Asia*

Early cultivation practices and plant domestication in the New Guinea and Island Southeast Asian regions were largely based on the vegetative propagation of a range of plant types – including root crops, shrubs, grasses and herbs – as well as the transplantation of palms, pandans and trees. The character of early agricultural practices within these regions, as well as in tropical rainforest environments elsewhere, requires different conceptual and methodological approaches than have been adopted or proposed elsewhere. This stance does not represent a descent into conceptual relativism, rather it seeks to understand the emergence of agriculture for each region of the world on its own terms.

Dennehy, Timothy

[153] *Free or Despotic? The Distribution of Hunter-Gatherer Ethnolinguistic Groups in California*

How do hunter-gatherers divide their landscape into territories? In this paper, I will delve into results from a prior study showing a significant difference in territory size between coastal and inland groups in California (Dennehy et al. 2014). I will first simulate territory sizes and locations using an Agent-Based Model (ABM) of hunter-gatherer bands. The model will draw on human behavioral ecology to simulate distribution of foraging groups under three different conditions of social organization: an Ideal Free Distribution (IFD), Ideal Despotic Distribution (IDD), and a hybrid where both forms are possible. "Ideal" here refers to agents that have perfect knowledge of the suitability of different patches in their environment. Such agents are "free" when they can come and go from any patch as they please; they are "despotic" in cases where social hierarchies exist that allow a patch's current inhabitants to successfully defend it from newcomers. I expect each condition to produce a different distribution of forager groups, visualized as maps of simulated territories. I will then compare these maps to that created by Alfred Kroeber (1922) to test which condition more accurately matches the known distribution of California foragers.

[153] *Chair*

Dennett, Carrie [170] see Manion, Jessica

Dennis, L. Meghan

[267] *Representations of Looting and Bad Practices as Entertainment*

Representations of archaeology in films and television have been historically problematic, frequently emphasizing bad practices, shoddy scholarship and ethically questionable professional behavior. In video games, however, there is an additional dimension of experience as the user in effect commits the acts actively instead of viewing them passively. By looking critically at the modern "adventure" game, *Uncharted 3: Drake's Deception*, examples of encouragement of looting, creating a false object pedigree, and participating in a black market in antiquities will be examined for their role in creating interactive experiences about how archaeology and archaeologists function.

[267] *Chair*

Dennison, Rory (University of Illinois at Chicago)

[391] *Porcelain, Kilns, and Chiefs: LA-ICP-MS Analysis of Sherds in the Pre-Colonial Philippines and Southern China*

This research examines issues of production and distribution of Chinese porcelain in the Song, Yuan, and Ming dynasties by comparing chemical signatures of porcelain sherds and clay collected from sites in Fujian, China both to each other and to sites of dispersal within Philippine chiefdoms in Tanjay, Cebu, and Manila. This research examines how patterns of long distance trade were negotiated within the Philippines at one end of the network and the variations in production

strategies, distribution, and sources within Fujian kiln sites at the other. Chemical signatures, through the use of Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) are used to distinguish patterns, examine ceramic homogeneity across the sites and regions, and begin to suggest porcelains kiln sites as sources of production within the network. This focus across various scales, and at both ends of this trade connection, allows for the examination of not just centers but also interior or 'periphery' groups which were likewise connected and interlinked into this porcelain exchange network.

Denoyer, Allen [278] see Trumbo, Aaron

Dent, Joshua (University of Western Ontario)

[13] *In(di)visible Fulcra: Perception and Balance in Canadian Archaeological Governance*

The history of provincial heritage legislation and policy in the Canadian context has been infrequently studied and rarely theorized. Contemporary critical heritage and applied archaeological research are beginning to reverse this trend and the past that is coming to light has significant implications to future archaeological governance. Drawing from research conducted in British Columbia and Ontario, this paper highlights two important facets of archaeological governance: perception and balance. Perception revolves around the fluctuating identities and performances within the provincial regulatory apparatus during the transition from academically to commercially driven archaeology. Perceived shifts in the roles of state-affiliated archaeologists and the negotiated perceptions of stakeholders segue into a discussion of balance within the archaeological bureaucracy. The history of archaeological governance is one of an orchestrated balance between seemingly competing interests and identities. Both internal and external equilibria are consciously and unconsciously maintained as provincial archaeologists realize their roles within a wider bureaucracy and the role of cultural resource management within wider economic and cultural sectors.

[13] *Chair*

Denton, Anne [260] see Radermacher, Matthew

Dering, Phil [256] see Hanselka, Kevin

Dervanian, Anaïs [24] see Matos Llanes, Carlos

Des Lauriers, Matthew (California State University, Northridge) and Danny Sosa (California State University, Northridge)

[32] *The Assumption of Insular Marginality: The Curious Case of Isla Cedros, Baja California*

What about islands inspires us to think of them as places on 'the edge?' The idea of an island is often more remote than the reality. The word itself conjures up notions of loneliness and isolation. Some islands are inextricably linked, to other islands and/or the adjacent mainland, while the nonpareil isolation of Rapa Nui is legendary. Lying off the Pacific Coast of Baja California, Isla Cedros presents a strange combination of these factors. The island supported a large resident population before European Contact due to ample fresh water, surrounding seas teeming with marine resources, and a robust terrestrial ecosystem. The islanders were tied into the social networks of the adjacent peninsula as evidenced by Jesuit documents and an abundance of obsidian brought from the mainland. This island was the largest population center for hundreds of kilometers in every direction. Isla Cedros was not a marginal place, but one of the most important centers, one of the most ecologically rich locations, and home to one of the most dynamic social environments in the region. Its remoteness from other major centers provides archaeologists an opportunity to examine the essential qualities of an island and the impacts of such on human behavior.

DeSantis, Larisa [202] see Tung, Tiffany

Desrosiers, Ryan [168] see Campbell, Sarah

Dettman, David [55] see Palacios-Fest, Manuel

Devos, Yannick [309] see Vrydaghs, Luc

Dewar, Genevieve (University of Toronto) and Brian Stewart (University of Michigan)

[174] *Explaining Intraregional Assemblage Variability in Southern Africa during MIS 2: Different Strokes or Different Folks?*

In southern Africa Marine Isotope Stage 2 was a period of intense cold, and palaeoenvironment and geoarchaeological data indicate inverse moisture availability in the different rainfall zones. Sea levels fell rapidly, exposing the continental shelf while the number of archaeological sites across the subcontinent decreased, likely a result of populations concentrating along the now-submerged coastline. There were, however, pockets of inland 'refugia'. People contracted into centers of occupation in the northwestern escarpment, the Western Cape, the southern Cape Fold Mountains and the Maloti-Drakensberg Mountains when the rest of the country seems largely abandoned. Similar artifacts (bladelets) suggest that these distant groups were socially enchainned. In two of these regions, the northwestern escarpment and Maloti-Drakensberg, some sites dated 24-23 cal kBP conform to the popular culture: Spitzkloof A and Sehonghong, but there are also contemporaneous intraregional differences, with other sites lacking not only bladelets but also grindstones (Apollo 11 and Melikane). Two hypotheses are being tested. First, there were multiple groups on these landscapes, with some participating in attenuated social networks and others not. A second hypothesis is that the different signatures reflect differences in the use of individual sites, whether seasonally or because of variable catchment potential.

DeWitte, Sharon (University of South Carolina)

[207] *Developmental Stress and Disease Susceptibility: The Association between Skeletal Indicators of Leprosy and Other Physiological Stressors*

Leprosy has long interested bioarchaeologists because of its antiquity and because it can cause skeletal lesions. These lesions are primarily associated with lepromatous leprosy resulting from a minimal cellular immune response. This study tests the hypothesis that early-life developmental stress increases the risk of developing lepromatous leprosy by examining the association between skeletal signs of leprosy and other skeletal stress markers. A combined sample of 126 adults from two Danish cemeteries (c. 12th-13th centuries CE) was assessed for the presence of skeletal indicators of leprosy and other, non-specific stress markers. Based on the results of chi-square tests, there are no significant associations between any indicators of childhood stress and having two or more signs of leprosy. There is, however, a significant association between tibial periosteal lesions and having two or more signs of leprosy. These results suggest that childhood stress is not predictive of developing lepromatous leprosy (or skeletal manifestations thereof) but that stress that can occur later in life might be. However, several of the leprosy-lesions have low specificity and thus the co-occurrence of periosteal lesions and signs of leprosy might reflect other conditions rather than indicating that previous physiological stress increases the risk of lepromatous leprosy lesions.

Dexter Kennedy, Jaime (University of Oregon) and Geoffrey M. Smith (University of Nevada, Reno)

[415] *Paleoethnobotany at LSP-1 Rockshelter, Lake County, OR: Assessing the Dietary Diversity of Plant Foods in Holocene Diet*

Over the past five field seasons, collaborative research at the LSP-1 rockshelter in Oregon's Warner Valley conducted by the University of Nevada, Reno archaeological field school and Bureau of Land Management has revealed a record of human occupation spanning the Holocene. While faunal remains are prominent in the deposits, nutritional information can also be derived from pollen and seed data at LSP-1. This paper presents the results of paleoethnobotanical analysis with respect to diet breadth and foraging of locally available plant taxa during the Early (~11,000-7,600 BP), Middle (~7,600-3,000), and Late Holocene (~3,000-contact). These data contribute to a growing body of

research identifying plant resources targeted by people living in the Warner Valley. Additionally, data generated by this study also have the potential to provide insight into the nutrient intake associated with preferred plant foods and to facilitate our understanding of hunter-gatherer dietary diversity over the course of several millennia in the northern Great Basin.

Di Giuseppantonio Di Franco, Paola (University of Cambridge)

[188] *Experiencing the Past through "Digifacts"*

This paper presents DIGIFACT, a project aiming at improving our understanding of how people perceive artifacts through different media. This project will clarify the role of 3D technologies in the perception of archaeological artifacts, which are critical to our world heritage, and help us understand how people experience artifacts in a museum and how 3D replicas can improve visitor experience of authenticity and understanding. For this research, I will collect data on how visitors experience the archaeological record in the Museum of Anthropology and Archaeology in Cambridge, developing a research program to feed into the redevelopment of the World Archaeology Gallery. In order to explore how people perceive museum artifacts through different media, I will videotape volunteer participants at the MAA while they interact with selected artifacts through different forms of media. Speech and gestures will be analyzed with methods borrowed from Cognitive and Information Science, to see how the medium (e.g. tactile experience vs interaction with 3D virtual copies) influences the way people describe and understand objects.

Diaz, Diana (Graduate Student in Anthropology, California State University, Northridge) and Danielle Kurin (Assistant Professor of Anthropology, University of)

[111] *Discerning Site Distribution and Settlement Patterns in Andahuaylas (Apurimac), Peru*

In the Andahuaylas region located in the southern central highlands of Peru, archaeologists have documented the presence of three critical cultural occupations: Wari, Chanka, and Inka (ca. A.D. 700-1400). Previous investigations claim that environmental change may have influenced collapse and played a decisive role in resettlement patterns. Using spatial data from 86 surveyed sites, this study investigates how state collapse, reorganization, and environmental transformations influenced settlement patterns in the region. Nearest neighbor analysis and other GIS applications are marshaled to evaluate how regional site density, settlement location, agglutination, and length of occupation varied over time. These data are then used to address the nature of site abandonment as well as motivations for population aggregation. This research emphasizes the role social agency as our results suggest that human settlement on the landscape may be more strongly predicated by the social milieu than macro climactic conditions.

Diaz, Amélie [401] see Khalidi, Lamy

Díaz Rocha, Ana María (Boston University)

[12] *Lacquer Arts of Viceregal Latin America: A Study of Transculturation*

The establishment of a trade route between Asia, the New World, and Europe during the sixteenth century allowed admiration, exchange, and adaptation of different motifs, materials, and artistic techniques. The study of lacquer arts offers unique evidence of the transculturation that defines the arts of Spanish America during the viceregal period. This poster explores the use of unique American lacquer traditions that combine indigenous techniques and European forms with designs borrowed from Europe, Asia, and prehispanic America. I look specifically at two separate lacquer art traditions that developed in the sixteenth and seventeenth centuries and are still in use today: Maque Lacquer and Barniz de Pasto. Both techniques developed from precolumbian Lacquer techniques that used organic materials prevalent in the regions of production. While trying to understand cultural and artistic modifications and new outcomes during the colonial period, I also focus on the subject's implications for our understanding of material and iconographic studies in archaeology.

Diaz Vazquez, Juan Carlos [111] see Rios, Jorge

Díaz-Díaz, Miguel (Para la Naturaleza)**[290]** *La erosión costera como agente de cambio geomorfológico y pérdida de contexto arqueológico*

La erosión costera es el proceso por el cual la acción hidráulica del mar transporta los sedimentos de un lugar de la costa a otro. Esta situación es particularmente importante en islas, donde gran parte de la población ha vivido y continúa viviendo en zonas costeras. Dentro del contexto de ciencia ciudadana, en esta charla presento el desarrollo de mi investigación multidisciplinaria que combina geomorfología y arqueología para evaluar cómo la erosión puede amenazar un sitio arqueológico costero. El proyecto evalúa el transporte de sedimentos en la boca del Río Grande de Manatí y su relación con el sitio arqueológico Tierras Nuevas dentro de la reserva natural Hacienda Esperanza en Manatí, Puerto Rico. El sitio comprende seis bateyes pre-colombinos y colinda con playa Machuca la cual le sirve como protección contra erosión. El estudio analiza datos sedimentológicos y geomorfológicos para entender el dinamismo de la playa y si la erosión presenta una amenaza para el recurso. Esta información nos podrá ayudar a identificar el potencial de riesgo para la preservación del sitio arqueológico, para la estabilidad de las comunidades aledañas ante el cambio costero futuro, y para la preservación de las áreas naturales que componen la Reserva Natural de Esperanza.

Dibble, Loretta (Rutgers University)**[174]** *Worked Bone Harpoon Technological Persistence and Variation Through Time and Geography (Turkana/Omo Basin, Kenya/Ethiopia)*

This paper reports results from a detailed study of the variation in Holocene worked bone harpoons from the Lake Turkana/Omo Basin (Northern Kenya/Southwest Ethiopia). Bone harpoon sites in this basin span more than 6,000 years (approximately 9,000/10,000 bp through 3,000 bp). A review of the dates associated with these archaeological assemblages and the dating of sedimentary features correlated with the changing lake levels in the basin is presented along with new dates and new material from recent excavations (FxJj108) and survey in Koobi Fora, Kenya. Throughout the basin considerable spatial and temporal variation exists in features such as harpoon length, haft, barb design, and attachment styles. Post-tool production variables such as harpoon usage breakage patterns and taphonomic variation also vary from site to site. A theoretical framework of harpoon functional variation is presented to encompass environmental differences, differences in prey species, and patterns of tool use. The goal is to use the archaeological record to test the hypothesis derived from this theoretical model and to identify patterns of harpoon production and usage. How this research can connect to larger issues related to movement of peoples and the persistence and function of bone technology will be considered.

Dibble, Harold [190] see Sandgathe, Dennis

Dibble, Harold (University of Pennsylvania), Alain Turq (Musée National de Préhistoire), Laurent Chiotti (Muséum National d'Histoire Naturelle), Marie Soressi (Leiden University) and Laurent Bruxelles (INRAP)**[190]** *A Brief Review of the Work of Paul Goldberg in SW France*

There are few researchers who have achieved the breadth of experience of Paul Goldberg, whose work spans almost every continent on the planet, and from the early Pleistocene to the Holocene. There are some regions, however, that have greatly benefited from his expertise, including SW France. In this paper we will review some of his work here, beginning with his dissertation work at the site of Pech de l'Azé II, and over the past 14 years at the sites of Pech de l'Azé I and IV, Roc de Marsal, and La Ferrassie.

DiBenedetto, Katelyn (University of Nevada Las Vegas) and Levi Keach (University of Nevada Las Vegas)**[7]** *Playing with Fire at 'Ais Giorkis: A Geospatial Analysis of Prehistoric Fire Residue*

Kritou Marottou 'Ais Giorkis is an Early Neolithic (9.5 kya) site located, uniquely, in the western foothills of Cyprus' Troodos Mountains. It is one of five near contemporary sites and has produced

the largest chipped stone and faunal assemblages recovered thus far. There are also several preserved circular, cobbled platforms, whose function has yet to be determined. In fact, little is currently understood about the lifeways practiced at the site. This includes the intensity and duration of its occupation, making interpretation of the site and its past human experience difficult. To better engage with this issue, this study will employ geospatial analysis, while taking a landscape approach. It specifically examines the residue of fire activity, including the spatial distribution of both burnt chipped stone and faunal remains as well as observed ash lenses. Preliminary examination of the burnt chipped stone has revealed spatially distinct clustering at the site indicative of anthropogenic fire. The other data will be incorporated within the geodatabase to determine what differences and similarities exist between patterns. This will then be compared within the spatial location of the platforms within the local landscape to produce a more robust understanding of both 'Ais Giorkis and its inhabitants.

DiBenedetto, Katelyn [138] see Woods, Aaron

Dick, Kristina (Portland State University), Virginia Butler (Portland State University) and Sarah Sterling (Portland State University)

[168] *Database Development and GIS Analysis at Tse-whit-zen*

Digital databases promote consistency and data quality, facilitate analysis of patterning at multiple temporal and spatial scales and promote accessibility to a wide range of potential users. The value of digital databases is especially clear with large complex projects that involve collaborators working in separate research settings with different collections, but where data integration is essential to meeting project goals, such as with the Tse-whit-zen project. This presentation reviews approaches used to create and maintain the Tse-whit-zen database-- that includes faunal, chronological, and geo-spatial records of excavated deposits. Hand-drawn excavation unit-level maps were digitized and stored in a geodatabase. Spatial and temporal analytic units of various scales were defined. Through a unique identifier, the analytic units (e.g. Chronozones) were linked to the faunal and other records stored in an Access database and used as the basis for analysis calculations and visualizations. Records were visualized both in 2D in ArcMap and 3D using ArcScene.

Dickau, Ruth (HD Analytical Solutions), Javier Aceituno (Universidad de Antioquia) and Anthony Ranere (Temple University)

[186] *From Frontier to Forefront: Microbotanical Evidence of Early Holocene Horticulture in the Middle Cauca Valley, Colombia*

Archaeological research in the Middle Cauca region of Colombia has identified significant human presence during the early to middle Holocene (10,600-3600 uncal BP), associated with lithic technology focused on plant processing (e.g., handstones, milling stone bases, and "hoes"). Starch residue analysis on these tools has documented the early availability and use of several domesticates; both exogenous, such as maize (*Zea mays*) and manioc (*Manihot esculenta*), and possibly indigenous, such as achira (*Canna edulis*) and cocoyam (*Xanthosoma* sp.). The Middle Cauca valley was a conduit for the dispersal of cultigens in and out of South America by early forager-horticulturalists, who were also potentially experimenting with the domestication of local plants. These results reinforce Piperno's pioneering work demonstrating that the humid Neotropics were an early and independent cradle of plant domestication and agricultural origins in the New World.

[271] *Discussant*

Dickau, Ruth [226] see Iriarte, Jose

Dickinson, William [77] see Chiu, Scarlett

Dickson, D. Bruce (Texas A&M University)

[214] *Reinterpreting the Rise of the State in Mesopotamia as a Self-Organizing Process Engendered by the Interaction of Interpersonal Behavior and Religious Eschatology*

Anthropologists have long used “integration theory” to explain the rise of the state in Mesopotamia. This perspective, derived from functionalism, structural-functionalism, general systems, or cultural ecology, sees state emergence as a response to problems of population growth, ecological distress, competition, warfare, or the need to organize long distance trade. Integration theory is thus “top down.” That is, it posits that state governance is imposed upon a population as a social solution to one, or a series of, adaptive challenges. Largely ignored in integration theory is human agency. We propose a “bottom up” perspective that gives primacy to interpersonal interaction and religious ideology. Specifically, we posit that (a) the interpersonal behavior characteristic of irrigation agriculture in interaction with (b) the “judgmental” form of religious eschatology that is invariably present where such agriculture is practiced, engendered self-organizing or multi-agent processes that led inexorably to the rise of the state in Mesopotamia.

[214] *Chair*

Diederichs, Shanna (Crow Canyon Archaeological Center), Grace Erny (Crow Canyon Archaeological Center) and Aryel Rigano (Crow Canyon Archaeological Center)

[85] *Architectural Specialization in Basketmaker III Proto-Villages*

The foundations of Ancestral Pueblo community organization were codified in aggregated communities during the Basketmaker III Period (A.D. 500-725). This study compares morphological differences in public architecture and habitation pit structures at several aggregated sites in the Northern San Juan Region to reveal functional specialization of space associated with both long-term habitation and periodic communal gathering behavior. This specialization may reflect the primary social institutions at the household, settlement, and community levels during Basketmaker III. These patterns are then compared with specialization of structures identified at aggregated Basketmaker III sites in other regions in order to identify the origins of the Northern San Juan Basketmaker III population.

Diehl, Michael

[55] *Farmaging and the Limitations of Storage during the Early Agricultural Period at Las Capas*

The charred macroplant assemblage from Las Capas yielded one domesticate (*Zea mays*), and forty-six wild plant taxa endemic to the greater Tucson Basin of southern Arizona. These 47 taxa, their ubiquities, and their natural ranges of occurrence, indicate that the San Pedro phase and Early Cienega phase occupants of Las Capas were primarily dependent upon wild foods. Agriculture was used to mitigate the risks of food shortfalls associated with the alternative strategy of foraging for wild food plant taxa. Limitations on the utility of agriculture for producing sufficient food supplies were a consequence of the use of a very low yield variety of popcorn maize, and the absence of storage facilities capable of protecting stored food from moisture intrusion and subsequent degradation. The resulting subsistence system was likely a semisedentary one that saw multiple abandonments and reoccupations of the site each season. The particular combination of irrigation supported maize cultivation, extensive foraging, and seasonal residential mobility has no clear analog in the southwestern US ethnographic record. The term “Farmaging” is introduced to describe the Las Capas subsistence and settlement system.

[55] *Chair*

Dietler, John (SWCA Environmental Consultants), Heather Gibson (SWCA Environmental Consultants) and Benjamin Vargas (SWCA Environmental Consultants)

[175] *“A Mourning Dirge was Sung”: Community and Remembrance at Mission San Gabriel*

Recent research at Mission San Gabriel (CA-LAN-184H), conducted in collaboration with descendant communities, has identified two major types of Mission-period features related to communal mourning. In addition to the known practice of interring and memorializing the deceased in the Mission’s cemetery, archaeological data recovery excavation has identified a series of artifact-filled pits that have much in common with prehistoric and historic Native American mourning features that have been documented throughout the greater Los Angeles area. While the cemetery reflects burial practices and mortuary rites under the purview of the mission’s Catholic priests, the possible mourning feature suggests a concurrent ceremonial practice that may have derived from indigenous

ritual traditions with a long history throughout the region. Taken together, these practices allow for consideration of the complicated power dynamic within the mission setting and the ways that group identity and community may have been formed and transformed on multiple levels. When paired with documentary evidence, particularly the mission's burial journal and ethnohistoric descriptions of traditional Gabrielino burial and mourning practices, these data can provide invaluable insight into the interplay between Native American and Catholic traditions as practiced within the mission community.

Dietrich, Oliver [16] see Clare, Lee

Diggs, David [300] see Brunswig, Robert

Dillehay, Tom

[186] *Long-Distance Adoption of Exotic Cultigens in Northwest Peru: Problems and Processes*

By 7,000-6,000 BP on the coast and in the western highlands of northern Peru, several long-distance food crops, whether domesticated or not, were adopted by local communities. Most of the crops are derived from Neo-Tropical environments far to the north, perhaps in the Ecuadorian and Colombian lowlands, or from the eastern side of the Andes. The technological, demographic, and economic mechanisms and processes by which this adoption process took place are considered for several archaeological localities dating between 10,000 and 6,000 years ago. The wider social and economic implications of this process are considered theoretically and historically.

[78] *Discussant*

Dillian, Carolyn (Coastal Carolina University)

[412] *Evocative Stones: Variable Obsidian Source Use in Northern California*

Northern California contains multiple, geochemically distinct, high-quality obsidian sources that were quarried in prehistory. However, not all were exploited equally. Instead, selection patterns suggest that some obsidian sources were reserved for manufacture of specific types of objects, while others could be used for more routine tools. The geologic and cultural context of the obsidian source may offer explanations for why differential quarrying and use occurred. Glass Mountain in Siskiyou County, California, provides a case study for selective use of obsidian for special objects. Just as obsidian objects fulfilled utilitarian or symbolic functions, obsidian sources retained special roles within prehistoric contexts.

[336] *Discussant*

[412] *Chair*

DiNapoli, Robert (University of Oregon)

[233] *Despotism, Cooperation, and the Evolution of Social Hierarchy in Prehistoric Hawai'i*

Ancient Hawaiian society is often emphasized as a locus for the evolution of complex hierarchical polities. At the time of European contact, Hawaiian society was divided into a large class of commoners and a smaller class of hereditary chiefs and land-managers, the latter controlling a vastly disproportionate share of land and resources. This despotism by Hawaiian elites is regularly emphasized in discussions of the 'development of the state;' however, the high level of cooperation inherent in this social organization is not. This paper is an attempt to complement previous research by exploring the evolution of social hierarchy in Hawai'i using a suite of models derived from evolutionary ecology and evolutionary game theory, specifically, the Ideal-Free and Ideal-Despotic Distribution models, economic defendability, and models of cooperation. In particular, problems associated with large-scale cooperation in despotic social groups are emphasized as a powerful force leading to hierarchy. The predictions of these theoretical models are evaluated using the archaeological record of the Leeward Kohala region on the Island of Hawai'i.

[233] *Chair*

Ding, Julie [132] see Cirillo, Laura

Dison, Braden (The University of Alabama at Birmingham)

[7] *Exploring Land Usage at Tannehill State Park: Giving Artifacts a Context through Watershed Mapping*

Tannehill Historical State Park encompasses a resource rich environment that has supported human settlement for thousands of years. Dozens of possible sites have been identified across the park's landscape, but few are thoroughly investigated, leaving a gap in current understanding of settlement patterns and land usage in prehistoric times. Josselyn Site 2G, a large surface collection, is one site where little is known. It holds projectile points indicative of the Middle Archaic, Late Archaic, Early Woodland, and Middle Woodland Periods, indicating regular site usage of the area over of thousands of years. Little was found under the surface at this site, indicating disturbance of the artifacts from their original location, likely caused by erosion or water runoff. This project uses existing site information in conjunction with remote sensing to help expand knowledge of land use and site locations at Tannehill State Park. Digital elevation models are used to map watershed in the region, with the goal of locating the possible original context of the artifacts collected at Josselyn 2G, as well as identifying other possible site locations. It holds the potential to greatly enhance our understanding of long term landscape usage as well as human adaption within the landscape.

Ditchfield, Peter [49] see Lee, Cheng-Yi

Ditto, Emily (Univ. of North Carolina)

[22] *House Ritual in Chaco Canyon: Scale, Context, Emergent Differentiation and Inequality*

At Chaco Canyon, clear indications of social differentiation in the Pueblo world first appeared during the 9th-11th centuries. One materialization of this is the contrast between two contemporaneous architectural forms: great houses, interpreted as populous communities or largely empty centers of seasonal ritual pilgrimage, and small houses, explained as multi-family households. Since ritual artifacts have been excavated from both house categories, analyzing inter- and intra-site variation in ritual assemblages is a fruitful way to investigate the structure of Chaco society. Approaching from the intersection of materiality theory, Pueblo ethnography, and collections-based research, I explore how the differing scales and contexts of ritual in Chacoan houses, particularly cosmological scale, structured sociopolitical relations and emergent inequality. At Pueblo Bonito, objects in ritual caches index a greater breadth and diversity of cosmological phenomena than those indexed in ritual contexts from small houses. This suggests that emerging leaders used their greater control over significant materials and linked cosmological phenomena to connect themselves to potent and distinct forces within a socially valued cosmic order. By doing so in varying public and private contexts, they materialized social differences both among themselves and from small house residents and negotiated their way to greater power in Chaco society.

Dixon, Christine (Green River Community College)

[75] *Sacbe Construction, Agricultural Production, and Community Organization in the Classic Maya Community of Cerén, El Salvador*

The exceptional preservation of the Classic Maya community of Cerén, El Salvador has afforded the opportunity to examine how one group of people constructed their built environment. The remarkably well- preserved site (public and domestic structures, earthen sacbe (road), agricultural fields, plant casts, and artifacts) greatly aids in our understanding of small-scale socio-political organization. This paper draws on data collected during the 2013 field season as well as earlier research. The presence of an earthen sacbe at the site raises significant questions about labor organization, power distribution, and the relationship of Cerén to other communities in the Zapotitán Valley. Additional understanding of cooperation and autonomy is gleaned from stylistic features of the agricultural fields, the synchronized harvesting, and the physical manifestation of other decisions that farmers made. Examining these multiple features helps to illuminate small-scale socio-political organization within one ancient Maya community.

[270] *Discussant*

[75] *Chair*

Dixon, E. James (Maxwell Museum) and Kelly Monteleone

[192] *Survey for Submerged Archaeological Sites on the Continental Shelf of SE Alaska: Proof of Concept*

Four seasons (2010-14) of underwater archaeological survey (NSF OPP -#0703980 and 1108367) on the continental shelf of SE Alaska demonstrates that survey for evidence of human habitation when sea level was lower is feasible. Real time ROV monitoring and video, hydrologic excavation, airlift sampling, and graduated screening can be reliably employed for sea floor sampling following multibeam, side-scan sonar, and sub-bottom profile surveys. Limiting dates for submerged landscape features and archaeological sites can be established based on their depth in relation to regional sea level curves in combination with 14C AMS dating. This research demonstrates proof of concept for survey and testing for sites on the continental shelf pre-dating post-Pleistocene sea level rise.

Dixon, Kelly [311] see Kemp, Dylan

Doat, David (David Doat)

[299] *What Moral and Ethical Considerations Should Inform Bioarchaeology of Care Analysis?*

The aim of this presentation is to submit for discussion a proposition of an 'orientation map in ethics' which may be useful for scholars engaged in bioarchaeology of care. To this end, I present as a first step the main objections that have been raised in the literature to any attempt of inferring care toward disabled persons in prehistory. I suggest that most of these objections come from two different ethical backgrounds: a number of them are motivated by the defense of a set of values which are required by the epistemology and methodology of any scientific research, while others relate to the interpretations of the moral signification of the contents and outcomes of a bioarchaeology of care analysis. Such objections rely on another normative field, that of both scholar's philosophical and moral valuations. In relation to this short classification, I state then, on the one hand, that a bioarchaeology of care methodology is an adequate answer to any objector who fears that ethics of scientific research may not be honored in the field. On the other hand, I explain why a moral position which differs from ethical relativism in the anthropological literature can contribute to progress in the field.

Dobereiner, Jeffrey [86] see Schroder, Whittaker

Dobereiner, Jeffrey (Harvard University)

[244] *Incorporation and Independence in the Preclassic Western Maya Lowlands: Integrating Local and Regional Traditions at Rancho Búfalo, Chiapas, Mexico*

In this paper, I explore tensions between territorial integration and local resilience at Rancho Búfalo, Chiapas, a five hectare Preclassic center that was geographically intermediate to the cultural territories of the Olmec, Lowland Maya, and Pacific Coast. This site's residents employed a localized approach to extra-local architectural packages, ceramic spheres, and burial traditions that complicates traditional narratives of ethnic and political incorporation in Preclassic Southern Mesoamerica. Their continuing access to imported goods such as marine shell and chemically fingerprinted obsidian indicates that this independence did not curtail their productive interaction with broader networks of Preclassic exchange. I contextualize their ability to balance local independence and broader territorial integration by drawing upon studies of the Classic Period and modern Usumacinta River Valley, and the unique geography that has led to its multi-millennia history as a contested space. By demonstrating heterogeneity in political and cultural territories that are traditionally construed as "well integrated," I interrogate the epistemological and geographic boundaries that have been imposed by researchers on the Maya area, and Mesoamerica more broadly.

Dobney, Keith [28] see Larson, Greger

Docchio, Rebecca (University of Colorado - Denver) and Julien Riel-Salvatore (Université de Montréal)

[53] *Lithic Analysis of Late Mousterian Assemblages at Riparo Bombrini*

We present a preliminary analysis of the Late Mousterian lithic assemblages from Riparo Bombrini, in Northwestern Italy. Riparo Bombrini is an important site because it contains some of the most recent Neanderthal occupations for that region. Our analysis includes both retouched pieces and unretouched debitage, focusing especially on piece dimensions; the presence, kind, and intensity of retouch; platform and termination types; as well as raw material procurement. These multiple dimensions combine to provide a fine-grained view of, among other behaviors, Neanderthal mobility in the various Late Mousterian levels at Bombrini, and thus shed light on the adaptations and behavioral strategies of Neanderthals immediately prior to the arrival of modern humans in NW Italy.

Dockrill, Stephen [351] see Maher, Ruth

Dodd, Walter (California State University, Fresno)

[153] *Oh What a Tangled Web: The Symbolic Use of Road Trash to Advertise Drug Sales*

This paper summarizes eight years of ethnoarchaeological research into the material consequences of drug-trafficking behavior. Tens of thousands of mundane trash items have been retrieved from roadway margins in a suburban setting, then sorted and analyzed. More than 175 artifact categories and pavement features are identified that carry subtle meaning for both buyer and seller. Artifactual, behavioral, and linguistic evidence has been assembled that links individual drug types to everyday objects on the street. Sales of marijuana, crystal meth, and crack cocaine dominate the sample. Several alternative substances are also represented. Recent interview of recovering drug users has provided a crucial chance to test the soundness of ideas generated by the fieldwork. The hidden undercurrent of drug dealing in contemporary society creates a fascinating but illusory archaeological record, one that interweaves systemic and archaeological contexts in an intricate structure of crypsis and mimicry.

Dodd, Justin [333] see Olson, Elizabeth

Dodge, Robyn [248] see Sweeney, Angelina

Dodge, Robyn (The University of Texas at Austin)

[376] *Hun Tun: Household Context and Social Complexity in Northwestern Belize*

The ancient Maya site, Hun Tun is located in northwestern Belize and serves as a platform of inquiry into social complexity at the household level. This paper addresses ancient Maya commoners in household contexts while discussing data that are pertinent to ideas of household identity, social formation, and household production by re-evaluating the value of domestic space. The analysis of everyday objects in domestic contexts contributes to these data. Major archaeological features at Hun Tun will be discussed as they pertain to household archaeology and its contribution to greater Maya social complexity. Particular features challenge existing ideas about the function of hinterland domestic space. In tandem with features, material culture is also discussed as it also contributes to knowledge about the function of domestic activity areas. Such examples include ceramic analysis, various lithic material assemblages, and eccentric artifacts. The data suggests a larger scale of access and exchange for domestic household artifacts and features.

Doelle, William (Archaeology Southwest), Karen Schollmeyer (Archaeology Southwest) and Jeffery Clark (Archaeology Southwest)

[262] *Salado in the Upper Gila*

Salado archaeology in New Mexico was largely defined in the Upper Gila, where the regional name "Cliff phase" originated. Early work by Kidder and the Cosgroves in the 1920s and several professional and avocational projects in the 1960s-70s included important Salado sites. Despite this early promise many projects were underreported, and there has been comparatively little research with modern methods. Recent research by Archaeology Southwest addresses this gap. A strong base of survey and excavation in the Lower San Pedro Valley coupled with a growing understanding of the spread of Salado pottery and other markers allows us to trace Salado influence into the Upper Gila. The regional scale of Salado as the complex outcome of the Kayenta migration from the northern to the southern Southwest in the second half of the 13th century has become increasingly clear. This paper reviews the story of Salado on the scale of the Southwest and then focuses on current Preservation Archaeology efforts in the Upper Gila. Planning is ongoing to define a long-term research program that will improve our understanding of Salado's place in the larger cultural and temporal framework of the Upper Gila.

Doelle, William [278] see Clark, Jeffery

Doering, Travis [83] see Collins, Lori

Doering, Travis (University of South Florida - AIST), Lori Collins (University of South Florida - AIST) and Margo Schwadron (National Park Service, Southeast Archeological Cen)

[83] *Digital Preservation and 3D Technology Strategies for the Management, Protection, and Interpretation of the Only Existing American Revolutionary War Tunnel: Developments from the 3D Documentation Project at Ninety Six National Historic Site, South Carolina*

New strategies for archaeological preservation and interpretation are emerging from collaborative research occurring within our nation's National Park Service (NPS) System. This paper shares results from a dangerous and challenging underground confined space archaeological project documenting a Revolutionary War Era tunnel system as part of cooperative work between the University of South Florida and the NPS Southeast Archeological Center (SEAC). Using digital imaging, terrestrial laser scanning, and aerial LiDAR combined with remote sensing and GPS survey, researchers documented, prepared conditional analysis, and developed public interpretation methods that extend management, preservation, and engagement potentials that yield insight into important historical events in our Nation's history. Three-dimensional survey allows critical assessment of tunnel construction and conditions, and data are being used to create virtual models and replicas for display and educational purposes. Augmented Reality (AR), 3D Printing, and Virtual Reality (VR) models are also allowing for new and engaging teaching methods that bring our Nation's Parks to life in the classroom and beyond.

Doering, Briana (University of Michigan)

[163] *The Earliest Catch: The Origins of Salmon Fishing in the Alaskan Interior*

Ethnographic records indicate that salmon fishing was a primary activity for Athabaskan people living in Alaska's interior. Evidence of fish use in antiquity is difficult to assess due to the highly degradable nature of delicate fish bones. Fishing in the archaeological record is identified by fishing tools in addition to faunal remains. This poster will discuss the antiquity of salmon fishing in Alaska's interior through a GIS-based comparison of anadromous fish streams and evidence of fishing in registered archaeological sites in Alaska's interior. This pilot project will serve as a basis for future archaeological investigations.

Doerner, James [300] see Brunswig, Robert

Dogandzic, Tamara (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology), Karen Ruebens (MONREPOS Archaeological Research Center and Museum), Michel Lenoir (Université Bordeaux 1, Talence Cedex, France) and Shannon McPherron (Department of Human Evolution, Max Planck Institut)

[389] *Late Mousterian Industrial Variability in Southwestern France: A Case of Abri Peyrony*

Variability of late Neandertal technological behavior has been a long debated question in which sites from southwestern France figure prominently. As suggested by some, rich datasets from this region show a pattern of chronological sequencing of late Mousterian technocomplexes. According to this model that assumes technocomplexes reflect different cultural groups among Neandertals, Quina Mousterian is always followed by Mousterian of Acheulean Tradition (MTA) and discoidal-denticulate is proposed as the latest expression of Mousterian in this region. This contradicts previous views where MTA is the latest manifestation of Neandertals and represents an origin of the Châtelperronian. Re-opened in 2009, Abri Peyrony, known as an MTA location since early 1900s, yielded a rich dataset that includes numerous lithic and faunal remains, bone tools and worked manganese oxide. Aside from a known MTA level, an older level has been discovered. In terms of lithic assemblage, it shows no bifacial elements characteristic of MTA and it features predominance of discoidal system and denticulate tools. Here we will present recent analysis of lithic industries from this site and discuss its contribution to the questions of the reality of the Mousterian technocomplexes and the validity of the chronostratigraphic sequencing of the late Mousterian in southwest France.

Dogandžic , Tamara [53] see Martisius, Naomi L.

Doherty, Raymond (University of Mississippi), John F. Lieb (UA/OAR retired.) and Brad Lieb (Chickasaw Nation)

[311] *Good Fare and Tribal Affairs: The George and Saleeche Colbert Site*

The George and Saleeche (Shillich'i) Colbert site in northeastern Mississippi is an early 19th century Chickasaw occupation that has yielded extensive evidence of a well-travelled site, with a wide and prolific scatter of period artifacts, including pearlware, flintlock gun parts, wagon and harness hardware, Chickasaw pottery, trade beads, and in situ architectural foundation features. Historic documentation indicates that Colbert's home served as the Chickasaw council house, where the treaty of 1816 was concluded with Andrew Jackson. This poster compares the rich oral history of the site with the historic record, and reviews recent research along with the latest archaeological findings.

Dolan, Patrick (Washington State University) and Colin Grier (Washington State University)

[80] *Reconstructing Settlement Histories Using Simulations and Calibration of Radiocarbon Dates: An Example from a Plankhouse Village in Southwestern British Columbia, Canada*

Documenting the formation, growth, and decline of individual settlements is critical to explaining the development of settled village life. Radiocarbon dating is often the best, and in our case only, chronometric tool for establishing these temporal dynamics. Here, we explore several approaches to reconstructing the temporality of settlement at the Dionisio Point site, a precontact plankhouse village in southwestern British Columbia. Two decades of research at this 1,500 year-old hunter-gatherer-fisher village has generated more than 30 radiocarbon dates, presenting a rare opportunity to investigate the timing, duration, and, most importantly, shape of the village occupation. We employ Monte-Carlo simulation of uncalibrated dates to evaluate which of several alternative probability distributions of datable events best fits the empirical data set. We compare the results of this procedure with the summed probability distribution of calibrated dates, and consider our results in light of more recent Bayesian approaches to chronology-building. Our results suggest that using multiple methodologies offers useful insights into the complex settlement histories we seek to understand.

Dolan, Sean (University of Oklahoma)

[91] *Black Rocks Beyond the Border: Obsidian in the Casas Grandes World*

Archaeologists in the North American Southwest have documented the source provenance of obsidian artifacts throughout the Ancestral Pueblo, Hohokam, and Mimbres Mogollon regions. These results have impacted how we portray obsidian lithic technology, procurement, and social interaction at both macro and micro regional and temporal scales. Despite the methodological and theoretical advances in southwestern archaeological obsidian studies over the years, obsidian from the Casas

Grandes region in northern Chihuahua, Mexico has not been examined. Casas Grandes is the largest and most socially complex regional system in northern Mexico and the North American Southwest from A.D. 1200-1450 based on the large quantities of exotic objects, ceremonial activity, and architecture. This poster presents XRF analysis of 117 obsidian chipped stone artifacts from four Medio period Casas Grandes sites. Preliminary results suggest differences in obsidian procurement and source use at the Casas Grandes sites compared to contemporary sites further north in southwestern New Mexico with the occurrence of both local and non-local sources. This is the largest sourcing project in northern Chihuahua and these data show the importance of studying social interaction, economy, and lithic procurement using sourced obsidian artifacts to address the scale of Casas Grandes influence to the north.

Dombrosky, Jonathan [121] see Barker, Andrew

Dombrosky, Jonathan, Andrew Barker (University of North Texas), Amy Eddins (University of North Texas), Steve Wolverton (University of North Texas) and Barney Venables (University of North Texas)

[122] *Characterizing Weathered Protein Residues from an Intra-Annual Cooking Experiment: A Mass Spectrometry Approach*

The identification of archaeological protein residues from cooking pottery using non-targeted mass spectrometry based approaches is a promising avenue of research. A major strength of mass spectrometry in archaeological protein residue analysis is that it allows for the reliability of protein identifications to be probabilistically quantified. Though it is clear that proteins can preserve in ceramics under favorable circumstances, little is known about diagenetic processes that affect preservation and identifiability in less than ideal contexts. Thus, archaeologists have few expectations about what residues can be found in archaeological samples, indicating that method development using mass spectrometry in archaeological protein analysis is needed. One pressing question is: Using mass spectrometry, how rapidly do protein residues weather in clay matrices? Here, we employ experimental archaeology to address this question by burying food and protein-spiked pottery in one depositional context (Denton, TX), while extracting the pottery samples at intervals over the course of a year. We use TOC and LC-MS/MS approaches to explore how the identifiability of protein residues changes over the course of a year. Results allow us to evaluate protein identifiability, exogenous contamination, and the utility of non-targeted mass spectrometry approaches.

Domeischel, Jenna (The University of Oklahoma), Leland Bement (The University of Oklahoma) and Scott Hammerstedt (The University of Oklahoma)

[229] *Geophysical Explorations at a Reservoir Site in Southwestern Oklahoma*

The erosion and subsequent looting of archaeological materials from reservoir sites has long been a cause for concern. The damming of rivers results in the inundation of prehistoric camp and burial sites. Human remains and associated burial goods are a favorite of looters, and are frequently exposed by the rise and fall of reservoir waters. This project employs geospatial analysis of the Lake Altus-Lugert reservoir in southwestern Oklahoma to locate high-risk sites before they are exposed to looters. In addition to point plotting, surface collection, and metal detection, three geophysical methods are used, gradiometry, electrical resistivity, and ground-penetrating radar. Primarily through the use of gradiometry and ground-penetrating radar, 28 areas were pinpointed for testing. The results of this testing will assist in determining a future protocol for dealing with reservoir sites and burial recovery in this region.

Donahue, Randolph (University of Bradford)

[17] *Trollesgave: Hunter-Gatherer Social Organization during the Late Glacial in Northwest Europe*

Microwear analysis in combination with refitting and lithic reduction is applied to reconstruct the function and social organization at the Late Glacial site of Trollesgave, Denmark. Analyses of the flint knapping and the spatial distribution of its products reveal the traces of at least three individuals: expert, medium competent, and inexperienced. Based on the quality of craftsmanship and the

aberrant habits of disposing their products of the latter, there is evidence for one and possibly two children. As with Bromme Culture sites in general, the assemblage consists of primarily three types of tools. There is a strong association between these types and their use: end scrapers for dry hide scraping; burins for working hard material, primarily bone; and tanged points primarily for projectile tips. Nearly all divergence from this pattern can be referred to the activities of the children. The site appears to be occupied by a single family hunting (and fishing) unit and provides hypotheses about the social organization of other kinds of Bromme Culture sites in northern Europe.

[17] *Chair*

Dong, Guanghui [37] see Ma, Minmin

Dong, Weimiao (Lanzhou University) and Guanghui Dong (Lanzhou University)

[37] *Cereal Cultivation Shift during Qijia Culture Period in Gansu and Qinghai Province, NW China: Archaeobotanic Evidence*

Qijia period (4400- 3500 cal yr BP) is the key period for the introduction of wheat and barley originated from West Asia into Gansu and Qinghai Province, northwest China. Based on archaeobotanic and radiocarbon data from Caomaidian, Lajia, Jinchankou and Lijiaping Qijia sites, we discuss change of cereal cultivation through that period. Our results suggest only foxtail millet and common millet were cultivated in Caomaidian and Lajia sites dated to 4300-3900 cal yr BP, which account for 97.19% of crop remains in Jinchankou site (4200-3700 cal yr BP), while barley and wheat weight 2.67% and 0.15% in that site respectively, which were firstly introduced around 4000 cal yr BP. Charred seeds of foxtail millet, common millet, barley and wheat weight 69.94%, 28.21%, 14.38% and 0.40% of crop remains in Lijiaping site dated to 3700-3500 cal yr BP. Though millet crops were the most important cultivated cereal crops throughout Qijia period, new crops including barley and wheat were utilized during late Qijia period, and significance of which in subsistence strategy increased after their emergence in the area.

Dongoske, Kurt [197] see Pasqual, Theresa

Dongoske, Kurt (Zuni Cultural Resource Enterprise)

[284] *Native Americans and Archaeology Training Workshop: A Twenty Year Retrospective*

The Arizona Archaeological Council received funding from the NCPTT during its inaugural granting cycle to conduct a two day training workshop between Native Americans and archaeologists. The goal of the workshop was to promote a productive dialogue between Native Americans, Federal agency archaeologists, academic archaeologists, and archaeologists from the contracting community. Three issues were the focus of that workshop: consultation, oral tradition and archaeological interpretation, and Native Americans' role in archaeology. This presentation reviews the proceedings and the products of that workshop followed by an evaluation of the current condition of the relationship between Native Americans and archaeologists and what progress, if any, has been made in the twenty years since that workshop.

Donner, Natalia (Leiden University)

[246] *Asking New Questions to Central Nicaraguan Pottery*

Prehispanic Central Nicaraguan pottery has often been addressed as "poorly studied", or "problematic". Therefore, a lot of questions remain regarding the region's ceramic development and especially its interactions with other areas. Even though a ceramic sequence was established at the end of the 1980s (Gorin 1990, Espinoza and Rigat 1994), analyses have traditionally focused on type-variety and modal traits, concentrating primarily on decoration techniques and motifs. As a result, we lack vital technological information that will help us determine pottery production. The Leiden University project "Late Prehistoric settlement of Aguas Buenas, Nicaragua, A.D. 500-1522", directed by Dr. Alexander Geurds, is surveying several prehispanic sites in Chontales to design a series of excavations aimed to obtain ceramic samples that will be analyzed using the premises defined by the Chaîne Opératoire (Grace 1997). In this paper, we will present a general research

plan, the methodological strategies we intend to pursue, and the challenges we expect to encounter.

Donohue, Patrick [121] see Schurr, Mark

Donohue, James

[230] *Buried Middle Archaic Period Occupations on the James River at 39BE122*

Evaluative test excavations were conducted at 39BE122 for the Bureau of Reclamation. One test unit and eight backhoe trenches were excavated. Six paleosols were documented in the upper 3 m of alluvium, four of which yielded evidence for cultural components. Four to five components were found from 140 to 290 cm below surface. Radiocarbon dates of 3690 \pm 30 B.P. from Component 2 and 5140 \pm 30 B.P. from Component 4 demonstrate a Plains Middle Archaic age for the site. The size, artifact densities, and features suggest a series of residential camps.

Donop, Mark (University of Florida)

[12] *Beings from the Third Dimension: Imaging Weeden Island Effigies*

The use of 3-D imaging enhances the ability of archaeologists to record and analyze artifacts for both public and academic purposes. This study used 3-D imaging to scan a sample of ceramic artifacts collected by Decatur Pittman in the 1880s from the Palmetto Mound (8LV2) mortuary facility on the Florida Gulf Coast housed at the Florida Museum of Natural History (FLMNH). This collection consists primarily of Woodland Period (A.D. 200-1000) Weeden Island ceramics that include large portions of eccentric and elaborately decorated sherds and vessels with zoomorphic and anthropomorphic effigies. Over 400 vessels have been analyzed using standard methods that include caliper measurements, hand-drawn profiles, photography, and brief descriptions of decorative motifs. The 3-D scanner at the FLMNH was used to create digital images from a sample of 10 modeled effigies and 20 incised and punctated effigy vessels in an effort to assess the advantages of 3-D imaging before destructive analyses were employed. The study provides a digital record that can be readily accessed and an additional tool to more accurately study artifacts, in this case ceramic effigies.

Donta, Christopher (Gray & Pape, Inc.)

[281] *Small Stemmed in the Northeast: Technology and Cultural Continuity in the Late Archaic*

Small Stemmed projectile points were made and utilized across a wide area of eastern North America, and are one of the most frequent point types found in Archaic contexts in New England. Recent excavations have shed new light on associations with features, dated contexts, and other artifact types. This paper looks at radiocarbon dating of Small Stemmed features across southern New England to document the connections between this point type and others during this complex time period. These documented associations refine our understanding of the origins, time depth, and likely functions of this tool. The distribution of Small Stemmed points and the manufacturing technology both indicate origins in Middle Archaic contexts, and long-term continuity of settlement across the Late Archaic and into the Woodland period. These data address questions as to the origins of Algonquians in New England and their relationships to the greater Northeast during the Archaic.

Doolittle, William (University of Texas)

[257] *In the Spirit of Sauer and Brand: Geographic Reflections on the RSV Project*

The Rio Sonora Valley Project directed by Richard A. Pailes in the late 1970s was pivotal in contributing to our understanding of northwest Mexico. It was the first systematic archaeological research conducted in eastern Sonora since Carl Sauer and Donald Brand in the 1930s, and it precipitated later research by John Douglas, Emiliano Gallaga, Elizabeth Bagwell, and most recently Matthew Pailes. The project was not without problems, and critics. As a member of the RSV Project, and one who continued to work in the area nearly annually for the next 30 years, I share my personal insights on the long-term positive aspects that remain unappreciated. The project was not only important in terms of archaeology, but it contributed to the intellectual development of scholars who

specialize in other topics. It also raised some intriguing questions that beg to be addressed, hopefully in the near future. A few of these are reiterated in this paper.

Doonan, Roger [345] see Hanks, Bryan

Dorland, Steven (University of Toronto)

[114] *Learning Landscapes within an Ancestral Wendat Village*

This paper concerns my proposed doctoral research that focuses on learning environments within Ancestral Wendat potting communities, more specifically, the 15th Century A.D. Keffer village. My theoretical perspective is grounded in a framework of apprenticeship, and experiential philosophy that emphasizes the experience and interaction of an individual within the material world, interwoven with both social and body memory. My methodological approach consists of micro-variation analysis to identify the material traces of learning and skill acquisition, and distribution analyses to identify spatial patterns pertaining to learning frameworks. Traditional approaches to pottery in Ontario isolate "juvenile" vessels from "adult" vessels, however, this prevents learning biographies from being identified, and thus, limiting understanding of the learned experience. I focus on identifying the stages of learning required to build the skills and knowledge needed to both form and decorate pottery vessels, as ethnographic examples demonstrate that learning trajectories involve both an understanding of decoration, as well as forming techniques (see Crown 1999; 2001; Wallaert-Petre 2001; Wallaert 2012). I hope to demonstrate that my theoretical and methodological approaches will allow me to explore how knowledge, both practical and abstract, was transmitted, learned, and mastered.

Dorshow, Wetherbee (University of New Mexico), Patricia Crown (University of New Mexico, Department of Anthropology) and John Crock (University of Vermont, Department of Anthropology)

[287] *Clear Views from the Ground: 3D Modeling of Architecture and Rock Art from Chaco to Anguilla*

Airborne LiDAR and orthophotography are increasingly ubiquitous in modern archaeological research, particularly at the regional scale. For detailed intrasite analyses of architectural sites, rockshelters, and caves, however, these airborne technologies offer limited utility. This paper highlights the significant research potential and conservation value of very high-resolution terrestrial LiDAR and gigapan HDR photogrammetry for architectural and "built" cultural dwelling places. Drawing on two unique case studies from the American Southwest and the northeastern Caribbean, we explore the benefits of very high-resolution 3D modeling, visualization and analysis afforded by these increasingly affordable, relatively user-friendly "terrestrial" technologies. The first case study focuses on 3D laser scanning and spherical panoramic HDR photography within Room 28 in Pueblo Bonito at Chaco Canyon. Room 28 is notable for the discovery of hundreds of ceramics vessels in the burned room, including the majority of Chacoan cylinder jars. The second case study entails laser scanning at two Amerindian ceremonial cave sites in Anguilla in the Lesser Antilles, one of which (Fountain Cavern), was previously nominated as a UNESCO World Heritage Site. Analysis-based discoveries and extremely accurate digital reconstructions derived from these studies show significant potential for understanding, documenting and protecting rare, inaccessible and unique sites such as these.

Dos Santos, Isabel (Isabel Teixeira-Santos), Luciana Sianto (Luciana Sianto), Sheila Mendonça de Souza (Sheila Mendonça de Souza), Adauto Araújo (Adauto Araújo) and Sérgio de Miranda Chaves (Sérgio Chaves)

[415] *Analysis of Food Remains in Human Coprolites from Furna do Estrago Prehistoric Site, Pernambuco State, Brazil*

The identification of human food remains from archaeological sites contributes to paleonutrition and paleoepidemiology studies, shedding light on key aspects of human biological evolution and cultural changes. In the present study, macroscopic and microscopic food remains were recovered from human coprolites from Furna do Estrago, Pernambuco State, Brazil. The remains are dated between 1,860 +/- 50 and 1,610 +/- 70 years BP. The region may have been subjected to harsh

environmental conditions periodically in the past. During these times, human groups may have been subject to food shortages and consequently drew on alternative food sources. The study seeks to understand diet alternatives and strategies used by this group during such periods. Based on analysis of microscopic remains, plants were widely used as food sources by the group that buried their dead at the rock shelter, both by the predominance of such items in the analyzed samples, and by the identification of plant resources in the site vicinity. It is necessary to understand the relationship between the natural and social environments, that is, the possibility of selection and distribution of resources beyond the natural supply and their potential use.

Doucette, Dianna [281] see Flynn, Erin

Doucette, Dianna (The Public Archaeology Laboratory (PAL))

[281] *Evaluating Archaic Period Settlement and Subsistence Patterns in Relation to Ecosystem Dynamics in New England*

This paper summarizes preliminary data and interpretations of Archaic Period land use patterns in relation to environmental dynamics within Massachusetts. This analysis is a component of a larger NSF-funded research project intended to analyze the drivers of and responses to ecosystem dynamics in the New England region. This project aims to better understand the dialectical relationship among human activity (fire, land clearance, horticulture), vegetational dynamics, and climate. The following are the specific alternative hypotheses examined in this three-year project: (1) changes in vegetation were the result of cultural development or "evolution"; (2) people passively responded to environmental change, contributing minimal ecological impact themselves; and (3) vegetational histories demonstrate the clear influence of human agency, with different drivers and responses in different cultural contexts. We present comprehensive archaeological and ecological data for the state of Massachusetts as a whole, and our more intensive analysis of three sub-regions within the state: Martha's Vineyard, the Taunton River Drainage Basin, and the Deerfield Valley—representing three distinct ecological zones.

[281] *Chair*

Dougherty, Sean (MATC) and Akira Tsuneki (University of Tsukuba, Japan)

[205] *To Snatch the Baby from Its Mother's Lap: Infant Mortality and Maternal Health at Tell el-Kerkh, Syria*

The injurious effects of the agricultural transition on health have been well documented. However, contributions from the Near East are relatively uncommon. Excavations at the Pottery Neolithic cemetery at Tell el-Kerkh in northwest Syria provide an opportunity to study into the effects of the agricultural transition in this less examined region. The cemetery sample consists of 258 individuals. The mortality profile reveals high infant mortality, with 40% of the sample dying before the first post-natal year. Thirty-six individuals were observed with enamel defects. Most developmental disruptions are estimated to have occurred between 3.5-5 years. Both cribra orbitalia or porotic hyperostosis were observed among 22 individuals, and were associated with early mortality. At Tell el-Kerkh, the increased reliance on agricultural resources, and the population changes that followed, did not come without deleterious consequences to health, particularly for the youngest of the community. The observed juvenile mortality and morbidity may be linked to heterogeneous resistance to acute and chronic disease, parasite loads, and malnutrition. The high frequency of early infant death observed at Tell el-Kerkh, while perhaps expected, further suggest the presence of multiple stressors of maternal health, such as limited dietary resources and culturally embedded expectations of high fertility.

Douglas, Matthew [94] see Magnani, Matthew

Douglass, John [175] see Hull, Kathleen

Douglass, John (Statistical Research, Inc.)

[175] *Community Formation and Integration in Colonial Alta California*

Community formation and integration in colonial settings has traditionally been viewed from the binary perspective of colonists and native people. This session views the concept of community in colonial Alta California (1769-1834) from more holistic and alternative viewpoints. To set the stage for this discussion, this introductory paper offers an overview of the sociopolitical landscape in colonial Alta California and presents a broad discussion of the concept of "community" as it may pertain to the region. How were communities formulated and integrated in colonial settings such as Alta California? Communities are not natural creations, as there are inherent tensions and conflicts within groups, whether by age, gender, ethnicity, or other constructs. What were the geographic and social scales of community seen in colonial settings? Were there "imagined" communities and, if so, in what settings and situations did they emerge? In what ways did multiethnic communities emerge within traditional colonial settings such as pueblos? Drawing primarily on ethnohistoric resources, a case study of the Pueblo of Los Angeles, serves to demonstrate the multi-faceted concept of community and the nature of multiethnic interactions and community formation colonial Alta California.

[175] *Chair*

Douglass, Kristina (Yale University)**[339]** *Early Human-Environment Dynamics on the Southwest Coast of Madagascar*

This paper discusses early occupations of the southwest coast of Madagascar and the impact that human subsistence practices may have had on the highly endemic spiny forest biome. A major transformation of Madagascar's environment post-human arrival is the extinction of a suite of mega fauna species. Ongoing work on the spread of domesticates throughout the western Indian Ocean will certainly improve our understanding of Madagascar's settlement history, but little is known to-date about the earliest arrival of invasive species on the island and the role invasives may have played in contributing to mega fauna declines. Though not as early as forager occupations recently uncovered on the north coast of Madagascar, the sites discussed in this paper also appear to be seasonal forager camps with low artifact densities. Thus far, excavations have yielded little, if any, evidence for the presence of invasive plants and animals. Instead these sites reveal a heavy reliance on endemic wild taxa. Evidence for the exploitation of the now-extinct ratites of Madagascar indicates that foraging for ratite eggs may have contributed to population declines, but the introduction of domesticates like chicken and cattle to the area appears to be a recent phenomenon.

Dover, Thomas [377] see Cioffi-Revilla, Claudio

Dowdall, Katherine [383] see Elliott, Evan

Dowdall, Katherine, Otis Parrish (Kashaya Pomo Tribe), Margaret Purser (Sonoma State University) and John Wingard (Sonoma State University)**[392]** *The Kashaya Pomo Cultural Landscape Project: A Community-Based Approach*

In order to more effectively co-steward Kashaya Pomo cultural resources, the California Department of Transportation and the Kashaya Pomo Tribe conducted a multi-year community-based cultural landscape study. This study documents that for some as yet immeasurable time back into antiquity, the lives of Kashaya ancestors were structured by a landscape that included burn-managed ecosystem components, clearings for villages and other Kashaya places, trails, and boundaries. Their accumulated bank of multigenerational landscape labor and knowledge structured the lives of, and benefited, each subsequent generation up to the present. This study also documents the enduring relationship that modern Kashaya tribal members have with their ancestral homeland, regardless of their proximity to it, and the importance of it to their cultural identity and well-being. Links between Kashaya tribal members and their places, between the past and the present, and between tangible and intangible heritage, have broadened our view of what is to be stewarded and how. We now see a vital part of stewardship to include protecting the linkages between the Kashaya community and their heritage in ways that support their identity in the present.

Downes, Jane [351] see Maher, Ruth

Downey, Jordan (University of Western Ontario) and Jean-François Millaire (University of Western Ontario)

[404] *Anchoring the Absolute to the Relative: Recent Chronological Research in the Virú Valley, Peru*

For decades north coast specialists worked within a paradigm that viewed the Moche as an expansionist state. Moche fineware was regarded as a reliable indicator for dating this polity's imperialism over its neighbors, an idea that traces its roots to the Virú Valley Project of the 1940s. Extensive recent field research has led many to question this colonial model, however, and to propose other, more fragmented, geopolitical scenarios. This shift has both undermined the universal usefulness of using finewares like Moche for building chronologies and constructing political histories, and also underscored the need for refined chronologies in each valley. This shift led us to question the accuracy of the original Virú Valley seriation and to develop a program of radiocarbon dating in Virú. In this paper we present results from this program that shed light on the political histories and foreign policies of the Virú and Moche polities during the Early Intermediate Period.

Downs, Mary (National Endowment for the Humanities)

[68] *Discussant*

Doyel, David (Estrella Cultural Research)

[229] *The Earliest Known Occupations of the Globe Highlands in Central Arizona*

Excavations along Pinal Creek north of the Town of Miami in the Globe Highlands of central Arizona have identified a lengthy settlement history extending several thousand years from the Archaic period to the historical Apache occupation. The focus of this paper is on the earliest known periods of occupation identified by excavation. A preceramic component consisted of a structure fragment and a pit from which maize was recovered that produced a date of 790-415 B.C. E. (calibrated two-sigma), which could be the earliest dated structure in the area. Several temporally associated dart points, including a Cienega-type, were also present. This Late Archaic manifestation could be attributed to the Cienega phase of the of the Early Agricultural period within recent chronological schemes. A nearby Early Ceramic component included two structures, several partial ceramic vessels including a seed jar, and other artifacts. Three associated inhumation burials may represent the earliest-known mortuary features in the Globe Highlands. This component appears to date to the late seventh-to eighth century. These early cultural and technological complexes will be placed within the context of the human settlement history of the region.

Doyle, Sean (McMaster University), Tristan Carter (McMaster University) and Daniel Contreras (Kiel University)

[215] *Archaeological Visibility at Stélida, Naxos: Identifying Activity Hubs at a Palaeolithic Chert Quarry in the Cyclades*

This paper details the methodology used by the Stélida Naxos Archaeological Project (SNAP) to distinguish primary activity areas within a Palaeolithic chert quarry. This work is undertaken in a challenging artifact-rich landscape that has undergone significant post-depositional modification through various environmental factors and anthropogenic disturbance. The two-year non-invasive survey involved walking numerous transect lines to produce a broad-stroke impression of artifact density, which were followed by intensive grid collections in recognized 'hot-spots'. This strategy was supplemented by grab samples of key diagnostic pieces discovered outside of the standardized collection units. Chert outcrops were mapped and sampled to gauge variability in the raw materials. Degree of slope and vegetation cover were recorded throughout, together with noting 'artifact trap' locations such as historic terrace walls and donkey paths, along with all instances of human disturbance including bulldozed tracks, clay pits, and buildings. These systematically documented data are then interrogated using GIS weighted overlay tools and other spatial analysis techniques in an attempt to analyse post-depositional effects and map areas of Lower and Middle Palaeolithic activity (quarrying, tool production). The paper offers some preliminary conclusions, and charts

alternative and supplementary techniques that will be employed in the future.

Doyle, Shane [236] see Alegria, Crystal

Doyle, James (The Metropolitan Museum of Art)

[244] *Preclassic Maya Territories and Boundaries*

Many Classic period (ca. A.D. 250–900) polities owe the location of their royal courts to decisions made by settlers in the Preclassic period (ca. 1000 B.C.–A.D. 250). This presentation evaluates the basic question of whether there is evidence of territories or political boundaries in the Preclassic Maya Lowlands. In the past, I have argued that Middle Preclassic residents constructed monumental E-Group architecture at specific places on the landscape as a conscious creation of distance between themselves and their neighbors. I based my conclusion on viewshed analysis that showed that early communities had complementary visible access to the landscape, in other words, non-overlapping views when measured from the E-Group. Here I interrogate the meaning of the perceived distance or implied boundaries between these monumental centers.

I include the latest evidence from ceramic production. The Mamom sphere ceramics, produced for several hundred years across the Maya Lowlands, complicate the question, as we lack any long-range studies of regional or polity-scale differences in the raw materials, production technology, or surface decoration of these vessels. I also reexamine the original data set of similar plazas and pyramidal architecture in the Middle Preclassic given new discoveries in recent years.

Drake, Lee [3] see Thomas, Jayne-Leigh

Drane, Leslie (Indiana University) and Joel Lennon (University of Illinois)

[173] *The Study of Temper and its Wider Implications at the Cahokian Lunsford-Pulcher Site*

Lunsford-Pulcher (11-S-40) is a Mississippian mound center located in the American Bottom, near modern day Dupo, Illinois. To date there has been limited excavation and analysis conducted at this important ceremonial village. For this study, 181 rim sherds from a surface collection by Timothy R. Pauketat and Bobby Pauketat were analyzed and then compared to other nearby Mississippian sites (the Washausen, Peiper, and Morrison sites), with a focus on the differences in temper usage. This paper will provide insight into whether people at Lunsford-Pulcher were less inclined to participate in particular Mississippian technological and aesthetic changes in comparison to surrounding sites through our examination of the stylistic and morphological ceramic differences. We investigate how Lunsford-Pulcher people may have used temper to express the fluid ontologies of their diverse population. Researching sites like the Lunsford-Pulcher is a necessary endeavor if we wish to further comprehend the assembling practices and ideologies that were present before and during the rise of Mississippian prominence.

Drane, Leslie E. [188] see Frazier, Mechell

Drelich, Jaroslaw [126] see Scarlett, TimothyJames

Drennan, Robert (University of Pittsburgh), Adam Berrey (University of Pittsburgh) and Christian Peterson (University of Hawai'i)

[36] *Elite Ambitions, Public Works, and Political Consolidation: A Comparative View*

We are accustomed to temples, platforms, plazas, tombs, statues, fortifications, raised fields, or other large-scale constructions as archaeologically conspicuous signs of the successes of early complex societies. Archaeologists often assign major roles to such public works in creating social cohesion and extending elite power. This may be a consequence of material benefits, such as increased agricultural production or protection from attack, or it may represent the materialization of politically useful ideology so as to strengthen or extend it. A broadly comparative empirical view makes it clear, however, that larger, more elaborate, and more costly public works do not necessarily

correspond to larger-scale and more successful political consolidation. Some especially impressive examples may instead indicate highly precarious political circumstances. There is a delicate balance of forces between ambition, power, resources, and resistance. Successful elite strategies can contain the seeds of their own destruction if they eventually upset this balance. The balance can also be altered, either to the benefit or the detriment of elites, by forces impinging from outside.

Drennan, Robert [82] see Peterson, Christian

Drew, Brooke [301] see Epstein, Emily

Drew, Brooke (University of Wisconsin-Milwaukee)

[301] *Who, What, Where, When and How: A Comprehensive Archival Investigation of the Milwaukee County Institution Grounds Cemeteries, 1882-1925*

Since its discovery during the original 1990s excavations, the Register of Burials at the Milwaukee County Poor Farm Cemetery has been the foundation for most historical and archaeological research involving the Milwaukee County Poor Farm Cemetery. Until recently the register was considered a complete listing of most, if not all, burials on the Milwaukee County Grounds between 1882 and the final burial in 1974. However, new excavations during the summer of 2013 as well as comprehensive archival investigations of Milwaukee County death certificates and coroner's inquests have shown that the burial activities on the county grounds were far more complex than the register suggests. This paper provides a summary of the archival findings including a detailed demographic profile of the burial population. A comparison of this data with that generated solely from the register will highlight the potential pitfalls of relying on a single documentary source. In addition, a brief discussion of how this comprehensive archival research will allow this author to identify individuals from this unmarked pauper's cemetery will be provided.

Drine, Ali [51] see Barnard, Hans

Driscoll, Killian (Université de Montréal), Adrian Burke (Université de Montréal), Gilles Gauthier (Université de Montréal), Graeme Warren (University College Dublin, Ireland) and Stefan Bergh (National University of Ireland, Galway)

[185] *The Irish Lithic Landscapes Project: Current Chert Provenancing Research in Prehistoric Ireland*

The Irish Lithic Landscapes project is investigating the places where prehistoric communities obtained the raw materials for their flaked stone tools during the Irish Mesolithic, Neolithic, and Early Bronze Age, which dates to c. 8,000–2,000 B.C. While Ireland has a very rich archaeological heritage, there is a significant gap in the island's raw material sourcing research. This project will begin to fill this gap, and therefore deepen our understanding of the prehistoric communities there. The 2014 geoarchaeological prospection for the project centered on the northwest of Ireland, which includes case study assemblages from domestic sites and ritual sites such as megalithic tomb complexes. During 2014 we collected 350 geological samples from over 400 survey points, which included examining c. 250 outcrop groups. The present analysis is using non-destructive energy dispersive X-ray fluorescence (ED-XRF) as a first-order technique to determine chert whole-rock geochemistry, which will be followed by petrographic analysis on a sub-sample of the collection. A significant part of this project is the creation of a lithoteque reference collection of Irish cherts; this will be physically housed at the UCD School of Archaeology, Ireland and accompanied by a web-based, spatial database, open for use by other researchers.

Driver, Jonathan (Simon Fraser University) and Karen Schollmeyer (Archaeology Southwest)

[85] *Intensive Archaeological Sampling for Fine-Grained Resolution of Human-Environment Relationships: Fauna from the Sand Canyon Locality and the Central Mesa Verde Region*

In the Mesa Verde region of the southwest USA the intensity of archaeological excavation, coupled with good preservation and high-resolution dating, creates an unusual opportunity to examine spatial and temporal variation in faunal assemblages. We examine methodological issues associated with

the analysis of hundreds of assemblages in a small region, and show how thoughtfully selected data provide opportunities to study a number of phenomena, including: differential human impact on animal species; direct and indirect human impacts; introduction of domesticates; the role of landscape heterogeneity; use of rare species.

Drollinger, Harold [311] see Beck, Colleen

Druc, Isabelle (University of Wisconsin-Madison)

[79] *Rojo Grafitado Is Not Graphite. A Slow-Science Interpretation of the Production of an Andean Ceramic Style*

Building upon the slow-science movement, and the work of Olivier Gosselain and others, this presentation examines how our understanding of ancient ceramic production depends upon the path a research may take. It argues for a re-articulation and re-evaluation of qualitative observation, small number of samples and quantitative data. The Rojo Grafitado case presented arose from research hazards, curiosity, and a regional perspective on ceramic production. During the first millennium B.C. in the northern Peruvian Andes, finely decorated Rojo Grafitado wares appeared in small numbers in different ceremonial centers. The paste and surface of a few of these wares have been recently analyzed and the petrographic results point to a non-local provenance, while the technology and paste recipe appear to be similar in the cases observed. In addition, an SEM-EDXRF analysis suggests that the black pigment used for surface decoration is not graphite, but manganese. Triangulating macropaste analysis, petrography and SEM analysis, with geological, stylistic and ethnographic data allows us to postulate the existence of specialists, operating from a particular region, and producing a specific type of ware for a particular clientele. Such a production scheme has not been identified yet for this early time period in the Andes.

[411] *Chair*

Dubois, Jonathan (UC Riverside)

[149] *Exchanges in Stone: Tracing the Influence of Amazonian Peoples on Andean Ones as Expressed in the Rock Art of Huánuco, Peru*

Recent fieldwork documenting hundreds of rock art panels in the region of Huánuco, Peru has allowed the author to begin to establish a more finely tuned chronology than has previously been possible. The process of revealing this chronology involves stylistic seriation using such features as color, line thickness, superpositions, and preference for particular design features during certain periods and in certain groups. One of the surprising revelations of this work has been the widespread penetration of Amazonian ideas expressed in iconography into seemingly remote parts of the Andes. This paper will begin with a discussion of the chronology, including the methodology involved. I will go on to explore the timing and nature of Amazonian influence in the Andes as expressed in rock art. The present research has revealed a strong similarity between the style of paintings on large boulders beside rivers in the highland Andes and those carved onto similarly located boulders in the Amazon. The presence of Amazonian iconography has also been detected at multiple highland locations. I will conclude by exploring some of the implications these revelations have for Andean archaeology and anthropological archaeology in general.

Dubouloz, Jérôme [211] see Weller, Olivier

Dubreuil, Laure [342] see Nadel, Dani

Ducette, Dianna L. [281] see Ort, Jennifer

Dudgeon, John [52] see Hernandez, Nicole

Dudgeon, John (Idaho State University - CAMAS), Rebecca Hazard (Idaho State University - CAMAS) and Amy Commendador (Idaho State University - CAMAS)

[233] Further Evidence for a Terrestrial-Focused Protein Diet in Prehistoric Rapa Nui

Previous analyses of subsistence activities on Rapa Nui generated new classes of data to explain human persistence on this remote, subtropical and ecologically-marginal island. Even compared to other small to medium-sized islands in Eastern Polynesia, Rapa Nui appears anomalous for several reasons: 1) an apparent shift away from marine protein sources, determined from stable isotope analysis of bone collagen, and 2) a far greater reliance on a single terrestrial carbohydrate (*Ipomoea batatas*), determined from microfossil phytolith and starch evidence. Here we report our efforts to extend this interpretive framework using next-generation sequenced amplicons from commensal species recovered from dental calculus. These data are compared with existing zooarchaeological sequence data from two Rapa Nui commensals (*Rattus exulans*, *Gallus gallus*) and modern marine taxa to further evaluate the terrestrial-focused subsistence hypothesis.

Dueppen, Stephen (University of Oregon)**[23] Opening the House: Transforming Identities at Kirikongo over the 1st and 2nd Millenniums CE (Burkina Faso, West Africa)**

Located at the intersection between Voltaic and Mande historical traditions, contemporary western Burkina Faso (West Africa) is a complex cultural mosaic in which local identities transcend linguistic boundaries and cultural practices, exemplifying the difficulties of employing bounded social categorizations in anthropological archaeology. The site of Kirikongo, located in this region and occupied continuously between 100 and 1700 CE provides an important case study to explore the changing nature of identities in a village community. Over time, inhabitants negotiated individual, house, village and regional identities in the context of growing and in-migrating populations at the level of the village and the greater region. This paper examines multiple dimensions of this dynamic and on-going process of identity formation in the past of Kirikongo with particular attention to durable and changing concepts of space and time. Through the analysis of multiple classes of material culture, it explores the complexity of social categories in the ancient community, as the membership of some social groups became more bounded (e.g., hereditary occupation groups) or open (e.g., houses) within the context of a general trajectory of increasingly permeable community and ethnic identities.

Dufeu, Val [155] see Werner, Roger

Duff, Andrew (Washington State University)**[22] Discussant**

Duff, Andrew [274] see Satterlee, Ashton

Duffy, Chris [32] see Jazwa, Christopher

Duffy, Lisa (University of Florida) and Timothy Garrett (University of Florida)**[248] Investigating Ancient Beverages from Cerro Maya, Belize through Chemical Residue Analysis**

Ceremonial vessels used by the ancient Maya are common archaeological findings, and are thought to have contained beverages made from cacao, maize and other plants of ritual and economic importance. Increasingly, methods of chemical analysis able to detect trace levels of organic compounds are being applied to the investigation of these artifacts. Two whole pottery vessels from the site of Cerro Maya, Belize were selected from the collection at the Florida Museum of Natural History at the University of Florida to undergo mass spectrometry. Goals of this testing were to determine if any chemical traces were recoverable and identifiable that would help reveal what ingredients may have been included. Both vessels were from well protected burial contexts and were in good preservational condition. One had undergone field washing and curation, while the other was unwashed. Both vessels underwent ultra-high performance liquid chromatography-high resolution mass spectrometry at the University of Florida. Results from both items were positive for multiple

chemical biomarkers associated with cacao and other ingredients. Among the implications of these results are that washed pottery artifacts in museum collections may be a valuable source of such information.

Dufton, J. Andrew [385] see Gosner, Linda

Dugmore, Andrew (University of Edinburgh)

[351] *Landscape Stability, Environmental Resilience and Anthropocene Transformations in Iceland*

Before the Norse settlement, Iceland was characterized by substantial areas of birch woodland in sheltered valleys, highland willow tundra and birch-willow scrub extending into more exposed areas of upland, coast, and marginal wetlands. Terrestrial mammals had been eradicated by Quaternary glaciations. Aeolian sediment accumulation rates were low and correlated over kilometer-scales. Rapid colonisation by the Norse and their introduction of domesticated animals triggered a rapid change in some environmental processes. In the first four centuries after settlement woodlands were cleared, grassland expanded, soil erosion developed, aeolian sediment accumulation rates increased and spatial variability of Earth surface processes intensified. These changes may have enhanced pastoral productivity and societal resilience in the face of climate change. Tephrochronology enables us to understand these transformations in detail, track change across the landscape and correlate episodes of landscape change with putative drivers of subsistence strategy, economic practice and climate. This helps us to understand when humans became dominant drivers of change, and the implications of this development in the interplay of resilience, sustainability, climate and society.

[288] *Discussant*

Duke, Hilary (IDPAS, Stony Brook University, New York) and Sonia Harmand-Lewis (Turkana Basin Institute, Stony Brook University)

[53] *New Data from Old Stones: A Technological Pilot Study of Lithics from Kokiselei 6 (1.8 mya) in West Turkana, Kenya*

Behavioral variability is a cornerstone characteristic of *Homo sapiens* that evolved among earlier hominins. Archaeological lithic evidence records changes in hominin behavior and knowledge systems over time. Major changes are evident among lithic assemblages ~1.76 mya in Africa, with the emergence of large, bifacial, core tools (e.g., handaxes). This technology shows marked change from earlier assemblages, conforming to different reduction strategies. The behavioral and cognitive implications of these changes have been topics of debate for several decades. To test hypotheses about the origins and long persistence of this technology, we need comparable technological data for the periods preceding and concurrent with these assemblages. The Kokiselei complex in West Turkana preserves sites amenable to studies of Early Pleistocene (EP) lithic technological variability. Kokiselei 6 (KS6) is one of the largest, densest and best spatially preserved EP (1.8 mya) sites in Africa, with two distinct stratigraphic layers. This paper presents pilot data on lithic technology from KS6, penecontemporaneous with Kokiselei 4, a site with the oldest-dated evidence for bifacial technology (1.76 mya). Forthcoming technological analyses of lithics from Kokiselei sites will facilitate the measurement of technological variability and change during a key phase in hominin behavioral evolution.

Duke, Daron (Far Western Anthropological Research Group)

[87] *Haskett Spear Points and the Plausibility of Megafaunal Hunting in the Great Basin*

Recent Haskett projectile point finds from western Utah's Great Salt Lake Desert provide a compelling case for megafaunal hunting in the Great Basin, a region that stands out in North America for its lack of direct evidence. The Haskett style is likely the oldest representative of the Western Stemmed series of projectile points, and radiocarbon age estimates on black mat organics at the locality suggest a date range between ca. 12,000 and 13,000 cal BP. In this paper, an argument for megafaunal hunting is constructed for critical examination against alternatives. Images and technological attributes for the collection are presented, including one 22.6-cm specimen that is the longest Haskett point documented archaeologically and another that tested positive to

proboscidean antiserum via protein residue analysis.

Duke, Riley (University of Arizona) and Stacy Ryan (Desert Archaeology, Inc)

[278] *Black and White and Shades of Gray: Projectile Points and Bifaces from the Dinwiddie Site, Southwestern New Mexico*

During Archaeology Southwest and University of Arizona's 2013 and 2014 field school seasons, close to a hundred bifaces were recovered from the Dinwiddie site, a Cliff phase (A.D. 1300-1450) Salado site in southwestern New Mexico. These artifacts include Archaic and late Pueblo period projectile point styles and several bifaces interpreted as having been discarded during the manufacturing process. This poster presents the biface and projectile point analyses results, expanding on a study initially conducted for the 2014 Upper Gila Preservation Archaeology field school public outreach project. The discussion focuses on the temporal and cultural associations of the recovered projectile point types and identifiable evidence for on-site point production. Differences and similarities among the three loci excavated at Dinwiddie are examined, and comparisons are made with previously excavated Cliff phase sites in the Upper Gila region. Located only 30 km from the Mule Creek obsidian source, obsidian bifaces are most common at Dinwiddie, followed closely by locally available chalcedony. Procurement strategies and possible social contacts are discussed using the results of obsidian XRF analysis.

Duke, Guy (University of Toronto), Victor Vásquez-Sánchez (Centro de Investigaciones Arqueobiológicas y Paleo) and Teresa Rosales-Tham (Centro de Investigaciones Arqueobiológicas y Paleo)

[347] *Putting Archaeobotany Under the Microscope: A Case Study for Increased Use of Starch-Grain and Residue Analyses on the North Coast of Peru*

Due to the arid environment and subsequent excellent preservation on the north coast of Peru, evidence obtained from macrobotanical remains has been the primary source of information on plant use. However, despite the richness of the macrobotanical record, the combination of arid conditions and the nature of many plants, such as potatoes and beans – which are consumed in their entirety – macrobotanical remains can only tell us so much. In this paper, we discuss some methodological issues in north coast Peruvian archaeobotany, specifically the over-reliance on macrobotanical analyses and the relative under-use of starch grain and residue analyses. We discuss starch grain evidence from Wasi Huachuma, a Late Moche site in the Jequetepeque Valley, including traces of potato from a grinding stone and a cooking pot. Prior to this, no physical evidence of potato had been recovered from Moche contexts despite Moche iconography featuring potatoes. This indicates that macrobotanical analyses alone are insufficient for uncovering the spectrum of foodstuffs utilized by the Moche. We argue for a more rigorous and consistent application of starch grain and residue analyses, in order to obtain as much information as possible about past plant utilization, rather than relying on macrobotanical remains alone.

Dull, Bryan (University of Minnesota), Mark Schurr (University of Notre Dame), Terrance Martin (Illinois State Museum) and Tamatha Patterson (University of Notre Dame)

[331] *A Hunter's Paradise: A Zooarchaeological Analysis of Hunting Practices in the Kankakee Marsh*

From about 16,000 B.C.E. to the early 20th century, the Kankakee Marsh was a vast wetland covering about a million acres in northern Indiana and Illinois. Today the marsh covers about one percent of its original area. After Removal Period, the marsh was famous among hunters for its abundant populations of fur bearing mammals and waterfowl. A regional analysis of the Kankakee Marsh is conducted to analyze the intersite variability of the faunal remains recovered. These sites date from the Archaic to the protohistoric. The data are then compared with primary historical sources in order to assess the ways that faunal populations changed over time. This research contributes to a broader understanding of past foodways, as well as to the discourse on the impact human societies have on animal populations.

Dumas, Ashley (University of West Alabama)

[109] *Eighteenth-Century Choctaw Pottery from Fort Tombecbe*

The French established Fort Tombecbe in 1736, in part, to secure their relationship with the eastern Choctaw. Over the following twenty-seven years, thousands of Choctaws visited the fort to trade, and, by 1763, a large town was located nearby. Choctaw pottery recently excavated from French components at the fort adds to a regional and offers insights into the relationship between the Choctaw and French during the middle of the eighteenth century at a remote frontier fort.

Dumitru, Ioana A. [287] see Harrower, Michael

Duncan, William (East Tennessee State University), Gabrielle Vail (New College of Florida) and Prudence Rice (Southern Illinois University Carbondale)

[158] *Fire and Smoke in Postclassic Petén: Human Remains, Deity Effigies, and Codices*

Fire and smoke were fundamental ritual forces in the Mesoamerican religious worldview. Found in varied contexts (funerary processing, animation ceremonies, and desecratory rituals), fire and smoke were applied to multiple media (human bodies, architecture, and ceramics). In the Postclassic (A.D. 950–1524) Maya lowlands, burning both processed honored ancestors' remains and violated enemies' remains. Ceramic incense burners with deity effigies were used to burn resins to communicate with supernaturals. Here we consider whether fire and smoke were applied in similar fashion to human bodies and censer effigies in the Petén lakes region of northern Guatemala during the Postclassic period. Specifically we document and compare (1) archaeological contexts in which human remains were burned (or have associations with burning), (2) archaeological contexts of ritual use of effigy censers, and (3) descriptions of ritual contexts involving the use of fire and smoke from codices and ethnohistoric and ethnographic accounts. Comparing human remains to representations of bodies suggests that both were subjected to similar ritual processes but that the former were particularly necessary under some political, and religious and calendrical circumstances.

Duncan, Neil (Stanford University)

[226] *The Nature and Status of Paleoethnobotany*

How does one honor the greatest generation of paleoethnobotany? It should not be difficult. What they have accomplished is no less than establishing paleoethnobotany as fundamental archaeology. Their cutting edge approaches succeeded in keeping scientific methodology in archaeology throughout the discipline's theoretical paroxysms, all the while keeping the "ethno" in paleoethnobotany. The next generation of paleoethnobotanists is already building on their mentors' successes by further advancing scientific approaches to phytolith, starch grain, and plant remain studies, working toward greater integration of these approaches, and acting as essential researchers in multidisciplinary archaeological investigations. This paleoethnobotany that the greatest generation established is set to keep advancing, although hurdles stand in the way. In this presentation, I will explain what I believe to be some of the issues facing the next generation of paleoethnobotanists, significantly, the loss of major laboratories and academic attrition, and what I hope the future nature and status of paleoethnobotany will be.

[271] *Discussant*

Duncan, Lindsay (University College London) and Elizabeth Graham (University College London)

[350] *Waste Not, Want Not: A Multi-Proxy Perspective on Soil Formation at Marco Gonzalez, Ambergris Caye, Belize*

Set in a coastal wetland environment, Marco Gonzalez—to paraphrase the session abstract—is a repository of sediments, fauna, artifacts and plant remains, pertinent to an understanding of human-environment interactions. Marco Gonzalez is also an area of naturally occurring coral sand, grasses and sedges that has been transformed over time into cultivable land. Our preliminary results indicate, however, an inadvertent, rather than planned, transformation. Nonetheless, the site can be characterized by a distinctive interaction of nature and culture that could be classed as anthropogenic.

This presentation examines the contribution of different proxies to an understanding of soil formation at the site by identifying the nature of occupation and characterising the fabric of cultural detritus. These proxies include archaeobotany to detail the important black carbon component, compositional analysis of artifacts and quantification of cultural materials. These data create a profile of available 'parent' materials which can be compared to known soil chemical and physical characteristics for potential delineation of cultural input. In this way, our current research aims to elucidate factors that contributed to soil formation processes in a setting in which transformation of a marginal area is connected directly to human modification and intensive, long-term habitation and exploitative activity.

Dungan, Katherine (University of Arizona)

[262] *Venturing into the Borderland: Revisiting the 13th-Century Occupation of the Upper Gila*

Between the end of the Mimbres Classic period in the 12th century C.E. and the beginning of the 14th-century C.E. Cliff Phase, most of the Upper Gila region of New Mexico is thought to have been only sparsely populated if not entirely unoccupied. Recent excavation in Mule Creek has demonstrated a strong 13th-century presence in this area, however. Like the Gila Cliff Dwellings on the West Fork of the Gila, the settlements in Mule Creek show clear connections to contemporary sites in the Mogollon Highlands to the north and west. A comparison of ceramic collections from previously excavated sites in the Upper Gila with assemblages from Mule Creek and the Gila Cliff Dwellings provides a window into the variable use of the region during the 1200's. I argue that the 13th-century Upper Gila served as a cultural borderland between Tularosa Phase traditions in the Mogollon Highlands and Black Mountain phase traditions to the south and east. The diverse social connections of the people who occupied or made use of this borderland contributed to the diversity and flexibility visible among 13th-century sites and ultimately at the Cliff Phase Salado sites that flourished in the Upper Gila during the 14th century.

Dunham, Sean (Chippewa National Forest)

[280] *Hunter-Gatherer Mobility Strategies: A Late Woodland Example from the Upper Peninsula of Michigan*

The Late Woodland (LW) period in the upper Great Lakes region has been linked to the development of the Inland Shores Fishery and especially to the advent of deep water fall fishing. A recent study of LW settlement and subsistence patterns in the eastern Upper Peninsula of Michigan has revealed a shift in the mobility strategies used by LW peoples of that region. Using site locational data and an assemblage diversity index trends were identified that directly inform on LW settlement and mobility patterns that have spatial, temporal, and environmental components. In brief, Early LW people were more residentially mobile and that Late LW people were more logistically mobile. Likewise, Late LW people were making greater use of the interior. This paper will explore the transition in LW mobility patterns and discuss this trend in the context of our understanding of LW dynamics in the region.

Dunning, Nicholas (University of Cincinnati), Vernon Scarborough and David Lentz

[295] *Tikal in Environmental Context: Peter Harrison and Ancient Maya Water Management and Subsistence*

Through the lens of Tikal, Peter Harrison developed an interest in how the ancient Maya thrived in the seasonally arid central Maya Lowlands. Initially this interest stemmed from his investigations of Tikal's Central Palace and its adjacent reservoir. However, soon his interest spread beyond the elite center to questions of basic subsistence and the potential use of wetlands (bajos) for intensive agriculture. Our work at Tikal, the Bajo de Santa Fe, and smaller bajos benefitted from some of Peter's work and ideas, though even his imaginative mind was ultimately impressed by the complexity of water management and agriculture being revealed today.

Dunning, Nicholas [350] see Griffin, Robert

Dupej, Jan [207] see Veleminsky, Petr

Dupras, Tosha [205] see Groff, Amanda

Duranleau, Deena [281] see Doucette, Dianna

Durante, Mark

[9] *A Geomorphic and Elemental Analysis of the Johnston Site (36IN002)*

The Johnston site (36IN002), in Blairsville, Pa, is the type site for the Johnston Phase of the Monongahela Tradition. This site was first discovered by Ralph Solecki during the River Basin Surveys carried out in preparation for flooding of the Conemaugh River Lake. Following its discovery the site was partially excavated in the 1950's by Don Dragoo for the Carnegie Museum. The Johnston site has been revisited by archaeologists from Indiana University of Pennsylvania; however, little geomorphological work or chemical analysis have been completed by either group of investigators. Elemental chemical analyses were conducted with a portable XRF to differentiate areas with a higher probability of yielding archaeological data upon subsurface investigation. Soil samples from the base of the plowzone and the horizon immediately below the plowzone were collected from a 90 square meter block and from a single transect spanning the site and analyzed for elemental content to ascertain preferred locations for subsurface investigation. Particle size analyses of column samples taken from three locations were used to correlate horizons across the site, and to propose a rational history of the development of the landform.

Durante, Mark [192] see Ford, Ben

Durécu, Mélisse [350] see McKey, Doyle

Duru, Gunes

[16] *Radical Neolithic?*

Continuity Phenomenon that lasted for thousands of years in Central Anatolia could be one of the reasons of a distinctive or local process of neolithization in Central Anatolia when compared to the Core Area or the PPN world. The rapid changes, the fast innovations in PPNB, defining discontinuity, have brought a development momentum to the region, however all these PPN began to loose power in their most glorious period. Aşıklı never became part of this system, the people found solutions within themselves, they lived collectively, they were not interested in the attractive but authoritarian life going on in the PPN world. Continuity phenomenon was the basis for the radical Neolithic in Central Anatolia clearly visible at Aşıklı, then transmitted to Çatalhöyük and that lasted more than two thousand years. In this presentation, conditions of the continuity phenomenon of Aşıklı will be discussed.

Dussubieux, Laure (Field Museum of Natural History)

[140] *Elemental Composition of Iron Age Glass Beads from Myanmar*

Glass appears in Southeast Asia at the début of the Iron Age, around the middle of the 1st millennium B.C. Variations in Southeast Asian glass type distributions were found to be excellent markers of changes in cultural and economic interactions but are based heavily on material from Thailand, Cambodia and Vietnam. Other regions, in particular Myanmar's pivotal position with India, have remained largely unexplored, making it difficult to draw a global picture for Southeast Asia during this transitional period. The Mission Archéologique Française au Myanmar has conducted excavations of Iron Age cemeteries located in Upper Myanmar since 2001, throwing new light on social interaction networks around the Bay of Bengal. The cemeteries yielded grave goods including glass, mostly in the forms of beads. An in depth study of this material including typology and elemental composition (using laser ablation – inductively coupled plasma – mass spectrometry) has recently started. Results are giving us insight into the chronology of the sites. Also, they are revealing that if the compositions of the glass do not support the possibility of a local glass production, the singularity of some bead types would suggest that glass beads were maybe

manufactured in the area.

[101] *Chair*

Dussubieux, Laure [140] see Wood, Marilee

Duwe, Samuel (University of Oklahoma)

[342] *Groundstone Shrines of the Pueblo Southwest*

The Pueblos of the American Southwest define their sacred geographies by using ground boulders and bedrock shrines (cupules, slicks, grooves, and channels) to establish land tenure, reflect cosmologies and religious organization, and to record history. Based on ethnography and Pueblo collaboration we know that these places mark the remains of the deceased, act as communication nodes with the spiritual world, and delineate social boundaries. Because these landscapes (and their associated shrines) vary between different Pueblo peoples and also change through time, archaeologists are excited to record these landscapes to understand the historical development of each modern Pueblo's religion and identity. However, similar types of features are found globally throughout history, including diverse Pueblo villages and their neighbors. How can a widespread (and seemingly common) practice of bedrock and stone grinding be used to address historical and cultural questions on a local scale? Using examples from one Pueblo people, the Tewa of northern New Mexico, I argue that archaeologists must go beyond identifying the presence/absence of certain shrine types and adopt a landscape focus that incorporates shrine morphology and the patterns, context, and association of shrine placement.

Duwe, Samuel [409] see Eiselt, B. Sunday

Dye, Thomas (T. S. Dye & Colleagues)

[221] *Compendia and Collaboration: A Case Study from Hawai'i*

This paper presents a case study of how open methods and practices of reproducible research facilitated collaboration in the archaeological community that led to the solution of the long-standing problem of when Polynesians colonized Hawai'i. Central to this effort was creation of a compendium from which the dating analysis could be replicated. Practical advice is offered on how to create and share a compendium using software tools familiar to archaeologists.

Dyrdahl, Eric (The Pennsylvania State University) and Carlos Montalvo (Sapienza Università Di Roma)

[367] *Late Formative Craft Production and Interregional Interaction at Las Orquideas, Imbabura, Ecuador*

Scholars long have realized the importance of interregional interaction in Ecuadorian prehistory. While many non-local goods have been recovered that signal interregional interaction, archaeologists rarely have had the opportunity to study the contexts where the production of these artifacts occurred. The recent discovery of intact stratigraphy dating to the Late Formative in the rural barrio of Las Orquideas that includes large quantities of craft production waste will help change our understanding of interregional interaction. In this presentation, we discuss the evidence for craft production at Las Orquideas and its implications for interregional interaction in prehistoric Ecuador.

Eakin, Daniel [29] see Peterson, Staffan

Earle, David and John R. Johnson (Santa Barbara Museum of Natural History)

[143] *Ethnohistoric Insights Pertaining to the Emigdiano Chumash and Other Southern San Joaquin Valley Indigenous Groups*

The native groups who inhabited the San Emigdio Mountains on the southwestern edge of the San Joaquin Valley are believed to have been speakers of an interior dialect of one of the Chumashan languages, although which one has been open to debate. Certainly the Emigdiano Chumash occupied an important position in the economic exchange system that linked indigenous Kitanemuk

and Yokuts groups of the San Joaquin Valley with coastal Chumash peoples. Ethnohistorical study of records kept by Franciscan missionaries shed light on the histories of the native groups who inhabited this region and provide important information regarding social interactions as reflected in reconstructed kinship and marriage patterns. These ethnohistoric data provide important contextual information to aid archaeological interpretation and supplement ethnographic and oral historical information collected by early twentieth century anthropologists, including C. Hart Merriam, Alfred L. Kroeber, and John P. Harrington.

Earley, Caitlin (University of Texas at Austin)

[266] *Art and the Ancestors: Sculpture from the Cave Complex at Quen Santo, Guatemala*

At the site of Quen Santo, Guatemala, a hilltop center overlies an elaborate cave complex. First documented by Eduard Seler, the caves at Quen Santo have also been explored by modern-day archaeologists. Missing from modern analyses of Quen Santo, however, is a consideration of sculpture from the site: Seler recovered almost thirty stone monuments, most related to themes of death, ritual, and the ancestors. In this paper I explore the sculptural corpus of Quen Santo for the first time, arguing that Quen Santo was a center for mortuary ritual. Using a combination of art historical and archaeological information, I explore how the sculpture, ceramics, and architecture of Quen Santo point to its unique regional role, and what the site can tell us about ancestor veneration and ritual cave use on the Western Maya frontier.

Early, Ann (Arkansas Archeological Survey)

[188] *Learn by Doing: Sharpening Understanding of Archaeologists and Sites Among Diverse Publics with Hands On Activities in Arkansas*

Most people have unformed ideas about what archaeologists really do; collector of stuff, oddball academic, dinosaur hunter, rock expert, 'save the planet' enthusiast, expert about dead people and dead societies. Poor understanding breeds scatter shot ideas about the 'values' of archaeological sites for science, history, or heritage. In Arkansas, hands-on collaboration showing how archaeologists learn things, and how ancient people made a living, tried out with replicas of archaeological specimens, attract diverse publics in relaxed settings. 'Hands On' clarifies what archaeologists really do and what archaeological sites tell us. We hope this leads to broader interest in preservation, and in the rescue of important stories about real people before developments erase the archaeological landscape.

[223] *Discussant*

Easton, Norman (Yukon College), David Yesner (University of Alaska - Anchorage), Vance Hutchinson (Simon Fraser University), Michael Grooms (University of New Mexico) and Jordan Handley (University of British Columbia)

[112] *New Dates and a Proposed Chronology for the Little John Site (KdVo-6), a Multi-Component Site in Eastern Beringia, Yukon Territory, Canada*

New AMS radio-carbon dates derived from culturally modified bone and charred material in association with artifacts has expanded our appreciation of the antiquity and continuity of occupation at the Little John site, from the early Bolling-Allerod in the Late Pleistocene post-glacial period through the Early and Later Holocene. These new dates, combined with dates from other local sites on the Yukon – Alaska borderlands, allow us to identify a number of discrete chrono-zones at Little John that can be related to, and increase our understanding of, regional vegetation and climate history, major Climate Events, and cultural complexes identified elsewhere in Eastern Beringia. In this paper we present a brief overview of the Little John site and the most recent developed chronology that currently guides our continued excavations and analyses.

Easton, Norman [112] see Hutchinson, Vance

Ebbert, Steven [339] see West, Catherine

Eberl, Markus (Vanderbilt University)**[158]** *Highland Mexican Souls as Essences and Symbols*

The ancient Aztecs believed in multiple souls, including Tonalli, Ihiyotl, Yolia, and Nahualli. These souls overlap and extend beyond animated bodies. For example, the Tonalli is not only the heat of life and centered in the head but also an essence shared by animals and humans, similar to the Nahualli. Yolia refers to the physical heart and animates living beings. At death, it takes the form of a bird and flies away. These examples mix description and symbol: Is Tonalli literally heat or comparable to heat? Does the Yolia of a dying person become a bird or is it like a bird? I argue that neither an essentializing nor a constructive approach can resolve the quandary. Instead, I develop a dialectical model. I pay particular attention to ephemeral substances like fire that are both essences and representations of souls.

Ebert, Claire E. [91] see George, Richard

Ebert, Claire (Pennsylvania State University), Richard George (The Pennsylvania State University), Julie Hoggarth (The Pennsylvania State University), Rafael Guerra (University of New Mexico) and Jaime Awe (Northern Arizona University)

[248] *Late to Terminal Classic Period Obsidian Exchange and Regional Interaction in the Belize Valley*

The ancient Maya employed a diverse set of economic strategies to access raw materials and finished products. In the Belize Valley, long-distance exchange of obsidian integrated sites into larger local and regional economic systems during the Classic period. We present the results of geochemical sourcing of obsidian artifacts using portable X-ray fluorescence (pXRF) from Late Classic to Terminal Classic period (ca. A.D. 600-900/1000) contexts at the sites of Cahal Pech, Baking Pot, and Lower Dover in the Belize Valley to understand mechanisms of exchange within and between communities in the region. Results indicate that the Belize Valley was economically linked to the highlands of Guatemala through obsidian exchange, with some weaker ties to the Basin of Mexico. Comparisons with sourced materials from other Classic and Terminal Classic period assemblages in the Belize Valley and elsewhere in the Maya lowlands may indicate the presence of shifting exchange networks, perhaps with an increasing reliance on riverine or coastal routes. The changing nature of exchange networks may have been a factor contributing to the transition to the Terminal Classic and the subsequent Classic period collapse ca. A.D. 780-900/1000 in the Maya lowlands.

Echavarri, Mikhail and Stephen Acabado (UCLA)**[238]** *Ending the Antiquity Debates: The "Short History" Model of the Ifugao Rice Terraces, Philippines*

Local wisdom and nationalist sentiments would have us uphold the long-held belief in the antiquity of the Ifugao Rice Terraces, espoused by pioneer anthropologists of the Philippines, Roy F. Barton and Henry Otley Beyer. Recent findings by the Ifugao Archaeological Project (IAP), however, have provided new information which has driven us to rethink this proposed date, primarily because of the dearth of archaeological data to support the "long-history" model. Evidence is now pointing to a relatively more recent history of Cordillera rice terracing traditions – a "short-history" model grounded on ethnographic, ethnohistoric, archaeological, and paleoenvironmental datasets. Our paper presents findings of the 2012, 2013, and 2014 field seasons of the IAP and their significance in finally resolving the antiquity of the Ifugao rice terraces.

Echenique, Ester (The University of Arizona)**[252]** *Technological Styles and Production Practices in the Río Grande de San Juan Basin (Argentinean-Bolivian Border) during the Late Intermediate Period*

The lack of direct ceramic production evidence, coupled with the lack of technical studies, hinder the understanding of ceramic production practices and its organization across the south central Andes. Yavi-Chicha ceramics associated with a diversity of sites in the Río Grande de San Juan Basin (straddling the border of Bolivia and Argentina) provide a unique entry point to explore socio-political

dynamics during the Late Intermediate (A.D. 1000-1450) and Inka (A.D. 1450-1540) periods. Framed within a larger project that examines the mechanisms through which state ideologies were materialized by the Inka, in this case specifically through the use and manipulation of local ceramic styles, this poster presents preliminary results on the technological styles and production practices employed during the Late Intermediate Period, using indirect evidence (macroscopic and archaeometric data including petrography, Raman spectroscopy, and SEM). Drawing from my analysis of materials from two discrete sites in two subregions of the Río Grande de San Juan Basin, Chipiwayco and Finispatria, located in the core and the periphery of the region, I discuss the relevance of technological variability for understanding craft production practices and socio-political organization at the intraregional level.

Echeverria, Jose

[367] *Patrimonio, Políticas de Estado y Arqueólogos. La Experiencia del Ecuador en los Últimos Cuarenta y Cinco Años*

Para un pueblo, conocer, valorar y usufructuar debidamente su patrimonio natural y cultural es parte esencial de su existencia. Para esto es necesario un trabajo colectivo permanente, una práctica social diaria enmarcada en una legislación adecuada y en una dinámica integradora conducida por líderes que cumplan y hagan cumplir las leyes. A los 185 años de vida republicana, el gobierno reconoce la función del Patrimonio como sustento del desarrollo social y económico del país. En consecuencia, fortalece el Marco Legal, las Instituciones, invierte un significativo presupuesto en inventariar y dar seguridad a los bienes patrimoniales a nivel nacional y restaura determinados bienes inmuebles. La preparación académica de los futuros arqueólogos es estimulada a través de becas y exige a las universidades del país un alto nivel académico y aplicación de una nueva racionalidad. En la formación de los nuevos profesionales, las universidades deben superar "la vieja racionalidad que educa e instruye para la repetición y obediencia, y forma solo especialistas o hiper-especialistas que saben hacer una o dos cosas, pero que carecen de una visión global de los hechos y de los acontecimientos. En el campo investigativo, la universidad debe crear equipos transdisciplinarios, para avanzar hacia una ambiciosísima teoría omniabarcadora

Eckerle, William [361] see Cannon, Kenneth

Eckert, Suzanne (Arizona State Museum) and Tiffany Clark (Applied Earthworks, Inc.)

[25] *Integrating Petrographic and INAA Compositional Data: Chupadero Black-on-white Ceramic Production and Distribution in the Salinas and Sierra Blanca Regions of New Mexico*

Ceramic research in the American Southwest is increasingly relying on both mineralogical and chemical compositional data to answer questions regarding pottery production and exchange. Due to differences in the structure and nature of these datasets, integrative studies that attempt to incorporate information on both types of compositional data often produce confusing and sometimes seemingly contradictory results. This paper explores the recently developed 'mixed-mode' method of data analysis, whereby both chemical and mineralogical data are incorporated into a single dataset. To evaluate the applicability of this methodological approach in Southwestern ceramic analyses, a case study was conducted using petrographic and INAA data on Chupadero Black-on-white, a widespread pottery type produced between A.D. 1150 and 1550 in central and southern New Mexico. Results of this study indicate that use of a 'mixed mode' approach may provide a richer interpretation of patterns of prehistoric ceramic production and exchange.

Eckert, Suzanne [34] see Huntley, Deborah

Eddins, Amy [121] see Barker, Andrew

Edgar, Heather JH [217] see Ragsdale, Corey

Edgar, Heather (Maxwell Museum of Anthropol) and Corey Ragsdale (Anthropology, University of New Mexico)

[346] *Origins of the Templo Mayor Skull Masks*

The offerings of human remains made at the Templo Mayor of Tenochtitlán include decapitated skulls, some of them reused as masks or headdresses. It is generally accepted that the sacrificial offerings of the Templo Mayor were obtained through warfare. To test this, we used bioarchaeological analyses to determine where the skull masks came from geographically, and whether the skull masks meet the biological profile of elite warriors. We recorded sex, age, and indicators of disease and nutritional deficiency among skull masks (n=6) corresponding to the reign of Axacayatl (A.D. 1469-1481). We then compared the dentitions of the skull masks with those from groups documented in the Codex Mendoza as the major military campaigns of Axayacatl. We used non-metric multidimensional scaling of dental morphological observations to determine whether individuals in the offering samples were similar to any comparison groups (n=127). Results indicate the skull masks fit the biological pattern expected of elite males, and probably originated from the populations in contact with the Aztecs through military campaigns. These results show that hypotheses derived from ethnohistoric records can be tested using dental morphological data, and that political processes such as warfare influenced the treatment of sacrificial victims at the Templo Mayor.

Edinburgh, Kevan (University College London)**[80] *Modelling Village Development in the Prince Rupert Harbour***

The initial results of a radiocarbon local marine reservoir correction study are presented for Prince Rupert Harbor in northern British Columbia, Canada. These preliminary results are integrated into a series of Bayesian age-depth models that illustrate how shell-midden accumulation rates can dramatically vary. Village development in the harbor is discussed in the light of these new findings.

Edinburgh, Kevan [80] see Ames, Kenneth

Edmonds, Jason (University of California, Davis)**[341] *Obsidian Sourcing and the Origin of the Occupants of the White Mountains High Altitude Villages***

The behaviors discussed in ethnographic accounts of the western Great Basin valleys vary widely and unexpectedly. Although both Owens Valley and Fish Lake Valley were inhabited by Eastern Mono speaking groups in historic times, their population density, settlement, subsistence, and sociopolitical organization were markedly different. Archaeological debate centers on whether these differences result from historic contact or if they have some meaningful time depth into prehistory. Situated between the two valleys, the high altitude sites of the White Mountains can help resolve some aspects of this debate and further explain the use and occupation of this extreme environment. If the ethnographic model is correct, only Owens Valley occupants are expected to have favored occupation of high altitude locations. However, if the ethnographic model has no time depth then occupants are predicted to have originated from throughout the region. Obsidian debitage samples from both pre-village and village contexts were sourced via x-ray fluorescence (XRF). The results of this analysis indicate that prior to the emergence of the village pattern, obsidian was sourced from a broad area. After the emergence of the village pattern, however, sources in Owens Valley overwhelmingly dominate.

Edwald, Ágústa [288] see Hicks, Megan

Edwards, Matt (HDR and UCSB)**[31] *Ni la costa ni la sierra: The Archaeology of the Upper Nasca River Basin***

The human and cultural geography of Andean South America has been seen as fundamentally divided between the coast and the highlands since the early days of Spanish colonization; a conceptual bifurcation that is assumed to have great antiquity and has subsequently shaped archaeological research in the region. Better settlement data from the foothills of the southern Nasca valley have demonstrated that the indigenous cultures of the Nasca valley extended much higher

into the Andean uplands than previously thought. Surveys and excavations in the headwater valleys of the Nasca's southern tributaries undertaken over the last decade have demonstrated that this pattern extends high into the sierra of southwestern Ayacucho. Rather than forming a border for indigenous south coastal development that was only broken by the expansion of highland empires during the Middle and Late Horizons, the upper Nasca Basin is better seen as a shifting zone of interaction throughout prehistory.

Edwards, Steven [47] see Banning, Edward

Edwards, Briece

[195] *Discussant*

Edwards, Susan (Desert Research Institute) and Jeffrey Wedding (Desert Research Institute)

[311] *Twentieth-Century Geoglyphs - Military Training Targets of World War II*

For archaeologists, the term geoglyph typically conjures up images of enormous carved landscapes such as the Nazca Lines in Peru or the Blythe Intaglios in California's Mojave Desert. But the creation of earth drawings is not restricted to people of the distant past. Modern populations have also been known to produce their own geoglyphs. Like their prehistoric predecessors, many contemporary geoglyphs have spiritual or ceremonial significance, but others were generated for purely functional purposes.

During WWII thousands of U.S. airmen trained stateside before being sent to the various theaters of the global war. Evidence of the military exercises has survived embodied in the large target configurations on the former precision bombing ranges attached to Army Air Corps training fields. These altered landscapes share many characteristics in common with the gigantic glyphs attributed to prehistoric groups. An informal study of online aerial imagery revealed "military geoglyphs" located in Idaho, Utah, Oregon, Nevada, New Mexico and other western states. The authors present examples of both aerial imagery and ground-level photographs for various target types examined during field projects in Nevada.

Eeckhout, Peter

[227] *Travelers Stones: Highland and Coastal Interactions in Late Ritual Contexts at Pachacamac.*

During the 2014 field campaign, the Ychsma Project (Université Libre de Bruxelles) has uncovered a small building decorated with murals in the Second Precinct of the site of Pachacamac, Central Coast of Peru. The floors of the building were covered with hundreds of various offerings, including many stones. These stones have shapes, colors and overall looks very different from those present in the local geology. The study of the archaeological context and origin of these stones offers a new and original light on the relationships between coast and sierra in the Late Horizon.

Eerkens, Jelmer [114] see Burns, Gregory

Eerkens, Jelmer (University of California, Davis), Robert Bettinger (University of California, Davis) and Ryan Nesbit (University of California, Davis)

[415] *Shellfish and Nutrition in San Francisco Bay: Clues from Seasonality Studies*

Shells are especially visible in the archaeological record of Central California. They comprise much of the midden in the large shellmounds that once lined San Francisco Bay. However, shells are also present in many inland sites, though they were collected from the Bay and hauled many kilometers inland. Seasonality reconstructions using oxygen stable isotopes show that shells on the Bay were typically harvested in two seasons, winter and summer, but inland sites contain shells from just winter. This pattern reveals important clues about seasonal foraging and the nutritional role of shellfish in Central California.

Egan, Rachel (University of Colorado at Boulder) and Payson Sheets (University of Colorado

at Boulder)**[75] *Geostratigraphy, Volcanology, and Chronology at Ceren: Implications of Dating the Ilopango and Loma Caldera Eruptions***

Built upon a fine white volcanic tephra from the eruption of the Ilopango caldera and buried under tephra from an eruption of Loma Caldera, the Maya village of Ceren affords a unique opportunity to explore geostratigraphy, volcanology, and chronology in relation to vulnerability and resilience. The sheer volume and scale of the eruption of Ilopango caldera, known as Tierra Blanca Joven (TBJ), would have had decimated not only the Zapotitán valley in which Ceren is located, but also all of El Salvador and parts of the greater Maya area. However, the dates of both the TBJ eruption and the later eruption of Loma Caldera remain debated. Initial studies found that the TBJ event occurred sometime in the 3rd century, supporting the foundation and occupation of Ceren as having occurred in the late 6th century. However, new radiocarbon dates have reappraised the TBJ eruption, moving it into the 6th century. Likewise, additional radiocarbon dates suggest a date in the later 7th century for the Loma Caldera eruption. This paper aims to explore the implications of the revised dating of the Ilopango and Loma Caldera eruptions for both the cultural trajectory of El Salvador and Maya village of Ceren.

Egan, Rachel [95] see Johansson, Lindsay

Egan-Bruhy, Kathryn (Commonwealth Cultural Resources Group) and Mark Bruhy (Commonwealth Cultural Resources Group, Inc.)**[280] *Prehistoric Subsistence Adaptation in the Upper Great Lakes: A Perspective from Butternut-Franklin Lakes***

The Butternut-Franklin Lakes Archaeological District is located immediately south of the confluence of the Upper Wisconsin, Menominee, Brule River watersheds, in an area dominated by several thousand lakes. The preponderance of streams, swamps, and marshes make this a vast and extraordinary aquatic ecosystem. Archaeological research in this region, extending back into the 1960s, provides a solid baseline for reconstruction of the dynamic settlement/subsistence adaptation of prehistoric populations in this region from the Archaic through the Oneota tradition.

Egeland, Charles [53] see Fitzgerald, Curran

Egeland, Charles (UNC-Greensboro, Department of Anthropology), Alexa Uberseder (UNC-Greensboro, Department of Anthropology) and Cynthia Fadem (Earlham College, Department of Geology)**[53] *Recent Paleoanthropological Work at DK East, Olduvai Gorge, Tanzania***

Olduvai Gorge, Tanzania, remains one of the richest sources of information on human bio-behavioral evolution between 1-2 million years ago. While much research has justifiably focused on the gorge's junction area and its rich collection of sites, including FLK 22 (The Zinjanthropus Floor), the older fossiliferous deposits to the west have received much less attention in recent years. The DK area, which lies along the north edge of the main gorge, is particularly intriguing and was made famous by Mary Leakey's excavation in 1962 and 1963 of thousands of fossils and lithics and, perhaps most famously, a stone circle originally thought to represent the remains of a windbreak. In October of 1968, a nearly complete cranium (OH 24), since attributed to *Homo habilis*, was discovered on the surface a few hundred meters east of the main DK excavations. It is in this area (DK East) that new excavations below Tuff IB (dated to ~1.85 million years ago) were undertaken in 2012, 2013, and 2014. Here, we summarize the work to date, which includes the taphonomic analysis of recently recovered faunal material and additional geological research.

Ehrich, Richard (UCLA Cotsen Institute of Archaeology)**[349] *Sichuan Life Styles – Traditions and Adaptations in Prehistoric Architecture and Settlement Structure***

Neolithic Sichuan formed a crossroad for influences from the north associated with millet agriculture and from the east associated with the growing of rice. But how did the different traditions of

habitation of the Upper Yellow River in the north and the Middle Yangzi River as well as the Three Gorges in the east affect the situation in Sichuan and what role did adaptation to the local environment play? This is a survey of prehistoric architecture and settlement structure in Sichuan and an interregional comparison of the Upper Yangzi River region in Sichuan with the Upper Yellow River region in Shaanxi and Gansu, the Middle Yangzi River region in Hubei, and the Three Gorges region in Chongqing. It is also a discussion of the concepts of “function”, “style”, “tradition”, and “adaptation” as pertaining to choices of habitation.

Eichner, Katrina (UC Berkeley)

[15] *Queering “American”: Archaeological Investigations of a 19th-Century Military Fort in West Texas*

This paper investigates how racial identity impacted the creation and maintenance of an American frontier and border community using an assemblage from a 19th century American Army encampment from Fort Davis, Texas as a case study. By engaging a queer theoretical framework, this research focuses on how Black, Mexican, and immigrant bodies challenged ideals of normative White citizenship during a period of great social upheaval and racial tension. With thousands of European immigrants and newly emancipated African-Americans enlisting in the army during the period of reconstruction, the demographics of the new postbellum U.S. Army challenged the very notion of a unified American perspective. Moreover, this research investigates what strategies were employed by members of these frontier/border communities that lead to a collective nationalized identity despite a racially and ethnically mixed population. This paper demonstrated that by queering our understanding of nineteenth century American identity, a more holistic and nuanced understanding of racial interaction can challenge traditional interpretations of the American Westward Expansion.

[15] *Chair*

Eimers, Molly (University of Montana)

[312] *The Groundstone Artifacts of Housepit 54, Bridge River Site, British Columbia*

The people of the Middle Fraser Canyon traditionally used groundstone to accomplish a wide range of tasks spanning food processing to weaponry and ornamentation. Excavations of Housepit (HP) 54 at the Bridge River Site, British Columbia, in 2014 revealed an unexpectedly large sample of groundstone tools. Many items were apparently used, broken, and recycled as cooking rocks on select floors. This study draws from multiple data sources to define variability in the nature of groundstone tools and tool functions. More specifically, groundstone are examined for variation in raw material, manufacture technology, use-wear, and residues. Conclusions are drawn regarding differentiation in morpho-function and use-history. Then, implications are developed for exploring differences in household activities between occupation floors. Groundstone thus may offer unique insight into shifts in household economies and sociality. This poster provides an overview of the research on groundstone with a focus on grinding slab tools.

Einarsson, Árni [288] see Hicks, Megan

Eiring, Melissa (University of Texas at San Antonio), Sarah Wigley (University of Texas at San Antonio), Cynthia Munoz (University of Texas at San Antonio) and Raymond Mauldin (University of Texas at San Antonio)

[276] *10,000 Years of Stone Tool Use by Hunter-Gatherers in Central Texas*

We report on stone tool patterns derived from several recent archaeological excavation projects in Central Texas that provide a record of lithic use spanning most of the prehistoric sequence in the region. The projects, located within a few kilometers of one another, effectively sample debitage and tools reflecting Late Paleoindian, Early and Middle Archaic, Late Archaic, and the Terminal Late Prehistoric periods. Supported by several radiocarbon dates, these assemblages span roughly 10,000 years, from 10,300 CAL BP to A.D. 1600. High quality, large-sized stone tool material was available as primary sources roughly 15 to 20 km north of the projects along the Balcones Escarpment, a limestone dominated fault zone with multiple chert exposures. We reviewed over

11,000 pieces of debitage, chipped stone tools, and cores from these projects. Focusing on chipped stone tools and debitage subsamples, we monitor changes in raw material use over this 10,000-year period. Material groups are defined primarily by chert color, inclusions, and patterns in ultraviolet light fluorescence, with groups further assessed by geochemical (e.g., pXRF) methods. Comparisons of shifts in material groups over time likely reflect changes in access, mobility, or subsistence patterns.

Eiselt, B. Sunday [361] see Trabert, Sarah

Eiselt, B. Sunday (Southern Methodist University), J. Andrew Darling (Southwest Heritage Research, LLC), Samuel Duwe (University of Oklahoma, Department of Anthropology), Chet Walker (Archaeo-Geophysical Associates, LLC) and Mark Willis (Archaeo-Geophysical Associates, LLC)

[409] *Groundtruthing from the Air: Reconstructing Tribal Agricultural and Landscape Systems in the Lower Chama Valley, New Mexico Using Low Elevation UAV Technology.*

Uninhabited Aerial Vehicles (UAVs) are changing the way that archaeologists conduct fieldwork with Native American Tribes. We present an application of UAV mapping and visualization technology in a combined boots-on-the-ground and satellite reconnaissance of Classic period (A.D. 1350-1600) ancestral Pueblo sites and agricultural systems. This approach reduced field time and enhanced efficiency in the identification and recordation of regionally extensive prehistoric features at a level of resolution not available to the human eye or with currently accessible high elevation imagery. When combined with software applications that enable three-dimensional visualizations of archaeological features, new insights emerge that were previously unavailable to the most discerning or intensive survey techniques. Adoption of this non-invasive (remote) technology by Tribes allows for time efficient compilation of information for applications in land and water rights cases and culturally sensitive land-use planning.

Ek, Jerald (Western Washington University)

[244] *Not That Stable, Not That Durable, but Very Dynamic: Political Geography and Geopolitical Dynamics in the Río Champotón Drainage, Campeche, Mexico*

The nature, plasticity, and durability of states as geographical and territorial entities has been a topic of longstanding debate in the study of Classic Maya political geography. One of the central tenets of Joyce Marcus's highly influential "Dynamic Model" is a view of states as comprised of relatively durable small-scale polities that were sometimes incorporated into more volatile larger scale hegemonic states. However, recent research in Central Campeche suggests that local and regional political geography was far from stable, with changes in broader political networks having important impacts in local territorial organization. Archaeological and epigraphic data instead reflect a much more dynamic political landscape, with shifting allegiances and external influences playing a major role in local dynamics. This paper examines the changing territorial organization of the Río Champotón drainage between the Classic and Postclassic Periods, focusing on the local impacts of larger-scale dynamics driven by external interactions, including the neighboring polity Edzná, the expansionist Kanu'l State of Calakmul, and more distant pan-Mesoamerican linkages via the Gulf Coast maritime trade route. The results of this research have implications for both our understanding of the internal organization of prehispanic Maya city-states and the relationships between these units that defined geopolitical landscapes.

Ekshtain, Ravid (Harvard University Department of Anthropology), Erella Hovers (Institute of Archaeology The Hebrew University of), Shimon Ilani (The Geological survey of Israel, Jerusalem) and Irina Segal (The Geological survey of Israel, Jerusalem)

[64] *The Use of Geochemical Analysis and Visual Methods for Understanding Raw Material Acquisition around Amud Cave, Israel*

Amud Cave (eastern Upper Galilee, Israel) is known for its Middle Paleolithic deposits, containing thousands of animal bones and lithic artifacts from 3 anthropogenic stratigraphic units, dated to 68-55 ka. Excavations revealed hominin remains, including Neanderthal burials. Technological characteristics of the lithic assemblage show that the knapping sequence started off-site. However, related mobility patterns remained poorly understood. In order to understand the organizational

decisions made by the Neanderthal hunter-gatherers occupying the site, we initiated a multi-disciplinary study involving a detailed geological survey of the Galilee and adjacent regions, visual characterization (color and texture) and geochemical fingerprinting (using ICP-MS and ICP-AES) of both geological flint exposures and of archaeological artifacts, and a detailed technological analysis of the earliest and latest assemblages. The combined results show that Amud cave inhabitants used flint from the local Eocene formation around the cave but not from its immediate (several meters away) surroundings. Flints from distant source areas (>60 km) were used in both occupation phases. The technological analysis revealed different organizational strategies involving their exploitation. The results of this study enable discussion of diachronic changes in land use behaviors at Amud Cave, which may be linked to ecological shifts in the site's environment.

Elder, James and Shane Sparks (ICF International)

[7] *Exploring the Relationship between Coastal Geomorphic Processes and Archaeological Site Distributions in Central Puget Sound of Washington State*

Although the uneven distribution of precontact archaeological sites along the Puget Sound shoreline is widely recognized, limited research has been undertaken to systematically consider how this pattern may relate to local anthropogenic and geomorphic factors. In this study, we consider archaeological site distributions through the lens of shoreline geomorphology and discuss possible reasons for any observed relationships. Using publically available drift cell data, we categorized the shoreline in our study area into three geomorphic types; depositional, erosional, and neutral. Following this, we grouped all documented precontact archaeological sites located adjacent to the shoreline in by geomorphic shoreline type. This analysis revealed that the distribution of nearshore precontact archaeological sites is strongly related to geomorphic shoreline type. We then tested these findings by categorizing the shoreline of a second study area by geomorphic type; and generated an archaeological predictive model by assigning each type a level of archaeological sensitivity. We evaluated this model by comparing it to the distribution of documented archaeological sites along the shoreline in the second study area. Our analysis reveals that precontact archaeological site distributions along the Puget Sound coast are strongly related to – and influenced by – geomorphic shoreline type.

Eldridge, Kelly (University of California Davis), John Darwent (University of California, Davis) and Christyann Darwent (University of California, Davis)

[302] *Under Threat of Erosion: Late Prehistoric to Historic Contact Houses near the Native Village of Shaktoolik, Alaska*

Historical documents note that the Shaktoolik Peninsula, located in Norton Sound, Alaska, was a nexus of interaction among local Yup'ik, Inupiat from the north, Athabaskans from the east, and Russian and American traders in the 1800s. Yup'ik populations were displaced from the area and replaced by Inupiaq groups during this time; however, limited archival, ethnographic and oral history accounts make it difficult to disentangle the local history. The archaeological record may be able to fill in the story. We report on our investigations, in collaboration with the Native Village of Shaktoolik, at the Shaktoolik Airport site (NOB-072) in 2014. Although noted in earlier archaeological surveys it had never been adequately documented, and unfortunately time is of the essence as the site is threatened by increased seasonal flooding and coastal erosion. The site proved to be considerably larger than anticipated; mapping revealed over 200 house depressions, including a large qasigi or men's house, and multiple complexes of houses with interconnected tunnels. Limited test excavation yielded well-preserved pre- and post-contact organic architecture and artifacts, and a faunal record of both maritime and terrestrial game. We have just scratched the surface of a rich archaeological record of the past 600 years.

Eldridge, Kelly [302] see Tremayne, Andrew

Eleazer, Courtney [207] see Page, Katherine

Elera, Carlos [187] see Hurtubise, Jenna

Elera Alvarado, Carlos [371] see Szumilewicz, Amy

Eli, Mark [399] see Cap, Bernadette

Elia, Ricardo J. [93] see Perez-Juez, Amalia

Elia, Ricardo (Boston University) and Amalia Perez-Juez (Boston University)

[418] *Challenges in Integrating Archaeology into Late-Period Preservation Projects: An Example from Menorca, Spain*

The island of Menorca, Spain, belonged successively in the 18th century to Spain, England, France, again England, and finally Spain. During this period, the British constructed their first purpose-built naval hospital on Isla del Rey, a small island in Mahon Harbor. To date, heritage-related efforts on Isla del Rey have focused on the architectural restoration of the hospital buildings, as well as on the development of exhibit spaces. In 2013, Boston University started a collaboration with the Foundation "Amics de la Illa del Hospital," to develop an integrated program of archaeological research and heritage management for the Island. However, archaeology is still not a priority for many restoration projects of post-medieval sites in Menorca, as in much of the Mediterranean area. Likely factors for this include the relatively late date of the historical remains compared to more ancient cultures, the availability of written records, and most of all, the presence of well-preserved architecture. In this paper, we present preliminary results of our work at the Naval Hospital and describe some of the challenges we experienced as we attempted to incorporate historical archaeology and archaeological heritage management into an architectural restoration project.

Elizalde Mendez, Israel (Proyecto Templo Mayor), Salvador Figueroa Morales (Aviario el Nido) and Ximena Chávez Balderas (Proyecto Templo Mayor/Tulane University)

[298] *Animal Captivity in Tenochtitlan's Sacred Precinct: Specialized Diet and Paleopathological Analysis of Golden Eagles Found in Offering 125*

After the discovery of the Tlaltecuhltli (earth goddess) monolith, the Templo Mayor Project explored an area known as the Mayorazgo de Nava Chávez, located at the foot of the Great Temple. Offering 125 was discovered west of the monolith and was deposited during the reign of Ahuitzotl (1486–1502 CE). Along with thousands of ritual items, two golden eagle skeletons were buried in this deposit. Commingled bones corresponding to at least three quail were found inside the keel of one of the eagles. Considering patterns of perimortem fractures and spatial distribution, we propose that these remains were not deposited intentionally as part of the ritual. By analyzing archaeological materials, sixteenth-century historical sources, and contemporary reference collections, we conclude that the quail bones correspond to a specialized diet provided to both eagles. In addition, paleopathological analysis of antemortem fractures support the hypothesis that both eagles were captives, confirming the existence of complex management strategies described in the historical sources. With this analysis we will address animal-human relationships, captivity strategies, and the ritual importance of animals.

Ellenberger, Katharine (Binghamton University)

[336] *Collaborative Archaeologies in Transformation: Preliminary Results from a Social Network Analysis of Archaeological Practice*

Collaborative or community-based archaeology can involve a range of activities, from modifying dissemination practices to shifting to writing research designs with a coalition including non-archaeologists. These approaches were built as responses to specific concerns by crafting research methods to the modern context of archaeology. Out of these myriad approaches has developed a social network of scholars whose professional interactions are consequential for understanding contemporary archaeological practice. This presentation will outline preliminary results of a social network analysis of collaborative archaeology using a database of publications, conference presentations, and other products of these projects.

Elliott, Michelle (Université Paris 1, Panthéon-Sorbonne)

[21] *Ritual Fires and Sacred Hearths: The Management of Wood Resources in Postclassic Tarascan Society of the Zacapu Basin, Michoacán*

According to ethnohistoric sources, fire played a central role in the ritual practices of Postclassic Tarascan society. To venerate Curicaueri, the fire god and the most senior-ranking deity in the Tarascan pantheon, sacred hearths were kept perpetually burning outside temples, and the cazonci (king) was personally responsible for obtaining the impressive quantities of wood necessary for this feat. Fuel acquisition for these fires was often embedded in other ceremonial activities, such as hunts carried out by the Tarascan nobility. Nevertheless, the sacred aspects of fire were not restricted to elite and public contexts. Commoners supplied the majority of the fuel for the temple hearths. Furthermore, domestic hearth rituals were a significant part of the day-to-day affairs of households of all social ranks. However, despite the central role of fire and fuelwood among the Tarascans, little archaeological study of these practices and their associated material culture has been undertaken. This paper presents new work focused on charcoal remains and combustion structures in a variety of contexts at the site of Malpais Prieto, in the Zacapu Basin of northern Michoacán, to elucidate how fire-related practices varied among social strata, in public vs. private contexts, and how wood resources were obtained and managed.

Elliott, Michael [81] see Oster, Elizabeth

Elliott, Evan, Thomas Origer and Katherine Dowdall

[383] *At the Continent's Edge: A View of Flaked-Stone Crescents from Sonoma County, California*

One of the most unique, enigmatic, and intriguing artifacts of the Western United States is the flaked-stone crescent. Crescents are tools that have been bifacially reduced into a crescent shape, although in some, referred to as "eccentrics," this form is extensively modified with multiple notches or extensions to their inner and outer margins. These lithics capture the imagination of both professionals and the public, reflected in the 1991 designation of a "bear-shaped" eccentric crescent as the California State Artifact. While these artifacts are most common in southern California and the Great Basin, they are also present in the northwest portion of the state, including 14 specimens found in Sonoma County. This paper analyzes these specimens and shows that the patterns demonstrated for crescents in the Great Basin and Southern California appear to be evident in Sonoma County as well. Additionally, evidence gathered using obsidian hydration to assess the age of these artifacts and protein analysis to gain insights into their use, although not completely conclusive, contributes to a wider understanding of Early Holocene occupation of the Southern North Coast Ranges in California.

Ellis, Peter [275] see Jones, Eric

Ellis, David (Willamette Cultural Resources Associates)

[330] *Discussant*

Ellison, Leigh Anne (The Center for Digital Antiquity)

[123] *Synthesizing Legacy Data : Using tDAR's Data Integration Tool*

Archaeological projects generate abundant data that is often underutilized in research and analyses beyond the life of the project. Although some projects curate their data, they often do not make those data widely available, accessible, or easy to aggregate at different granularities for additional research. Discipline specific digital repositories and data publishing platforms (e.g. tDAR, A.D.S., Open Context) are beginning to address problems related to the access and the utility of legacy databases and data sets. Now, tDAR has a tool to aid in synthesizing data collected without a priori standardization, meaning researchers can easily bring together large data sets from within and across sites and regions for new and exciting analyses. This poster presentation describes the tool and how to use it for synthetic research with case studies from the American Southwest.

[123] *Chair*

Ellyson, Laura [85] see Winstead, Christy

Ellyson, Laura (University of North Texas) and Steve Wolverton (University of North Texas)

[85] *Lagomorph Exploitation and Garden Hunting in the Northern San Juan Region*

The northern San Juan (NSJ) region of the United States contains a high density of archaeological sites. Ancestral Puebloan people lived in small hamlets (ca. A.D. 1000) prior to aggregating into large pueblo villages (ca. A.D. 1150). Periods of drought occurred prior to the abandonment of this sub-region (ca. A.D. 1300), influencing the availability of animal resources. Zooarchaeological studies of subsistence in the NSJ region have focused on a decline in availability of large game concurrent with increasing reliance on small wild and domesticated resources. This can be attributed to a combination of factors including resource depression and habitat change as human populations grew prior to the depopulation of the region. Faunal assemblages from later occupation periods are dominated by lagomorphs, specifically cottontails. Shifts in lagomorph abundance are thought to indicate habitat alteration; however it is possible that relatively K-selected jackrabbits (*Lepus* sp.) were overexploited leading to an increased reliance upon more r-selected cottontails (*Sylvilagus* sp.) through garden hunting practices. Zooarchaeological studies of resource depression use the test implication that under substantial harvest pressure, mortality profiles exhibit steepened survivorship (increased representation of juvenile animals). This possibility is explored through analysis of zooarchaeological mortality data from sites in the NSJ region.

Elquist, Ora (Public Archaeology Laboratory, Inc.)

[281] *Archaic Estuarine Resource Use in the Lower Hudson Valley: New Information from the Old Place Neck Site, Staten Island, New York.*

Models of estuarine resource use in the Lower Hudson Valley, particularly fishing, have typically been based on a limited set of archaeological materials and ethnohistoric information. Key issues include early evidence of estuarine resource use, the range of resources exploited, and their role in settlement and subsistence patterns. Recent investigations at the Old Place Neck Site involved using various residue analyses that contributed important new information beyond what artifacts and features alone could provide. The new data expands on previous archaeological perspectives and hypotheses, and highlights the importance of employing such techniques.

Elson, Christina [216] see Walker, Sarah

Elston, Robert (University of Nevada, Reno - Dept. of Anthropology)

[296] *James F. O'Connell and Great Basin Archaeology*

Jim O'Connell began his professional career in anthropology as a Berkeley graduate student under Robert Heizer, conducting his dissertation (1971) research on the prehistory of Surprise Valley in NE California. A teaching position at UC Riverside (1970-72) was soon supplanted by a research fellowship (1973-78) in Prehistory at Australian National University during which he pursued ethnoarchaeological research among the Alyawara. In 1978, he joined the Anthropology Department at the University of Utah, where he soon began the long collaboration with Kristin Hawkes in human behavioral ecology (HBE) that continues to the present. Although working with Hawkes and others mostly in Africa among the Hadza, and no longer a practicing field archaeologist, O'Connell has continued to publish archaeological work based on his dissertation, as well as critiques, insights and applications to Great Basin archaeology derived from his ethnoarchaeological and HBE research. O'Connell and his graduate students have played a key role in the wide adoption of HBE theory and application of HBE models (diet breadth, patch choice, central based foraging) in Great Basin archaeological research.

Ely, Nancy (Bay Farm School, Alameda, CA) and Alyssa Scott (U.C. Berkeley)

[236] *Archaeology and the Common Core: Bay Farm School and UC Berkeley*

Archaeology provides an amazing vehicle for teaching the Common Core and engaging students in

lessons across the curricula, while emphasizing teaching for deep understanding of big ideas or broad concepts. Social sciences, history, and science easily find avenues for collaboration, while students use language arts and math skills to analyze and apply data, as well as to write reports. Archaeological inquiry may be used to understand the human past, employing such tools as observation, inference, context, evidence and chronology, as well as to inform us about contemporary problems. Especially significant is the opportunity to teach cultural sensitivity and to learn about the former inhabitants of one's own region: how these people met basic human needs, such as food and shelter. Seventh grade students at Bay Farm School learned the basics of archaeological inquiry through Project Archaeology and got some first-hand experience at local archaeological sites which have been excavated by UC Berkeley; this paper presents the results of their investigations.

Ely, Kristy (University of Wisconsin - La Crosse)

[357] *Paleoindian Occupation in the North Dakota National Grasslands: A Geoarchaeological Analysis of Site Preservation and Land Use*

A GIS model was utilized to help understand Paleoindian land-use, site formation processes and major landform changes in the North Dakota National Grasslands since the terminal Pleistocene. This landscape has changed dramatically over the last 12,000 years and geoarchaeological methods can help understand what the landscape and environment may have looked like during the Paleoindian period. Further, a recent survey has shown that soil erosion in the North Dakota National Grasslands is occurring rapidly which is impacting site preservation and visibility. Geoarchaeological analyses have been able to detect where and how quickly erosion has occurred. This GIS model is also used to predict probable and potential locations of Paleoindian sites to determine where these sites may be preserved, may be destroyed, and where they are yet to be discovered. These analyses thus, help inform on Paleoindian behavior and modern site formation processes and provide a useful management tool to the North Dakota National Grasslands.

Emerson, Patricia (Minnesota Historical Society)

[30] *Defining Sacred*

In American archaeology, as practiced in the context of cultural resource management, recognition and protection of sacred places requires application of bureaucratic standards that may not co-exist peacefully with the cultural norms of those most concerned about such protection. Definitions of the sacred exist in an awkward balance between the regulatory need for a precise, legally defensible definition and the reality that sacredness is a culturally-based concept that resists easy understanding. This paper will review the definitions of "sacred" that currently exist in law, regulation, and Executive Order, and will examine the assumptions that seem to underlie those definitions. It will contrast existing regulatory definitions with cultural understandings of sacredness, particularly those of American Indian tribes, communities and individuals. Comparison to the concept of significance as it is used in National Register evaluation of other property types may illuminate how legal protections for sacred places could function. Case studies will provide examples of the problems and potentials that can be found within the current system.

Emerson, Thomas [348] see Pauketat, Timothy

Emery, Kitty [244] see Foias, Antonia

Endo, Naoko [312] see Lyons, Natasha

Eng, Jacqueline (Western Michigan University) and Mark Aldenderfer (University of California, Merced)

[205] *Skeletal Trauma in an Ancient High Altitude Himalayan Community of Mustang, Nepal*

High altitude regions in the Himalayas provided a challenging environment for the early human populations who migrated there. In addition to the risks of hypoxia and cold stress, people had to

deal with difficult terrain and limited resources. Yet populations persisted and established complex polities, including those in the Mustang region of Nepal. Surface recovery and excavations of shaft tombs located near the village of Samdzong in Upper Mustang have yielded human remains and artifacts dating to approximately A.D. 200-700. Bioarchaeological analysis was performed on all remains recovered, a minimum number of 105 individuals (38 subadults, 67 adults). Results indicate that while fractures from accidents are uncommon, there is evidence of interpersonal violence within the adult sample, which is not limited to male victims. Injuries include cranial fractures in four males and three females, three of those wounds perimortem, as well as an embedded projectile in the ankle bone of a male. We examine these signs of trauma for insight into interpersonal relationships at Samdzong, a major node along the ancient salt trade route, as the injuries may reflect tension within the community, or they may indicate intercommunity disputes.

Engel, Damita [230] see Green, Debra

Englehardt, Joshua (El Colegio de Michoacan)

[259] *Formative Period Interregional Interaction and the Emergence of Mesoamerican Scripts*

Interregional interaction often serves as a catalyst for cultural innovation. This paper explores the effects of interaction on the development of Mesoamerican scripts during the Formative period. Current models suggest that the transition from iconography to phonetic writing involved the recontextualization of visual symbols: motifs were excised from the pictorial frameworks in which they were usually contextualized and enclosed within the emergent textual-linguistic conventions and organizational schemes of writing. The dynamics of this developmental process, however, remain obscure. We propose that interregional interaction facilitated the re-situation of iconographic elements and their incorporation into the nascent structure of writing. Sustained interaction between distinct groups employing an integrated, mutually-intelligible iconographic system potentially allows certain users to extract signs from that system to serve in more specific contexts. Scribes may thus juxtapose new values on visual elements, infusing icons with new meaning, and allowing them to function within the context of writing. Effectively, fixing variable meanings to icons in the context of interregional interaction detached them from previous interpretations and facilitated their new use as written signs. This paper examines several potentially illustrative examples of this process.

[259] *Chair*

English, Nathan [110] see Guiterman, Christopher

Enloe, James (University of Iowa)

[35] *Rockshelters and Farming Villages: Complementary Seasonal Occupations at Woodpecker Cave*

The Late Woodland Period in the Midwest of North America shows a marked shift in diet from mixed hunting, gathering and farming a few indigenous crops to a predominance of maize in the diet, indicated by radical changes in stable isotope ratios. The sumptuary displays of elite trade goods of the Adena and Hopewell Interaction Sphere in the Early and Middle Woodland were replaced by more egalitarian burial practices. Farming villages in the major river valleys underwent a major reorganization in spatial structure, also indicating increased egalitarianism. This economic and social transformation was accompanied, however, by increased occupation of rockshelters in upland areas during the Late Woodland. Analysis of the spatial structure of various artifact classes at Woodpecker Cave rockshelter in southeastern Iowa is employed to increase understanding of complementary seasonal exploitation of upland wild resources during a time of radical changes in the intensity of agriculture at farming villages.

Enloe, James [53] see Waterman, Anna

Enote, Jim (Executive Director, A:shiwi A:wan Museum and Heritage Center)

[160] *Discussant*

Eppich, Keith (Collin College)

[375] *The Evolution of Classic Maya Ceramic Shape-Classes through Time: New Evidence from El Peru-Waka, Guatemala*

This paper presents new work from the analysis of recovered ceramic vessels from the Classic Maya site of El Peru-Waka'. The research focuses on the development and evolution of four shape-classes from A.D. 300 to A.D. 1000. These include presentation platters, cacao vessels, small drinking cups, and bowls. These were serving vessels, designed not only to hold foodstuffs, but as social and political currency in their own right. They were to be present at Classic feasting events to display the wealth and largesse of the hosts. This research argues that changing styles of feasting become evident in the analysis of these ceramics. Such feasting styles may have been regional in scope, illuminating one aspect of an integrated elite subculture of the Classic Maya in the Western Peten.

[255] *Discussant*

[375] *Chair*

Epstein, Ethan (University of Wisconsin -Milwaukee)

[113] *A Hearth with a View: The Spatial Analysis of a Late Holocene Hunter-Gatherer House*

Excavations of a house floor located in North America's Great Basin resulted in hundreds of bone and stone artifacts. We present a spatial analysis of the recovered household artifacts. Identified raw materials provide evidence for connections to communities farther afield. Results indicate a diverse and complex suite of social goals.

[113] *Chair*

Epstein, Stephen [236] see King, Eleanor

Epstein, Emily (University of Wisconsin -Milwaukee), Brianne Charles (University of Wisconsin -Milwaukee) and Brooke Drew (University of Wisconsin -Milwaukee)

[301] *Neonatal Line Assessment among Milwaukee County Institution Grounds (MCIG) Perinates to Determine Viability*

A sample of perinatal individuals recovered from MCIG Cemetery (ca. 1890-1920) included broken teeth. We evaluate these teeth for the presence of the neonatal line to differentiate stillborn individuals from those that died as postnatal individuals. Our research is nondestructive. We compare the results of the dental analysis to the distribution of stillborns and live births documented in the MCIG burial record and City of Milwaukee vital records.

Erb-Satullo, Nathaniel (Harvard University)

[241] *Applying Innovation Diffusion Theory to Archaeology: a Case Study on the Rise of Iron Technology in Western Asia*

For a variety of historical reasons, the interdisciplinary field of innovation diffusion research has been underutilized by archaeologists examining technological change. Yet there is much to be gained by engaging with the predictive models produced by hundreds of investigations of technology adoption. Using the case of iron adoption in Western Asia, I demonstrate how an approach utilizing these concepts, with some modifications, provide a more complete perspective on technological change.

Innovation-diffusion theory identifies both structural factors (e.g. the nature of interaction networks and the presence of so-called "opinion leaders") and innovation-specific features (e.g. an innovation's observability and compatibility) that influence the pace and pattern of adoption. Using these concepts, I examine patterns of metal usage and the economic structure of metal production on the southeastern Black Sea coast in the late 2nd and early 1st millennia B.C. Archaeological evidence demonstrates that iron, when it appears, was made with great skill and used in large quantities in ways that were probably highly socially visible. I argue that concepts from innovation-diffusion theory explain these patterns more effectively than approaches which attempt solely to identify relative advantages of iron over copper alloys in terms of efficiency or mechanical

effectiveness.

[241] *Chair*

Erek, Cevdet Merih [8] see Basiran, Alper

Erel, Yigal [321] see Knabb, Kyle

Eremin, Katherine [37] see OConnor, Ariel

Eren, Metin [35] see Andrews, Brian

Ericksen, Connie and Haagen Klaus (George Mason University)

[393] *Fighting Back at Yellow Jack*

Since the beginning of the twentieth century, burial status has been a subject of archaeological investigation. Tainter (1978), Saxe (1970), Hertz (1907), and Pearson (1999) have contributed to our understanding of what status means in various cultural contexts and how it may be interpreted from archaeological contexts. This paper is an application of the burial status theme applied to burials recorded in late-colonial Peru. In 1868 burial records note the advent of yellow fever. Monthly mortality counts escalated to 7400% that of pre-fever months. Burial status is indicated as entierro mayor or entierro menor, translated to mean "high" or "low" burial, and following Ramos (2010), designated a range of mortuary details. Beyond the cost of high burial compared to low, there were also differences in the number and rank of persons in the funeral, the size and prominence of the cross, length of mass, and burial locale. This paper investigates the demographics of the deaths and the predicted change in burial status due to greater strain on families and community. The concept of status adds a new specificity to the prevailing question of mortuary performance: who merited "high" burial and how would escalated mortality rates influence this performance feature?

Erickson, Clark (University of Pennsylvania)

[180] *Discussant*

Erickson, Katrina (National Park Service) and William Reitze (National Park Service)

[364] *Lithic Landscapes and Basketmaker Villages: An Update of the 2014 Petrified Forest Boundary Expansion Survey*

In 2004 Congress authorized Petrified Forest National Park to more than double in size, in part to protect unique cultural resources. This poster introduces the preliminary results of the first and second seasons of pedestrian survey in these new lands. So far this research has recorded archaeological sites dating from the Early Archaic through the Late Pueblo periods. Sites range from lithic landscapes covering hundreds of acres to multi-room masonry or jacal structures. Mapping in semi-stabilized dunes has focused on large Basketmaker village sites and detailed ceramic analysis has documented phenomenal diversity of ceramic types and sources. This survey and documentation project is being conducted in order to better understand prehistoric land use and change through time in this prehistorically significant area of the southwest. In addition to cultural resource management goals this project also functions as a teaching laboratory with the Petrified Forest National Park internship program. To date, this program has incorporate nine college student interns for in-depth field training and independent research.

Ericson, Jessica (Colorado State University CEMML), Julie Esdale (Colorado State University's Center for Environment) and Whitney McLaren (Colorado State University's Center for Environment)

[90] *Creative Mitigation: Archaeological Site Monitoring on Military Lands in Central Alaska*

The creation of a large live-fire training range in the Donnelly Training Area (DTA) of United States

Army Garrison, Fort Wainwright (USAG FWA), required Army archaeologists to integrate standard mitigation techniques with a creative new approach. Extensive survey of the entire Battle Area Complex (BAX) target area and the surface danger zone (SDZ) downrange of targets uncovered over 150 archaeology sites. Twenty-nine sites in the target area were excavated and USAG FWA and the Alaska State Historic Preservation Officer developed a creative plan to monitor the condition of sites in the SDZ to maintain a status of “no adverse effects” for the use of the range. Colorado State University’s Center for Environmental Management of Military Lands was contracted to conduct site condition assessments of the 124 sites within the BAX SDZ. Sites are monitored on an annual or more frequent schedule depending on their proximity to target areas and the amount of use the range receives. This paper serves as an update on the successes and challenges of this approach, as well as an example of how training and cultural resource protection can coincide on military lands.

Erlandson, Jon [32] see Ainis, Amira

Erlandson, Jon (University of Oregon), René Vellanoweth (California State University-Los Angeles), Torben Rick (National Museum of Natural History, Smithsonian In) and Nicholas Jew (University of Oregon)

[32] *Toolstone Sources off the Pacific Coast of Alta California: Implications for Evaluating the Marginality of Islands through Space and Time*

Except for major sources of chalcedonic chert on eastern Santa Cruz and soapstone on Santa Catalina, the islands off the Pacific Coast of Alta California were long thought to be impoverished in high-quality materials for making stone tools. As a result, cherts and other toolstones could have been a major source of trade between islanders and mainlanders. We summarize the distribution of known lithic resources on the islands, documenting numerous chert types on the Northern Channel Islands and quartzites, metavolcanics, rhyodacites, and sandstones on the Southern Channel Islands. For islands occupied since the Terminal Pleistocene, the abundance and distributions of such resources may also have changed significantly through time due to sea level rise and coastal erosion. This spatial and temporal variability has implications for understanding a variety of issues, including the antiquity of initial colonization and permanent settlement of California’s islands, the distribution of Paleocoastal lithic technologies, the development of exchange and alternative technologies, and the broader issue of the ‘marginality’ of island environments. Given the discovery of new lithic sources over the last twenty years, further geoarchaeological surveys are required to better understand the diversity, abundance, and distribution of toolstone resources on California’s islands.

Ernenwein, Eileen [7] see Klehm, Carla

Ernenwein, Eileen (East Tennessee State University), Katie Simon (University of Arkansas) and Christopher Tuttle (Council of American Overseas Research Centers)

[8] *Ground-penetrating Radar at edh-Deir, Petra, Jordan*

Petra is famous for the many tomb façades and complex water management systems carved in its surrounding mountains. The ancient city has been studied by traditional archaeological survey and excavation techniques for more than 100 years. Ground-penetrating radar (GPR) has been previously used in several locations with excellent results, including in front of the al-Khazneh (“the Treasury”), near the Temple of the Winged Lions, on the “Upper Market” and the Garden and Pool Complex (the “Lower Market”), as well as on several agricultural systems in the hinterland. This poster presents results from the 2013 GPR survey conducted in front of edh-Deir (also known as the Monastery), which is located on a high plateau above the city center. A 400 MHz antenna was used to explore the ca. 2,500 square meters immediately in front of the façade, revealing an architectural arrangement oriented at a 45 degree angle from the monument. The nature of the orientation and architectural pattern, combined with insights gained from a related terrestrial scanning project, lead to a new understanding of how edh-Deir may have been used in the broader Petra landscape.

Erny, Grace [85] see Diederichs, Shanna

Erny, Grace, Gerardo Gutierrez (CU Boulder), Alyssa Friedman (CU Boulder), Melanie Godsey (CU Boulder) and Machal Gradoz (CU Boulder)

[409] *Archaeological Topography: Comparing Digital Photogrammetry Taken with Unmanned Aerial Vehicles (UAVs) versus Standard Surveys with Total Stations*

This paper addresses how Unmanned Aerial Vehicles (UAVs) are used as a platform to produce accurate topographic maps with a considerable reduction in time and costs associated with fieldwork when compared with a total station. For this study, data was collected in the controlled environment of a mapping course to compare the procedures and time required to train archaeology students in the operation of a total station versus the operation of a small UAV equipped with digital cameras. An artificial mound of 3 ha was mapped with both a total station and the UAV. On average the UAV platform captured topographic data 27 times faster than the total station.

Ertsen, Maurits [84] see Murphy, John

Ervin, Kelly (Auburn University and Coastal Environments Inc), Alex Colvin (Auburn University), Philip Chaney (Auburn University), Kathryn Braund (Auburn University) and April Antonellis (The National Park Service)

[103] *Mapping the Homelands: A Collaborative Effort of Auburn University, the National Park Service, and Native American Tribes*

Native American land ownership underwent significant geographic changes following European settlement. This intensified after the American Revolution due to demographic changes, tribal migration, and aggressive Euro-American expansion. This paper presents the results of a collaboration between Auburn University, the National Park Service, and federally recognized tribes to plot land loss from ca. 1790 through the 1850s, with particular emphasis on the impact of the War of 1812 on native landholding. The historical and cartographic work combined ethnohistorical data collection with GIS methodology, and resulted in a series of maps showing the locations of federally recognized tribal groups through time. This project is unique in including consultation with Native American tribes. The final result is a dynamic, interactive, and user-friendly online database of tribal land tracts that is accessible to the public on the NPS.gov website. This paper will examine the process and challenges of creating a digital database of land loss for fifty-four tribes across four distinct time periods.

Eschbach, Krista (Arizona State University)

[76] *Consequences of Warfare, Reforms, and Capitalism in Late Colonial Port of Veracruz, Mexico*

At the beginning of the 18th century, Spain and its American colonies were still steeped in mercantilism with the Spanish Crown and elite merchants struggling to maintain a monopoly over trans-Atlantic trade. Over the next hundred years, this economic system was transformed as a result of political and economic events in Europe and the Spanish colonies. By the end of the 18th century, the Port of Veracruz, once one of the few legal ports in Spain's American colonies, was now one of many ports open to rapidly growing trade with Europe. Wealthy merchants who benefited from the mercantile policies of previous centuries were replaced by a new generation of local and foreign entrepreneurs. In this paper, I investigate the social and economic consequences of global developments within the Port of Veracruz by examining periodic shifts in the consumption of local and imported ceramics that coincided with European wars, economic reforms, and developing capitalism. I consider how these shifts varied between two lower status neighborhoods within the port in order to evaluate different consumption strategies and the impact of global changes on economically vulnerable people.

Escobar, Luisa (CIRMA) and Guido Pezzarossi (Syracuse University)

[76] *Booms, Busts, and Changing (Anti)Market Engagement in Pacific Piedmont Guatemala*

Located in the cacao-rich Pacific piedmont region of Guatemala, the colonial period Kaqchikel Maya

community of San Pedro Aguacatepeque produced cacao for the Iximche Kaqchikel polity prior to colonization. With the 16th century global cacao boom that followed Spanish colonization, cacao producing communities in the region became critical sources of this increasingly desired regional and global exchange good. The bust of the global cacao market in the latter part of the century, coupled with increasing depopulation and the impact of colonial antimarket effects (i.e. unequal, exploitative exchanges underwritten by power disparities) led to the decline of cacao production, the abandonment of formerly thriving communities, and the emergence of new opportunities and modalities of market engagement and economic mobility for individuals and communities in the region. This paper focuses on how Aguacatepeque navigated these booms and busts through a transformation of production away from cacao and towards the market-oriented production of sugar cane, and sugar-based products, both legal and illegal/illicit. This transformation in production brought with it a shift in consumption as market dependence for craft goods intensified, redirecting the majority of Aguacatepeque's time, labor, and land use toward globally connected regional Spanish colonial (anti)markets and their broader economic networks.

Esdale, Julie [90] see Ericson, Jessica

Esler, Karen [294] see Singels, Elzanne

Esparza Lopez, Rodrigo (Faculty Member), Francisco Rodríguez Mota (El Colegio de Michoacán, A.C.) and Juan Morales (Instituto de Geofísica, UNAM, Campus Morelia)

[21] *The Archaeological Site of Presa de la Luz: New Insights on the Relationship between the Altos of Jalisco, the Bajío and the Mexico Basin*

During the years of 2012 and 2013 draft surface survey was conducted to record more than 600 petroglyphs of the archaeological site known as Presa de la Luz in southern highlands of Jalisco, Mexico. This site drew attention from the beginning due to the high number of pecked cross or solar markers, we recorded nine of these, could be the site with the largest number in any Western Mexico. Solar markers are very similar to those recorded in first instance in Teotihuacan and Mexico Basin. Also, the relationship with the Bajío you can see this in the architecture of sunken patios (patios hundidos) of at least two nearby petroglyphs archaeological sites, as well as a constant debitage obsidian, from which a collection was analyzed through XRF technique. In addition, the surface ceramics collected points to an occupation during the Epiclasic between 700-900 A.D. and perhaps some earlier. In this paper the results and inferences will be tabled and discussed this influence of distant regions.

Espenshade, Christopher

[188] *The Public Swinging Detectors: Interaction With Professional Archaeologists*

Avocational detectorists are one segment of the public that offers great opportunities and challenges for public outreach. It has become increasingly clear that not all laypersons with a metal detector are the same, and that past and ongoing vilification of "relic hunters" is not always appropriate. The class, Archaeological Partnership Program, is introduced. This class teaches avocational detectorists how they can contribute to professional archaeological research, and hopes to help bridge the gap between these two communities.

Espinosa, Ma Alejandra (UA.D.Y)

[24] *Las primeras sociedades agrícolas sedentarias en el Valle de Oaxaca: producciones líticas y surgimiento de nuevas necesidades*

Los vestigios de las primeras aldeas agrícolas muestran una sociedad que se caracteriza por la fabricación de un tipo de cerámica elaborada, la presencia de productos de intercambio y un modo de vida sedentario. De manera general, se ha considerado que la diferenciación de estatus social de estos grupos domésticos es poco perceptible o incluso inexistente. Sin embargo, el inicio del Preclásico se caracteriza por el surgimiento de innovaciones de importancia fundamental y el establecimiento de las primeras aldeas agrícolas tuvo sin duda implicaciones de gran importancia tanto en el patrón de asentamiento como en la economía, conduciendo así a nuevas necesidades.

En esta ponencia se presenta el análisis del material lítico tallado de los primeros grupos sedentarios de los Valles centrales de Oaxaca. La industria lítica de los primeros grupos agrícolas demuestra una regresión cualitativa de la producción lítica local, la cual ha sido generalmente considerada como desprovista de valor social o simbólico y con poco significado en cuanto a la organización de los grupos. No obstante, esta tendencia a la simplificación se explica como una respuesta de eficacia ante las necesidades cotidianas dentro de un nuevo contexto doméstico.

Esteban, Irene [294] see Albert, Rosa-Maria

Estes, Byron (Arizona State Museum), Claire S. Barker (University of Arizona) and Vincent M. La Motta (University of Illinois at Chicago)

[343] *Ceramics and Social Identity at RAR-2: A Pueblo III Period Site near Winslow, Arizona*

RAR-2 is a small Pueblo III period site located on private land outside Winslow, Arizona. Excavations in 2011-12 by the University of Illinois at Chicago and the University of Arizona Field School at Rock Art Ranch have revealed the production of local utility ware, Rock Art Ranch utility ware, in addition to a variety of imported, non-local utility wares, including Tusayan Gray ware, Mogollon Brown ware, and Puerco Valley utility ware. This study analyses the technological style of the locally produced corrugated utility ware to explore the diversity of social identity within the local community. The technological style of imported corrugated utility wares will also be analyzed; correlation between the locally produced pottery may indicate the origins of extraregional trade connections of the inhabitants of RAR-2. This study will provide insight into larger demographic and migratory patterns within the broader cultural landscape.

Esteva, Maria [123] see Trelogan, Jessica

Estrada-Belli, Francisco (Tulane University/Boston University/AMNH)

[306] *The Rise and Fall of Maya Kingdoms in the Holmul Region*

Research in the Holmul region of northeastern Peten has focused on Cival as its major political center during the Middle and Late Preclassic period since its rediscovery in 2001. The goals of this research continue to be inspired by several ideas expressed in *Forest of Kings* in 1990. Mainly, the rise of kingship in the Late Preclassic period, the interpretation of giant 'mask' sculptures on the facade of pyramids as backdrop for royal rituals as well as the interpretation of ritual caches. Centers like Cival, El Mirador and Cerros were simultaneously abandoned and replaced by new political capitals in the Early Classic period, such as Holmul, Tikal and Santa Rita Corozal. Newly acquired imagery and texts as well as environmental data allow us today to build upon the influential ideas expressed in the 1990 volume and reveal new untold stories on the nature of Maya kingdoms.

Estrada-Belli, Francisco [350] see Wahl, David

Etnier, Michael [168] see Butler, Virginia

Eubanks, Paul (The University of Alabama) and Ian Brown (The University of Alabama)

[109] *Salt Production and Economic Specialization at Drake's Salt Works*

The Drake's Salt Works Site Complex in northwestern Louisiana was one of the most intensively-utilized salt production sites in the south-central United States during the seventeenth and eighteenth centuries. According to the historic record, the Caddo salt makers at this saline were capable of producing hundreds of pounds of salt each year to sell to nearby European and American Indian groups. Given the limited availability of salt away from coastal areas, participating in the production and exchange of salt at inland salt springs, such as Drake's Salt Works, would have been a profitable economic venture. Using recent archaeological data from a stratified midden of salt production debris and two habitation zones, this paper examines the intensity of Caddo salt production at Drake's Salt Works. An analysis of salt production vessel rim diameter and thickness from the stratified midden indicates that vessel standardization remained relatively consistent

through time. Additionally, the data from the two habitation zones suggest that the salt makers worked at this site on a seasonal or opportunistic basis. Thus, it would appear that the Caddo were able to meet and profit from the local demands for salt without the need for full-time economic specialization.

[109] *Chair*

Eusebio, Michelle (University of Florida)

[349] *Between Manufacturing and Disposal: The Lives of the Pots in the Neolithic and Metal Age Settlements of Southern Vietnam*

Studies on pottery from archaeological sites in Southeast Asia are largely orientated towards aspects of manufacturing and typology. Emphasis is on the identification of transregional similarities and differences of form, decoration, and composition to establish patterns of human migration, contact, and identity. Less emphasis has been directed towards understanding what happens to different pottery vessels between their manufacturing and disposal, as well as their actual functional use. For example, was a particular pot used to prepare, serve, or store food? To address this question, pottery vessels from the settlement sites of Rạch Núi, An Sơn (Neolithic), Lò Gạch, and Gò Ô Chùa (Metal Age) in southern Vietnam were analyzed for technofunctional attributes and organic residues to determine their usage and food contents. Specifically, organic residues were analyzed for fatty acid profiles with gas chromatography-mass spectrometry, carbon isotopic signatures ($\delta^{13}\text{C}$) of palmitic (C16) and stearic (C18) fatty acids with compound specific isotopic analysis, and carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) with bulk isotopic analysis to elucidate former food contents on pottery. This paper then explores the “lives of the pots” as they were utilized in foodway practices by the inhabitants of Neolithic and early Metal Age sites in southern Vietnam.

Evans, Adrian (University of Bradford)

[17] *Representative Samples and Method Calibration for Lithic Microwear Interpretation Frameworks*

This paper builds on discussion of combined blind-test datasets for lithic microwear analysis method previously presented by the author (Evans 2014). A large randomly sampled assemblage, from the Mesolithic site of West Stainton in England, was analyzed using traditional microwear analysis. The size of the assemblage may allow an investigation of variation of tool function within different classes. However predicted error rates from the combined blind-test dataset were used in monte carlo and bootstrapping algorithms that were run on the primary results from analysis. This paper discusses this experiment and impact of such probabilistic modelling on microwear data when blind-test results are considered and presents this as a possible means of using blind-test data in a positive way to strengthen basic microwear data prior to interpretation.

[17] *Chair*

Evans, Jane [154] see Madgwick, Richard

Evans, Susan (Penn State University)

[182] *It's Alive: Gambling, Animatism, and Divination among the Aztecs*

Gambling and divination both pit the hopes of the petitioner against an uncertain future outcome. Popular for millennia, they seem to inhabit distinct spheres of interest, secular and spiritual, but overlap as the individual tries to assess the odds and garner available forces of knowledge, luck, or patronage of the spirits. In Aztec culture, this overlap linked the spiritual realm of divination and the base entertainment presented by gambling (which they regarded as dissolute, though common). The Aztecs lived in a rich, nuanced environment which they perceived as alive, its vitality evidenced by its animated aspects. The Aztecs responded with patterns learned since childhood: the rites and fates of the calendars of nature and culture, the good and bad omens, and the appropriate chants, adages, or exorcisms to restore a balance if chaos should threaten. One could seek advice from “wise ones” (as Aztecs referred to those with specialized knowledge) to interpret phenomena and their bearing on the future. Similarly, the movement of a few beans and a little time in a game of patolli might radically alter one’s fortune. Gambling and divination depended on animated

phenomena, and Aztec practices reveal their methods of communicating with this living world.

Evans, Amanda (Tesla Offshore)

[192] *Right Place, Right Time: Paleoindian Landscapes on the Gulf of Mexico, Outer Continental Shelf*

Archaeologists have been conducting prehistoric archaeological research on the world's continental shelves for the last 40 years, with a general consensus that remote sensing combined with physical sampling is the best method for identifying sites. Following the conclusion of a US federally-funded (BOEM) study in the Northwestern Gulf of Mexico, two promising Paleoindian landscapes have been verified 20 and 30 miles offshore, at depths of between 16 and 32 m BSL. Remote sensing and physical sampling revealed evidence of highly favorable conditions for supporting human populations, however the survey areas are classified as archaeological landscapes and not "sites". This paper will summarize the results of environmental reconstruction, highlighting the unique differences between identifying archaeological landscapes versus sites. It will also address challenges facing cultural resource managers charged with protecting submerged landscapes and sites offshore.

Evans, Caitlin (James Cook University)

[286] *Sites, Survey, and Ceramics: A GIS-Based Approach to Modeling Early Prehistoric Settlement Patterns in the Upper Mun River Valley, Northeast Thailand*

Recently, a series of intensive pedestrian surveys were conducted in the Upper Mun River Valley, northeast Thailand to examine prehistoric and historic settlement patterns at an intermediate scale. This paper will focus on the early prehistoric (1650 – 420 B.C.) finds, in particular evidence of Neolithic (1650 – 1050 B.C.) occupation. Our results indicate that during the early prehistoric period, site density was unexpectedly high, but settlement integration was weak; site sizes varied greatly and distances between them were uneven. Early prehistoric sites primarily followed a linear pattern, stretching alongside the fossil river network within an elevation range of 141-166 MAMSL. Neolithic sites were located within an even narrower elevation range (151 – 156 MAMSL) and situated on large natural ridges jutting from the low terraces into the alluvial floodplains. How these newly-identified intermediate-scale settlement patterns complement existing excavation and regional aerial surveys within northeast Thailand, will be explored further in this paper.

Evans, Sally (Evans & De Shazo, LLC)

[293] *Auditory Exostosis: A Marker of Occupational Stress in Pre-Contact Populations from the San Francisco Bay Region of California*

The formation of auditory exostosis in prehistoric populations living along the shoreline of San Francisco Bay is due to participation in cold water subsistence behavior. Rates of auditory exostosis in populations from previously excavated archaeological sites located along the Bay Shore were compared with those located in the interior East Bay. A sample population of 1,291 individuals dating from the Early Period (3500 – 200 B.C.) to the Late Period (A.D. 1050 – 1769) was employed to address inter-regional and sex-based differences, and diachronic trends in the frequencies of auditory exostosis. Corresponding with environmental conditions that are conducive to its formation are higher rates of auditory exostosis in populations living along the Bay Shore compared to those occupying an inland setting. Diachronic trends in frequencies of auditory exostosis in the Bay Shore sample also correlates with changes in the use of marine resources, and it is suggested that diving was a strategy employed regularly during the Middle Period (200 B.C. – A.D. 1050) to access shellfish. The sex-based analysis shows this activity was primarily performed by males and reveals different inter-regional diachronic trends in the sexual division of labor as it relates to cold water foraging behavior.

Everett, Mark (Texas A&M University), Timothy S. de Smet (Texas A&M University), Robert Warden (Texas A&M University), Tanya Komar (Chico State University) and Jason Hagin (Golden Gate National Recreation Area, National Park)

[310] *Ground-Penetrating Radar and Terrestrial Laser Scanning Reconstruction of the Prison and*

Civil War Era Historic Fortifications on Alcatraz Island

Between 2012 and 2013 we conducted a cultural resources assessment and historic preservation project with the National Park Service on Alcatraz Island using terrestrial laser scanning and ground-penetrating radar. Alcatraz is most (in)famous for its brief period as a Federal Penitentiary (1934-1963); however, for the vast majority of its history it was a military fortification – Fortress Alcatraz - under the U.S. Army. As the need for harbor defense diminished, the island was converted into a military prison during the 1860's. The conversion of the island to a prison greatly reduced the surface record of this historic period. An analysis of georectified historic maps showed that historic masonry and earthen work fortification structures once stood in the Parade Ground and Recreation Area of the island. Ground-penetrating radar with 200 and 500 MHz antennas was used to detect the presence, integrity, and extent of these significant historic remains below the island's current prison facade. Laser scanning was undertaken to obtain a current 3D reproduction of the island. The integration of GPR and laser scanning data was used to create a 3D reconstruction, which allowed for a greater understanding of the process of change over time on the island.

Evin, Allowen [28] see Larson, Greger

Ewen, Charles

[81] *Discussant*

Ewing, Diana (UNLV)

[114] *The Thermal and Transpirative Properties of Arctic Clothing Construction: A Women's Adaptive Technology*

The technical ability of women to engineer clothes as adaptation to the harsh arctic environment in Indigenous North America has not been extensively investigated. My research focuses on the analysis of the thermal and transpiration properties of Arctic clothing. The materials chosen for clothing have certain inherent properties that include species of animal selected, different tanning processes, patterning of the garments, seam construction, and tailoring. All these properties play into the thermal and transpirative properties of a finished piece. Through the examination of garments in the collections of the Smithsonian National Museum of Natural History I determined the patterning and seam construction employed by Western Alaskan women; here I focus on a parka, a pair of leggings, and a pair of mittens. Such patterning, seam construction, and tailoring techniques make possible year round habitation of the Arctic.

Ewonus, Paul (University of British Columbia / Kwantlen Polytechnic University)

[154] *A Geography of Foodways in the Salish Sea, Pacific Northwest Coast*

This paper examines past foodways within the southern Strait of Georgia, Pacific Northwest Coast at a number of geographic scales. It also addresses the extent and nature of temporal shifts in the social landscape of the region. Seasonal use of the landscape is revealed through an understanding of place in the Salish Sea. Zooarchaeological analysis of a regional sample of 30 sites suggests that while extensive variation was characteristic of southern Strait of Georgia settlement from 3200 B.C. to the arrival of Europeans, late winter and early spring site use was prominent on southeastern Vancouver Island. The southern Gulf and San Juan Islands appear more generally to have been a focus of spring and summer inhabitation. This pattern is most evident during an important period of village aggregation in the southern Strait of Georgia between 650 B.C. and A.D. 650, although it is expressed to a lesser extent both before and after this interval. People may have established a larger number of villages after 650 B.C. in order to not only increase their use of food resources available in seasonal concentrations, such as herring and salmon, but also to engage in more elaborate ritual activity.

Fábrega-Álvarez, Pastor [180] see Hayashida, Frances

Fábreas Valcarce, Ramón [137] see Rodríguez-Rellán, Carlos

Fadem, Cynthia [53] see Egeland, Charles

Fadem, Cynthia (Earlham College)

[272] *Farming the Great Sage Plain: Mesa Verde Loess, Soils, and Agriculture*

The Pueblo Farming Project (PFP) seeks to preserve traditional farming knowledge and educate the public concerning traditional farming practices and the place of corn cultivation in Pueblo cultures. Soil profiles inside and adjacent to project gardens reveal the impact of farming on soils over relatively small temporal and spatial scales.

The Basketmaker Communities Project (B.C.P) focuses on better understanding the Basketmaker III Period, as well as the development of Early Pueblo communities. B.C.P geoarchaeological investigations at Basketmaker III (1250-1500 BP) sites focus on the soils' development and tilth. Soil profiles on- and off-site demonstrate differences between farmed and un-farmed soils over larger temporal and spatial scales.

Examination of modern non-irrigation farming practices suggests intimate connections between fertility, soil identity, and management. Both PFP and B.C.P soils exhibit soil hardening and pan development to varying degrees. As pan accumulation limits productivity, its rate of formation is an important factor with implications for Ancient Puebloan site choice and occupation span. Understanding the interplay of climate, cultural practice, and pedogenesis is, therefore, key to deciphering this geocultural record.

Fagan, Brian

[222] *Discussant*

Fairbairn, Andrew [16] see Baird, Douglas

Faith, Tyler [77] see Weisler, Marshall

Faizul, Hazwan [358] see Sakai, Sachiko

Falk, Carl [230] see Picha, Paul

Falvey, Lauren W. [311] see Beck, Colleen

Fanjul Peraza, Alfonso [394] see Bondura, Valerie

Fankhauser, Amber [392] see Burnett, Katherine

Farah, Kirby

[253] *Examining Elite Domestic Practices in Postclassic Xaltocan, Mexico*

The Postclassic site of Xaltocan has been the focus of archaeological investigation for nearly 30 years. Over this period a solid ceramic chronology for the site has been established thanks in large part to the pioneering efforts of Elizabeth Brumfiel and her students. While the vast majority of archaeological research at Xaltocan has focused predominately on commoner contexts, recent archaeological excavations of elite domestic spaces at Xaltocan inform and expand upon the current ceramic chronology. Using these new findings as a jumping off point, this poster presents comparisons between ceramics found in commoner and elite domestic settings at Xaltocan, enabling a greater understanding of local class relations. Additionally, ceramic data sets collected from elite domestic spaces at Xaltocan are also compared with those from other Postclassic elite residences in

the Basin of Mexico. Such comparisons contribute to a greater understanding of how regional elite identity was created and sustained through a shared symbol system and trade relations.

Farahani, Alan (University of California, Los Angeles)

- [162]** *Morphometric Analyses of Cereal Grains from Central Jordan Improve the Resolution of Identifying Shifts in Crop Cultivation and Processing Strategies over 2000 Years (ca. 800 B.C.E. - 1300 CE)*

The measurement of carbonized domesticated cereal caryopses through a number of established morphometric parameters has the potential to provide information on past cultivation conditions, crop processing practices, and taphonomic processes. This poster presents the results of morphometric analyses using a microscope-mounted camera on carbonized cereal caryopses of wheat (*Triticum aestivum/durum* and *Triticum dicoccum*) and barley (*Hordeum vulgare*) collected from the archaeological site of Dhiban, Jordan. The settlement of Dhiban was occupied by agricultural societies for over 2,500 years, although it is located in a semi-arid bioclimate with rainfall too low and variable for reliable rain-fed agriculture. Computer-imaging based morphometric analyses of these grains illustrates that barley caryopses are significantly thicker in the Byzantine period (ca. 500 CE) than in the later Middle Islamic (ca. 1300) period, although wheat grain sizes are not significantly different between these periods. The decreased size yet increased variance of barley caryopsis size in Middle Islamic period samples indicates a shift in agricultural production towards targeted expediency as well as increased crop processing on the site itself. The morphometric analysis of cereal caryopses thus enhances the resolution of the identification of long-term shifts in agricultural practice at the level of changes in individual cultigens.

Farella, Joshua [239] see Swetnam, Thomas

Farella, Joshua, Thomas Swetnam (University of Arizona Laboratory of Tree Ring Rese) and Mathew Liebmann (Harvard University)

- [239]** *Forests, Fires and People: Reconstructing Human-Natural Interactions on the Jemez Plateau, New Mexico with Tree Rings*

The Jemez Plateau of northern New Mexico contains a rich archaeological and tree-ring record characterizing interactions between humans, forests, climate and fire over the past 500 years. Ponderosa pine and pinyon-juniper woodlands on the Plateau were occupied by roughly 6,000 people within an area of about 30,000 hectares during the early 1600's. Using dendrochronology we reconstructed detailed fire and forest histories directly on and surrounding several large, ancestral Jemez village sites (i.e determining tree establishment dates and fire events). Comparisons with site provenance from ceramic assemblages and structural tree-ring dates enabled us to assess human, forest, and fire interactions. We found (1) reduced or no fires occurring immediately around villages during occupations prior to 1680 CE, (2) trees re-established around and on village sites within approximately 30 years of site de-population, and (3) subsequently, spreading, low severity surface fires began burning at intervals of about 5 to 20 years, until about 1880-1900 CE when fire occurrence generally ceased due to intense livestock grazing. This study demonstrates novel applications of terminus ante quem tree-ring dating of site occupation and utilization, fire and forest dynamics. These methods have potential for application elsewhere, and may complement other chronological methods and archaeological interpretations.

Fargher, Lane (CINVESTAV del IPN), Marc N. Levine (University of Oklahoma) and Flor Arcega-Cabrera (Universidad Nacional Autónoma de México, UMDI-Sisa)

- [25]** *Using Natural Breaks to Work Together: Compositional Analysis of Archaeological Ceramics Using Petrography and NAA*

Historically, the application of petrographic techniques and NAA to the compositional analysis of archaeological ceramics in the New World emerged from two very distinct intellectual foundations. Initially, petrographers focused on studying temper to characterize the types of materials used, their geological sources, and their coarseness in an effort to reconstruct the cultural development of potting traditions and interaction among cultures. NAA, on the other hand, was originally used to measure trace elements to distinguish geological clay sources. Thus, at base, each technique

focused on very different things for very different ends. Accordingly, they have traditionally produced divergent and, sometimes, contradictory results. Therefore, in order to build a bridge between these methods, we present a new method that uses mineral chemistry, continuous variables, and insights from Central Limit Theorem to bring Petrography and NAA together in such a way that they can effectively provide complementary information on temper (or natural occurring aplastics) and clay. In order to do this, we move away from the classic analytical techniques in each area (e.g., ternary data in petrography and log transformations in NAA analysis) and incorporate statistical methods not traditionally used in compositional analysis by archaeologists.

[79] *Chair*

Fargher, Lane F. [237] see Antorcha Pedemonte, Ricardo

Fargo, David, Maolin Ye (Institute of Archaeology, CASS) and Yin Lam (University of Victoria)

[37] *Early Bronze Age Animal Use at Lajia, a Qijia Culture Site in Qinghai Province, China.*

The faunal remains from Lajia, a late Neolithic and early Bronze Age site in northwestern China, reveal that sheep, a newly introduced domesticate during this time period, are the central source of meat for the site's residents. This represents a shift from earlier modes of subsistence in the region, which were focused on pig husbandry. Sheep were the most common domesticate in the Lajia assemblage, followed by pigs and cattle. An examination of age profiles reveals that mature adult sheep individuals were rare in the assemblage, which suggests that sheep were being exploited for meat. This finding is not consistent with evidence from contemporaneous northern Chinese sites, where sheep are interpreted as being a source of secondary products such as milk and wool. An analysis of bone breakage aimed at determining whether remains were processed for grease and marrow was inconclusive, revealing that the main source of fragmentation in the assemblage was related to butchery, with no significant correlation between increased levels of fragmentation and high-utility skeletal elements. This study provides preliminary but important information regarding food production and animal husbandry during a period in which larger centers of power were emerging and new domesticates were being exploited.

Farley, Greg [408] see Nielsen-Grimm, Glenna

Farmer, James

[187] *Evolving Identities in Early Andean Art: Figurative Ceramics from Ancient Ecuador*

For nearly 5000 years, between c. 4,000 B.C.E. and 500 CE, a continuous tradition of figurative ceramics evolved in ancient present-day Ecuador. Though known only through now-anonymous archaeological remains, this tradition represents some of the earliest dated sculptural and ceramic art forms in all of ancient America. At least five distinct, chronologically sequential styles have long been recognized in this tradition, beginning with the earliest Valdivia style and continuing with subsequent Machalilla, Chorrera, Jamacoaque and La Tolita variations. Within each style, noticeably different approaches to establishing identity were employed, including body posture and gesture, basic clothing and skin adornment (cosmetic or tattoo), elaborate jewelry and costuming, display of status paraphernalia (sacred, utilitarian or ceremonial), or highly naturalistic anatomical renderings (individual portraiture?). This paper considers the evolutionary sequence of these differing identity strategies and the implications for interpreting changes in social organization, fashion and emerging cultural ideologies, such as (though not limited to) increased social stratification and specialization, elite power brokering, and long-distance trade..

Farnsworth, Katherine [192] see Ford, Ben

Farnsworth, Paul (Temple University) and Nydia I. Pontón (Dept. of Anthropology, Temple University)

[394] *Archaeological Excavations at Hacienda La Esperanza, Manatí, Puerto Rico*

Hacienda La Esperanza, a sugar plantation on the north coast of Puerto Rico, was established in the

1830's by Captain Fernando Fernández, a wealthy merchant and slave trader. Hacienda La Esperanza thrived until the abolition of slavery in 1873. At its height, La Esperanza was the most technologically advanced sugar factory in Puerto Rico and one of the most successful plantations at the semi-mechanized level in the Antilles. It also housed one of the largest enslaved populations in Puerto Rico as documented by the slave census of 1870, which registered 152 enslaved people. The research at Hacienda La Esperanza focuses on the examination of class relations and how these shaped the enslaved people's experience at the plantation. This paper will report on the results and on-going analysis from three field seasons conducted at the site between 2012 and 2014. The first season evaluated the current condition of the site using ground penetrating radar and documented previous excavations. The second and third seasons tested the results of the GPR survey and excavated in and around structures where the enslaved people of the hacienda lived and worked. Plans for future research at the hacienda will also be presented.

[394] *Chair*

Farquhar, Jennifer [418] see Hadel, Patrick

Farrell, Michael [302] see Yesner, David

Farrell, Michael (University of Alaska Anchorage), Daniel Monteith (University of Alaska Southeast) and David Yesner (University of Alaska Anchorage)

[337] *The Moose Hill Site: The Dynamic Interplay of Climate Change, Marine Productivity, Volcanism, and Cultural Transitions on the Kvichak River, Bristol Bay, Alaska*

The Moose Hill Site is a multi-component settlement along the Kvichak River in Bristol Bay Alaska. The site consists of ~40 semi-subterranean structures with archaeological assemblages representative of the Arctic Small Tool, Norton, Thule, and Koniag traditions. This research focuses on a late Norton tradition occupation at 840 +/- 30 BP and presents a refinement of the complex transition between the regional Norton and the Thule traditions. The timing and method of culture change during this period is marked by extreme fluctuations in population size, the adoption of new subsistence strategies, migrations, and increased competition for resources. These changes may have been in part due to a regional decline in marine productivity associated with the Medieval Warm Period (MWP), ca. 1100 BP to ca. 650 BP, and a decrease in availability of terrestrial resources resulting from a Katmai area eruption.

Farris, Glenn (Farris, West & Schulz)

[175] *Looking at the Cosmopolitan Community of the Pueblo of San Diego in the Mexican Period in California: 1821-1846*

Following the successful conclusion of the Mexican Revolution, many soldiers from the old Spanish Presidio of San Diego moved down the hill to found a civil pueblo. The soldiers themselves represented a diverse background of people from Mexico to which were added local Native Americans as wives and, more often, as servants. With the opening of the province of California to foreigners under the new Mexican regime, a variety of men of European and American descent including merchants and sailors arrived at San Diego and entered the village. For a short period (1825-1830) San Diego was the seat of government for the two Californias (Alta and Baja) under the leadership of José María de Echeandía. Recent research on the peopling of San Diego has expanded our knowledge of this diverse community, including the sizable number of Indian servants who have generally escaped the attention of historians. This paper seeks to broaden our understanding of how this cosmopolitan community worked.

Fash, Barbara [366] see Hartford, Alexis

Fash, Barbara (Harvard University)

[366] *Chair*

Fash, William (Harvard University)**[366]** *New Approaches in Archaeological Research, Heritage Management and Community Engagement for the Copan Valley*

Archaeological sites in the Copan Valley have benefited from a number of large-scale Honduran government-sponsored and international research projects over the past 80 years. Those efforts have contributed strongly to the broad dissemination of knowledge about the ancient city, and the conservation of many Copan monuments and residential sites. However, even before the global recession and the traumatic events of the coup in 2009, it was clear that the State was challenged in trying to address all of the urgent needs detailed in the various Copan Site Management Plans. Two locally based non-profits created to support Copan archaeology and education (with which we are involved) have accomplished a great deal and remain very active. Nevertheless, to maintain heritage management initiatives, community engagement, responsible sustainable tourism, archaeological awareness, and continued research and rescue operations, requires establishing flexible and responsive collaborative endeavors in the region. We explore some of our own efforts to those ends with our ongoing Santander Program for Research and Conservation of Maya Sculpture, including the Proyecto Arqueológico Rastrojón Copán (PARACOPAN), and introduce the diversity of approaches that will be presented in the session.

[366] *Chair***Faugere, Brigitte (University Paris 1)****[88]** *The Bajío (Guanajuato/Michoacan) during Epiclassic: Cultural Assertion and Macro-regional Interaction*

In the North-Center region of Mexico, the Bajío reached its peak population during Epiclassic period. From the Preclassic background of the Chupicuaro Culture, emerges a rich ceramic and architectural tradition. Following the fall of Teotihuacan, the Bajío has extensive networks of sites organized around ceremonial centers with frequently sunken patios and I-shaped ball courts. The ceramics are nevertheless far from uniform, denoting a will of cultural assertion for each polity. From A.D. 800, evolutions appear in connection with phenomena of interaction with the nearby regions, in particular in the East Acambaro's basin and, on the West side, near Penjamo/Penjamillo. This paper will present these aspects, placing them in a macro-regional perspective.

Faught, Natalie**[93]** *These Stones Will Destroy Us*

This poster presents a critical reflection on the dialectical and power-imbued relationships of archaeologists and stakeholder communities, focusing on the ongoing Stélida Naxos Archaeological Project in the Cycladic islands, Greece. While much has been written about archaeologists' interaction with neighboring populations, Stélida provides a complex case due to the transitory and heterogeneous nature of what constitutes its "local" community. Residence is both seasonal (summer) and fluid in nature, the population a mix of well-heeled native Naxians (including hoteliers and their resident tourists), holiday home-owners from mainland Greece, plus a handful of long-term foreign seasonal occupants.

This poster charts the negotiations of these relationships in the broader context of debates on 'community engagement' (e.g. Ian Hodder's work at Çatalhöyük), where the 'local' voices are often those of economically and/or culturally powerful characters who have divergent interests in the future of Stélida and by extent their relationship with archaeologists ("these stones will destroy us!" proclaimed an angry hotelier). Various forms of outreach and engagement are detailed, together with the challenges for developing such relationships in the context of our responsibility to the desires of the state's Ministry of Culture and Naxian cultural and political figures.

Faught, Michael (SEARCH, Inc)**[243]** *Spring Surprise: The Lessons Learned and Unexpected Results of the Chassahowitzka Headsprings Archaeological Assessment and Monitoring Project*

In 2013 SEARCH conducted underwater archaeological investigations and monitoring at the

Chassahowitzka Headsprings restoration project in Citrus County, Florida. Although the initial underwater survey yielded a sparse artifact count, hundreds of artifacts were recovered during the monitoring of commercial diver's as they removed substantial amounts of algae, detritus, and cultural materials from the springhead with 6-inch induction dredges. Diagnostic and rare artifacts include a Suwannee Paleoindian projectile point; a bone fishhook; an intact Pasco Plain bowl (Woodland aged); 17th Century Spanish majolica fragments; a hand-carved, radiocarbon-dated prehistoric wooden paddle; a large radiocarbon-dated prehistoric wooden fin effigy; and over 100 soda bottles dating from 1885 to present. The project is important not only for the cultural materials it produced, but for the lessons learned; the results of which will undoubtedly influence future compliance work in Florida springs. Many springs in Florida are slated for similar restorations.

[243] *Discussant*

[192] *Chair*

Faulkner, Patrick (The University of Sydney), Alison Crowther (The University of Queensland), Mary Prendergast (Saint Louis University in Madrid), Mark Horton (University of Bristol) and Nicole Boivin (University of Oxford)

[105] *Maritime Adaptations and Indian Ocean Trade in East Africa: The Role of Small Offshore Islands*

Decades of pioneering archaeological research have firmly established East Africa's offshore islands as important localities for understanding the region's pre-Swahili maritime adaptations and early Indian Ocean trade connections. While the importance of the sea and small offshore islands to the development of urbanized and mercantile Swahili societies long been recognized, the formative stages of island colonization – and in particular the processes by which migrating Iron Age groups essentially became 'maritime' – are still relatively poorly understood. Here we present an overview of recent fieldwork by Oxford's Sealinks Project in the Mafia and Zanzibar archipelagos, which aims to understand these early adaptations and situate them in a longer-term trajectory of island settlement and proto-Swahili cultural developments. We focus on the results of detailed zooarchaeological, archaeobotanical and material culture studies relating to early subsistence and trade on these islands to explore the changing significance of marine resources to the local economy. We discuss the implications of these maritime adaptations for the development of local and long-distance Indian Ocean trade networks and the coastal migration of early farming communities into southern Africa.

Faull, Kym [121] see Warmlander, Sebastian

Faulseit, Ronald (The Field Museum), Gary Feinman (The Field Museum) and Linda Nicholas (The Field Museum)

[216] *Ceramic Paste Distribution and Market Exchange in the Tlacolula Valley, Oaxaca, Mexico.*

Over four decades ago, economic anthropologists recognized the importance of marketplace exchanges in the contemporary Valley of Oaxaca, Mexico, but the historic roots of this region's exchange system were less clear. Was the Oaxaca market system a product of recent capitalism, Spanish Conquest, Aztec imperialism, or were underpinnings even deeper in the past? Here, we examine INAA studies of ceramic assemblages from two Classic-period (ca. A.D. 200-850) sites in the Tlacolula arm of the Valley of Oaxaca, in conjunction with the distribution of other commodities, to argue that the roots of this modern economic institution extend back to at least this period, well before an Aztec or European presence.

Fauvelle, Mikael (University of California, San Diego)

[32] *Calories, Canoes, and Cross-Channel Trade: Exploring the Efficiency of Maritime Subsistence Exchange*

The exchange of botanical subsistence resources such as nuts and seeds is well documented in ethnohistoric accounts of Chumash trade across the Santa Barbara Channel. But on what scale was such exchange carried out? Due to the perceived marginality of island environments, it has long been assumed that the need to import subsistence goods from the mainland to the islands was a

central instigator for cross-channel exchange. Recent research, however, has shown that the islands were characterized by more extensive terrestrial subsistence resources than previously understood. This paper will provide new experimentally determined caloric values for a number of important plant resources in southern California. Caloric values will be compared with canoe volumes in order to determine the caloric returns for cross-channel shipments. The resulting values will be compared with estimates for island populations with the goal of evaluating the efficiency of subsistence exchange in the channel area. Our results will provide important new data on several indigenous coastal plants and will have implications for the understanding of maritime exchange systems used by hunter-gatherers in island and coastal environments around the world.

[32] *Chair*

Fayek, Mostafa [185] see ten Bruggencate, Rachel

Fazzone, Charles [391] see Delaney, Colleen

Feathers, James [121] see Brown, James

Feathers, Valerie (Louisiana State University), Heather McKillop (Louisiana State University) and E. Cory Sills (University of Texas at Tyler)

[243] *Excavation of an Inundated Shell Midden: Methods and Preliminary Findings at a Classic Maya Saltwork*

The mangrove peat comprising the sea floor at the ancient Maya saltworks in Paynes Creek National Park, Belize, provides an ideal matrix for the preservation of wooden architecture. The acidic peat has preserved wood, charcoal, and botanicals at other inundated saltwork sites in the area. The unexpected discovery and subsequent excavation of an underwater shell midden at the Eleanor Betty Site in 2013 allowed for a greater comparison between the two matrices and their preservational properties. Although the peat matrix does not preserve bone, the calcium carbonate composition of the shell midden is suitable for such preservation. In this paper, we describe the excavation methods, screening, mapping, and preliminary results of this shallow submerged site. In addition, we address the wooden architecture and spatial distribution of the accompanying shell midden.

Fecher, Franziska (University of Bonn)

[100] *An Interactive Map of Honduran Archaeological Sites*

Honduran Archaeology has long focused on the investigation of Copan and the ancient Maya culture in the western part of the country. The non-Maya region has only been investigated intensively in the past 50 years, despite the fact that as a bridge between the cultures of Mesoamerica and South America Honduras offers an exciting area of investigation. Access to information about the non-Maya archaeology of Honduras is difficult, given that there are hardly any introductory summaries. In order to make this material more accessible, and to offer a new investigation tool, the MayaArch3D Project has developed a 2D Web-GIS for the documentation and analysis of archaeological sites in Honduras. While some interactive maps for Central American archaeology do already exist, none of these offers more than an overview function and none enables complex analysis. The MayaArch3D 2D Web-GIS facilitates GIS analysis and complex queries. Hence, the tool holds a great potential for educational purposes, for the documentation and administration of archaeological sites and also as an investigative tool to answer particular research questions. This user test case analyzes the spatio-temporal development of the southern frontier of the Maya region in Honduras.

Fedick, Scott (Anthropology, University of California, Riverside), Jennifer Chmilar (Anthropology, University of California, Riverside) and Daniel Leonard (Anthropology, University of California, Riverside)

[295] *Diversity of Wetland Form, Historical Ecology, and Human Use in the Maya Lowlands: The View from the Yalahau Wetlands*

Two major freshwater wetland systems of the eastern Maya Lowlands are the riverine-associated wetlands around the New and Hondo Rivers of northern Belize, and the wetlands of the Yalahau region of northern Quintana Roo, Mexico, which are found in karstic depressions associated with the Holbox fracture zone. Both of these wetland systems are linked directly to the freshwater aquifers of the respective regions. In northern Belize the nature and timing of ancient Maya manipulation of the wetlands has been a source of long-standing debate. It has been suggested that ancient Maya use of wetlands in northern Belize has been significantly impacted by changes in the water table resulting primarily from changes in sea level. Recent and ongoing research in the Yalahau region has documented widespread evidence for manipulation of the wetlands by the ancient Maya, as well as evidence from wetland sediment studies that indicate a highly dynamic hydrological history. Comparing the historical ecology of the two major wetland systems has implications for the trajectories of ancient settlement and economic change in the eastern Maya Lowlands.

Fedje, Daryl (University of Victoria), Quentin Mackie (University of Victoria) and Duncan McLaren (University of Victoria)

[192] *Paleoshorelines and Archaeology of the Discovery Islands on the West Coast of Canada*
The sea level history of the Discovery Island archipelago on the Canadian West Coast shows that early post-glacial paleoshorelines are stranded up to 165 m above modern. Under the auspices of the Tula Foundation we are using this history and landscape modeling to guide investigation into the early human history of the area. Survey has focused on land forms such as raised marine terraces, tombolos and wave cut notches (potential rockshelters). In 2014 we located and tested archaeological sites on or proximal to paleoshorelines at elevations from two meters below to ninety-five meters above the modern high tide mark.

Fedorov, Sergey [28] see Germonpré, Mietje

Feeley, Frank (CUNY Graduate Center)

[351] *Cod, Sand & Stone: Proto-Industrial Scale, Medieval, Commercial Fishing at Gufuskalar in Western Iceland*

At the start of the 15th century a major commercial fishing was built on the far western coast of Iceland at a farm called Gufuskalar. During the winter months cod fish were caught, processed and dried on site for trade with continental European merchants. This paper details the rescue excavations at the site and discusses some of our preliminary results.

Fehrenbach, Shawn

[123] *A Digital Approach in Consultant Archaeology: PaleoWest at the Ironwood Village Site*
In the Summer of 2014, PaleoWest Archaeology stripped seven acres within Ironwood Village site in Marana, AZ for archaeological data recovery ahead of a land development project. Digital methods allowed PaleoWest to conduct high-quality cutting-edge archaeology, manage a complex field effort, and complete work on time within an aggressive development schedule. This poster outlines a fully digital workflow using tablets and smartphones connected over cellular networks in the field. Data entry directly to servers in Phoenix and regular tracking of progress using aerial imagery allowed PaleoWest to find creative ways to manage this massive field effort while drastically reducing post-field reporting time.

[209] *Chair*

Fehrenbach, Shawn [209] see Motsinger, Thomas

Fehren-Schmitz, Lars

[2] *Lauricocha v2.0: Ancient Highlanders Grant New Insights into the Precolumbian Population History of South America*

The Lauricocha caves in Peru were the first known evidence for an Early Holocene presence of humans in the high altitude Andes. However, critical examination of the excavation reports cast

doubts on the status and significance of Lauricocha in the archaeological record of South America. Here, we present a thorough revision of site data including new radiocarbon dates, as well as morphological, craniometric, and genome-wide genetic data obtained from the human remains found at the site. Our results not only challenge suggestions that Lauricocha was occupied no earlier than 7000 BP, but also prove the site to be a valuable archive with regards to the population history of the Andes and South America. We show that the earliest Paleoindians and later inhabitants of the high Andes shared the same genetic history despite pronounced variation in their cranial features. Our observations support the hypothesis of a single-wave expansion/colonization scenario for South America, in which both early and later precolumbian populations derived from a continuous, single source population.

Feibel, Craig [174] see Hlubik, Sarah

Feinman, Gary [216] see Faulseit, Ronald

Felch, Jason (Antiquarium)

[279] *The Kapoor Case: International Collaboration on Antiquities Provenance Research*

Manhattan antiquities dealer Subhash Kapoor faces trial in India as the alleged mastermind of an international idol smuggling network. A year-long investigation by researchers, journalists, art aficionados and law enforcement on three continents established the illicit origins for more than a dozen ancient objects allegedly trafficked by Kapoor. In September 2014, Australian museums returned two of those objects to India -- a 10th century Shiva Nataraja purchased by the National Gallery of Australia for \$5 million, and a 900-year old Ardhanarishvara sculpture purchased by the Art Gallery of New South Wales for \$300,000. More returns are expected in the coming months. The case provides a model for collaborative inter-disciplinary provenance research.

Felling, Danielle (University of Nevada, Reno)

[150] *Lithic Technological Organization at Last Supper Cave: Reconstructing Paleoindian Mobility and Landscape Use at an Upland Site in Northwestern Nevada*

Excavations at Last Supper Cave (LSC), Nevada by Tom Layton and Jonathan Davis in the early 1970s revealed an extensive record of occupation including a Paleoindian component recently re-dated to ~10,300 14C B.P. Despite the potential for the site to reveal information about Paleoindian lifeways in the Great Basin during the Terminal Pleistocene/Early Holocene (TP/EH), analysis of these early artifacts, including numerous Great Basin stemmed projectile points, tools, and debitage, was never completed. LSC overlooks Hell Creek in the High Rock Country of northwestern Nevada and is located ~20 km away and 350 m higher than the nearest pluvial basin that would have sustained a wetland during the Terminal Pleistocene. As a result, LSC represents a rare type of Paleoindian site in the Great Basin. Further research on the collection has the potential to reveal how groups operated away from wetland environments. Here, I present the final results of my analysis of lithic debitage and tools from LSC to reconstruct the lithic technological organization and settlement strategies of Paleoindians in the northern Great Basin.

Fenclová, Petra [207] see Velemínská, Jana

Feng, Yuexing [77] see Weisler, Marshall

Fenn, Thomas (Department of Anthropology)

[101] *Ancient Glass Studies from 1st-2nd Millennium A.D. Africa: What Have We learned and Where Are We Going*

The study of ancient glass in Africa has undergone resurgence in the past 10+ years, particularly with regards to the integration of new and varied analytical approaches. Glass from Roman,

Byzantine and Islamic Era contexts are increasingly undergoing scrutiny to explore modes of manufacture, access to raw materials, provenance of raw materials and finished glass goods, and the role that glass production and consumption played in those societies, to name a few. Advances in instrumental analytical techniques (e.g., LA-ICP-MS, MC-ICP-MS, etc.) have allowed for the generation of more accurate, precise and comprehensive elemental and isotopic composition data. These data are providing new means to examine issues of production, trade, and consumption patterns in Africa through time. This paper will present a “state of the research” for ancient glass studies in Africa to highlight important contributions to our understanding of this issue in Africa. Important new methodological approaches also will be discussed. The paper will conclude with a consideration of future directions in African glass studies.

Fenoglio, Fiorella (Fiorella Fenoglio)

[231] *La minería en la Cultura Chalchihuites.*

La minería fue un recurso económico importante para el desarrollo de la Cultura Chalchihuites. En este trabajo se realizará una revisión a la forma en que se pudo haber organizado esta tarea productiva desde una perspectiva económica política.

Ferguson, Jeffrey (University of Missouri) and James Allison (Brigham Young University)

[6] *Obsidian Provenance Studies of Sites in Northern Utah*

Previous studies of obsidian from archaeological sites in Utah Valley and the Salt Lake Valley have used relatively small samples to document temporal shifts in obsidian procurement, with southern sources (especially Black Rock) dominating Fremont assemblages, while most post-Fremont obsidian comes from the Malad source to the north. Our greatly expanded XRF analysis of almost 4,000 obsidian artifacts from sites in Utah and Salt Lake Valleys confirms the temporal change noted by earlier researchers, but also shows site- and source-specific patterns of obsidian use, as well as variation in the frequency of different obsidian sources in tools, debitage, and micro-debitage.

[412] *Discussant*

Ferguson, Jeffrey [53] see Terry, Karisa

Ferguson, T. J. (University of Arizona), John Welch (Simon Fraser University), Benrita Burnette (White Mountain Apache Tribe) and Stewart Koyiyumptewa (Hopi Tribe)

[239] *Fire Adds Richness to the Land: Ethnographic Research for the FHiRE Project*

One component of the multidisciplinary FHiRE project included ethnographic research with 50 members of four tribes. Specific historical and traditional information about fire ecology related to the occupation of Hemish ancestral sites in the Jemez Mountains was collected at the Pueblo of Jemez. More generalizing information about the role of fire in Southwestern lifeways was collected with research participants at the Hopi Tribe, Pueblo of Zuni, and White Mountain Apache Tribe. Our ethnographic research provides information about the traditional uses of fire in agriculture, grazing, and cultural practices. It also documents the personal experiences of many tribal members in fighting forest fires, and tribal research participants contributed information about native concepts of healthy and unhealthy forest structure. Although wildland fire plays a relatively minor role in tribal discourse and oral traditions, numerous references to fire in the remote past and “traditional times” focus on domestic, agricultural and hunting contexts. The choice of wood harvested for construction and fuel has implications for modeling fire behavior. Tribal research participants explained how there are both destructive and beneficial aspects of forest fires.

Ferguson, Tim

[415] *Human Ecology and the Economy: Illogical Responses to Resource Risk in Southern Nevada*

Research in the Virgin Branch Puebloan region indicates that during the middle Pueblo II Period there were strong socio-economic mechanisms linking the lowlands in southern Nevada to the uplands on the Arizona Strip. Ties between these areas are demonstrated by the presence of large

numbers of ceramics produced in the uplands that have been recovered from lowland sites. Traditional ecological and economic models suggest that these trade networks may have been a way to reduce risk by diversifying the resource base; however, by the end of the early Pueblo III Period the trade networks with the uplands had collapsed. Coincident with the collapse of these networks there was an increase in the production of Tusayan Virgin Series ceramics in the lowlands. Compositional analyses were undertaken to understand if Tusayan Virgin Series ceramics were being traded between southern Nevada and the St. George Basin during the Pueblo III period to counteract the loss of a diverse resource base after the collapse of the trade networks with the uplands. This study proposes that Tusayan Virgin Series ceramics were not traded between the two regions. This suggests that ecological models of the economy may not fit preconceived notions of logical responses.

Feria Cuevas, Alfredo and Karim Bulhusen Munoz (INAH BAJA CALIFORNIA SUR)

[156] *Cazadores recolectores en Baja California Sur: Un campamento al sur de la Paz*

Dentro de la dinámica social de los grupos cazadores recolectores encontramos una evidente relación con el medio ambiente, en donde con base a un gran acervo de conocimientos, explotaban los recursos naturales y aprovechaban perfectamente el uso de los espacios. En ambos casos, dicha explotación se manifiesta con la presencia/ausencia de diversas evidencias materiales, las cuáles mediante un minucioso registro arqueológico sistematizado nos permite reproducir contextos, que una vez analizados nos ayudan a definir actividades en periodos cronológicos específicos. Elementos arqueológicos que fueron utilizados para la preparación y consumo de alimentos, como lo son una gran variedad de conchas marinas y herramientas de molienda; un espacio perfectamente delimitado asociado al entorno geográfico, y el registro de evidencias funerarias, nos han permitido identificar un amplio campamento de cazadores recolectores con evidencias de una posible diferenciación social manifestada en los usos del espacio al interior como parte integral de una organización estacional.

Fernandez, Lilia [130] see Zimmermann, Mario

Fernandez, Andrew, Lauren Klein (The University of San Diego), Donald Millar (The University of San Diego) and Alexia De Loera (The University of San Diego)

[273] *Mugs of the Mesa and Old Chocolate: Evidence of Prehistoric Cacao Use in the Mesa Verde Region of the North American Southwest*

Undergraduate Anthropology and Chemistry students at the University of San Diego (USD) collaborated on the application of analytical chemistry to archaeological ceramics. USD curates 1000's of prehistoric Southwestern artifacts, all of which are available for student research. We examined some of the collections vessels for cacao, which is the raw form of chocolate. Patricia Crown and W. Jeffrey Hurst recently found cacao residue in cylinder jar fragments from Chaco Canyon. Crown's methodology was adapted for our project, using the university's mugs from the Mesa Verde region near Durango, Colorado. The chemical analysis of residues extracted from Pueblo II to Pueblo III period (A.D. 1100 to 1300) Mesa Verde mugs indicates the presence of theobromine, a chemical component of cacao. In all, 24 vessels were tested using liquid chromatography-mass spectrometry. Two mugs had positive indications for chocolate. Cacao is endemic to Mesoamerica and was used in ritual practice that made its way north with other exotica. The chemical results will be discussed along with an analysis of long distance trade networks as well as the morphological, iconographic and use-wear characteristic of each vessel.

Fernandez Goetz, Manuel [285] see Arnold, Bettina

Fernandez Souza, Lilia (Universidad Autónoma de Yucatán)

[24] *Explorando la diversidad socioeconómica en grupos domésticos mayas del período Clásico. El caso de Sihó, Yucatán.*

En el sitio arqueológico de Sihó, Yucatán, conjuntos habitacionales intervenidos arqueológicamente

sugieren una marcada diferenciación socioeconómica entre los grupos domésticos, que se manifiesta materialmente incluso en la zona central del asentamiento. El objetivo de esta ponencia es, con base en arquitectura, artefactos y ecofactos, ofrecer información sobre similitudes y diferencias respecto a las actividades llevadas a cabo, así como acerca del uso de los espacios en tres contextos residenciales de este sitio del Clásico Tardío. De esta manera, esperamos contribuir con la discusión acerca de grupos de actores que, con base en aspectos como el género y el status, ocuparon lugares y jugaron papeles diversos tanto al interior de sus espacios domésticos como de la comunidad en su conjunto, dando lugar, a su vez, a grupos domésticos social y económicamente diferenciados.

[24] *Chair*

Fernández Souza, Lilia [24] see Matos Llanes, Carlos

Fernandez-Gotz, Manuel (University of Edinburgh)

[177] *Debating Early Urbanization in Temperate Europe: From Heuneburg to Bourges*

The genesis of large fortified central places is one of the most important phenomena in Later Prehistoric Europe. In Temperate Europe, the origins of urbanism have long been identified with the emergence of the Oppida of the 2nd-1st centuries B.C., considered to be the 'earliest cities north of the Alps'. However, large-scale research projects carried out over recent years have started to challenge this long-established view, to the point that nowadays it is possible to assert that the term 'urban' already applies to some of the so-called Fürstensitze or 'princely sites' of the 6th and 5th centuries B.C. These sites, among which names like the Heuneburg, Mont Lassois, Bourges, Hohenasperg, Glauberg or Závist stand out, stretch across an area from central France in the West to Bohemia in the East. They are testimony to a process of differentiation and hierarchization in the pattern of settlement that was at the same time both an expression and a catalyst for increasing social inequality, and saw the establishment of aristocratic, in some cases even monarchic forms of rule that cultivated close contacts with the Mediterranean world.

Fernandez-Lopez De Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social (IPHES)), Samantha Jones (Institut Català de Paleoecologia Humana i Evolució), Magdalena Gómez Puche (Institut Català de Paleoecologia Humana i Evolució) and Francesc Burjachs (ICREA, Institució Catalana de Recerca i Estudis Av)

[74] *The Impact of the 8.2 kyr cal BP Event on Late Mesolithic Demography in the Central Mediterranean Region of Spain*

The central Mediterranean region of the Iberian Peninsula witnessed two major environmental processes affecting early and middle Holocene hunter-gatherers: rapid sea-level rise, with the consequent flooding of coastal plains; and the replacement of open-landscape by forest- taxa. In this context, much less is known regarding how the 8.2 kyr cal BP climatic event impacted Late Mesolithic human populations. Using multiple lines of archaeological and paleoenvironmental evidence, in this paper we investigate the effects of the 8.2 kyr cal BP event on human demography, subsistence, settlement distribution and socio-ecological interactions at local and regional scales.

New multi-proxy paleoenvironmental reconstructions on lake deposits and geologic studies on the continental shelf allow an appraisal of the changes produced by the 8.2 kyr cal BP event on hydrological systems and eustatic changes. In addition, we used an audited database of geo-referenced radiocarbon dates, transformed to occupation events, as a demographic proxy to compare relative population levels before, during and after the 8.2 kyr cal BP event.

The regional radiocarbon record suggests a chronological correlation between the reduction of Late Mesolithic sites and the 8.2 kyr cal BP event. However, the paleoenvironmental and archaeological results indicate differences when comparing local and regional scenarios.

Fernandini, Francesca (Stanford University)

[134] *Change and Continuity in Ceramic Production at Cerro de Oro, Cañete*

Cerro de Oro, a 150ha settlement located on the lower Cañete valley presents a long term occupation that spans from the Early Intermediate Period through Colonial times (0-1600 A.D.). Research performed by the Cerro de Oro Archaeological Project at the site during 2012-2013 has focused on the Early Intermediate-Middle Horizon occupation (500-1000 A.D.) yielding important information regarding the nature of the settlement, the sequence of its construction and use, as well as its possible relations and interactions with nearby settlements both within and outside of the Cañete valley. Following this line, this study will present the result of XRF and SEM analysis performed on ceramics excavated from well controlled contexts within the site. These analyses have been oriented towards understanding how the production of ceramics, both in terms of paste and pigment use, changes throughout time. In turn, these results are contrasted with the detailed study of the sequence of change presented by iconographic motives in these ceramics.

[134] *Chair*

Fernstrom, Katharine (Towson University)

[267] *The Object Is the Thing: Developing a Framework for Understanding the Culture of Looting*

Objects are central to looting. The illegally excavated object has a relationship to the past person who produced it; the landscape that held it; the person who clandestinely excavates it; and the people who sell and buy it. To date, in the United States, there are no systematic multi-State data assemblages that can be used to analyze the culture and behavior of looters. Studies of dealers and collectors examine object relationships after the looting has occurred. Understanding the connection between the looter and the object happens in the dirt. I propose a framework for assembling multi-State information about the relationship between looters and objects at the site where they engage with one another. The information can be collected from archaeologists, NPS professionals, conservationists, recreational hikers and campers, and assembled in a computer file for analysis. Relevant information might include GPS coordinates; remaining artifactual remnants; culture and phase designations; environmental surroundings; and a photograph of the style of the excavation/backfill. Assembled on a multi-State scale, aggregate information can be used to address such questions as: do successful looters sample the landscape systematically? Are there trends and "fashions" in the kinds of sites that are targeted in a given time-frame?

Ferrari, Giada [264] see Bouwman, Abigail

Ferring, Reid

[190] *New Evidence for Complex Occupation Patterns at Dmanisi, a 1.85-1.76 Ma Site in the Georgian Caucasus*

Recent excavations and geoarchaeological testing at Dmanisi have revealed a large and complex site structure. Up to 7 meters of stratified deposits, with nine artifact and fossil-bearing strata, are now documented over an area of at least 35,000 square meters on the Dmanisi promontory. These new data indicate that the site was visited repeatedly for a considerable period, indicating a well-established pattern of group cohesion, mobility and planning. These patterns are rarely evidenced in the archaeological record of earliest Homo, and may reflect adaptations to temperate seasonality by the first Eurasians that are characteristic of much later populations. Geomorphic-soils records indicate that differential densities of artifacts and faunas, both within and between strata, mainly register primary accumulation with minimal post-depositional movement or weathering. From this perspective, Dmanisi appears to have multiple "site types" as traditionally recognized in east Africa. Although Dmanisi's variable hominin fossils exhibit many primitive characteristics, including small brains and stature, this geoarchaeological record provides evidence that those populations survived and thrived in Eurasia the old fashioned way: as cohesive, cooperative social groups with well-defined subsistence strategies. In this sense, the earliest members of our genus may have been less "primitive" than traditionally assumed.

Ferris, Neal (University of Western Ontario)

[13] *Archaeological Heritage as State Nuisance: Object Lessons from Accidental Burial*

Discoveries

State control of archaeology has tended to originate from the agendas of archaeologists - altruistic, capitalistic, and entirely self-serving. This has framed practice as aiding and abetting State processes and societal differentials that play out over land and resource consumption. Despite this, a chronic phenomenon of this process is the need to resolve unmarked burial discoveries. These occurrences are typically achieved within vague regulatory frameworks, and often lack direct State intervention, reflecting their desire to actively avoid "owning" the issue or outcome. Indeed, from the State's perspective, burials are idiosyncratic, chronic nuisances. More by consequence than by design, then, commercial archaeologists finding themselves in the middle of such occurrences are expected to be less experts managing "their" data and more service providers mediating outcomes between the primary stakeholders: landowners and representatives for the deceased. This in turn enables resolutions to be negotiated below and beyond State expectations, and as such become object lessons at redefining archaeological identities and archaeology's relationship with the State. The past and present application of the Ontario Cemeteries Act to unmarked Indigenous and Euro-Canadian burial localities illustrates this critical dimension of chronic nuisance heritage management leading to reimagined roles and relevances for archaeology in society.

[42] *Moderator*

Fertelmes, Craig (Arizona State University), Michael Withrow (Gila River Indian Community Cultural Resource Mana) and Letricia Brown (Gila River Indian Community Cultural Resource Mana)

[225] *Vesicular Basalt Provenance Analysis: A Collaborative Research Effort among Southern Arizona Native American Communities and Archaeologists*

Vesicular basalt was a preferred material for groundstone manufacture in central Arizona, and identification of source areas for raw materials will provide important information regarding prehistoric and historic exchange and interaction patterns in the region. As part of archaeological research under the Pima-Maricopa Irrigation Project, the Gila River Indian Community's Cultural Resource Management Program has recently devoted considerable effort to the creation of a vesicular basalt geochemical database that is essential for conducting geographic provenance analyses of groundstone artifacts from sites in the Phoenix Basin. The development of this database has required collaboration among several Native American communities, federal agencies, and public universities. Additionally, community members were trained in cutting-edge archaeological techniques (portable XRF) as part of the research. This presentation highlights some of the benefits of collaborative investigations among archaeologists and Native American communities, and summarizes the initial results and importance of the vesicular basalt research program.

Fetterman, Jerry

[369] *Discussant*

Fie, Shannon (Beloit College)

[99] *Digging without Dirt: An Excavation Simulation*

Efforts to simulate archaeological excavations typically include the seeding of objects in plastic tubs, sandboxes, and even cakes. Although these activities may spark excitement in students at the discovery of artifacts, they are often simple caricatures of the methods employed in actual archaeological investigations. Far worse, this treasure-hunting approach tends to reinforce the quest for "things", while also undermining key aspects of excavation that educators hope to instill, namely, the importance of context and provenience in making sense of these same objects. Simply eliminating the dirt mitigates much of the problem by directing student interest towards observing, recording, and interpreting different archaeological materials. Instead a seeded sand box, the highlighted activity utilizes craft paper units, unprovenienced artifacts, and painted features to simulate modern, historic, and prehistoric residential deposits. While highly effective in introducing students to in basic artifact recovery and interpretation, this approach is also highly flexible and can be easily modified to suit different age groups, time constraints, and a variety of course goals.

Fiedel, Stuart (Louis Berger Group)

[87] *The Spore Conundrum: Does a Dung Fungus Decline Signal Humans' Arrival in the Eastern US?*

In pond sediments in Ohio, Indiana, and New York, *Sporormiella* (dung-fungus) spore declines at ca. 14,000 cal BP are followed first by charcoal particle peaks, and then dramatic shifts in tree pollen percentages. This sequence has been interpreted as the outcome of initial human predation on megafauna. New dates push "classic" Clovis back to ca. 13,500 cal BP, but this still leaves a 500-yr gap between the ecological signals and the earliest Paleoindian artifacts. How can this gap be explained?

Fiehring, Benno (Instituto Nacional de Antropología e Historia) and Guillermo Cordova Tello

[217] *The Political Organization of the Tampaón River Region, San Luis Potosí, Mexico*

During the past eighty years, a succession of investigators has carried out reconnaissance surveys in the Huastec region of San Luis Potosí, and has recorded a lot of prehispanic settlements. Based on a focus on regional aspects and incorporating a survey program, the archaeological project "Origin and Development of the Urban Landscape of Tamtoc, S.L.P.," aims to understand the character and scale of the social, economic and political integration of the society in question, which empowered itself of and transformed its territory diachronically, as well as it pretends to explain the social relations between individuals and groups, and different modes of the exercise of power we suppose. Pretending to understand the sociopolitical organization, beside archaeological excavations we realize a systematic survey in the region, which will allow us to comprehend the ancient settlement patterns. The preliminary results obtained during the first research seasons give us a chance to assume that, at least during the Postclassic period, the urban society of Tamtoc had been able to integrate a large population and produce a settlement pattern similar to the one proposed by the Segmentary State Model, political organization theory of a society composed by central and peripheral entities.

Field, Julie [52] see Hernandez, Nicole

Field, Judith (University of New South Wales, Australia)

[296] *A View on Late Pleistocene Megafauna Extinction in Sahul: An Emu Hunt Revisited*

The extinction of megafauna across the globe generates lively and sometimes heated discussion on timing and cause. In the case of Sahul (Pleistocene Australia-New Guinea), the debate is divided into two distinct camps – those that hold a firm belief that humans were responsible, and those that consider the current datasets too thin to provide any definitive answer. These big picture issues are reliant on the acquisition of data from individual sites and data on megafauna comes predominantly from cave sites, as well as rockshelters and fluvial deposits where material is rarely identified in a primary context. Yet, as Jim O'Connell so clearly articulates in the Emu Hunt paper, the likely location for interactions of humans and these large beasts are open sites such as ephemeral waterholes. Currently there is only one site in Australia where a record of megafauna and humans co-occurs and it falls into this category. Cuddie Springs is an ephemeral waterhole in the modern semi-arid southeast of Sahul, and was part of the arid zone when the site was formed. Here I will revisit the Cuddie Springs evidence to consider the likely role, if any, of people in the extinction of the Sahul megafauna suite.

[271] *Discussant*

Field Murray, Wendi (State Historical Society of North Dakota)

[230] *Revisiting Like-A-Fishhook: Coalescence and Community on the Missouri River, North Dakota*

Critical attention to the concept of "community" in archaeological research over the last decade has recast communities from homogeneous groups of people living at a site to emergent networks of social interaction that both derive from and are reproduced by a sense of common interest and affiliation (Wernke 2007). Coalescent communities are in a constant state of becoming, as residents

must continuously negotiate aspects of their identities in ways that mitigate conflict. Historical records describing the coalescence of the Mandan, Hidatsa, and Arikara people at Like-A-Fishhook village in North Dakota during the nineteenth century often refer to it as the "uniting" of these tribes, implying a sense of community that has never been critically examined. Integrating archaeological, archival, and ethnographic data, this paper problematizes the essentialized Like-A-Fishhook "community" construct that permeates the written record. I resituate the village as an "imagined community" (Anderson 1991), in which the threat of a common enemy (the Dakota), the shared experience of epidemic devastation, and the imposition of a singular "tribal" identity by the U.S. government created an ideological-historical (rather than a socio-spatial) basis for long-term co-residence.

Figol, Timothy [4] see Malainey, Mary

Figueroa, Valentina [2] see Salazar, Diego

Figueroa Flores, Alejandra [31] see Whalen, Verity

Figueroa Larre, Valentina (Universidad Católica del Norte), Carola Flores (University of Santa Barbara) and Diego Salazar (Universidad de Chile)

[152] *Production and Distribution of Fishing Artifacts on Mussel Shells (Choromytilus chorus) during the Middle Holocene on the coast of Taltal, Atacama Desert, Chile*

Two Middle Holocene residential camps (7500 to 45000 years cal B.P.) on the Atacama Desert Coast show differences in their mussel shell fishing tools (MSFT) assemblages. One archaeological site has a high abundance of fishhooks and mussel debris, together with the absence of fishing weights. The other site, 50 kilometers north, has low abundance of fishhooks and mussel debris, and the presence of fishing weights. The differences observed in the MSFT assemblages of these two sites, suggest the emphasis of differential activities towards the production of mainly fishhooks at one site and fishing weights at the other. Are these differences related to coastal conditions and resource availability, fishing strategies or socio-economic contexts? Spatial variability of upwelling activity and its consequence on fish community and productivity, together with increasing maritime subsistence, specialized technology and social complexity may have played a role. The Middle Holocene is a time period when maritime economies flourished all around the world. The appearance of fishing tools such as hooks and canoes have been linked to processes of social transformation and complexity and the coast of the Atacama Desert in Chile does not seem to be an exception.

Figueroa Morales, Salvador [298] see Elizalde Mendez, Israel

Filimoehala, Christopher, Alex Morrison (University of Auckland) and Melinda Allen (University of Auckland)

[233] *Modeling Climate Impacts and Human Predation on Marine Populations Using Prey Age Profiles: An Agent Based Model*

Archaeological assemblages provide data on marine prey age that can inform researchers about the influence of human predation and climate related habitat change. While human predation may generally lead to a reduced mean prey age, climate related impacts may produce different age profile patterns. In this paper we model the impact of both human foraging and climate change on prey age using an agent based model. We assess our model results using zooarchaeological marine assemblages from Tokelau.

Filimoehala, Darby (International Archaeological Research Institute, Inc.)

[233] *Agent Based Modeling (ABM) Approaches to Understanding Prehistoric Forager Ecology in Tokelau*

Exploring the complex relationship between humans and the environment is essential for

understanding important mechanisms of cultural change. The last decade has given rise to advances in zooarchaeological research and computer-based modeling that provide tools to examine the links between environmental variability and human cultures. This paper draws on assumptions derived from evolutionary ecology using Agent Based Models (AMB), to test predictions regarding foraging and marine exploitation in Tokelau, a group of atolls in the South Pacific. At present, marine resource use and foraging patterns in pre-Contact Tokelau are poorly understood. Agent based models will help to more adequately inform our interpretations of the archaeological record.

Filimoehala, Christopher [391] see Herdrich, David

Filin, Sagi, Vera Miller (Mapping and Geo-Information Engineering, Technion), Danny Rosenberg (Zinman Institute of Archaeology, University of Hai) and Dani Nadel (Zinman Institute of Archaeology, University of Hai)

[342] *Intra- and Inter-Site Geometrical High-Resolution Analyses of Deep Natufian Bedrock Mortars*

Bedrock features such as mortars and cupmarks are known in the southern Levant at least from the late 1920's. Many were dated to the Natufian and the Pre-Pottery Neolithic A periods (15,000-10,500 cal BP). Likely, the appearance of large and diverse bedrock feature assemblages, reflecting a variety of functions, has played an integral role in the earliest transition from hunting-gathering to food producing economies. So far, research was limited due to the lack of precise documentation of these complex features. Recent advances in photogrammetry provide new methods for high-resolution three-dimensional documentation even of deep narrow shafts. We have recently published the first relevant protocol, where the characterization of each feature is based on a high-resolution 3D model and includes its dimensions, volume, shape of the rim and the shaft, symmetry and regularity. Here, we extend our analysis and use our characterization method to analyze and compare deep mortars from Natufian sites in two ecological settings: Raqefet Cave (Mt. Carmel) and Rosh Zin (Negev Highland). Our goals are to characterize several mortars in each site, and then conduct intra- and inter-site comparisons. This is the first attempt of its kind, and results are assessed against the Natufian economic and social background.

Filini, Agapi (El Colegio de Michoacan)

[129] *Death, Ritual, and Social Space in the Cuitzeo Basin, Michoacán, México*

The Cuitzeo Basin in Northern Michoacán was a key area at the local and supralocal levels for its rich lacustrine resources, and its geographic position that facilitated interaction between the Central Highlands and West Mexico. Mortuary rites were fundamental for the social reproduction of regional elites. The continuous occupation of some sites for more than a thousand years underscores the ritual and religious significance for the lacustrine societies. The comparative study of both biological and social death, and their associated material culture and rites, reveals that the use of ritual space was highly symbolic and reflected processes of culture change and sociopolitical complexity. Through references to specific archaeological sites it is suggested that ritual activities defined a specific social space which formed part of the lacustrine way of life.

Fillios, Melanie (The University of Sydney)

[28] *Do Dingoes Hold the Key to Understanding Human Behavioral Change in Ancient Australia?*

Archaeological evidence suggests dingos were brought to Australia sometime during the mid-Holocene (ca. 5,000-3,500 years ago). Their introduction coincides with significant changes in human behavior, specifically in technology, settlement patterns and diet. While their relationship with Aboriginal people is commonly held to have been commensal, this interesting amalgamation of changes certainly begs the question of whether there may be a dingo 'signature' in the archaeological record. Zooarchaeological data from numerous sites across Australia suggests there was a shift in human diet around this time, with Aboriginal people favoring smaller animals in place of larger kangaroos. Previously, we drew on modern ecological studies of dingoes and postulated that this change could be a result of human-dingo competition, whereby dingoes suppress kangaroo populations, thereby decreasing human encounter rates, and resulting in the exploitation of smaller

bodied species. However, what if hunting with dingoes actually just increased the encounter rate with smaller bodied prey, rendering hunting of larger macropods unnecessary? This paper explores both possible explanations using a multi-disciplinary approach combining ethnography, zooarchaeology and ecology to understand early dingo-human relationships as a pivotal factor in changing human subsistence strategies.

Filloy, Laura (Museo Nacional de Antropología) and María Olvido Moreno Guzmán (Instituto de Investigaciones Estéticas-UNAM)

[194] *The Chapultepec Castle Chimalli: A Habsburg-Repatriated Mexica Feline-Hide Shield*

This paper examines a well-known Mexica chimalli (shield), possibly from the sixteenth century, currently found among the holdings of the National Museum of History, Chapultepec Castle, Mexico City. The importance of this study lies in three fundamental aspects: 1) very few Mexica shields have survived; 2) the examples found outside of Mexico have not been fully analyzed; and 3) the chimalli now residing at Chapultepec Castle was originally taken from the Basin of Mexico to Europe during the sixteenth century and subsequently returned to Mexico in the collection of objects brought by the Habsburg emperor Maximilian in 1866 for his new Imperial Museum. Data obtained in our analysis of the shield will be compared with information contained in the historical sources. The various materials utilized in the shield's design will also be discussed, along with a final section tracing the ways and means, primarily tributary and commercial, by which its constituent raw materials arrived in Tenochtitlan, the Mexica capital.

Fincham, Derek (South Texas College of Law)

[279] *The Ka Nefer Nefer and Federal Intervention in the Illicit Antiquities Trade*

The Federal Government has taken a more active approach to the illicit trade in looted and stolen antiquities. In some cases this Federal role has produced increased awareness and produced some notable seizures and returns. However the Federal intervention in a dispute between Egypt and the St. Louis Art Museum over an ancient Egyptian mask known as the Ka Nefer Nefer offers a cautionary tale. The Museum purchased the mask in 1998, after a cursory examination of the object's history. Egypt called for its return in 2006 when it became aware of its location in the St. Louis collection. At the last few days before the expiration of a statute of limitations, in 2011 the United States attorney for the Eastern District of Missouri initiated a civil forfeiture action against the mask, seeking to intervene on Egypt's behalf. The result in the case for the federal government provides an unfortunate but helpful example of how the federal government should not be intervening into disputes over the illicit antiquities trade.

Finkelstein, Aviva (SFU/Kleanza Consulting)

[9] *Understanding the Health of the People of Pender Island (B.C.) Through Portable X-ray Fluorescence of Human Remains*

Bioarchaeology has undergone some amazing advancements since the 1970s. Due to ancient DNA and isotopic analysis, we are now able to understand health, ancestry, and diet, among other topics. Unfortunately, these methods of investigation are largely inaccessible to many descendant communities due to prohibitive costs and the destructive nature of many forms of analyses on human remains.

Archaeologists are beginning to respond to these concerns, by developing non-destructive analytical tools. More recently, archaeologists have made use of portable x-ray fluorescence (pXRF) to analyze the chemical composition of lithics, ceramics, and the geochemistry of living floors. However, its applicability as a bioarchaeological analytical tool has yet to be determined.

This study applies pXRF to an assemblage of human remains from Pender Island, B.C. with the intent of investigating the application of pXRF as a bioarchaeological tool. If successful, I will employ pXRF to study the presence of health issues among the human remains recovered from Pender Island, using the information collected to expand our understanding of the health status of the people of Pender Island and of the applicability of the instrument as a bioarchaeological tool.

Finlayson, Bill (Council for British Research in the Levant)

[210] *Community and Agency in the Early Neolithic of SW Asia*

The accepted Neolithic narrative involves increasingly sedentary behavior within a context of villages composed of houses. Yet, although the novel way of life represented is given center stage, there is little discussion of the nature of the communities that were developing, other than passing references to nuclear families, ancestor cults and the emergence of lineages and households. There is still less reference to human agency, with Neolithic people being buffeted around by a number of big factors, such as climate change or demographic pressure. More recently a rise in symbolic behavior or even a cognitive revolution have become perceived as prime movers, although both are invoked as a response to life in larger communities. To understand the role of human agency in these processes, we have to consider the nature of society, how communities were constructed, and how agency operated. We know of no recent autochthonous transition from hunting and gathering to farming: the early Neolithic of SW Asia is essentially non-analogous. We have to study society through architecture and settlement configuration. Recent work has indicated that individual identity was less important than community identity, and that group agency may be an appropriate starting point for our study.

Finley, Judson [6] see Jones, Hillary

Finley, Judson (Utah State University) and Matthew Rowe (Indiana University-Purdue University at Indianapolis)**[35] *Rockshelters as Late Quaternary Geoarchaeological Records in the Bighorn Mountains, Wyoming***

Rockshelters in Wyoming's Bighorn Mountains have a long history of archaeological research resulting in a rich dataset of geological and paleoecological information that provides a context for the region's 12,000 year cultural record. In this study we focus on three deeply stratified and well-dated rockshelters to meet three primary objectives. First, we apply Bayesian statistics to each record to create an age model that contextualizes stratigraphic variability and contrasts autogenic and allogenic sedimentation processes at each site. Second, we correlate the stratigraphic record with a recently published regional temperature and precipitation record that provides a paleoclimatic reconstruction at 50-year intervals spanning the last 13,500 cal years BP. Third, we propose a biogeomorphic process-response model that examines complex linkages between Late Quaternary climatic variability, ecological response, and human foraging behavior. The results of this study complement recent archaeological reconstructions in the Bighorn Basin that demonstrate distinct, long-term relationship between climate conditions and human population densities in this part of the semi-arid Rocky Mountain west.

Finney, Bruce [233] see Commendador, Amy

Fino, Nazih (William Self Associates)**[416] *GIS Model Development for Historic Census Data in San Francisco***

This article demonstrates how to build historical data sets from the 1800-1900 San Francisco census/city directories, using GIS model to enhance the meaning of the census data and add a micro-depth, and to enable researchers to depict and analyze the spatial pattern of their study. The raw data of the census/city directories is organized according to addresses (parcels). The historic census GIS model integrates the city parcels to the census/city directories to spatially process and map the census data as entered and to aggregate data as needed.

Fischer, Lisa (The Colonial Williamsburg Foundation)**[5] *Discussant***

Fischer, Anders [17] see Donahue, Randolph

Fischer, Alysia (Miami University, Oxford, OH)

[101] *Some Suggestions for Archaeologists Who Have Glass at Their Site*

What are some of the potential pitfalls archaeologists can avoid when dealing with glass at their sites? First and foremost, archaeologists need to recognize the importance of glass as an artifact class and what it can do for them if examined and interpreted competently. This presentation will focus on glass from Old World sites, especially the Mediterranean region, but many of the concerns are universal in nature and can be applied to any site with glass. Drawing upon the experience of many glass specialists, best and worst case scenarios will be described.

Fisher, Christopher [21] see Urquhart, Kyle

Fisher, Philip (Washington State University) and Luke Premo**[84] *A Spatially Explicit Model of Lithic Raw Material Composition in Archaeological Assemblages***

Lithic studies have benefited from the increased availability of raw material provenience data. The ability to determine the source locations of obsidian artifacts through X-ray fluorescence, for example, provides archaeologists with another line of evidence for addressing questions concerning mobility, settlement patterns, trade, adaptations to environmental conditions, and subsistence strategies. Brantingham (2003, 2006) previously demonstrated the importance of “null” model expectations in interpreting raw material provenience data. Here, we present a spatially explicit model that provides “null” expectations of raw material composition in assemblages across a landscape for a given set of raw material source locations and simple assumptions about forager mobility and artifact deposition rates. We combine a landscape archaeological approach with simulation experiments to explore how different assumptions about forager mobility, raw material quality, and raw material procurement affect the relative frequencies of raw materials in assemblages. Although we focus on the results of a simple abstract model in this paper, the ultimate goal of the study is to develop a tool that can be used to produce “null” expectations of raw material composition in empirical archaeological assemblages given the locations of the actual raw material sources of a region.

Fisher, Jacob (California State University, Sacramento)**[127] *Patch Choice Model Predictions for Jackrabbit Processing at Antelope Cave, Arizona***

Zooarchaeological research conducted under the conceptual realm of behavioral ecology has generally focused on the decision-making processes made during and immediately after hunting activities, at the cost of studies that explicitly attempt to predict culinary processing according to ecological or social conditions. It is critical that archaeologists develop tools for predicting and identifying culinary processing methods if our goal is to fully understand prehistoric foraging decisions. Since an individual animal is a clumped resource, a patch-choice model may be used to determine the amount of time a processor should spend on extracting nutritional benefits through cooking. The predictions from the patch choice model are tested using the faunal assemblage from Antelope Cave, northwestern Arizona. The assemblage is strongly dominated by jackrabbits with a high level of preservation that allowed for the building of inferences regarding acquisition, butchering, cooking, and consumption activities. As predicted by the patch choice model, the occupants of the site were maximizing the extraction of nutritional benefits from jackrabbits during a period of relatively poor environmental conditions.

Fisher, Lynn (Univ of Illinois Springfield)**[223] *Discussant*****Fisher, Chelsea (University of Michigan)****[249] *Water Management and City Founding at Yaxuná, Yucatán***

Like many other sites in the northern Maya lowlands, Yaxuná and its environs incorporate a number of cenotes (natural pits in the limestone bedrock that expose underlying groundwater) into the built environment. Interestingly, all but one of these permanent water sources lie beyond the limits of the site's public and residential core. Residents of the ancient city compensated for this, at least on a

seasonal basis, by constructing an aguada (a natural, or in this case human-modified, pond) in the site center. How did water access factor into the initial layout of settlement and construction of public/ceremonial buildings at Yaxuná? Using data from surface collection conducted in 2014, this poster will address how some of the earliest urban planning decisions incorporate water and other natural resources during the Formative period at Yaxuná. This approach will stimulate further discussion on the specific nature of Maya cities and on the variability of ancient urbanism more generally.

Fisher, Erich (Arizona State University)

[356] *The P5 Project Archaeological Reconnaissance along the Pondoland Coast, South Africa*
South African sea caves preserve evidence for early modern humans' longstanding interest in coastal resources. However, changes in coastlines location throughout the Pleistocene prevented the development of long-term and continuous records of coastal foraging and there are still many outstanding questions about when, where, and how coastal foraging developed. Pondoland (Eastern Cape Province) is one of the few places where we may be able to fill in these gaps. An exceptionally narrow continental shelf provides a unique opportunity to study coastal occupation and foraging in an area where coastline changes may have had negligible impacts on hunter-gatherer foraging patterns throughout the Pleistocene. Here, we summarize our results of a survey of the Pondoland coast that described >20 near-coastal rock shelters and open-air sites revealing occupation from the Early Stone Age onwards. We also describe the first direct ages of the coastal red sands that contain Acheulian and early Middle Stone Age stone tools. These OSL ages show that humans have inhabited Pondoland for >300,000 years, predating the currently-known origins of the modern human lineage and systematic coastal foraging. Pondoland, therefore, is anticipated to be a productive area for discovering long-term and continuous records of coastal occupation and intertidal resource use.

[294] *Chair*

Fisher, Victor (Towson University)

[385] *Effective Use of Site Reports as Pedagogical Tools in Courses on Environmental Archaeology and Archaeoastronomy*

Requiring students to analyze individual site reports in terms of theoretical schemes presented in lectures has yielded very positive results. Students have come away from this experience with excellent comprehension of both the site reports and difficulties involved in fitting the data contained therein to a theoretical framework.

Fisher, Abigail (Southern Methodist University)

[397] *Identifying and Applying a "Canopy Effect" as a Marker for Deforestation: Stable Isotope Analysis of Small Artiodactyl and Rodent Fauna from Hunter-Gatherer Sites in Central Africa*

Applying stable carbon isotopic analyses to discern anthropogenic and natural deforestation events is both useful and important to current deforestation and landscape modification research. The goal of this project is to identify a shift in $\delta^{13}\text{C}$ content of mammalian teeth caused by the thinning of canopied forests using the "canopy effect" hypothesis. This pilot study tests the merits of the canopy effect hypothesis as applied to deforestation signatures using two extant village sites on the edge of the Central African Republic's N'Gotto Forest Reserve, which each have different deforestation histories and differing levels of canopy cover. The two species of fauna, giant pouched rats (*Cricetomys gambianus*), and blue duikers (*Philantomba monticola*), chosen for this pilot study represent commonly and similarly hunted genera, thus allowing for widespread application of this method. Future studies will encompass multiple varieties of forested environments (e.g., tropical, island, temperate, etc.), to test the limits of this hypothesis and its applications.

Fisher, Jr., John W. [300] see Forney, Meghan

Fishman, Susannah (University of Pennsylvania)

[214] *Pots and Production: The Secret Agents of the Urartian Empire*

In archaeological analyses of empire, certain aspects of material culture, such as specific architecture, metal work, and ceramic styles are often interpreted as diagnostic of imperial presence, the corporeal residue of political change. But these materials must be understood as agents of change working in concert with the people whose lives shift with the political reality. Elite ceramics are an essential component of the Urartian "State Assemblage," the material signature of the first empire in the northwestern highlands (800-600 B.C.) of the Near East. This paper will explore how the selection and rejection of Urartian ceramic elements in Oğlanqala, Azerbaijan, an administrative center on the periphery of Urartu, instigated changes in local production and exchange. Petrographic analysis demonstrates that new styles required new methods, which in turn required shifts in the organization of production and exchange. The limited adoption of Urartian ceramics does not simply reflect imperial affiliation, aspiration, or mimicry, but performs an important role in technological shifts that have implications for local practice and identity. Most of the ceramics mediating these changes do not appear typically Urartian, but demonstrate the creative ways that the inhabitants of Oğlanqala employed technology to negotiate their position in the Urartian network.

Fitts, Mary Elizabeth [311] see Cranford, David

Fitzgerald, Curran (Department of Anthropology, University of North Carolina at Greensboro), Charles Egeland (Department of Anthropology, University of North Ca), Ryan Byerly (Far Western Anthropological Research Group), Cynthia Fadem (Department of Geology, Earlham College) and Audax Mabulla (Archaeology Unit, University of Dar es Salaam)

[53] *Geochemical and Physical Characterization of Lithic Raw Materials in the Olduvai Basin, Tanzania*

The study of raw materials has traditionally been deeply embedded in analyses of the Early Stone Age, and the impact of source rock characteristics on early human ranging behavior and technological variation is now widely acknowledged. Olduvai Gorge, Tanzania, apart from being one of the most well-known paleoanthropological sites in the world, is also home to a great diversity of potential sources for the production of stone tools. While the lithology and mineralogy of these sources have been well described, quantitative data on inter- and intra-source geochemical and physical characteristics are still rare, which makes it difficult to rigorously test models of early human home ranges and raw material selectivity. This project reports preliminary quantitative studies of variation in the geochemical (via portable x-ray fluorescence) and physical (via standard engineering tools) characteristics of primary and secondary rock sources that presumably served as important supplies of toolstone for Early Pleistocene hominins at Olduvai Gorge

Fitzgerald, Richard [392] see Green, Scott

Fitzgerald-Huber, Louisa

[37] *Discussant*

Fitzpatrick, Scott (University of Oregon)

[238] *Prehistoric Mobility and Population Movements in Palau: New Data from aDNA and Stable Isotope (Sr, Pb) Analysis*

Ongoing research at the Chelechol ra Orrak rockshelter in Palau, Micronesia, has revealed the presence of one of the oldest (ca. 3000-1700 BP) and most demographically diverse cemeteries in the Pacific. Archaeological excavation of only a small portion of the site indicates that dozens of individuals were buried here for more than a millennium. Subsequent osteological analysis coupled with recent attempts to extract ancient DNA and stable isotopes (Sr and Pb) have shed new light on genetic affinities and population movements within and between islands in the archipelago. Results provide important opportunities for examining the origins of colonizers to Palau and their relationship with other groups in the western Pacific.

[32] *Discussant*

[105] *Chair*

Fitzpatrick, Scott [52] see Thompson, Adam

Fitzpatrick, Tony and Leslie Brown (University of Wyoming)

[204] *A Novel Method of Stature Estimation for Fragmentary Femora*

Stature estimation formulae for native populations in North America have historically been problematic, utilizing incorrect reference samples, for example; however recent research has allowed for the creation of more precise formula for evaluation of adult remains. Incomplete bones, however, can hinder stature estimation. There are a number of methods which can provide estimates of the overall length of the bone, or of stature, based on segments of a bone. A method that uses a simple to collect measurement based on easy to identify skeletal markers, designated as Upper Epicondylar Length, was initially tested on skeletal remains in Africa. It was subsequently tested on modern populations in the United States and continues to show moderately high correlations with both femur length and stature. This research, which is an extension of the work completed in the United States on modern individuals, reflects the first stage of a larger project which the authors hope will be a useful tool for skeletal research in archaeology. The results herein will include data collected at the University of Wyoming Human Remains Repository.

Fitzsimmons, James

[244] *Territorial Boundaries and the Northwestern Peten: The View from Jaguar Hill*

What actually constitutes Classic Maya political units? One way to address this question would be to examine ancient Maya conceptions of territory. Certainly, many major Maya sites had emblem glyphs, and these did provide—for those who could read—the sense of a geographic place controlled by a ‘holy lord.’ The real issue for understanding territory, however, is not an emblem glyph but what a Maya kingdom was to the people within it; how territorial boundaries were perceived by different socioeconomic strata, or whether or not clear boundaries were even in effect, are things that an emblem glyph simply cannot tell us. In exploring the situation at the archaeological site of Zapote Bobal, Guatemala (ancient Hiix Witz, or ‘Jaguar Hill’), this paper argues that territorial boundaries are largely dependent upon authority. That is to say, if and where boundaries exist, they exist only because people believe in them. It need not be everyone; boundaries are ultimately enforced by those who have respect for them. Ultimately, then, it is the authority of the belief in the territorial boundary that sustains it and, arguably, the polity.

Flad, Rowan (Harvard University)

[37] *New Research at Qijiaping*

In 2014 a team from the Gansu Provincial Institute of Archaeology, Peking University, Harvard University and National Taiwan University conducted intensive site survey and geophysics work at the site of Qijiaping, the type site of the Qijia Culture. This research complements previous excavation work in the cemetery area of the site, and coring conducted by the Gansu Provincial Institute, and has provided new understandings of the distribution of cultural material in the site area, as well as the viability of geophysics and surface collection as collection strategies for understanding community size and layout during the Neolithic and Bronze Age periods in the Tao River valley. The research is part of a more extensive effort to understand community configuration and technological change in the Tao River area during the late Neolithic and early Bronze Age.

[37] *Chair*

Fladd, Samantha [22] see Bishop, Katelyn

Fladd, Samantha (University of Arizona)

[343] *Access, Accumulation, and Action: The Relationship between Architectural and Depositional Patterns at Homol'ovi I*

Throughout its occupation, Homol'ovi I, a Pueblo IV site in northeastern Arizona, underwent continuous alteration reflecting the movement of groups both internally and externally. The constant attention to rebuilding, redirecting, and resurfacing rooms, and the meticulous patterning of depositional material within structures indicate a continued endeavor to reform the built environment to better reflect the identities, needs, and memories of the current residents. In order to analyze the relationship between occupied and closed space at the site, a theoretical and methodological framework, social syntax, was developed. This involved the combination of multiple theories to track shifts through space and time in architectural access and closure activities involving the filling of structures with sediment and artifacts. Specifically, social syntax combines tenets of spatial syntax, practice theory, behavioral archaeology, and social memory to address the negotiated use of space through time. In this paper, three room blocks from Homol'ovi I are analyzed to discuss the complex relationships within the site and their impact on the use of space. In particular, the patterning of architectural and depositional choices is examined to better understand identity as it pertains to power dynamics across the site.

[22] *Chair*

Flanigan, Tom (University of Utah / U.S. Forest Service)

[6] *Decisions in the Desert*

This is a study of stone tool raw material procurement utilizing archaeological sites located in and around the Sheeprock Mountains in north-central Utah. In an effort to apply Metcalfe's and Barlow's "Field Processing Model" (1992) to prehistoric lithic raw material procurement, the researcher collected culturally deposited obsidian from archaeological sites in and around the Sheeprock Mountains. Over the course of three field sessions from 2011-2013, 250 samples of obsidian lithic debitage were collected to ascertain the samples' geological sources. It is anticipated that the volume of lithic debitage found on the sites will be consistent with expectations set forth in the Field Processing Model. The model will be supported if the geological obsidian sources nearest to the archaeological sites are represented by a higher volume of lithic pieces of non-utility or low utility versus geological sources that are significantly further away from the archaeological sites that have been sampled.

Flensburg, Gustavo [203] see Martinez, Gustavo

Fletcher, Roland (University of Sydney)

[36] *Difference, Non-correspondence and the Material Contexts of Sociality*

Human beings use three signaling systems, words, actions and material which differ in their replication rates, the degree to which the signals persist and their magnitude. Speech replicates rapidly and transmits a signal over a small distance that last only briefly. Action in the form of positioning and gestures replicates more slowly and can carry its signal for somewhat longer. Material by contrast is replicated more slowly, sometimes very slowly. Material signals, such as the dimensions of buildings, can also be very durable and massive. An event may be expressed in all three kinds of signals but each records a different aspect and hence a complementary difference. In addition, versions of speech can be recorded materially. Several profound operational outcomes derive from the differing replication rates, durability and magnitude. Because copying error is a function of replication rate, changes cumulates in the various signal systems differentially and they cannot therefore assuredly remain in synchrony with each other. Differing physical durability creates differing degrees of inertia in cultural phenomena leading to varying degrees to which sociality can manipulate or change material features, such as infrastructure. Signal non-correspondence and the risks of operational dissonance are therefore inherent to cultural evolution.

[286] *Discussant*

[36] *Chair*

Fletcher, Christopher [230] see Wiewel, Adam

Flexner, James (Australian National University)

[388] *Towards a Historical Archaeology of Heiau: Hawaiian Traditions, Colonialism, and Religious Transformation in the Recent Past*

Hawai'i occupies a somewhat unique position as one of two Polynesian archipelagos thought to have been the location of "primary" or "archaic" states in the time before European contact (the other possible example being Tonga). Hawaiian people created an elaborate ritual hierarchy that accompanied the emergence of state religion, which was associated with the construction of monumental stone temple complexes known as heiau. Heiau have long been a staple of archaeological investigation in the islands, combining physical evidence, local informants, and oral traditions written down in the 19th century to identify and interpret these sites. It is generally assumed that after the abolition of kapu (the traditional religious system) in 1819, and the arrival of missionaries in 1820, indigenous Hawaiian religion declined and eventually disappeared. Archaeological and ethnohistoric evidence suggests that this was simply not the case, and we argue for a re-evaluation of Hawaiian religious practices, specifically surrounding heiau, through the 19th century and into the present.

[255] *Discussant*

Flood, Roger [284] see Merwin, Daria

flores, carola [2] see Salazar, Diego

Flores Ramirez, Rosa (ANTROPOLOGA FISICA) and Marco Zavaleta Lucido (Centro INAH Colima)

[21] *Conchita y sus amigos: "Un estudio bioarqueológico de los entierros infantiles recuperados en el Salvamento Arqueológico Mina de Peña en la Ciudad de Villa de Álvarez, Colima, 2014"*

Una de las principales incógnitas al excavar contextos funerarios en los trabajos de investigación arqueológica, es conocer acerca del sistema de enterramiento y la forma en como los individuos preparaban los restos mortales de las personas fallecidas para su tránsito a su otra vida, si existió un área de enterramiento exclusivo o donde se depositan a los individuos fallecidos, si hay una diferencia por edad y sexo en el área de enterramiento y porque colocan determinados elementos (objetos arqueológicos) junto a los sujetos o sujetos muertos. En el presente trabajo se da a conocer un caso especial en Colima, el cual proviene del Salvamento Arqueológico Mina de Peña efectuados por los que suscriben, el que consiste en un área de enterramiento de la que sobresalen los restos óseos infantiles de cinco infantes que denominamos Conchita, los cuales fueron depositados unos sobre otros, y los que les colocaron diversos objetos entre los que sobresalen el collar de conchas, cuentas de dientes (posiblemente jabalí), un pigmento rojo, (posiblemente Cinabrio), y omoplatos de venado quemados y trabajos a manera de omechicahuaxtlis, colocados a los pies, lo que nos lleva a preguntarnos porque fueron depositados en ese lugar estos individuos.

Flores-Fernandez, Carola (UCSB)

[152] *Effect of Past Ecological and Oceanographic Variability on Shellfish Harvesting and Suitability of Coastal Locations. A Case Study from two Late Holocene (2200-500 cal B.P.) Sites on Santa Cruz Island, California*

The islands off California have long been recognized for their predictable and abundant shellfish resources, which provided a wealth of food for ancient people. Although fluctuations in the marine environment through time affected resource availability periodically (for example El Niño Southern Oscillation), the effects were variable on a local scale, resulting in local marine microclimates. California mussel (*M. californianus*) is the most abundant shellfish species in the archaeological sites along the California coast. Isotopic analysis ($\delta^{18}\text{O}$) on archaeological mussel shells was used to reconstruct local sea surface temperature (SST) through the occupation of two Late Holocene (2200-500 cal B.P.) sites on the south and western coast of Santa Cruz Island. Compared with regional paleoceanographic SST records and modern long-term mean SST values, local SST sequences show variable microclimates through time, influencing marine productivity and settlement decisions.

Local variability in upwelling patterns provides important insights to interpret stable isotope records obtained from archaeological sites around the Channel Islands. As spatial variability in intertidal ecology and nearshore oceanography is an intrinsic characteristic of coastal environments around the world, it is important to identify and understand the differential effects of local vs regional oceanographic fluctuations.

Florey Folan, Lynda [213] see Folan, William

Flor-Stagnato, Kate [207] see Knaub, Colene

Flynn, Erin (PAL) and Dianna Doucette (PAL)

[281] *Community Connections from Archaic to Present in Southeastern Massachusetts: Insights from Halls Swamp and Beyond*

The Halls Swamp Site represents a newly identified Middle and Late Archaic multi-component occupation in Kingston, Plymouth County, Massachusetts. Community interest and insight in archaeology through the local historical commission, along with dedicated Native American monitors, prompted a professional archaeological survey resulting in an overwhelming municipal response to the importance of preserving a unique cultural landscape. The Halls Swamp Site is also yet another piece of an ever evolving and growing puzzle about Archaic Period settlement patterns in the Northeast that questions what we can still learn from the limited amount of research typically allowed through cultural resource management, and reflects the importance of choosing the most efficient interdisciplinary approaches for mitigation as well as preservation. Excavation of just two percent of the Halls Swamp Site yielded over 24,000 artifacts and 78 cultural features, including a stone row feature and evidence possibly associated with Archaic Period house structures.

Foarde, Chip

[193] *Maya Graffiti and Sacred Spaces*

This paper explores the nature and possible implications of graffiti identified inside presumably abandoned Maya architecture. There exists a wealth of ancient iconographic graffiti scattered throughout the Maya world. It has been argued that such graffiti was, in many cases, created after the spaces in which it is found had ceased to be used for their original purposes. Therefore, graffiti in this context is a possible example of the repurposing of Maya architecture by members of a society with ever changing needs and intentions. Through a comparative study of various examples of these images, along with the new-found graffiti at the site of Xultún, an attempt will be made to draw inferences on the significance of Maya graffiti and how it contributed to the repurposing of "sacred" spaces. Consideration will be given to the possible ways in which this practical change in artistic space is related to the constant and often volatile shifts in the history of Maya society.

Fogelin, Lars (Univ. of Arizona)

[20] *Discussant*

Foias, Antonia and Kitty Emery (Florida Museum of Natural History, University of F)

[244] *The Land of the Windy Water Lords: Secondary Centers in the Motul de San Jose Polity, Guatemala*

Motul de San José dominated a swath of the northern shore of Lake Peten Itza in central Peten, Guatemala, during the Late Classic. Its Ik' Emblem Glyph has now been translated as "Windy Water," an apt name for this zone. Excavations at two small sites in the periphery of Motul de San José, Kante't'u'ul (approx. 3km northwest) and Chachacklu'um (approx. 5km east) aimed to investigate the relations between these secondary centers and their political overlords at Motul de San José. Settlement patterns, architecture, burials, and material culture in general will be compared to reflect on the territory controlled by Motul at its apogee during the eighth century A.D.

Foin, Jeremy (University of California, Davis)

[302] *Comparative Faunal Analysis of Four Early Thule House Features from Cape Espenberg, Alaska, and Inglefield Land, Greenland*

The Thule expansion was the extremely swift colonization of the eastern Canadian Arctic and Greenland by Thule Inuit moving east out of Alaska ca. A.D. 1000-1300. The rapid pace of the migration implies that it may have taken these pioneering Thule groups some time to “settle in” to their new environment. Poor familiarity with local conditions should be reflected in the zooarchaeological record as highly uneven, low-diversity faunal assemblages, with a heavy bias toward small phocids in the earliest sites (e.g., Darwent and Foin 2010). In addition, houses should have similar internal organization owing to their shared ancestry. In 2009, two well-preserved early Thule house features were excavated at Qaqaitut, northwest Greenland, radiocarbon dated to ca. A.D. 1300-1400 and A.D. 1350-1450. In 2010, two well-preserved early Thule house features were excavated at Cape Espenberg, Alaska, dated to ca. A.D. 1270-1320 and A.D. 1450-1500. The faunal assemblages from all four features were subjected to detailed zooarchaeological analysis in order to explore similarities and differences in species composition, cultural and natural bone modification, discard patterns, and use of space by early Thule peoples on opposite sides of the Arctic.

Folan, William (Univ. Autónoma de Campeche), Terance L. Winemiller (Auburn University) and Lynda Florey Folan (Universidad Autónoma de Campeche)

[213] *Using 3D Geographic Information Systems to Understand Settlement Decisions at Calakmul*

In 1982, fifty years after the Carnegie Institution of Washington surveyed and mapped sections of Calakmul, a project under the direction of William J. Folan began mapping the site. The completed map published in 2001 covers 30 square kilometers of the ancient site. Many printed maps or datasets like those from Calakmul created with laser total stations or conventional surveying equipment can provide the essential geospatial information to produce accurate topographic maps and 3D map objects within a Geographic Information System (GIS). The methods we developed to transform and integrate published maps of Calakmul into a three-dimensional GIS provide new perspectives about the site. Archaeologists can employ methods presented in this paper to represent archaeological sites as three-dimensional interpretations while preserving iterative analytical capabilities designed into modern GIS. The GIS preserves the fidelity of projected geospatial map entities, allowing the researcher to perform complex analytical operations to reveal new information related to organization of the settlement and location rationale.

Follensbee, Billie (Missouri State University)

[187] *Imitation is the Sincerest Form of Flattery: Gulf Coast Olmec Sex, Gender, and Dress as Reflected in the San Bartolo Murals*

The murals within the Pinturas structure at the site of San Bartolo, Guatemala have provided invaluable information for understanding the Late Formative period Maya, as well as for understanding their emulation, adoption, and adaptation of Epi-Olmec culture, religion, and iconography. As noted by a number of scholars, the figures depicted in the murals have the distinctive, graceful, and relatively naturalistic body forms of early Maya images, but the facial types, clothing, and adornments reflect Olmec and Epi-Olmec types. In their emulation and imitation of Olmec garments and accouterments on the more sexually identifiable Maya-style figures, therefore, the San Bartolo murals also serve to provide clear evidence confirming recent identifications of sexed and gendered features, gendered clothing, and gendered accouterments in Gulf Coast Olmec sculpture.

[187] *Chair*

Foor, Thomas [312] see Howerton, Sarah

Forbes, Veronique [337] see Ledger, Paul

Forbes, Véronique (University of Aberdeen), Kate Britton (University of Aberdeen) and Rick Knecht (University of Aberdeen)

- [337]** *Beetle, Lice and Flea Sub-Fossils as Evidence for Resource Exploitation, the Use of Space and Ecological Conditions at the Pre-Contact Eskimo Site of Nunalleq, South-Western Alaska*

Samples collected from the permafrost-preserved floors of 14-17th century Eskimo winter sod houses at Nunalleq, south-western Alaska, have yielded thousands of insect sub-fossils. These diverse and exceptionally well-preserved insects are invaluable indicators of the ecological conditions which prevailed inside the structures, but also of the activities that took place inside them. Indeed, while external parasites such as human lice, bird fleas and dog lice reveal details about hygienic practices and animal resource use, the numerous beetle fossils identified from these samples suggest that despite their seasonal character, the sod houses at Nunalleq and the activities that took place inside them had a profound impact on the local insect fauna. The results of archaeoentomological analyses at Nunalleq are used to explore how the study of insect remains from northern hunter-gatherer sites could potentially enrich our understanding of past Arctic life-ways by illuminating details about animal and plant resource collection, storage and processing practices and their influence on local conditions and ecosystems.

Forbis , Adam [316] see Cortes-Rincon, Marisol

Ford, Anabel (UCSB)

- [38]** *Discussant*

Ford, Ben (Indiana University of Pennsylvania), Mark Durante (Indiana University of Pennsylvania) and Katherine Farnsworth (Indiana University of Pennsylvania)

- [192]** *The Potential for Submerged Prehistoric Sites Beneath Pennsylvania's Lake Erie Waters*

This paper presents the results of a preliminary model of submerged prehistoric site potential within the Pennsylvania portion of Lake Erie. The model takes into account both cultural and natural factors that may have influenced the placement and preservation of archaeological sites. Archaeological data from the current Lake Erie littorals of Pennsylvania, Ohio, and New York were used to model likely site locations based on known bottom features within Lake Erie, such as drowned shorelines and river channels. Geologic data, drawn from previous remote sensing and coring surveys, were then employed to model erosion and deposition that effect the survival and accessibility of submerged sites. The presentation concludes with a discussion of the potential to test this model.

Ford, Dabney [354] see Bustard, Wendy

Ford, Renee (McMaster University), Tristan Carter (Department of Anthropology, McMaster University) and Elizabeth Healey (Department of Archaeology, Manchester University)

- [401]** *Sourcing Late Neolithic and Chalcolithic Obsidian from Iraq and Iran: New Perspectives from Tell Nader and Yanik Tepe*

Historically Near Eastern obsidian characterization studies have focused on south-eastern Anatolian and Levantine assemblages of the Pre-Pottery Neolithic as a means of contributing to debates upon Neolithization. This study contributes to redressing this spatial and chronological bias, by detailing analyses of artifacts from 6th-5th millennium B.C. contexts in Iraq and Iran. The first assemblage comes from the new excavations at Tell Nader, a Ubaid to Assyrian period settlement near Erbil in Iraqi Kurdistan, the second from the 1960's work at Neolithic Yanik Tepe in NW Iran. Further brief references are also made to material from Tell al-'Ubaid, Seh Gabi and Arpachiyah. The artifacts were elementally characterized using the non-destructive technique of EDXRF. Our results indicate a variety of different sources being exploited by different communities at different times, including products from both Cappadocia (many hundred kilometers to the west), plus eastern Anatolia, north-eastern Anatolia and Transcaucasia. Our results reflect the general trend for an expanded range of source materials being consumed after the Pre-Pottery Neolithic, the discussion focusing on the significance of the various exchange networks and the other media and ideas that would have flowed through them alongside the obsidian, not least the early circulation of metals.

Forde, Jamie

[253] *Material Culture Change, Continuity, and Innovation at Postclassic and Early Colonial Achiutla, Oaxaca, Mexico*

In this poster, I present results of an analysis of ceramic materials recovered from domestic contexts at the Postclassic and Colonial site of Achiutla, located in the Mixtec highlands of Oaxaca, Mexico. Materials from distinct household middens corresponding to the Postclassic and Colonial periods, respectively, facilitate intra-site comparisons of domestic ceramic assemblages, providing insights regarding cultural change and continuity at the micro-level over the course of the Spanish Conquest. Results suggest intriguing patterns that confound traditional models of acculturation. For example, despite indications that indigenous peoples of Achiutla rapidly adopted European-introduced ceramic technologies, such as glazes and the potter's wheel, Spanish-influenced pottery did not replace traditional wares; in fact, far from it. Certain native-style decorated serving wares, such as polychromes, not only persist from the Postclassic period into Colonial times—they become significantly more frequent, though with considerable changes in formal characteristics and design motifs. This suggests not simply the endurance of an indigenous ceramic tradition, but instead a reformulation and florescence of one.

Forman, Steven (Baylor University)

[80] *Assessing the Accuracy and Precision of OSL Dating against Well Vetted Radiocarbon Ages*

OSL dating has advanced in the past decade with refinements in single aliquot and single grain regeneration (SAR) dating of quartz and feldspar. There are now many independent studies to evaluate the accuracy and precision of OSL dating, particularly for eolian and littoral sediments where solar resetting is often assured. This assessment will examine the potential meaning of radiocarbon ages that are > 45 ka in light of corresponding finite OSL ages for fluvial and marine sediments from the Hudson Bay Lowlands, Canada. A robust data set for evaluating the finite range of radiocarbon ages is the eolian stratigraphic record in the central U.S. where over the past decade an OSL chronology has emerged. In turn, OSL has utility in dating sediments < 1 ka, when radiocarbon ages often have poor precision. OSL can date distinct historic events, like eolian sand deposition during the 1930s Dust Bowl Drought. Lastly, the inherent limitations of OSL dating will be discussed including concepts of data overdispersion, precision versus aliquot/grain number, the assumptions behind statistical models, and associated errors. OSL can date many sediments but there remains a poorly defined population of quartz that defies the SAR protocols and yield spurious results.

Forne, Melanie [413] see Demarest, Arthur

Forney, Meghan [98] see Howell, Ryan

Forney, Meghan (University of Oklahoma), John W. Fisher, Jr. (Montana State University) and Lawrence Todd (University of Texas, Austin)

[300] *A Multi-Scalar Chipped Stone Analysis in the Northern Rocky Mountains: Comparing the Bridger Mountains, Montana to the Absaroka Mountains, Wyoming*

Conducting research in montane settings, while rewarding, comes with a set of challenges which can result in a relative paucity of data from these locations. However, this problem can be mitigated by various analytical techniques. One approach is to employ a multi-scalar analysis on available data, a method that has produced richer results from limited data in other archaeological contexts. We have applied a multi-scalar analysis to the Pre-Contact era archaeological record of the Bridger Mountains in southwestern Montana and of the Absaroka Mountains in northwestern Wyoming and found interesting differences in raw materials types at different scales that might relate to varying site types and landscape use in the Rocky Mountains.

Forringer-Beal, Anna (University of Michigan), Polina Hristova (University of Michigan) and Jason De León (University of Michigan)

[93] *A Story Told Two Ways: Exploring the Intersectionality Between the Archaeological Record*

and Social Context of Undocumented Female Migrants

The number of undocumented women crossing from Mexico into the United States has been increasing since the 1980s, leading to a steady upsurge in studies focused on the experiences and strategies of this subpopulation of migrants. Much of the discourse thus far has been focused on the social contexts of female migrants, that is, the interpersonal and informational networks that influence their experience and survival strategies while crossing. In this poster we investigate how these social conditions during crossing do or do not map onto the material culture used and discarded by women migrants crossing the Arizona desert. Part of our analysis includes juxtaposing recorded narratives of female border crossers with gendered artifacts collected by the Undocumented Migration Project. Specifically, we discuss how women are underrepresented in the overall archaeological record and yet are traceable through the examination of intrinsically feminine artifacts, such as feminine hygiene products, bras, etc., and microfacts (i.e., small and often-fragmented artifacts that remain after migrant sites have been cleared). We posit that some gendered forms of migration-specific capital are visible in the archaeological record.

Forste, Kathleen and Mac Marston**[268]** *Paleoethnobotanical Investigations of the Economy of Islamic Ashkelon*

The coastal city of Ashkelon, in present-day Israel, was a key economic port in the commercial system that connected the Mediterranean and Middle East from the Bronze Age into the Crusader Era. The advantage of its position is attested by its continued occupation as well as the luxurious and finely made, often imported, objects recovered from various time periods. The Islamic period (640-1153 CE) is considered a time of great expansion and growth, with evidence of fine craftsman having resided within the city's expanding jurisdiction. However, there is a need for greater systematic study of plant remains to more fully understand the importance of plant goods to the inhabitants and the merchants of Islamic Ashkelon. By examining the distribution of archaeobotanical remains, including charcoal, we assess patterns of plant use and attempt to differentiate between domestic and mercantile contexts. Evaluating patterns of distribution in such contexts allows us to recreate economic practices at various levels, and opens the door to investigate differences in products used for household purposes versus those used for commercial purposes. Plant-use patterns at Ashkelon are then compared to those of contemporary sites in the region in order to assess its role in regional economies.

Forste, Kathleen [291] see Allen, Susan

Forsyth, Donald**[408]** *The Ceramics of the El Mirador Region: An Update*

Investigations in the Mirador Basin over the last thirty or so years have demonstrated that the region was one of intense occupation over a long period of time, particularly during the period that has come to be known as Preclassic. This period was marked by evidence of changes in the complexity and increasing uniformity in various cultural characteristics such as architecture, sculpture and iconography. In a similar manner the development of the ceramic industry provides evidence of a process towards uniformity that, as in other cultural characteristics, is not limited to the El Mirador region, but also is found in a large area that includes a large part of the Maya Lowlands.

[408] *Discussant***Fort, Joaquim (Universitat de Girona)****[73]** *Neolithic Transitions: Demic or Cultural?*

We review a method to estimate the percentages of demic and cultural diffusion in Neolithic transitions (Fort, PNAS 2012). We extend that method and identify mainly demic and mainly cultural regions in Europe.

Forte, Maurizio (Duke University)

[401] *Digital Archaeology at Çatalhöyük: New Inferential Methods for the Interpretation of Neolithic Buildings*

The 3D-Digging Project started at Çatalhöyük in 2009 with the intent to digitally record in 3D all the archaeological stratigraphy in some areas of excavation assembling different devices and technologies for virtually reconstructing all the process in desktop and virtual reality systems. The introduction of 3D data recording and 3D simulation marks a qualitatively new phase of the research process at archaeological sites. This shall facilitate a new mode of inference that can fundamentally change the excavation process. The project, focused mainly on the B89 East mound has demonstrated in 5 years of experiments that it is possible to integrate different tools and methods during the excavation, achieving important results in terms of standardization, information quality, virtual interaction and reliability of the digital workflow. The “mediated experience” of digital documentation devices is always assisted by an empirical observation of data on site. Since the 3D models are visualizable and ready in a very short time, the interaction between empirical observation and mediated experiences creates new forms of knowledge and interpretation. Finally the paper will present the realization of a specific software platform for the 3D visualization and reconstruction of archaeological excavations.

[42] *Discussant*

Fortin, Louis (Washington State Univ.) and Donna Nash (University of North Carolina, Greensboro)

[250] *From Bedrock to Biface: An Examination of Wari Lithic Technology within the Moquegua Valley of Southern Peru*

This research investigates lithic artifacts, and debitage recovered from Middle Horizon (A.D. 550 – 1000) households in the Moquegua Valley, Peru to assess models of Wari state expansion and polity interaction. While lithic technology, in the form of formal and informal flake tools, are present throughout complex societies, they are traditionally overlooked by archaeologists and result in few published studies. This study examines two Wari sites (Cerro Baul and Cerro Mejia) in the upper Moquegua Valley of southern Peru. The research presented expands upon our current limited knowledge of the lithic assemblage through the utilization of retouch analyses for formal chipped stone tools, as well as expediency indices to determine the overall curation, or tool use, of the lithic material. Gephi, a visual exploratory data analysis tool usually reserved for social network analysis, is incorporated into this analysis in order to define intra-site variations in lithic attributes among households and inter-site variations among the two sites.

Forton, Maxwell (Binghamton University)

[278] *Ground Stone as a Migration Marker: Using Finger-Grooved Manos and Fully Grooved Axe-Heads to Trace Kayenta Influence at Salado Sites.*

The Salado phenomenon in southern New Mexico and Arizona includes a set of cultural traits that are believed to have been stimulated by the arrival of Kayenta migrants in the late 1200s from northern Arizona and southeastern Utah. Identifying the influence of these northern migrants at Salado sites has been one of the ongoing goals of Archaeology Southwest's field excavations. In addition to perforated plates and certain architectural features, the presence of particular ground stone tools at Salado sites may serve as markers of Kayenta influence. Manos possessing finger grooves and axe-heads displaying a full groove are tool styles associated with Ancestral Pueblo peoples. The presence of these tools at the Dinwiddie site is further evidence of Kayenta influence in Cliff phase communities. Further analysis of the distribution of finger grooved manos and fully grooved axes among Cliff phase ground stone assemblages may lead to a better understanding of the dispersal of migrants and cultural influences associated with the rise of the Salado phenomenon.

Foster, John

[27] *Examination of an Archaeological Legacy Collection from San Fernando Mission, California.*

The 1971 San Fernando Earthquake severely damaged several buildings at San Fernando Mission, which had been established in 1797. In May 1973, the church was slated for demolition and during the course of that activity several burials were encountered. Students and volunteers from California

State University, Northridge (CSUN) were asked to assist in the removal of the burials, artifacts, and documentation of features that had been found. I had been one of those volunteers and was the “dig foreman” for the project. Forty years later to the month (May 2013) I returned to CSUN with the intent to analyze and publish those findings. Coincidentally a revitalized Anthropology Department had repackaged and assembled the artifacts and records into a coherent body of data that could easily be accessible just prior to my arrival. The result was a challenging and rewarding experience in working with old collections. Piecing together notes, maps, photographs, artifacts, and fragmented catalogs was as much an excavation as the original work albeit with paper and files. This paper summarizes the trials and tribulations of revisiting these collections, and makes recommendations for future researchers.

Foster, David [281] see Doucette, Dianna

Foster, II, H. Thomas [327] see Garner, Nancy

Foster, Jr., Robert [316] see Cortes-Rincon, Marisol

Fournier, Patricia [76] see Otis Charlton, Cynthia

Fournier, Patricia (Escuela Nacional de Antropología e Historia) and Bridget M. Zavala (Universidad Juárez del Estado de Durango, Mexico)

[76] *Firing Pots in Durango: Craft Manufacture of Glazed Wares and the Origins of Consumption and Production Inequality in Northern Mexico*

The historiography of nineteenth century industrial development in the northern Mexican state of Durango has tended to focus on the biography of a few successful businessmen, rather than on the local production and consumption of daily material culture. Specifically, the inhabitants of this northern territory experienced greater socioeconomic inequality, as only the minority that belonged to the entrepreneurial class reaped the benefits of industrialist projects. Thus only a small number of agents participated in the consumption of non-local luxury goods. In this paper, we use the results of the analysis of ceramic wasters and partially finished vessels from a Republican-period pottery workshop on the outskirts of the city of Durango as an entry point to the study of the organization of craft production by local artisans. Furthermore, we consider changes in the production of these simple vis-a-vis the influence of industrialization, in the making of the region itself.

Fowler, William (Vanderbilt University) and Jeb Card (Miami University)

[393] *Structure 4G1, Ciudad Vieja, El Salvador: A Sanctuary of Earth and Stone*

The archaeological site of Ciudad Vieja, El Salvador, represents the ruins of the Conquest-period town of San Salvador. Although founded as a Spanish conquest town with a small Spanish population, the inhabitants of San Salvador were mainly indigenous Mesoamericans including Mexican warriors and their families who traveled with their Spanish allies during and after the initial military conquest and transplanted members of colonized Nahua-speaking Pipil groups from western and central El Salvador. Previous investigation has revealed domestic and economic activities within the villa, but a new phase of mapping, remote sensing, and excavations conducted in 2013 and 2014 on the eastern edge of the site have revealed Structure 4G1. Preliminary results indicate that this structure may be the sanctuary of an open-air chapel used for baptisms and acts of worship for newly converted Indians who inhabited or visited the town of San Salvador. While similar “sanctuaries of earth and stone” are known from indigenous towns in central Mexico and Yucatan, this structure appears to be the only known example of indigenous religious architecture in a Spanish conquest town in Mesoamerica. The historical and archaeological evidence call into question how we view this “Spanish” colonial settlement.

Fowles, Severin [342] see Damick, Alison

Fowles, Severin (Barnard College, Columbia University)**[400]** *On the War Machine*

This paper takes up the writings of Clastres, Deleuze and Guattari on the core premise that war is a driving sociological principle in societies that have successfully opposed the development of state organization. My first goal is an attempt at clarification: if predatory military exploits are involved in the consolidation of most, if not all, states, what did Clastres mean when, in contrast, he wrote about the centrifugal logic of the war machine in non-state societies? My second goal is to extend this analysis to the case of equestrian warrior society of the Comanche during the eighteenth and nineteenth centuries.

Fox, Georgia (California State University, Chico)**[15]** *Gazing Upward: New Directions at Betty's Hope Plantation, Antigua, West Indies*

Plantation archaeology in the Caribbean region has been grappling with the complexities of plantation life through studying asymmetrical power relationships, spatial organization, and other important avenues of research. As there is no one "size fits all," this provides an opportunity to explore new approaches and methodologies in plantation research. For my presentation, I propose that Betty's Hope—a 300-year-old sugar estate located on the island of Antigua—serves as a laboratory to test new methodologies in excavating and interpreting a British colonial site. At Betty's Hope, we have adopted new technologies and scientific testing to address such questions of sustainability and ecological devastation resulting from monocrop agriculture. Using drone technology, we have been able to explore the landscape from an aerial perspective to further ascertain the scope of imprint on the island landscape. Scientific testing in soil sampling is being conducted to test ideas about ecological devastation, while the use of a Bruker hand-held x-ray analyzer allows us to source locally made coarse earthenwares made by enslaved Africans. Such methodologies, in combination with new theoretical approaches are helping us attempt to understand the many facets of colonial plantation life and its impacts, both short and long term, locally, and regionally.

Fox, Jacqueline (Arizona State University)**[96]** *Comparative Social Inequality and Class Structure in Ancient Cities*

Using the Gini index and associated Lorenz curve, this paper compares representative measurement of wealth across ancient cities dispersed throughout several cultural areas and from varied temporal periods. Using residential house size in several sites where the complete extent of the residences is mapped, calculated area and volume will be used as the standard for comparison. The volume of each structure is a more representative measurement of wealth because it encompasses the cost of labor more appropriately, however the limited number of sites with this level of detailed measurement available may not allow for as wide a sample. Area will also be measured in order to have a larger sample from which to derive conclusions. The comparison of these calculations with the Gini index will provide a new insight into variable levels of inequality with a consistent measurement that can be correlated with specific contexts to provide new insight into site variation within culture areas as well as variation between culture areas.

Fox, Georgia L. [176] see Wells, E. Christian

Fox, Keri (Wichita State University) and David Huges (Wichita State University)**[260]** *Where the Buffalo Roam and the Antelope Play: A Comparison of Soils in the Walnut River Valley of South-Central Kansas and associated Woodland and Late Prehistoric Period Settlements Using ArcGIS*

Huges's (1988) dissertation showed a relationship between late prehistoric settlement patterns on the Washita River of Oklahoma and the soils of that region, among other variables. This paper is an effort to extend that research north into the Walnut River Valley of Kansas. The valley of the Walnut in Butler and Cowley Counties is a rich archaeological area that has had little synthetic analysis conducted. As a first step in the process of a new regional synthesis, this project will specifically look

at the soil distribution of the area to determine correlation with settlement patterns. The resultant model will enhance our management capabilities for the area and serve as a building block for a more comprehensive settlement and distributional analysis.

Frachetti, Michael (Washington University in St. Louis)

[146] *The Common Sense of Institutions and Modalities of Happiness*

Love, money, success, purpose, identity, companionship, family, enlightenment: these 'things' and more have been proposed as measurable indexes of happiness. Recent scholarship on the theme of happiness presents it paradoxically as something seemingly tangible and sensory -- a common-sensical object of pursuit -- and something ethereal and subject to existential contemplation. Does one choose "the red pill or blue pill" (to quote the film "The Matrix"). Yet setting its existential reality aside, the topic of 'happiness' and how it manifests itself in real social context leads one to examine a compelling intersection of sociality and materiality, rendering the topic within broader institutional frameworks that can be explored archaeologically. While this paper inevitably falls short of defining happiness (either here and now or in the past), it explores happiness and its expression among prehistoric communities of Central Asia as a cross section of common-sense and institutionality, with the goal of contextualizing a number of practical and material signatures available in the archaeological record.

[234] *Discussant*

Frachetti, Michael [155] see Winter, Jacob

Frahm, Ellery (University of Minnesota)

[412] *Exploring Hominin Cognition via Paleolithic Obsidian Provisioning, Transport, and Technology*

A central issue in paleoanthropological research is understanding the cognitive and behavioral variability of Lower and Middle Paleolithic hominins, including differences with respect to the modern humans who replaced them. Some scholars argue that these hominins had fundamentally different cognition and behavior than *Homo sapiens*, whereas others hold that their capabilities are essentially indistinguishable from those of modern humans. In obsidian-rich landscapes, artifact sourcing and lithic analysis can yield insights regarding hominin provisioning strategies, settlement patterns, and social interactions and, consequently, their cognitive abilities. Various data from Eurasia, including an apparent reliance on local cherts, have been interpreted as evidence for local, relatively "intimate" LP and MP societies, whereby hominins exploited small seasonal territories, slowly migrated through them, and maintained small social networks. In turn, the apparent scales of Neanderthal and modern human interactions have been incorporated into arguments regarding cognitive differences between them. For example, it has been proposed Neanderthals did not develop larger networks because they lacked the cognitive abilities to do so, and the larger-scale interactions envisioned for modern humans are frequently cited as a factor in the Neanderthals' demise. New obsidian research, however, has yielded data at odds with such ideas regarding Paleolithic cognition and behavior.

France, Christine [403] see Huffer, Damien

Frances, Guillem (Guillem Francès), Xavier Rubio (Barcelona Supercomputing Center, Barcelona, Spain), Carla Lancelotti (CaSEs, Department of Information and Communication), Alexis Torrano (Barcelona Supercomputing Center, Barcelona, Spain) and Alex Albore (Onera, Toulouse, France)

[73] *Embedding Artificial Intelligence in Agent-Based Models*

Agent-Based Models (ABMs) have been increasingly used to study social phenomena, from the emergence of social norms to population dynamics or cultural transmission processes. Key to this method of computational simulation is the tension for explaining how macroscopic phenomena emerge from the interaction of agents behaving in a plausible manner. However, the behavior is too often encoded as a simple set of condition-action rules. We consider this kind of rule-based behavior too simplistic, specifically when simulating human action and exploring the impact of decision-making

processes on the simulation outcome. Therefore, we experiment with a novel type of agent whose decisions are based on casting the surrounding world as a Markov Decision Process, a decision-making model widely used in Artificial Intelligence. The performance of this type of agents is assessed on a simple ABM simulation and compared to that of traditional rule-based agents. We then analyze the interplay between decision-making processes and relevant simulation parameters such as the distribution of resources. Finally, we present the results of applying the insights thus gained to a concrete case study within the Simulpast project concerning the dynamics of Hunter-Gatherer populations in North Gujarat, India, in the mid and late Holocene.

Franchetti, Fernando [252] see Sugrañes, Nuria

Francis, Joyce [197] see Swidler, Nina

Franco, Nora [215] see Pintar, Elizabeth

Franco, Cristina (University of Puerto Rico, Rio Piedras)

[290] *Breaking the Untold Rule: Community Archaeology a Bond of People and Information*

The relationship between the academia and non-academic individuals is often challenging, as there are tensions between who owns the power to produce knowledge. Citizen science is breaking this untold rule by incorporating the communities, fostering interactions that help transform segregated relationships. Recovery of knowledge from traditional and local perspectives has shown that individuals and communities hold very valuable, deep knowledge regarding their specific surroundings and daily life. In community archaeology the line that separates the archaeologist and the community is blurred, permitting the development of bonds between people that stimulates sharing of information. When information is shared knowledge grows and can inspire teaching others, permitting the formation of strong bonds between the groups sharing it. With the creation of information flows from multiple perspectives, it is possible to reach a better understanding of the topic at hand. These interactions not only benefit the research at the academic stage, but can also enrich the personal development of all the parties involved. In this presentation I shall be discussing these ideas of interaction between academic and community environments, from a personal perspective, including possible doubts and benefits, and how both communities and researchers can both develop relationships starting from equality.

Franklin, Jay [8] see Menzer, Jeremy

Franklin, Kathryn (University of Chicago)

[258] *Prosthetic Angels: Empirical Anxiety and Rationalizing Vision in Archaeology*

Working from tensions within historical and landscape archaeology, this paper examines the stress expressed by the question: "how can we know what happened in the past if we weren't there?" This query shapes much of the analytical framework within archaeology and underlies anxious discussions of archaeology's status as a 'real' science. At the heart of both this anxiety of "how do we know" and the ways in which we cope with it methodologically are assumptions about what facts are and how (or whether) they can be made. Among these assumptions is that of a close (if not identical) relation between observation and knowledge, and a privileging of empirical facts over other forms of truth. These assumptions spring from an entrenched western conviction that vision is the prime route to understanding, which persists despite progressive reflexivity among archaeologists. This conviction drives ongoing ambivalence towards history as data, and motivates fetishization of the visual in practices such as landscape archaeology, a prime example of making-visible so as to make-knowable. This paper argues that, rather than maintaining narrative in opposition to observation, the benefit of an expanding barrage of empirical tools is in enriching the stories we construct about the past.

Franklin, Jay, Maureen Hays (College of Charleston), Frédéric Surmely (Ministère de la

Culture DRAC Auvergne/SRA), Lucinda Langston (Bureau of Land Management) and Ilaria Patania (Boston University)

[333] *Migration Terminus? Late Pleistocene/and Early Holocene Archaeology at Rock Creek Mortar Shelter, Upper Cumberland Plateau, Tennessee*

Rock Creek Mortar Shelter (40Pt209), in Pickett State Forest on the Upper Cumberland Plateau of Tennessee, possesses a more or less continuous 11,600 year occupation history. This history may be consistent with previous ideas of first colonization of upland rock shelter zones at the end of the Younger Dryas with significant climatic amelioration. However, we have not yet encountered culturally sterile deposits and believe the site may be older still. We focus here on the late Pleistocene and early Holocene components paying particular attention to unifacial and blade tool technology, use-wear analysis, and depositional history. Variability in blade production during the late Pleistocene deposits suggests a residually mobile family group. It could also represent the colonizers' struggles with adapting a blade tool technology to the locally abundant small, rounded Monteagle chert cobbles. We present our current understanding of the site based in our field work through January 2015.

Franzén, Adel [154] see Thurston, T.

Frasca, Corey (Radford University), Michael Carlson (Radford University), Carlton Gover (Radford University) and Cliff Boyd (Radford University)

[275] *A Comparison of Lithic and Ceramic Artifacts from Two Adjacent Late Woodland Villages*

The later Late Woodland period (A.D. 1200-1650) in Southwest Virginia saw the development of circular palisaded villages as the common settlement type. Two of these villages – 44PU8 and 44PU72 – are located 300 meters apart along the floodplain of the New River in Pulaski County, Virginia. Survey and limited test excavations of these sites between 2011 and 2014 defined the site boundaries and resulted in the identification of several features and the recovery of substantial samples of lithic and ceramic artifacts, as well as bone and shell ecofacts. This poster compares the lithic and ceramic artifacts from major contexts at these sites by examining the attributes of raw material and manufacturing stage for lithics, and vessel portion, temper, and surface treatment and decoration for ceramics. Because of their spatial proximity, this study provides an opportunity to compare sites in identical environmental settings. Even though 44PU72 dates earlier than 44PU8, similarities between the classes of artifacts and attributes examined reflect a use of similar resources and a successful adaptation to this riverine environment by these Late Woodland populations.

Frazier, Mechell (Arizona State University), Leslie E. Drane (Indiana University) and Ricardo Higelin Ponce de Leon (Indiana University)

[188] *Engaging the Public Through Women's Emergence in Archaeology*

As we live in a world in which the social sciences continually undergo negative publicity in the public sphere, spreading our knowledge is more important than ever. Since archaeology depends on the support of non-academic communities, we must combat negative portrayals of social science through outreach events and public portrayals of our work. We explore the impact of doing archaeology through women's life experiences. Through this lens, we discuss the passive and active manners in which archaeologists and our audiences comprehend public archaeology, archaeological scholarship, heritage, occupations, and contemporary issues. Three cases are discussed: 1. Graduate students creating a community outreach event, which demonstrates how we can cultivate young girls' interest in archaeology, 2. How women in field supervisor positions can create different dialogues and alter group dynamics amongst field crews, and 3. The emerging cultural heritage in southern Mexico, developing from the shared identity between an ancient priest woman and contemporaneous indigenous women. Through these three examples, we investigate different manners in which we can captivate wider audiences and the meaning this may have for public archaeology and the current position of women in academia and the public sphere.

Frederick, Kathryn (Michigan State University)

[139] *Holes: The Beginners Guide to Food Caching*

The Michigan State University Subterranean Storage Research Experiment (MSU SStoRE) employed experimental archaeology to better understand the storage efficiency, capacity, and reliability of hunter-gatherer food storage pits. Drawing on archaeological, ethnographic, and ethnohistoric information the project accurately recreated below ground storage pits for the late Late Woodland period (A.D. 1000-1600) of northern lower Michigan. Over three consecutive yearly cycles, subterranean storage pits were constructed with appropriate lining materials, filled with dried blueberries, acorns, and corn, and cached from November until late March. During the five month period the pits were monitored for temperature and humidity multiple times daily. Revisions were made each annual cycle, culminating in a successful storage episode. The most recent caching of foodstuffs was tested for microtoxins, pathogens, and water activity level in order to determine food safety. This paper discusses the lessons learned, resulting degree of success, and the importance of MSU SStoRE for archaeological research.

Frederick, Charles, Mark Willis (Blanton and Associates), Ken Lawrence (SWCA), George R. Hermann (Texas Department of Transportation (retired)) and Jacob Sullivan (Pape-Dawson Engineers, Inc)

[256] *Flooding Past and Present: Extreme Geomorphic Events in the Lower Pecos Canyonlands*

Although presently a desert environment, extreme flood events are part of life in the Lower Pecos Canyonlands. This paper examines two such flood events, one preserved in the deposits of Skiles Shelter and Kelly Cave, and another that occurred on June 20th 2014. These events provide examples of catastrophic floods that punctuate the sedimentary records in the shelters and contrast with the more incrementally formed deposits that occur in association with human activity in these settings. The presentation also examines the issue of which process is more formative in the local landscape: rare extreme magnitude flood events or low magnitude but higher frequency floods.

Frederick, Charles [256] see Lawrence, Ken

Fredericks, Brian [110] see Wescott, Konnie

Freeburg, Adam (University of Washington)

[302] *Subsistence and Settlement at Cape Krusenstern, Alaska*

A group of recently discovered features from Cape Krusenstern, Alaska have yielded radiocarbon ages within both the Western Thule and Kotzebue culture periods. Results of preliminary faunal analyses indicate the presence of fish bone in proportions higher than have been previously reported for other Cape Krusenstern settlements. This paper reviews and assesses the zooarchaeological data from these features and provides comparisons to known archaeological subsistence practices of the region. Results of this work offer a chance to re-evaluate interpretations of resource consumption and landscape use over the past 1000 years in Northwest Alaska.

Freeman, Jeremy B. [149] see Lindsay, Audrey

Freeman, Jacob (Arizona State University)

[167] *The Social Opportunity Hypothesis*

My work is motivated by the finding that the first farmers of the deserts of Northern Mexico and Southern Arizona formed settlements near and farmed reliable and productive flood plains. To understand why, I investigate to the processes that lead hunters and gatherers to invest in the low-level production of food in general. I use a dynamical systems model to investigate the effect of low-level food production on the ability of foragers to predictably allocate time to reaping the fitness benefits of social opportunities. I propose that there is a social-ecological Goldilocks zone where investment in low-level food production leads to a positive feedback cycle. Multilevel selection dynamics drive the coevolution of foragers and resources into a state of committed food production at the expense of hunting and gathering. Specifically, low-level food production makes the time budgets of individuals more robust to environmental variation at an annual time scale, but leads to

population growth at longer time-scales. Population growth eventually feeds back to affect the ability of individuals to maintain a robust time budget. This feedback, in turn, creates an environment in which foragers who adopt more effective food production strategies gain a fitness benefit over foragers who do not.

Freeman, Jeremy (Shumla Archaeological Research & Education Center), Victoria Munoz (Shumla Archaeological Research & Education Center) and Carolyn Boyd

[353] *Preserving Our Legacy: Understanding Transformation Processes for Rock Art Conservation*

The Lower Pecos Canyonlands of southwest Texas retain hundreds of rock art murals exhibiting varying degrees of preservation. Since 2009 Shumla Archaeological Research and Education Center has been documenting the murals, some of which date back 4,000 years. As part of this project, we collect Legacy Photographs to assess historic deterioration of the art. Analysis of these photographs has revealed significant changes in the imagery over the past 50 years; however, the factors affecting its preservation are poorly understood. Shumla is now launching a project aimed at understanding the transformation processes affecting its preservation. This will be a long-term study aimed at collecting data for inter- and intra-site comparisons. Some of the tools we are using include: protimeters (to collect substrate moisture readings), light meters (to record light intensity), FLIR thermal imaging cameras (to monitor temperature variation), game cameras (to monitor human and animal traffic), and weather stations (to record relative humidity, temperature, rainfall, wind speed, and wind direction). This data will help us better understand the processes affecting preservation at each site. Working with conservators, we will be able to offer recommendations to site stewards who are working to preserve the art for future generations.

Freers, Steve

[352] *Pictograph Handprint Analysis in Southern California--Stature and Gender Projections*

Pictograph hand impressions (n=288) from 42 rock art loci in southern California were analyzed to infer the physical stature and gender of the most likely Native American participants against contemporary assertions of regional rock art style and function. The analytical underpinnings were as follows: anthropometric data of Mission Indians (Boas 1895); ethnographic accounts of young adolescent female participation (e.g., Oxendine 1980:39) and the statistical difference in female adult stature (Gasser et al. 2000); research correlating human stature with hand length measures (e.g., Jasuja and Singh 2004); and, research utilizing finger-length ratios to infer gender (e.g., Nicholls et al. 2008).

A data plot created a bimodal distribution suggesting both young adolescent (expected) and adult participation at many sites. Several San Luis Rey Style (Hedges 1990) loci suggested male participation; however, pictograph handprint panels qualitatively presenting as consistent with an intensive puberty ceremony did indeed have impressions measuring in the stature range of young female adolescents. Conversely, qualified handprint panels categorized as Rancho Bernardo Style (Hedges 1979) contained hand prints analytically suggesting males in the range of late adolescence to adulthood.

Freestone, Ian (UCL)

[89] *Microanalytical Perspectives on the Evolution of Glass-making Technologies*

Glass has a number of distinct chemical types which are restricted in space and time and reflect several processes including (1) the spread of a dominant glass-making technology from an inferred single place of invention by the transfer knowledge and skill through the movement of people; (2) modification of the parent technology due to restricted availability of materials or selective improvement; and (3) the re-invention of glass making due to stimulus diffusion in the form of exposure to imported objects. In the present paper, I suggest that in addition to the widespread evidence for technological transfer, there is evidence for the re-invention of distinctive glass-making technologies in at least three regions over the past four thousand years, and probably others. Glass technology is thought to have originated in Bronze Age Mesopotamia but evidence is extremely limited due to poor preservation and recovery. However, a comparison of the materials

science of Near Eastern vitreous materials with those of glass characteristic of other regions and periods, especially first millennium B.C.E China, allows insights into the likely trajectory of early glass-making technology and the desirable properties which gave rise to what was, in the first instance, a purely decorative material.

Freestone, Ian [102] see Lin, Yi-Xian

Fregel, Rosa, Martin Sikora (Stanford University, University of Copenhagen), Krish Seetah (Stanford University), Hannes Schroeder (University of Copenhagen) and Carlos Bustamante (Stanford University)

[116] *Genetic Impact of Slavery Abolition in Mauritius: Ancient DNA Data from Le Morne and Bois Marchand Cemeteries*

From a demographic point of view, the island of Mauritius can be considered a multicultural melting-pot derived from forced and free labor, as it was there where the British conducted the 'Great Experiment' to replace slaves with indentured workers after abolition.

Despite the huge potential that Mauritius offers for studying admixed populations, it has remained uncharacterized from a genetic perspective until now. Several genetic markers have been analyzed in the current Mauritius population with the aim of understanding its present-day structure. However, to better ascertain the temporal evolution of its composition, the analysis of ancient human remains is required.

Ancient DNA data was retrieved from two different archaeological sites in Mauritius. The cemetery of Le Morne dates from the 1830s and is thought to contain the remains of slaves or freed slaves, within the maroonage movement of slaves' freedom. The Bois Marchand site is a nineteenth-century cemetery that is expected to reflect the population composition during the indentured worker period.

Here, we present a comparison of the genetic composition of historical and modern samples to interpret population genetic changes in Mauritius over time, within the historical context of European colonialism, transoceanic slave trade, and Indian and Chinese diasporas.

Freidel, David [306] see Reilly, Frank

Freidel, David (Washington University in St. Louis)

[413] *Inland Ports in Northwestern Peten, Guatemala: A Preliminary Assessment*

Northwestern Petén is characterized by an extensive wetland system subject to flooding during the annual rains, connecting what appear as isolated bajos in the dry periods of the year into larger, intermittent drainage networks. The San Juan, Chocop and Xan rivers drain these flooded areas into the San Pedro Martir River, which flows west, ultimately joining the Usumacinta River. We hypothesize that El Achiotal, a Preclassic center located within these seasonally occurring flood lands, and the Classic center of El Peru-Waka', functioned as ports on water routes connecting northwestern Peten with regions to its west.

[344] *Discussant*

Freire, Shannon [301] see Jordan, Alexis

Freire, Shannon (University of Wisconsin-Milwaukee) and Alexis Jordan (University of Wisconsin-Milwaukee)

[301] *The Application of Strontium Isotope Analysis to Historic Cemetery Contexts: A Case Study for the Creation of Robust Individual Identifications*

Following the 1991-1992 excavation of the Milwaukee County Institutional Grounds Cemetery (1878-1925), up to 190 individuals were preliminarily identified using historical documentation, material culture, and geospatial analysis. Subsequent bioarchaeological analyses have provided an additional line of evidence for the identification of these individuals. The cemetery population of Western

European immigrants and local/nonlocal native born Americans is composed of paupers, the institutionalized, and the unidentified of the city of Milwaukee during this period. The limited recovery of discrete individual burial markers and the complex depositional sequence of interments necessitate further interrogation for the secure identification of these individuals. Improvements in strontium isotope testing have led to its increased applicability for the study of population movement, and for the purposes of this project, applicability as an additional line of evidence for the identification of individuals in this cemetery. Sample material will be obtained from the tooth enamel of select individuals with robust preliminary identifications. The natal strontium signatures of each sample will be compared with the expected local strontium levels of southeastern Wisconsin and the known strontium levels of the geographic regions ascribed to individuals in the historic burial record, thus supporting or rejecting previous preliminary identifications.

Freiwald, Carolyn (University of Wisconsin), Katherine Miller (Arizona State University) and Tim Pugh (Queens College)

[219] *The Effect of Missionization on the Itza Maya from Isotopic and Biodistance Evidence*

The Spanish victory over Itza factions in 1697 initiated a period of significant change in the Petén Lakes region, where the construction of Spanish missions and resettlement of indigenous populations likely altered patterns of population movement. We present trace element and isotopic values for eleven individuals buried in Structure T-31 at San Bernabé, a newly discovered mission near the modern town of San Miguel. Markedly different burial patterns, combined with new material culture, suggest that population changes also may have occurred. However, the majority of the isotopic values suggest an origin within the region and show little evidence for in-migration, either voluntary or forced, from centers under varying levels of Spanish control such as Tipu or more distant locales in the northern Yucatan. We incorporate biodistance analysis of the cemetery sample to identify kin-based mortuary patterns and to interpret the beginning of the Colonial period in the Petén lakes region.

[219] *Chair*

French, Charles [31] see Lane, Kevin

French, Jennifer

[40] *Human Responses to Late Pleistocene Environmental Change in South-Western France*

A key question for archaeologists studying the late Pleistocene is how human populations responded and adapted to the dramatic, and often rapid, global climatic changes which characterized this glacial period. Using a range of archaeological data attributed to the Upper/Final Magdalenian and Azilian techno-complexes (15 000-10 000 uncal BP), this paper assesses the evidence for changes in settlement patterns and human demography during the Late Pleistocene in South-Western France. Data on numbers and location of archaeological sites, site size, and densities of material culture remains were analyzed for differences which correlated chronologically with, and could potentially be attributed to; 1) the climatic warming of the Bölling/Alleröd interstadials (Greenland Interstadial 1), and; 2) the subsequent Younger Dryas cold period (Greenland Stadial 1) which interrupted the general trend of late-glacial warming. Drawing upon ethnographic data, I interpret these results with recourse to the ways in which hunter-gatherers both respond to, and are affected by, climatic and environmental change and the expected archaeological signatures of these effects and adaptations.

French, Kirk (Pennsylvania State University)

[266] *In and Out: Initial Investigations from the Palenque Pool Project*

Emblematic of Palenque's ancient name, Lakamha' or Big Water, the city is scattered with natural cascades and uniquely constructed aqueducts, bridges, and pools. In May 2014, the Palenque Pool Project began excavating and consolidating the largest of the three pools in the Picota Group, one kilometer west of the site center. Prehispanic construction of the feature required the Maya to excavate through bedrock and below the water table. The main pool is equipped with entrance and exit drains as well as a monumental staircase to access a perennial source of fresh water. Although likely a ceremonial feature, the pool's true function remains unknown. This paper introduces a few

interpretations from the first season of the project.

Freund, Kyle (McMaster University), Robert Tykot (University of South Florida) and Andrea Vianello (Oxford University)

[412] *A Longue Durée Approach to Obsidian Consumption and Social Value in Prehistoric Sicily (Italy)*

This study focuses on the long-term exploitation of obsidian in prehistoric Sicily and the factors that influenced the procurement and consumption of these raw materials from the sixth to second millennia B.C. A detailed study of 6,287 prehistoric artifacts from 43 sites shows that the vast majority of obsidian found in Sicily comes from a single Lipari subsurface, with smaller quantities of Pantelleria obsidian found in the west. Despite differences in the color and physical properties of these raw materials, there is a remarkable continuity through time in the use of both Lipari and Pantelleria obsidians to produce pressure-flaked blades. While obsidian undoubtedly served as a raw material for the production of stone tools, it is argued that much of the social value of obsidian rested in its capacity to facilitate social relations, where the circulation of these products through maritime networks of interaction both underpinned and reflected social structure. This paper presents new data on the long-term use of obsidian on the island of Sicily and in doing so makes an important contribution to the study of the various symbolic, ceremonial, and functional roles that these raw materials played in prehistoric society.

Friberg, Christina (University of California, Santa Barbara) and Gregory Wilson (University of California, Santa Barbara)

[173] *Cahokia's Western Frontier: Consolidation and Collapse as Viewed from the Big River Valley, Missouri*

Cahokia was the largest and most complex precolumbian Native American society in North America. Its cultural influence extended throughout the Mississippian period Midwest (A.D. 1050–1400). A diachronic investigation of greater Cahokia from its western periphery provides insight into the polity's consolidation, fragmentation, and collapse. Cahokian groups appear to have annexed portions of the Big River Valley (BRV) in southeast Missouri as part of the polity's formational Big Bang. However, by A.D. 1200, the population of Cahokia and the surrounding American Bottom region had significantly declined and Cahokia's pan-regional influence had markedly diminished. At this time, the BRV witnessed a major increase in Mississippian occupation. A detailed examination of these patterns provides insight into Cahokia's long-term developmental trajectory. This is accomplished through (1) a diachronic settlement pattern analysis of the BRV; and (2) a more focused analysis of the Long site mound center (23Je9), including a gradiometer survey and an analysis of architecture and ceramics from Robert McCormick Adams' 1941 excavations at the site.

Frie, Adrienne (University of Wisconsin-Milwaukee) and Patricia Richards (University of Wisconsin-Milwaukee)

[301] *Historical Craniotomy and Autopsy Practices at the Milwaukee County Institutional Grounds Poor Farm Cemetery*

The Milwaukee County Institutional Grounds Poor Farm Cemetery (MCIG) served as the burial ground for county institutions, including the coroner's office and the Milwaukee County Hospital. This paper describes craniotomy practices in particular, and autopsy practices more generally, evidenced by the population from the MCIG Cemetery. In addition, this research attempts to distinguish between craniotomies and autopsies carried out by the coroner's office versus the Milwaukee County Hospital to determine how these individuals came to the MCIG Cemetery. The attempt to differentiate which institution carried out the perimortem intervention is based on the hypothesis that the craniotomies and autopsies performed by the Milwaukee County Coroner's Office were more standardized due to the low number of active coroners and the standardization of perimortem intervention. This is expected to contrast those carried out at the Milwaukee County Hospital by pathologists and local students, which may be more idiosyncratic due to their exploratory and pedagogical goals. Investigating perimortem interventions will not only shed light on historical craniotomy and autopsy practices, but more importantly, determining through which institution these individuals came to the MCIG Cemetery will aid in ongoing attempts to identify these individuals.

Friedel, Rebecca, Sonia Alconini (The University of Texas at San Antonio) and Maria Bruno (Dickinson College)

[184] *Feasting, Exchange, Sociopolitical Interaction: Assessing the Tiwanaku Presence in the Kallawaya Region*

In the Tiwanaku era, the Kallawaya territory was part of a web of an inter-ecologic exchange networks that provided altiplanic polities with a myriad of resources flowing from the valleys and tropical Yunga mountains. In this context, Tiwanaku centers were important places of exchange, storage, and ritual celebrations. By looking at the botanical remains, this paper will explore the changes in feasting and consumption patterns, and the ways in which various resources were utilized in funerary and commensal activities. Further, such comparison will illuminate the nature of the Tiwanaku presence in this strategic corridor, and the ways in which this polity influenced the local political dynamics after its collapse.

Friedman, Erin [56] see Look, Cory

Frink, Liam (University of Nevada Las Vegas) and Celeste Giordano (University of Nevada Las Vegas)

[415] *The Birth of Economic Woman*

Modern humans have been living in the Arctic for over 30,000 years and their ability to adapt to the ecological limitations and challenges is relevant to questions of human adaptation and evolution. However, we know very little about the actual technologies and nutritional implications that were necessary to develop in the northern latitudes. Here we focus on two aspects of Arctic dietary practices that are little understood in the literature and yet would have been essential to successful occupation of the extreme Arctic environments—the seal poke storage system and the fermentation of foods. We present our original research on the construction and nutritional benefits of this kind of storage and the ways foods have been fermented. Embedded in our discussion of Arctic nutrition is the critical role of women and their applications of transformational technologies and their essential contributions to the Arctic diet.

Frison, George [138] see Kornfeld, Marcel

Fritz, Gayle (Washington University in St Louis)

[345] *Prospects and Challenges toward Globalization for Crops in the Eastern Agricultural Complex of North America*

Two crops domesticated in North America north of Mexico before European colonization have achieved global economic success: (1) sunflower (*Helianthus annuus* var. *macrocarpus*); and (2) eastern squash (*Cucurbita pepo* ssp. *ovifera* var. *ovifera*). Other members of the Eastern Agricultural Complex became extinct as domesticates before European contact or shortly thereafter, forfeiting potential to figure in the Columbian Exchange. Both sunflower and the domesticated eastern chenopod (*Chenopodium berlandieri* ssp. *jonesianum*) might have spread via long-distance exchange to Mesoamerica and the U.S. Southwest, but the molecular and archaeobotanical evidence is equivocal and controversial. Scholarly resistance may stem from overly strict adherence to centric models in which “advances”—agricultural and otherwise—diffuse from major civilizations to less politically complex regions. A key factor in all discussions of the demise of native eastern North American crops other than sunflower and squash is the intensification of maize agriculture at approximately A.D. 1000. Maize, of course, went on to become a huge success beyond the Americas after 1492, so its economic dominance in late prehistoric North America is one chapter in the wider and longer-term saga of globalization.

Froese, Tom (Universidad Nacional Autónoma de México), Carlos Gershenson (Universidad Nacional Autónoma de México) and Linda Manzanilla (Universidad Nacional Autónoma de México)

[317] *Can Government Be Self-Organized? A Mathematical Model of the Collective Social*

Organization of Ancient Teotihuacan, Central Mexico

Teotihuacan was the first extensive urban civilization of Mesoamerica and one of the largest of the ancient world. Following a tradition in archaeology to equate social complexity with centralized hierarchy, it is still widely believed that its origin and growth was controlled by a dynastic lineage of powerful individuals. However, much data is indicative of a government of co-rulers, and artistic traditions expressed an egalitarian ideology while deemphasizing individuals. Yet this heterarchical alternative keeps being marginalized because the problems of collective action, such as the tragedy of the commons, make it difficult to conceive how such a coalition could have functioned even in principle. We therefore devised a simplified mathematical model of the city's hypothetical network of neighborhood representatives, serving as a proof of concept that widespread cooperation was realizable in a fully distributed manner. In this model, political decisions become self-organized into globally optimal consensuses, even though local representatives always behave and modify relations in a rational and selfish manner. The network's self-optimization of connectivity crucially depends on occasional communal interruptions of normal activity, and becomes impeded when groups are too independent. We relate these insights to theories about community rituals at Teotihuacan and the city's eventual disintegration.

Frohlich, Bruno [403] see Huffer, Damien

Frost, R. Jeffrey (California State University-Stanislaus)**[393]** *Pueblos, Palenques, and Dual Organization in Sixteenth Century Costa Rica*

Contact era Spanish descriptions from central Costa Rica through western Panama offer compelling evidence that many indigenous settlements throughout the region were arranged as two spatially discrete parts, implying that these societies were similarly organized as two social groups.

Documentary sources further indicate that there were at least three regionally distinct spatial arrangements of villages. Spatial patterns of settlements recorded in these documents closely resemble those identified in late precolumbian archaeological sites from throughout the region. I present and evaluate documentary and archaeological evidence to propose new interpretations of political and ethnic boundaries throughout southern Costa Rica and western Panama at the time of Spanish contact.

Fruhlinger, Jake (Idaho Army National Guard)

[70] *Moderator*

[70] *Discussant*

Fry, Robert**[295]** *Into the Unknown: The Uaymil Survey Project 1972-1976*

As his first major project following his dissertation research on the Central Acropolis at Tikal, Peter Harrison chose a challenging topic: a site reconnaissance and survey in the recently accessible territory of south-central Quintana Roo. In this paper I will discuss the genesis of the project, the challenges of fieldwork in this at that time remote region, and the results of this reconnaissance and survey. I will place the project in the context of the often tumultuous debates, and new approaches in archaeology during this contested period.

Fu, Janling (Harvard University)**[214]** *The Expression of Ideology in Levantine Submission Scenes: The Black Obelisk of Shalmaneser III as Feasting in a Neo-Assyrian Context*

Cultural appropriation of Levantine feasting forms by Neo-Assyria was an expression of agency that effectively subsumed, subverted and captured the dynamic of traditional Levantine polities. For those, the feast had represented an act of royal legitimation depicted iconographically by the figure of a king drinking from a cup. The rise of the Neo-Assyrian empire and the prominent appearance of this image, particularly in the 9th century B.C.E., deserves consideration as a probable co-opting of this ideological trope, but now directed toward the Assyrian ruler. The Black Obelisk of Shalmaneser

III provides a case in point. Here, one panel represents the figure of Shalmaneser III, standing and drinking a cup before the figure of Jehu, prostrated in submission. I will argue that this monument performs an affective function that recalls at once the Levantine tradition while also redirecting its ideological focus. Understanding the monument then involves acknowledging the junction between its materiality, historical context and the referent .

Fu, Qiaomei (Harvard Medical School, Max Planck Institute for Evolutionary Anthropology)

[264] *The Complete Genome Sequence of a 45,000-Year-Old Modern Human from Eurasia*

We have sequenced to high coverage the genome of a femur recently discovered near Ust-Ishim in western Siberia. The bone was directly carbon-dated to 45,000 years before present. Analyses of the relationship of the Ust-Ishim individual to present-day humans show that he is closely related to the ancestral population shared between present-day Europeans and present-day Asians. The over-all amount of genomic admixture from Neandertals is similar to that in present-day non-Africans and there is no evidence for admixture from Denisovans. However, the size of the genomic segments of Neandertal ancestry in the Ust-Ishim individual is substantially larger than in present-day individuals. From the size distribution of these segments we estimated that this individual lived about 200-400 generations after the admixture with Neandertals occurred. The age of this genome allows us to directly assess the mutation rate in the different compartments of the human genome. These results will be presented and discussed.

Fucillo, Jenny [311] see Hallihan, Melissa

Fuentes, Agustin (University of Notre Dame)

[146] *Discussant*

Fuentes , Agustín [53] see Kissel, Marc

Fukuhara, Hironori [317] see Murakami, Tatsuya

Fulkerson, Tiffany (Washington State University) and Adam Rorabaugh (Washington State University)

[92] *Timing the Introduction of Arrow Technologies in the Salish Sea*

A substantial amount of recent literature has re-examined the applicability of dart-arrow indices for hafted chipped stone tools from archaeological assemblages ranging from the Columbia Plateau to Californian Coast. As yet, these approaches have not been employed to examine variation in Coast Salish lithic traditions. We critically apply Hildebrandt and King's (2012) recent-dart arrow index and also employ a discriminant function analysis (DFA) to a data set of chipped and ground stone points from 49 archaeological sites spanning the past 5,000 years in the Salish Sea. These indices yield different timing for the introduction of arrow technologies in the region, ranging from 3500-2000 cal BP. However, all suggest that darts and arrows were complementary technologies. Following Erlandson et al. (2014), we argue that applying metric indices for functional interpretations overlooks the complexities of coastal lithic assemblages and the wide range of potential functions for hafted chipped stone technologies.

Fuller, Dorian [174] see Arthur, John

Fuller, Dorian (University College London)

[414] *Pastoral Pathways to Plant Domestication: Current Evidence for African Pearl Millet and Sorghum in Comparative Perspective*

Recent archaeobotanical evidence has provided important, although limited evidence, for the steps on the domestication trajectory for Pearl Millet in western Africa (Mali, Mauretania) and Sorghum in eastern Africa (Sudan), during the middle Holocene (3000-1000 B.C.). Both were exploited by and

domesticated by societies that in the Sahelian and northern Savannas practiced mobile herding alongside hunting and low-level cultivation, but full-scale agricultural dependence may not have emerged until after 1000 B.C. While these data can fit a protracted domestication process like that known for other cereals, we will argue that the particularly mobile form of early cultivation may have promoted a somewhat faster selection of non-shattering but with less marked selection for large grain size, and differing developments in the cultural evolution of crop-processing and storage, that were more expedient to mobility. Domesticated cereals, however, provided the basis for the development of sedentary village societies, demographic increase, full agriculture, and free-threshing cereal varieties. These particular pathways suggest parallel processes and similar causative processes to savannah transitions elsewhere, such as mid-Holocene Western and Southern India.

[414] *Chair*

Fulton, Marsha (The Extreme History Project) and Crystal Alegria (Project Archaeology)

[95] *Making History Personal: Community-Focused Archaeology in the Nevada City Cemetery, Nevada City, Montana*

The small cemetery overlooking Nevada City, Montana, holds this history of the town in a unique and personal way. To the nearby descendants, the cemetery symbolizes the continuity of family, community and history. In August, 2014, Extreme History partnered with Project Archaeology to map and assess the cemetery as part of a Teacher Workshop. The project revealed the value of the personal community connection to sacred places. By working with descendant members of the community, we were able to assess the needs of the historic 1864 cemetery, then provide manpower with teachers attending the Project Archaeology workshop. The work will continue with the Montana Site Stewardship program, subsequent Project Archaeology Workshops and additional Extreme History volunteer hours. Developing the community relationship was crucial to the relevance of the project which will ultimately give back to the community accurate, digitized records of the cemetery for future use. These Records will help support efforts for future maintenance and preservation needs. Continued plans for the project include a community presentation and volunteer day as well as a possible website telling the story of the cemetery and its people. Community-focused archaeological projects such as this validate and support community identity by honoring its history.

Fulton, Kara (University of South Florida)

[248] *Shared Practices and Identities in the Northern Settlement of Actuncan, Belize*

This poster examines how urban families developed and shared neighborhood identities at the Maya city of Actuncan, Belize, ca. A.D. 800-900, a time when the city experienced rapid population growth as surrounding centers, including Xunantunich, declined. To investigate household relationships, this research considers the nature and location of activity patterns in and around three commoner households to infer shared practices and the shared identities that those activities both enabled and constrained. Multiple methods were employed, including subsurface testing, soil chemical residue analysis, and macro- and microartifact analysis. The data were examined spatially using geostatistics as well as with quantitative assessment. This research contributes to the understanding of urban processes of growth and decay in this region, and how they are linked to the behaviors of social factions in neighborhood communities.

Funk, Caroline [7] see Hornbeck, Bobbi

Funk, Caroline (SUNY University at Buffalo), Nancy Bigelow (University of Alaska, Fairbanks), Debra Corbett (Nanutset Heritage), Brian Hoffman (Hamline University) and Nicole Misarti (University of Alaska, Fairbanks)

[119] *Human and Environmental Histories of the Rat Islands, Western Aleutians, Alaska: The 2014-2015 Research Season*

Our multidisciplinary research team is beginning to model the role of humans in shaping the characteristics of existing southern Bering Sea and North Pacific terrestrial and marine ecologies in the Western Aleutians. During this past research season, we defined new cultural loci, acquired on and off-site pollen/tephra cores, and surveyed the coastal zone on areas of Kiska, Segula, and Little

Sitkin Islands. The cultural occupations span Aleut prehistory and the World War II Japanese occupation. They include several large Aleut villages, a previously undefined type of Aleut mound feature, and previously unknown Japanese military construction. Coastal biological sampling paired with isotopic studies of modern and archaeological fauna are providing initial data for a regional, long-term marine food-web model. Pollen cores are allowing us to define volcanic activities, examine local climate trends, and test for Aleut manipulation of local landscapes. Our research is changing commonly held perceptions of human impacts on what have traditionally been considered "pristine" natural land- and seascapes.

Furlong Minkoff, Mary and Teresa Moyer (National Park Service)

[83] *The Urban Archaeology Corps 2014: Rethinking Youth Employment in the National Park Service*

The Urban Archaeology Corps (UAC) was created as a way to rethink youth employment, archaeological education, the contributions young people can make, and how the National Park Service can more effectively serve the next generation of Americans. An experimental youth employment program in the National Capital Region, the UAC employs underserved and minority youth in the Washington, DC area. What has resulted is a program that is a mix of school, summer camp, and work unlike any of the youth programs in the region. In this paper, we will discuss why the UAC should be the new model for youth employment and teaching archaeology in NPS.

Gabe, Caroline [300] see Merriman, Christopher

Gabe, Caroline (University of New Mexico)

[307] *A Life in the Mountains: Spanish Identity in 17th-Century New Mexico*

As opposed to typical well-defined urban areas, 17th c. Spanish colonial New Mexico consisted of a series of small, dispersed, rural, isolated settlements. The colonists were also isolated in the sense that they had extremely limited and irregular access to trade goods and communication with the broader Spanish Empire. Furthermore, they stemmed from diverse ethnic backgrounds, often lumped as mestizo by modern researchers. Given these challenges to maintaining a perceived Spanish identity, how did the initial Spanish settlers in New Mexico define themselves? What, if anything, united 17th c. settlers as Spanish at a regional level? This paper examines the cultural identities of secular Spanish colonists through a synthetic analysis of material culture, focusing on identity proxies of culinary practices and self-adornment, from four households in the foothills of the Manzano Mountains, south of Albuquerque. The archaeological proxies brought to bear on colonial identity include demonstrably European introductions, such as metal, glass, and domestic Old World fauna, but also locally available material and technology (e.g. ceramics, flaked stone tools, and ground stone).

[307] *Chair*

Gadison, Davette (Georgia State University), Kassie Sugimoto (North Carolina State University), Danielle Kurin (University of California at Santa Barbara) and Bethany Turner-Livermore (Georgia State University)

[203] *Ethnic Disparity and Stress in Prehispanic Peru: A Contextualized Analysis of Cranial Pathology and Facial Asymmetry*

This study evaluates the effects of stress on a prehistoric population from the south-central highlands of Andahuaylas, Peru during the Late Intermediate Period (LIP: A.D. 1000 - A.D. 1400). This era was characterized by skyrocketing violence, resource competition, and increasing social inequality. We test the impact of these phenomena by examining cranial lesions and fluctuating facial asymmetry-- both indicators of non-specific stress-- among different ethnic groups, identified by the absence, presence, and intensity of cranial modification. Skeletal analysis of 76 crania informed on age, sex, pathologies, and modification patterns. A Microscribe digitizer and attendant software programs were used to gauge facial asymmetry. If stress disparities between ethnic groups increased during the LIP, then we hypothesize that: 1) groups with modification will have higher rates of lesions than unmodified groups, 2) groups with modification will display more facial asymmetry than unmodified

groups, and 3) cranial modification intensity will directly co-vary with facial asymmetry. Preliminary results suggest that individuals with modification indeed have higher rates of cranial lesions and greater facial asymmetry than the unmodified group. Finally, since facial landmarks appear unaffected by modification, these results support a model of increasing stress disparities between ethnic groups.

Gadsby, David

[83] *The National Park Service Archeology Program Role in Protection and Management of International Cultural Heritage*

Since it began exporting the national park idea nearly a century ago, the National Park Service (NPS) has become instrumental in the protection and preservation of cultural heritage throughout the world. Cultural heritage conservation activities conducted in partnership with other nations enable NPS to disseminate important messages about the dangers of looting and the importance of protecting heritage sites. They also help to spread contemporary preservation practices and technologies to partners overseas.

Working in conjunction with the Office of Foreign Affairs, the NPS Archeology Program has conducted several initiatives related to the cultural heritage of other nations. Most recently, NPS has executed a memorandum of understanding (MOU) with Spain and a MOU with the United Kingdom, regarding the management of cultural heritage in United States National Parks. Additionally, the Archeology Program continues to participate --as part of a long-term partnership with the United States Department of State and the University of Arizona -- in a training program for cultural heritage managers and scholars from Afghanistan. This paper reviews those recent programs, and explores possibilities for future international collaborations in the domain of cultural heritage conservation.

[83] *Chair*

Gaggio, Giacomo [347] see Van Gijseghem, Hendrik

Gaggio, Giacomo (University of California, San Diego.) and Paul Goldstein (University of California, San Diego.)

[347] *"Good to Eat and Good to Think": Interpreting the Role of Plants in the Tiwanaku Temple of Omo M10, Moquegua, Peru*

Much is known nowadays about the role of plants in Tiwanaku households and political economy, yet, their function in ceremonial contexts is still unclear. Unlike the state's heartland in the Bolivian altiplano, where preservation conditions are not always favorable for the systematic recovery of paleobotanical remains, excavations of Tiwanaku sites in the hyper-arid environment of the Moquegua valley in southern Peru have resulted in the recovery of a wide array of ancient organic finds, including botanical remains. This research focuses on the Tiwanaku site of Omo M10, A.D. 600 - A.D. 1100, that features the only Tiwanaku temple found as yet outside the Altiplano. Based on the systematic collection, analysis and study of spatial distribution of the paleoethnobotanical samples collected from the temple's three excavated platforms we interpret the multiple roles of the plants recovered in this ceremonial context. In particular, we focus on local species such as *Zea mays*, *Schinus molle* and *Prosopis pallida*, among others, which were "good to eat and good to think" in the Tiwanaku Temple of Omo M10.

Gagnon, Celeste (Wagner College)

[404] *To Live and Die in the City: Investigations of Health at the Huacas de Moche*

During the last two decades of work at the Huacas de Moche site a large number of human interments have been excavated. Although the remains of human sacrificial victims have been well studied, those buried as part of the daily course of events at the site have received less attention. Yet, if we are to understand how the Southern Moche Polity developed, thrived, and ultimately declined, then we must investigate the everyday lives of the women, men and children who were the polity. In this paper I detail the results of bioarchaeological analysis of 117 individuals recovered from tomb contexts either located in the urban core or in the plazas of Huaca de la Luna. The collected

data concerning diet and health, provide new insights into the Moche society.

Galeazzi, Fabrizio (University of York)

[221] *A.D.S 3D Viewer: an example of open 3D real-time visualization system in archaeology*

In this paper I will present A.D.S 3D Viewer, a project designed to develop a 3D real-time system for the management and analysis of archaeological data. The main aim of this interactive application is to give users the ability to access archaeological data to ground-truth interpretations. Thanks to the A.D.S 3D Viewer, in fact, multiple experts will share and analyze 3D replicas of the archaeological excavation record, which can be revisited and subject to new analytical techniques over the long term. In the past ten years 3D technology in archaeology has become a strong tool to support the communication and recording of cultural heritage. However, its efficacy for data analysis and interpretation has not yet been fully tested. The 3D viewer is being developed as a tool for the A.D.S (Archaeology Data Service), a major UK-based cyber-infrastructure hosted at the University of York. This paper will discuss specific case studies that will help clarify the potential of the 3D viewer. The possibility to share complex 3D models of archaeological sites and monuments, and the interpretations made by archaeologists during the excavation process, on the web, will promote discussion between scholars and represents a significant opportunity for the discipline.

Galindo Cumplido, Selene [231] see Zavala, Bridget

Gallaga, Emiliano (EAHNM, University of Arizona)

[156] *The Rancho Santa María II: An Archaic Site In the Galeana Valley, Chihuahua*

In the summer of 2014, we conducted a rescue project in the Galeana Valley, Chihuahua on a site recorded earlier. The site name is Rancho Santa María II, has a surface of 30,000 m², and was identified by the high amount of FCR on the surface mainly from ovens (several of them identified on surface). In addition, nearly 350 projectile points were found (70% as fragments and 30% complete), some of them from the Paleo-Indian period. Four excavation units were dug at the site, mainly on ovens to collect radiocarbon and soil samples. In one of these units a burial was encounter. Although dating analysis is in progress, we presume it is 4-5,000 years old. If this is correct, we could have one of the oldest human remains from this area.

[156] *Chair*

Gallagher, Daphne (University of Oregon)

[23] *Material Complexities in Dispersed Communities: Archaeology of 2nd Millennium CE Southeastern Burkina Faso (West Africa)*

In several regions of the West African savanna, the pre-colonial complex polities described in oral and written histories have left a minimal archaeological signature on the landscape. One such region is the Gobnangou escarpment of southeastern Burkina Faso, where from the early second millennium CE, the archaeological record consists almost entirely of small, ephemeral sites, likely resulting from short term occupations of household compounds. Broadly dispersed on the landscape, and almost certainly associated with an extensive agricultural land use practice that involved regular shifting of fields and residences, these sites represent an anthropogenic landscape in which physically distant households were likely linked in close political, social, and economic networks. Associated with the emergence of this new landscape was the development of an elaborate material culture tradition that incorporated multiple specialized ceramic wares, each associated with the use of unique decorative techniques. This paper explores the ways that this shared tradition may have provided a sense of persisting collective identity throughout the region.

Gallardo, Francisco [203] see Pestle, William

Gallardo, Maria De Lourdes

[346] *Clothing for the Mexica Gods: Shell Garments from the Great Temple of Tenochtitlan*

El presente trabajo aborda el estudio integral de los restos de prendas rituales elaboradas con textiles y elementos laminares de conchas nacaradas, que se depositaron en cuatro ofrendas del sitio arqueológico del Templo Mayor. A pesar del mal estado de conservación que actualmente se observa en la mayor parte de estos objetos, fue posible identificar cuatro prendas rituales, a través de una investigación que observa varios aspectos relevantes y complementarios. Así, el estudio comprende: la identificación y procedencia de sus materiales constitutivos, la importancia de su forma y disposición originales, la significancia de los motivos ornamentales representados, la vinculación de los diseños con determinadas deidades y la función que estos objetos representaron dentro de las oblaciones del sitio. El trabajo también incluye el análisis de aspectos relevantes de su manufactura y algunas propuestas para su interpretación.

Gallareta Cervera, Tomás (University of North Carolina at Chapel Hill), George J. Bey III (Millsaps College) and Rossana May Ciau (INAH Yucatán)

[263] *Dissecting the Heart of a Puuc Royal Court: A Diachronic Analysis of Structure N1065E1025 and Associated Deposits at Kiuic, Yucatán*

Research on the site of Kiuic, in the Puuc region of the Yucatán Peninsula, has recovered evidence of a long and continuous period of building activity that dates from approximately 700 B.C. to A.D. 900. The construction sequence of Structure N1065E1025, a nine meter temple-pyramid located at the center of the site, evidences episodic changes that transformed the building from a raised platform in the Middle Preclassic to the center of a royal court in the Late Classic and finally a ceremonial precinct before it was abandoned at the middle of the 10th century. During the time it functioned as the heart of the royal court of Kiuic, Structure N1065E1025 was a knot linking the main ceremonial, civic, residential and service plazas of the larger architectural complex known as the Yaxché Group. Excavations in and around N1065E1025 identified numerous middens and special deposits associated with its evolving architectural history and its relationship with the ceremonial, civic and residential life of this Maya court. In this paper, we will discuss the content of these deposits in order to understand the changing activities and functions of N1065E1025, particularly as it represents the center of a royal court in the Puuc region.

Gallareta Negrón, Tomás [113] see Parker, Evan

Gallegos Gomora, Miriam (Centro INAH Tabasco) and Ricardo Armijo (Centro INAH Tabasco)

[24] *Hilar y tejer en el Palacio y la periferia. Coincidencias y particularidades de dos espacios domésticos del Clásico Tardío en Comalcalco, Tabasco*

La variedad de atuendos que portan los individuos representados en las figurillas y los ladrillos decorados de Comalcalco, evidencian una actividad textil especializada que daba lugar a la indumentaria que caracterizaba los diferentes niveles de la sociedad local. No se observa en la iconografía existente la presencia de cuerpos desnudos. Por tanto, el hilado y tejido debieron constituir algunas de las actividades femeninas más frecuentes realizadas al interior de los grupos domésticos de esta ciudad. El objetivo de este trabajo se enfocará a dilucidar las coincidencias y particularidades de los malacates –ubicación, material, peso, forma, decoración-, y su asociación con otros materiales culturales –figurillas, metate miniatura y navajas de obsidiana-, en algunos espacios domésticos y entierros de la Gran Acrópolis y una unidad habitacional periférica.

Galm, Jerry, Stan Gough (Eastern Washington University) and Fred Nials (Desert Archaeology, Inc.)

[92] *Haskett Biface-Point Production and Occupation of the Pacific Northwest and Northern Great Basin at the Pleistocene-Holocene Boundary*

The Sentinel Gap site (Washington) lithic assemblage documents the sequential production of bifaces and projectile points stylistically associated with the Haskett type. Lithic workshop debris analysis identifies patterns in the reduction trajectory of large cores into bifaces and lanceolate projectile point/knives. An average of 10.2 ka B.P. for six radiocarbon dates place short term Sentinel Gap site occupation at the Pleistocene-Holocene boundary. Stylistic and technological evidence obtained from the biface-point sample, when combined with these dates, argue for a relationship to Agate Basin-Hell Gap complexes in the American Great Plains. In view of a probable east to west

movement of the Haskett point into the region, the inclusion of Haskett in Western Stemmed and Windust Phase point complexes is problematic. This analysis indicates the need for a revised assessment of the temporal positions and cultural affiliations of early-dating biface-projectile point records defined for the Western Stemmed Tradition, Windust Phase, and Lind Coulee site.

Gamble, Lynn (University of California, Santa Barbara)

[32] *Household Archaeology on the Northern Channel Islands of the Santa Barbara Coast, California*

House depressions are visible at many archaeological sites on the Northern Channel Islands, including some that are thousands of years old, yet household archaeology is a topic that is often overlooked in the region. Documenting the number, size, location, and layout of house depressions can help in understanding past settlement strategies, access to resources, the emergence of cultural complexity, demography, cultural landscapes, environmental change, and craft specialization, among other significant issues. In this paper, we present data on house depressions and structures from archaeological sites on Santa Cruz, Santa Rosa, and San Miguel Islands and situate this information in a chronological framework. These data are analyzed and compared to ethnographic and ethnohistoric records that provide details about Chumash Indian houses in the Santa Barbara Channel area, both on the mainland and the islands. Some of these accounts suggest that island settlements are marginal when compared with those on the mainland. The perception of island settlements as marginal places is addressed in this paper through the analysis of detailed empirical evidence in the archaeological record. Changes through time in household organization are noted and correlated with demographic shifts, cultural landscapes, significant resources, climate change, and other important issues.

[1] *Discussant*

Gandy, Devlin [352] see Gorden, Mary

Gangloff, Deborah

[72] *In Defense of Archaeotourism*

Archaeotourism, the visiting of sites of historic and prehistoric significance, not only satisfies people's interest in the past, but more importantly helps to build greater support for cultural resource preservation and research. While protecting sites is paramount, professional archaeologists cannot ignore or risk losing the opportunities archaeotourism provides; namely creating a scientifically- and culturally-literate population that can help advance the protection of cultural resources and the appreciation of historic preservation for the future. For over 30 years, the Crow Canyon Archaeological Center has used archaeotourism to build a passionate and knowledgeable constituency for archaeology, cultural resource protection, and historic preservation. In this way, we have also built a donor base that can help sustain Crow Canyon as an autonomous, independent nonprofit organization.

Ganio, Monica (NU-ACCESS), Nicholas Barbi (PulseTor LLC, 1580 Reed Road C2, Pennington, NJ 08) and Marc Walton (NU-ACCESS, Northwestern University, 2145 Sheridan)

[101] *Hyperspectral X-Ray Fluorescence of the Luni glasses*

To investigate raw materials provenance, date and models of production of archaeological glass it is essential to characterize and define compositional groups based on the elemental composition. However, obtaining such information traditionally requires performing micro-destructive analysis on micro-samples. Here, the use of hyperspectral X-Ray Fluorescence (XRF) is investigated as alternative tool for the examination of Roman natron glass. The full multichannel analyzer (MCA) data of the individual spectra is exported as a stack of images corresponding to every channel present in the XRF spectrum. The resulting hyperspectral image cube can be interrogated using image-based chemometric techniques, namely principal component analysis (PCA). A dataset of 31 glass fragments excavated at the archaeological site of Luni, Italy, and dated 1st to 4th century A.D., has been selected to illustrate the strong potential of this qualitative examination method for archaeological glass research. The good agreement with the compositional groups defined by LA-

ICP-MS analysis of the same glass samples strongly support the use of hyperspectral XRF as a powerful non-invasive and non-destructive tool for the analysis of archaeological glass, able to highlight the main differences in glass samples and discriminate compositional groups without the need for quantification.

Gann, Douglas (Archaeology Southwest)

[235] *Introducing CVR, a Content Management System for Digital Archaeological Interpretation*

With a wide range of digital tools now being successfully utilized for capturing and modeling archaeological data, public archaeologists have realized how entertainment software (aka video games) can be repurposed to create compelling visualizations and interactive experiences to share our research on the people, landscapes, places, and objects of the past. Archaeology Southwest, with support from the National Science Foundation, recently began an effort to develop one such interactive visualization to share the story of the ancient Chaco Phenomenon in northwestern New Mexico. However, a fortunate set of design choices resulted in the creation of both a digital touch screen exhibit called "Chaco's Legacy" and a flexible, database driven tool, built within the Unity 3D game engine, which we are calling Chronological Virtual Reality or CVR. The CVR system represents an open source tool that can be used to compile platform-independent digital exhibits featuring three-dimensional models of landscapes, sites and artifacts. The system uses a node-based tour system, utilizing multiple languages to share virtual archaeology with descriptive text, maps, audio and alternate viewpoints, through multiple time periods. We at Archaeology Southwest are pleased to celebrate the release of the CVR system at this annual meeting.

[5] *Discussant*

Gao, Xing [179] see Guan, Ying

Gárate, David [144] see Crothers, George

Garay, Jose

[290] *Into the Mind of an Undergrad: Personal Experience, Training and Archaeology*

Only in exceptional moments can we explore the thoughts of others. Community archaeology projects, together with the ethical practice of the discipline, foster communication between the academia and the communities. Being part of one of these projects as a research assistant has given me the opportunity of interacting with people of diverse backgrounds, and of learning about their concerns and interests towards archaeology and their historical and cultural heritage. This experience has taught me that the frontier between academia and community is a permeable gray zone. This experience has been transcendental in my formation as an undergraduate student. It is often difficult to discover our professional interests when we learn about the discipline from the abstract teaching of a classroom. Being part of a project has allowed me to apply what I have learned through my studies, and to develop awareness regarding the ethics in archaeological practice and the preservation and conservation of our cultural heritage. From my perspective as an undergraduate student, in this presentation I will be discussing how working as a research assistant in a community archaeology project contributes towards the solid formation of a student, both professionally and as preparation for graduate school.

Garcia, Michelle [11] see Carini, Claudio

Garcia, Jorge (Jorge L. Garcia University of Florida Department of Anthropology), Augusto Oyuela-Caycedo (University of Florida Department of Anthropology) and Alexis Rojas (University of Florida Department of Geology)

[107] *Holocene Paleoclimate Reconstruction from $\delta^{18}O$ Isotopes of Neocyclotus Opercula a Morphometric Analysis of Variation at the Archaic Site of San Jacinto1 Colombia*

Neocyclotus snails produce opercula, a calcified plate attached to the foot of the gastropod serving as a protection mechanism from predators, and dehydration. Opercula are rarely found in the

archaeological record, and have only been recovered from few archaeological contexts. Excavations at the Archaic site of San Jacinto, Colombia have facilitated the unprecedented recovery of 3,542 opercula a presence that has not been recorded previously in the neotropics. These calcified plates form calcareous layers, which halt growth during yearly dry seasons, and are useful as markers for seasonality of deposition. The isotopic data from opercula samples is superior to that of shells as they display less natural variability, and preserve intra-crystalline proteins due to the greater stability of calcite. The particular characteristics in opercula make these structures ideal for analysis of stable isotope variability ($\delta^{18}O$) to infer seasonal variation. A random sample of the San Jacinto opercula was analyzed to determine spatial attributes, taxonomy, morphometrics, and human-modifications. Said analyses allow us to infer the opercula's function at the site, and determine the variation as well as the conservation of opercula samples for a future stable isotope analysis as a proxy for Paleoclimatic variation in Northern Colombia during the middle Holocene.

Garcia, Patricia (Agua Caliente Band of Cahuilla Indians)

[195] *Moderator*

Garcia, Karina (PARACOPAN) and Barbara Fash (Harvard University)

[366] *Exhibiciones fotográficas en el pueblo de Copán Ruinas: Arqueología y Comunidad desde 1890 hasta hoy día*

Desde 2007, las autoras han participado en una serie de proyectos de investigación de la comunidad recopilando información a base de entrevistas con personas locales antiguas, archivos, y colecciones fotográficas históricas relacionadas con la historia de la ciudad de Copán Ruinas y el yacimiento arqueológico de Copan, un Sitio de Patrimonio Mundial. Tomando en cuenta el contexto social de las primeras excavaciones, examinaremos cómo las exposiciones, "Memorias frágiles: Imágenes de arqueología y comunidad, Copán, 1891-1900", (instalado en el Salón Municipal, Copan Ruinas, y la Antigua Casa Presidencial, Tegucigalpa, Honduras) y "Cien años de comunidad: Copan 1912-2012" (instalado en el Colegio Viejo, Copan Ruinas) han abierto diálogos entre los residentes locales (ancianos, estudiantes jóvenes y visitantes), proporcionado oportunidades para los miembros de la comunidad de volver a conectar con la historia de Copán, y ayudado a informarles sobre el papel influyente que la arqueología ha jugado en su pasado y jugará en su futuro.

García, Carlos, Maria de la Luz Gutiérrez Martínez (Centro INAH-B.C.S) and Diana Irasema Larios Córdova (Centro INAH-B.C.S)

[156] *Patrón de Asentamiento en el Desierto Central de Baja California sur "El Estudio de Sitios Arqueológicos que Conforman un Corredor Sierra-Oasis-Mar"*

Como parte de los trabajos de localización, registro y protección de sitios arqueológicos durante obras de construcción de una línea de transmisión y sus respectivas Subestaciones eléctricas propiedad de CFE, se realizaron una serie de prospecciones a lo largo de 133 km, logrando así adquirir un nuevo cúmulo de información sobre esta vasta región, que en suma a los proyectos de investigación previos por parte del INAH, fue posible identificar patrones de asentamiento vinculados a una serie de condiciones tanto geográficas como geomorfológicas, las cuales permitieron el establecimiento de campamentos por grupos cazadores-recolectores-pescadores asentándose por periodos de corto, mediano y largo plazo para fines diversos. Este conjunto de sitios presentan características idóneas que nos ayudan a definir el área como de importante valor explicativo, ya que al estudiarse, es posible formular hipótesis sobre estrategias de movilidad por parte de estos antiguos Californios, que van desde el aprovechamiento de los recursos para la subsistencia, la organización social, incluso el ejercicio de manifestaciones con carácter simbólico, revelando así un complejo cultural propio de la región.

García, Magdalena [318] see Vidal Elgueta, Alejandra

García, Josué R. García (Josué R.)

[408] *Virtual Graphic Representation and Urban Analysis Architectural Grand Central Acropolis:*

Main Access and Structure 4D1-20 El Mirador, Petén; Guatemala

El presente trabajo desarrolla el urbanismo y arquitectura Maya de este conjunto arquitectónico tipo acrópolis, del sitio El Mirador. Con el objetivo de realizar un análisis de esta edificación, proponiendo una representación gráfica que permita su reconstrucción virtual y escenográfico del mismo. Esta propuesta hipotética se modela en base a la información histórica y evidencias arqueológicas recientes en este sector. Esta gran acrópolis ocupa un área de 86,139m²; por la dimensión que abarca este conjunto arquitectónico, la investigación se centra en el epicentro de esta acrópolis, en el que presenta rasgos arquitectónicos tempranos como lo es el Patrón Triádico, enfocándose en su acceso principal y la estructura conocida como "El Trono" (Estr. 4D1-20), resaltando sus distintas etapas constructivas y momentos históricos. Al examinar el urbanismo, su arquitectura, y construir este recorrido virtual, permite conocer de forma dinámica este patrimonio cultural, que caracteriza el arte y complejidad de la cultura Maya temprana y su devenir a lo largo del tiempo.

García Gómez, Víctor Hugo (Instituto de Investigaciones Antropológicas) and Guillermo Acosta Ochoa (Instituto de Investigaciones Antropológicas UNAM)

[141] *Procedencia e Intercambio de obsidiana durante el Holoceno Medio en la Cuenca de México (ca. 6200-5000 calBP). Un análisis mediante pXRF*

Se caracterizó mediante análisis de Fluorescencia de Rayos X (XRF) un conjunto de obsidianas obtenidas en las excavaciones en el sitio de Tepexpan, Edo. de México y San Gregorio Atlapulco, Xochimilco, D.F. (n=149), procedentes de los niveles precerámicos de ambos sitios, a través del análisis de diversos elementos (Na, K, Ti, Mn, Fe, RB, Sr, Y, Zr, Nb y Ba); esto nos permitió conocer la composición química de cada uno de los artefactos líticos para posteriormente efectuar comparaciones con obsidianas de yacimientos sistemáticamente muestreados. Los resultados indican una amplia predominancia del sistema de Otumba (94%), además de otras tres fuentes menores que incluyen a Pachuca. Lo anterior tiene implicaciones importantes sobre los procesos de interacción de los grupos precerámicos del Holoceno Medio en la Cuenca de México, y permite vislumbrar la importancia de esta fuente en el desarrollo temprano de comunidades cercanas al yacimiento que controlaron su explotación durante periodos subsecuentes.

García González, Miguel (Proyecto Templo Mayor)

[298] *The Sun, the Xiuhcoatl and the Eagle: Incense Burners Found at the Great Temple of Tenochtitlan*

In 2009 a spectacular offering containing incense burners was excavated close to the area in which the Tlaltecuhli monolith was located. Three of these artifacts preserved complex decoration, similar to the iconography that characterizes the incense burners discovered in 1900. Two of the handles of these ritual objects represent disarticulated eagle legs, while the other symbolize the segmented body of a mythical creature, the Xiuhcoatl. The eagle was an essential animal for the Mexica: it was the representation of the Sun and their pelts were dressed by rulers and depictions of gods. It was considered the symbol of bravery and force. On the other hand, the Xiuhcoatl was Huitzilopochtli's weapon. The body of this animal was composed of trapezoid motifs, culminating in triangular design adorned with flowers of the species *Tagetes lucida*. This mythical being was related to the Sun and it was considered the nagual of the gods Huitzilopochtli and Xiuhtecuhtli. Designs from this incense burner also evoke the butterfly, insect that symbolized fire, rebirth and the soul of the dead warriors. In this paper I will address the symbolism and use of these complex ritual artifacts in the Great Temple of Tenochtitlan.

García Puchol, Oreto [155] see Aura Tortosa, J. Emili

García Sanchez, Magdalena (El Colegio de Michoacán)

[129] *El río Lerma en la región de Angamacutiro en el pasado reciente*

En el siglo pasado, en su paso por Michoacán, el río Lerma influyó en la vida de los pobladores de la región de Angamacutiro, que abarca las localidades de Santiago Conguripo, Aramútaró y Añichuácuaro, entre otras. En éstas, la pesca, la caza y la recolección se llevaron a cabo sólo por algunos de los pobladores, pero existieron otras actividades hasta mediados del siglo XX que se

desarrollaron en mayor medida y constituyeron en conjunto la economía preponderante en la región. Es el caso por ejemplo de la elaboración de la cal, de la carpintería, de la herrería e incluso de la elaboración de retablos para los templos. Este trabajo explora esas otras actividades distintas y complementarias a aquellas esperadas en un modo de vida lacustre, y plantea el hecho de que la mera presencia de cuerpos de agua no conlleva a este modo de vida, como una posibilidad de análisis hacia las sociedades antiguas.

Garcia-Cosme, Elimarie

[11] *Spatial Patterns of Raised Fields and Linguistic Diversity in Mojos, Beni, Bolivia*

Throughout Amazonia, agricultural earthworks are found in diverse geographical settings, including Venezuela, Bolivia, and the Guianas. These earthworks can be seen throughout areas of diverse linguistic and ethnic backgrounds. This suggests that dynamic, multiethnic networks can be found in Amazonia, influencing the methods of landscape modification used by different groups. Being able to observe influences of diverse cultural interactions in the archaeological record could contribute to the complex issue of defining identity within the Amazon. This poster presents a GIS spatial analysis of raised fields, earthworks found along the Yacuma and Iruyañez Rivers in the Llanos de Mojos. With this spatial analysis, an understanding of the various forms of raised fields utilized in this area of Mojos could be achieved. The goal of the spatial analysis is to distinguish patterns within raised fields found along two sets of rivers and their connection with spatial patterns of linguistic groups in the area. Patterns within these areas could help understand the history of multiethnicity in Mojos.

Garcia-Des Lauriers, Claudia (California State Polytechnic University, Pomona)

[338] *Masking Practices and Layered Identities in Offering 1 from Los Horcones, Chiapas, Mexico*

Discovered in 2006, Offering 1 from Los Horcones, Chiapas represents a unique grouping of figurines deposited perhaps to commemorate the construction of Mound B1 from this site. Previous publication of this offering focused on deriving meaning from this cache based on its context and stylistic attributes. During the summer of 2014, the offering was reconstructed and new layers of meaning perhaps representing a more emic perspective emerged. The offering, made up of masks and figurine heads, sheds light on the practices of ritual masking and on discourses of layered identities taking place at the Early Classic site of Los Horcones. The ritual practices revealed will be viewed in light of Los Horcones' history of contacts with distant regions and centers such as Teotihuacan, the Maya region and the Gulf Coast of Veracruz to reveal how masking practices viewed here from analysis of small scale artifacts addresses larger scale social processes.

Garcia-Moreno, Cristina [189] see Phelps, Danielle

Garcia-Moreno, Alejandro (MONREPOS Archaeological Research Center and Museum for Human Behavioral Evol), Jarod M. Hutson (MONREPOS Archaeological Research Center and Museum), Aritza Villaluenga (MONREPOS Archaeological Research Center and Museum), Elaine Turner (MONREPOS Archaeological Research Center and Museum) and Sabine Gaudzinski-Windheuser (MONREPOS Archaeological Research Center and Museum)

[396] *Spatial Distribution and Site Formation of the Schöningen Spear Horizon, Lower Saxony, Germany*

The discovery of the Schöningen 13II-4 Spear Horizon represents a major milestone in the study human behavioral evolution. Once viewed as a single mass kill site of horses, aided by wooden spears, it is becoming increasingly clear that the site represents multiple hominin hunting episodes along the margin of a middle Pleistocene lakeshore. However, there are still questions to be addressed regarding the spatial relationships between and within the spear, lithic, and faunal assemblages. Here we present the results of an ongoing spatial analysis of the complete faunal assemblage from the Spear Horizon to address hypotheses regarding the events that led to accumulation of the site. Detailed spatial data, combined with other multidisciplinary studies, provide important ecological and depositional contexts for the site, from which we can reconstruct hominin behavior on a high-resolution scale. Preliminary results indicate a complex depositional history, but spatial patterns provide clues to interpret the frequency, timing, and nature of multiple hominin

hunting episodes at the site.

García-Moreno, Cristina (Arizona State University)

[257] *Batacosa, a Río Sonora or Serrana site?*

In 2009 and 2010 we worked at Batacosa, an archaeological site first recorded in 1967 by William Wasley, and later visited by Victoria Dirst. Our work allowed us to determine the full extent and material culture present at the site. In addition it allowed us to date this site to the Batacosa (200 - 700 A.D.) and early Cuchujaqui phases of the south branch of what Richard Pailes defined in 1973 as Río Sonora culture, geographically located in the Sonoran lower foothills. In this paper we present the results obtained by the Proyecto Arqueológico Sur de Sonora and discuss the affiliation of this extensive site.

[257] *Chair*

Gardner, Chelsea (University of British Columbia), Lisa Tweten (University of British Columbia) and Maude Côté-Landry (University of British Columbia)

[121] *From Stone to Screen: Squeezing into the World of Digital Archaeology*

As the field of Digital Archaeology becomes increasingly prevalent, large-scale projects tend to dominate both thinking about and approaches towards the digital landscape. Scholars and students with smaller budgets and resources are often at a disadvantage; we believe renewed energy should be devoted to exploring the value and integrity of small-scale projects.

This poster presents From Stone to Screen, a multi-disciplinary, collaborative, and open-access digitization project launched in 2012 by the graduate students of the department of Classical, Near Eastern and Religious Studies at the University of British Columbia. From Stone To Screen is a successful, viable, and tested project that reveals the increasing potential of open-source digital tools for scholars and students with small teams and variable budgets. This initiative is completely student-run and focuses on the digitization of the departmental epigraphic squeeze (an impression of an inscription) and ancient Near Eastern artifact collections. While similar digitization projects exist, From Stone To Screen is unique in its accessibility objectives, its solely student-based administration, and the scanning techniques and subsequent quality of the scanned images, all presented in this poster, and all of which are replicable for squeezes and artifacts obtained from all corners of the globe.

Gardner, Karen [293] see Bartelink, Eric

Gardner, Karen (ICF International), Eric J. Bartelink (California State University, Chico), Antoinette Martinez (California State University, Chico), Alan Leventhal (San Jose State University) and Rosemary Cambra (Chairwoman of the Muwekma Ohlone Tribe)

[293] *Feeding the Ranks: Correlating Social Organization and Dietary Patterns at the Yukisma Mound (CA-SCL-38)*

The Yukisma Mound (CA-SCL-38), located in Santa Clara County, California, was used by the ancestral Ohlone as a mortuary site between approximately 940 and 230 years BP. Analysis of mortuary contexts within the mound revealed evidence of social differentiation in wealth, prestige, moiety affiliation and power. Special mortuary treatment, artifact abundance, and association with costly artifacts or culturally significant wealth items suggested that some individuals held higher status than others without these associations. These observations were enhanced by dietary evidence from stable carbon and nitrogen isotope analysis of bone collagen (n=127) and apatite (n=122). Measures of wealth were not correlated with advancing age, an indication that wealth was inherited. However, larger bead caches with adults suggested that wealthy status could also be achieved. Prestige, inferred from elaborate mortuary treatment (e.g. burning of possessions or offerings), was surprisingly not correlated with measures of wealth but did have dietary implications. Dietary patterns were only weakly correlated with measures of wealth, but elevated $\delta^{13}\text{C}$ values of bone apatite were observed in individuals buried with Haliotis pendants, likely a marker of moiety affiliation. Multiple lines of evidence revealed social complexity at the Yukisma Mound, characteristic of ranked social organization.

Gardner, A. Dudley (Western Wyoming College), Glade Hadden and Adreanna Jensen (Western Anthropological and Archaeological Research)

[386] *Eagle Rock: A Brief Look at Cultural Changes in One Rock Shelter between 13,000 and 6,000 BP*

Eagle Rock is a multi-component site with occupational horizons dating from 13,000 to 350 BP. This rock shelter is located in west central Colorado along the Gunnison River. Between 13,000 to 6,000 BP there is evidence of change in the lithic technology at the site. This is readily apparent in the artifact assemblage. However, there seems to be some continuity in food-ways at the site. This presentation will briefly put forward what we have learned as a result of micro- and macro-botanical analysis over the last seven years. We will also put forward how the faunal remains at the site indicate subtle changes in diet but also indicate some continuity in terms of the types of meat processed and consumed at the site. Over time the continuity in food selection seems to indicate a dependence on similar plant and faunal resources at this site. There is a tenuous suggestion that throughout the sites occupational history certain food sources were always available at this location contributing to the reuse of this rock shelter by a variety of groups from 13,000 to 6,000 BP.

Garfin, Timothy (California State University Northridge), Sachiko Sakai (California State University Long Beach) and Hector Neff (California State University Long Beach)

[133] *Possible Functions of a Late Prehistoric Coarseware from the Estuary Zone of Eastern Soconusco*

Recent surveys in the mangrove zone of far-southern Pacific coastal Chiapas, Mexico, identified a coarse pottery, called "sewer-pipe ware," that was initially thought to have been used in sal cocida salt production during historic times. Distributional and excavation data along with functional considerations, however, point to a potentially more interesting hypothesis, namely that "sewer-pipe ware" vessels may be portable kilns or saggars used in the production of Plumbate pottery, a famous and widely traded ware of the Late Classic and Early Postclassic periods. The present paper presents evidence that supports the portable-kiln hypothesis, as well as evidence favoring alternative hypotheses.

Garfin, Timothy [151] see Neff, Hector

Garfinkel, Yosef [91] see Campeau, Kathryn

Garfinkel Gold, Alan (California Rock Art Foundation / AGG Associates), Geron Marcom (Death Valley Avocational Rock Art Studies) and Don Austin (Sand Carved Designs, Rock Art 101)

[352] *Religious Symbolism In Eastern California Ghost Dance Rock Paintings*

Multi-colored, historic Native American rock paintings are found throughout eastern California. In a minimum of 21 locations, Native, indigenous, polychromatic rock paintings have been documented that apparently date to a time period between 1870 and 1900 (Schiffman et al. 1983; Garfinkel 1978, 1982, 2005, 2007). These rock painting sites exhibit subject matter that may relate to revitalistic religious movements popular during this short 30 year time frame. Such paintings have been described and detailed analysis provided as a basis for asserting that they relate specifically to Native American Ghost Dance religious observances. The present discussion provides more extensive and systematic analysis attempting to show how the element composition of one of the largest and most elaborate of these sites is a visual representation of an overall cosmology informed by Numic religion and Ghost Dance ontology (Goss 1972; Hittman 1997, 2014; Hultkrantz 1986; Vander 1997). Specifically, it appears that certain paintings in eastern California exhibit elements of Numic cosmology and Ghost Dance religion manifesting central ideational themes through their subject matter, use of certain colors, animal attributes, spatial arrangement of figures and order of color applied - reconstructed via superimposition.

Garlinghouse, Thomas (Albion Environmental, Inc.), Sarah Peelo (Albion Environmental, Inc.),

Linda Hylkema (Santa Clara University) and Clinton Blount (Albion Environmental, Inc.)**[310]** *Persistence and Change: Evidence from the Indian Rancheria at the Third Mission Santa Clara de Asis*

Recent archaeological excavations within the Indian Rancheria at Mission Santa Clara de Asís have uncovered a dense accumulation of Mission Period refuse, most conspicuously cattle bone. Analysis of these remains suggests a “matanza-like” event that was geared primarily toward supplying the indigenous community with beef. A variety of wild foods, especially fish and waterfowl, was also recovered. This variety suggests that mission Indians devoted considerable time, energy, and effort in securing their traditional resources. Analysis of the artifact assemblage suggests a similar scenario. Mission Indians were introduced to European tools; however, these new implements did not supplant the already existing Native material culture. The indigenous population continued to work stone, bone, shell, and fiber, while, at the same time, often using these new metal implements in wholly indigenous ways. Taken together, the evidence suggests that at least some Native values and lifeways persisted despite the constraints of the colonial system. Indeed, this evidence suggests that the Native inhabitants within the mission, rather than undergoing what some scholars have deemed a “cultural extinction”, actively engaged and negotiated the constraints of European colonialism. We argue that this negotiation can best be viewed as a dynamic process of both change and persistence.

Garner, Nancy (University of Tulsa) and H. Thomas Foster, II (University of Tulsa)**[327]** *Interactions with the Lower Creek: Historic Document Quantification*

Historic documents are a useful tool in understanding post-contact archaeological sites. Documents can show different forms of interaction between Europeans and Native Americans and chronicle events that are invisible in the archaeological record. Notations in archaeological reports often refer back to letters, journals, orders, laws, treaties, reports, newspaper articles and trade records, to support findings and give credence to interpretations of the past. However, use of historic documents has some troubling challenges, one of which, is the qualitative nature inherent in document use. Often a single document reference is used to support an interpretation. This paper offers a method by which historic documents can be quantified and seeks to create a more scientific approach to using documents to support archaeological conclusions. Using interactions between the Lower Creek and westerners as a case study, historic documents, written between 1620 and 1840, and containing information about events in North America's colonial period and early American Republic were analyzed and quantified. Preliminary results indicate that this method of quantification reflects historic events seen both in the document and archaeological records.

[327] *Chair***Garraty, Christopher (Logan Simpson Design)****[304]** *Settlement Dynamics in the Margins of Hohokam Villages in Canal System 2: Recent Investigations at La Ciudad*

Recent excavations at La Ciudad highlight settlement and socioeconomic changes along the margins of the larger village during the Pre-Classic period, especially the Pioneer-Colonial period transition. High-resolution chronological evidence was obtained based on a combination of radiocarbon, archaeomagnetic, and luminescence assays, including an unprecedented 34 optically and thermally stimulated luminescence assays from ceramic sherds. In addition, 36 archaeomagnetic assays from an early investigation in a more densely occupied area of La Ciudad were reexamined using the current archaeomagnetic curve for the U.S Southwest. This chronological information provides a refined diachronic perspective from which to evaluate and compare patterns of village development and growth in central and peripheral residential areas of the village. The settlement trends observed at La Ciudad are compared with settlement evidence from other Hohokam sites along Canal System 2 to infer broader patterns of Hohokam village development and growth.

[304] *Chair*

Garrett, Timothy [248] see Duffy, Lisa

Garrett, Zenobie (New York University)**[289]** *Bridging the Gap: Understanding the Empty Medieval Landscape of Post-Roman Aquitaine*

The end of the Roman Empire is marked archaeologically by an impressive shift in material culture. Changes in land organization and the use of more ephemeral building materials created a largely invisible and difficult to detect post-Roman landscape. Archaeologists initially assumed such landscapes were abandoned as a result of the political and economic chaos resulting from Rome's fall. Work in northwest Europe in the past two decades, however has shown that new techniques can help locate these post-Roman occupations, and the issue of abandonment is much more complex than originally assumed. In the Dordogne area of France, the situation has been exacerbated by a lack of documentation both historically and archaeologically. Both Roman and post-Roman occupations are underrepresented; creating a map that is largely devoid of archaeological material. Using GIS analysis, I will address whether this "emptiness" represents cultural absence or simply new forms of cultural organization. In doing so, I will problematize the issue of site definition, particularly in regards to survey strategies and landscape analysis and posit ways archaeologists can include empty 'scapes' in their analysis.

[289] *Chair***Garrido, Francisco (University of Pittsburgh)****[46]** *Non-State Artisan Specializations and Exchange in the Margins of the Inca Empire*

Although most of the time is assumed that local economies were almost completely overtaken and transformed by the interest of Inca elites, there were situations where households behaved in more autonomous and probably unexpected ways from the point of view of the empire. Low-scale artisan specialization in mining related activities using imperial infrastructure such as the Inca road was one of the ways to thrive and succeed during times of political change, when isolated areas like the Atacama desert became more globalized and integrated into wider social systems. Opportunities for exchange were open and profited by some corporate groups who detached themselves from agricultural production. They became at least for some seasons full-time miners and artisans living and working far from home in the middle of the desert.

Garrison, Ervan [192] see Cook, Jessica

Garrison, Thomas (University of Southern California) and Brett Houk (Texas Tech University)**[244]** *Crossing Ancient and Modern Borders: Territoriality in the Three Rivers Region*

The lowland jungle environment of the Maya area presents numerous challenges to archaeologists in the study of ancient territoriality. Incomplete settlement survey data and fragmentary textual records hinder attempts to formulate comprehensive hypotheses comparable to those put forth for complex societies in other areas of the world. The Three Rivers Region of northeast Guatemala and northwest Belize is one area where some advancements may be made. Large portions of the region have been surveyed over the last 30 years on both side of the modern national border, and there is a firm understanding of the environmental history of the region, which played a crucial part in territorial dynamics through time. This paper presents case studies from the San Bartolo-Xultun territory in Guatemala and the Chan Chich territory in Belize to illustrate how a long record of regionally based research has allowed for some progress in our understanding of ancient political boundaries at local levels and argues that new technologies will only improve upon this knowledge moving forward.

Garrison, Andrew (Scientific Resource Surveys, Inc.), Connie "Destiny" Colocho (Scientific Resource Surveys, Inc.) and Nancy "Anastasia" Wiley (Scientific Resource Surveys, Inc.)**[310]** *Getting into the Groove: Replicating the Southern California Cogged Stone*

Cogged Stones are an ambiguous artifact often associated with Bolsa Chica in Orange County, California. Scientific Resource Surveys, Inc., has been involved in the study of the Bolsa Chica mesa for over 30 years resulting in the longest privately funded cultural resource investigations in Southern

California. This poster highlights one facet of SRSinc's, current studies on the cogged stones. It has been purposed that the manufacture of cogged stones took place on the Bolsa Chica mesa at the site known as CA-ORA-83. Cogged Stones from the Bolsa Chica collection range from gritty porous material such as vesicular basalts, to denser tough material, like andesite, indicating the manufacture of the artifact type would have likely followed a similar trajectory seen in the production of utilitarian groundstone implements. As highlighted in another poster by SRSinc, tools associated with groundstone production were prevalent within the lithic assemblage of the site. Drawing on past replicative experiments, SRSinc, developed a hypothetical manufacturing sequence for the cogged stones. Utilizing the proposed sequence, SRSinc conducted a number of replicative experiments to test how well beveled shaped hammerstones worked in the manufacture of cogged stones on different lithic materials.

Garvey, Raven (University of Michigan) and Robert Bettinger (University of California-Davis)

[135] *Cultural Transmission and Diversity among Hunter-Gatherers of the Subarctic and Subantarctic*

The behavioral ecological approach Kelly champions in the Foraging Spectrum has clearly enhanced our understanding of hunter-gatherer diversity. Still, despite important developments in modeling and comparative analysis in the twenty years since first publication, occasional stark contrasts between groups living in similar environments suggest that ecological factors and adaptive behaviors cannot alone account for the impressive record of ethnographic and archaeological diversity. We consider one such case—contemporaneous hunter-gatherers of the Subarctic and Subantarctic—from the perspective of cultural transmission theory to restate the special role of culture in explaining hunter-gatherer diversity.

Gasco, Janine (CSU-Dominguez Hills)

[194] *Life in the Tributary Province of Xoconochco*

Our work on Late Postclassic Xoconochco/Soconusco has been greatly influenced by research carried out by Frances Berdan, particularly her focus on the Codex Mendoza and other Aztec documents and her approach which integrates multiple disciplines. In this paper I use ethnohistoric and archaeological data to review the role of the Soconusco region as an Aztec tributary province. More specifically, I examine what these data seem to tell us about how the Aztec conquest and the subsequent collection of tribute payments impacted the local population of the Soconusco. I also discuss the process by which we sometimes have to reconcile the seemingly contradictory evidence provided by the documentary and the archaeological record.

Gaskell, Sandra (Tribal Archaeologist Southern Sierra Miwuk Nation), Danette Johnson (Tribal GIS Analyst, Southern Sierra Miwuk Nation), James Les (Past Chairman, Southern Sierra Miwuk Nation), Lois Martin (Chairwoman, Southern Sierra Miwuk Nation) and Sis Calhoun (Traditional Elder, Woman of the Bear, Southern Sie)

[66] *The Rights of Construction Design for Ancient Architecture Wah-ho-ga Village Traditional Ceremonial Structure of the Seven Affiliated Tribes of Yosemite*

As the exploration into the political and legal relationships between the United States and Indian Tribes continues into the area of building codes and regulations for non-modern and ancient traditional methods, what transpires here at Wah-ho-ga may have a broad range effect upon traditional structures in other Native American territories all over the nation where traditional ceremonial practices occur. The current building codes based upon far different construction methods and materials cannot grade the stability of a traditional ceremonial structure but have been used to degrade the cultural integrity and traditional significance of the current structure. The Seven Affiliated Tribes of Yosemite agree that ancient methods prevail

Gaspar, Maria (Museu Nacional) and Daniela Klokler (Universidade Federal de Sergipe)

[152] *Shell Mounds from Southern and Southeastern Brazil*

Systematic archaeological research focused for centuries on large scale shell mounds and now scholars have turned their attention to smaller sites located on the southeastern coast of Brazil.

Similar to large mounds, these sites were built with mollusk and fish remains, have a complex stratigraphy and high numbers of burials. Researchers have used data from the formation processes and funerary contexts to establish comparisons between regions. Results indicate that small mounds located around the Guanabara bay in Rio de Janeiro, despite their specificities related to size, were constructed following the same set of activities that resulted in the construction of monumental shell mounds at the Santa Catarina state. The repetition of funerary rituals, the inclusion of hearths and offerings and the care with bodies are present in both regions, indicating similar customs in a greater extension of the coast. An interest in "body" preservation through the deposition within shell valves is seen as a structuring element in these societies.

Gatsov, Ivan and Petranka Nedelcheva

[211] *Lithic Assemblages in NW Turkey during the 7-6 Millennium B.C.*

This paper deals with the main features of the lithic technology, which appeared at the settlements south and east of Marmara Sea and Eastern Thrace during the 7-6 mill B.C. The new results show evident invariability in those technological and typological characteristics, which may provide direct proof for common lithic traditions and possibly similar environment features in the region. A new question arises after the research of the Central Northwest Anatolia lithic artifacts. This empirical material could be related with the suggested earliest traces of PPNB occupation in the area of south and east of Marmara Sea and Eastern Thrace. In this connection it should be suggested that the region was penetrated before the appearance of the first pottery Neolithic bearers.

Gaudreau, Mariane (Simon Fraser University)

[374] *Oral Narratives and Archaeology: Telling Multiple Stories for Multiple Pasts?*

It is widely accepted that the study of material culture and oral narratives are two different but equally important avenues for looking into the past. While the distinct sets of data they produce frequently corroborate and/or complement each other, allowing for a deeper understanding of the past, discrepancies are not uncommon. In those cases, "scientific" data often take precedence and local knowledge is marginalized. While archaeologists see oral narratives as useful "tools" to archaeological interpretations, ones they can incorporate or discard, for First Nation groups, such narratives form the core of their identity and their history, and thus are essential to preserving their culture and their past. This ranking of knowledge is something Indigenous scholars have been denouncing for many years now on the grounds that knowledge systems should be evaluated within their own epistemological logic. Privileging archaeological interpretations over traditional knowledge can lead to substantial conflict between researchers and descendant communities, with negative impacts on communities, especially when the archaeological data challenges the latter's conceptions of "identity," "history," and "heritage." In this paper I consider the ethical and social implications of the bridging of knowledge derived from distinct epistemologies and of the use of oral traditions by archaeologists.

Gaudzinski-Windheuser, Sabine [396] see Garcia-Moreno, Alejandro

Gauthier, Nicolas (Arizona State University), Christina Luke (Boston University) and Christopher Roosevelt (Boston University)

[167] *Extreme Weather Events and 10,000 Years of Land-Use Change in the Gediz River Valley*

We analyze long-term community responses to extreme weather events in the Gediz River valley of western Anatolia. Today, as in antiquity, the valley is one of the most agriculturally productive in Turkey, and its agroecosystem is well-adapted to the seasonal variability of its Mediterranean environment. Nevertheless — and in spite of modern water-management infrastructure — unpredictable droughts, storms, and floods can still devastate the region's food production. How were the valley's ancient inhabitants able to sustain themselves, and even flourish, in the face of such risks? To answer this question, we draw on diverse lines of evidence — including aerial imagery, oral histories, early traveler accounts, municipal records, engineering reports, paleo-environmental data, and global climate models — to reconstruct the frequency and severity of droughts, storms, and floods in the valley over the past 10,000. We then couple these

reconstructions with simple computational models of agricultural production and land-use change in the valley, and test the results against data from 10 years of intensive surface survey conducted by the Central Lydia Archaeological Survey. We argue that the flexibility of small-scale agropastoral production and transhumant pastoralist networks is the key to long-term, sustainable settlement in the valley.

Gauthier, Gilles [185] see Driscoll, Killian

Gavette, Peter (National Park Service) and Leo Barker (National Park Service)

[416] *A Civil War Period Ossuary Pit, Point San Jose Hospital Site, San Francisco*

The United States Army reactivated Point San Jose, a military base established by Spanish in 1776, during the Civil War to protect the San Francisco Bay from Confederate threats. In 2010, the National Park Service undertook rehabilitation of several historic buildings dating back to the late nineteenth century. This paper examines a significant feature discovered during the refurbishment of the army hospital that was active from 1863 to 1903. Archaeological monitors discovered an ossuary pit containing human remains during removal of contaminated soils around the foundation of the structure. Careful excavation of the pit revealed a profusion of waste material from the hospital that included unarticulated post-cranial and cranial elements from multiple individuals. Diagnostic bottles recovered from the feature indicate that the deposit dates to between 1860 and 1880. Historic research on the Point San Jose hospital and staff provide amazing insight into the nature of this feature and its formation.

Gay, Brandon [11] see Carini, Claudio

Ge, Wei (Xiamen University) and Weijin Huang

[179] *The Diversity of Botanical Food of the Hemudu People: Evidence from an Examination of Food Residues in a Fu pot*

Carbonized black debris was found in many fu pots recovered from an early stratum at the Hemudu site (c. 7000–6500 cal. BP). The debris resembles food residues. Although this kind of debris has been regarded as residues of cooked rice for a long time, so far no specific research has been conducted. To clarify the nature of these residues, we carried out a microscopic morphological analysis and stable isotope analysis on one of the specimens. The morphological analysis found starch granules of a variety of plant tissues, including seeds of the genus rice (*Oryza* sp.), the bulb of the genus lily (*Lilium* sp.), seeds of *Quercus variabilis*, seeds of *Vigna* sp. and *Triticeae*. Stable isotope analysis shows that the residue was mainly composed of C3 plants, without or with very little animal material. These results prove that the residues in the fu pots of Hemudu were really food remains, but not purely made from rice. This study reveals the diversity of botanical food of Hemudu people and also provides new clues regarding the function of fu pots as cooking vessels.

Gearheard, Shari [288] see Strawhacker, Colleen

Geiger, Elspeth

[54] *Investigating Wood Acquisition Strategies from Archaeological Charcoal: Implications for the Bronze Age Site of Pecica Șanțul Mare*

The Bronze Age site Pecica Șanțul Mare is an important fortified tell settlement in Arad County, Romania. Situated along the river Mureș, Pecica lies within a unique resource zone between the ore rich region of the Western Carpathian Mountains and Carpathian Basin. While metal production and regional connectivity are associated with the site, it is poorly known how wood fuel for metal work was acquired. Archaeological charcoal remains are often used to reconstruct local woodland compositions of the past. Given the role of wood fuel as a potential limiting factor in metalworking, analysis of archaeological charcoal sheds light on the usefulness, abundance, and procurement of wood for fuel. Through analyzing archaeological charcoal, evidence of fuel management and acquisition strategies can be used to improve our understanding of the regional connectivity of

metalworking.

Geiger, B (University of California, Santa Barbara)

[131] *Cuts to the Bone: Using Scalping Evidence to Examine the Relationship Between Warfare and Gender in Pre- and Proto-Historic North America*

Stories of brutal cranial de-fleshing terrorized European settlers throughout colonial North America for centuries. Scalping was simultaneously dreaded by common settlers and promoted by European military leaders. In this context, scalping has often been viewed from a western, etic perspective. However, recent bioarchaeological studies of prehistoric scalping provide an opportunity to examine the cultural contexts of scalping and trophy-taking within American Indian culture, both before and after European contact. In this paper, I use multiple lines of evidence, including bioarchaeological sex and age data from scalping victims, to examine the dynamic relationship between gender and warfare as it changed over time in North America.

Geller, Pamela (University of Miami)

[146] *Love Never Dies?*

In this talk, I examine the contemporary commonsensical thinking about sex, gender, and sexuality that informs study of bioarchaeological remains. To this end, I focus on double burials whose decedents appear to be embracing—their discovery, investigation, and presentation in scholarly and popular settings. Images of and stories about these ancient embracers garner significant and often sensationalized attention in myriad global spaces. Here I deliberate about their representation in mediascapes, museum exhibits, and heritage sites. What dominant discourses and representations about sex, gender, and sexuality circulate in these spheres? In answer, I argue that proximity is cited as evidence by archaeologist and non-specialists alike of eternal, romantic, and heteronormative love. Dissemination and consumption occur with minimal consideration of the disparate cultures, geographic locations, and time periods from which these burials come. What, I query, is the consequence—intellectually, ideologically, economically, politically—of identifying these burials' ancient occupants as lovers? Ultimately, I argue that to interrogate our common sense about sex, gender, and sexuality in the past invites us to think more deeply about the naturalization of culture, consequences of scientific study, and ways evidence from the past is represented to the public.

[146] *Chair*

Gendron, Daniel [360] see Lanoë, François

Gentil, Bianca (The Pennsylvania State University)

[7] *Measuring Power and Influence: GIS Modeling of Political Spheres of Influence*

In an area where most of the written record is destroyed, modeling political interactions through spatial relationships with the environment and other political centers along with exchange relationships, can provide insight into regional inter-site relationships. This poster displays a theoretical model using Geographic Information Systems technology of regional heterarchical relationships between sites in the Northeastern Petén. The model is formulated by implementing hierarchical political markers and environmental elements as weighted variables to estimate political spheres of influence. Weighted Voronoi diagrams are used to create theoretical political boundaries that provide modeled perimeters of political economies, and by extension power and influence between sites. This theoretical approach can then be measured archaeologically by using the distributional model of network exchange. Modeled boundaries coupled with the distributional approach can then test proposed theories of political allegiances and/or conflict between centers.

Gentil, Bianca [355] see Lorenz, Samantha

Gentry, Jewel (California State University Monterey Bay)

[30] *Marking the Sacred: Reading between the abraded lines of Mission San Miguel the Arcángel*

The Californian Spanish colonial community of Mission San Miguel the Arcángel consisted primarily of Salinan, Tulare native populations and included neophyte Indians from previously established Missions of San Luis Obispo and San Antonio. Within the Mission Church examples of 19th century "graffiti" can be found etched throughout the sanctified interior. Researchers have suggested that specific sections of these stylized markings are analogous to California Indian rock art with parallels being drawn from regional archaeological sites. The present research works to broaden previous studies by relating spatial positions of proposed neophyte etchings within San Miguel to Catholic mandates which directed the use of sacred space. Spatial and liturgical organization of neophytes within the mission church was defined by many factors including; age, gender, musical aptitude, and level of religious training. By tradition and edict access to Catholic sacred space was linked to neophyte identity and status. Associated to this, proposed neophyte etching within the church of Mission San Miguel are found located in pronounced form in areas of access corresponding to prominent positions within the church community. This observation offers many compelling perspectives related to the continuance and conflation of indigenous traditions and the formation of sacred space.

George, Richard (The Pennsylvania State University), Claire E. Ebert (The Pennsylvania State University), Sarah B. McClure (The Pennsylvania State University), Barbara Voorhies (University of California, Santa Barbara) and Douglas J. Kennett (The Pennsylvania State University)

[91] *Archaic and Formative Period Obsidian Exchange on the coast of Guerrero, Mexico*

Long-distance trade of obsidian formed an essential part of inter-regional Archaic and Formative Period Mesoamerican economies (~3,500 B.C.-A.D. 250). We analyzed obsidian artifacts (n=522) from Late Archaic through Late Formative Period deposits at the sites of Puerto Marques and La Zanja in the Acapulco Bay region of Guerrero, Mexico using X-ray fluorescence spectrometry to assess the economic importance of different obsidian sources through time. The presence of obsidian artifacts at Puerto Marques indicates that coastal populations in coastal Guerrero joined developing exchange networks by at least 3,500 B.C. Highland Mexican obsidian sources dominate the assemblages at both sites with Otumba (Estado de México) emerging as the primary source used during the Late Archaic Period (3,500-1,600 B.C.). Ucareo-Zinapécuaro (Michoacán) predominates during the Early Formative (1,600-1,000 B.C.) prior to the diversification of obsidian source use in the Middle Formative (1,000-550 B.C.). The number of sources used in the Late Formative Period (550 B.C.-A.D. 250) appears to contract, but our sample is small for this interval. These data contribute to our understanding of early exchange networks that ultimately provided the foundation for the emergence of more complex societies in Mesoamerica.

George, Richard [244] see Hoggarth, Julie

Germonpré, Mietje (Royal Belgian Institute of Natural Sciences), Sergey Fedorov (Mammoth museum of the Institute of Applied Ecology), Mikhail V. Sablin (Zoological Institute RAS, Universitetskaya nab. 1), Martina Láznicková-Galetová (Department of Anthropology, Faculty of Philosophy) and Robert J. Losey (Department of Anthropology, University of Alberta,)

[28] *Paleolithic Dogs in Europe and Siberia*

Our group has demonstrated, on the basis of detailed morphometric analyses, the antiquity of the domestication of the wolf. The dog is the first domesticated animal and its origin can be traced to the Upper Paleolithic. Two canid morphotypes can be distinguished in Pleistocene Eurasian sites dating from before and after the Last Glacial Maximum (LGM): a morphotype that is similar to extant wolves, described by us as Pleistocene wolves, and a morphotype distinct from wolves. Relative to wolves, the latter morphotype is characterized by short skulls and snouts, and wide palates, and short mandibles and lower carnassials. The upper and lower carnassials of this morphotype are larger than those of modern dogs. To differentiate this morphotype from modern dogs, they are termed Paleolithic dogs. So far, sites with Paleolithic dogs dating from before the LGM are limited. Sites yielding material from Paleolithic dogs dating from after the LGM are more numerous and wide spread, as far as northern Siberia and the Far East. Here we present the fossil canids from these Pleistocene Eurasian sites, including a canid pup found in the permafrost of northern Yakutia.

Gershenson, Carlos [317] see Froese, Tom

Gerstenblith, Patty

[254] *Legal Responses to the Intentional Destruction and Looting of Cultural Sites: The Paradigm of Syria*

The civil war in Syria, now in its fourth year and with multiple parties, has engendered probably the most widespread and numerous examples of destruction, damage and looting of cultural sites since the Second World War. Several international legal instruments, including the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict and its First Protocol, were drafted in the wake of World War II to prevent the repetition of such harms inflicted on cultural sites and repositories. More recently, the prosecution of military leaders by the International Criminal Tribunal for the former Yugoslavia, the increasing use of customary international law, and the adoption of the Second Protocol to the 1954 Hague Convention have raised awareness of the consequences of violating these international legal norms and treaty obligations. Despite these provisions, the parties to the conflict in Syria have continued to engage in cultural heritage destruction for differing reasons and motivations. This paper will explore the deterrents of international law and its limits in protecting cultural heritage.

Geurds, Alexander (Leiden University - University of Colorado Boulder)

[246] *Understanding Exchange in Late Prehispanic Central America. Current Thinking on Culture Areas and Ethnicity*

This paper argues that improving understanding of exchange in Central American prehistory is hampered by static cultural taxonomies, and traditions of thinking and publishing that are limited in terms of the 'archaeology of Costa Rica, Nicaragua, Panama', dividing the field to the point where scholars are uncomfortable discussing Prehispanic Central America as such. This has put an unsatisfactory halt to the discussion about how to understand and conceptualize this isthmian region. If ethnic and cultural containers were forgotten, then the diversity of material culture would become apparent. Clearly recognizable object forms such as circular earthworks, and monumental stone sculpture would still be apparent. A bewildering diversity of different 'styles', however, would predominate. In material culture terms, Late Prehispanic Central America is about the reworking and redistributing of such material forms. To allow for an analysis of such object mobility in Central America, an archaeological viewpoint is needed that studies the diversity from a global and local vantage point, perhaps using landscape characteristics as a point of departure. The argument is illustrated by the Late Prehispanic period coastal exchange routes between Mexico and Costa Rica that date back to the Middle Formative period, becoming part of the Mixteca-Puebla pottery complex.

Giambastiani, Mark [341] see Morgan, Christopher

Giambastiani, Dayna and Andrea Catacora (ASM Affiliates, Inc.)

[362] *Comparative Analysis of Incised Stone Artifacts from Gatecliff Shelter and Ruby Cave, Great Basin, Nevada*

As part of our on-going research on incised stones throughout Nevada, this poster presents the results of a comparative study we recently undertook of the Ruby Cave artifact collection and Trudy Thomas's (1983) illustrations of the Gatecliff Shelter collection in order to determine whether shared stylistic patterns exist between the two incised stone assemblages. Our analysis techniques are based on a combination of methods used by previous researchers in the Great Basin as well as new methods employed in the analysis of rock art.

Gibbons, Kevin (University of Maryland) and George Hambrecht (University of Maryland)

[154] *Icelandic Livestock Improvement and an Emerging National Identity: Biometrical and Genetic Markers of a New Landscape*

Early in the settlement of Iceland, social perceptions were imported along with herds of livestock primarily from Norway. Cultural identity and agricultural traditions can influence and react upon each

other. Iceland provides a unique location to explore these intersections as an island intellectually connected to Europe but isolated from significant trade routes. An exploration of Iceland's rich literary tradition suggests that the Icelandic social landscape coalesced and matured from the early settlement period into a new national identity with an ideological state apparatus related to the Church. During this process, statistically significant improvements to the size of livestock occurred. The increase in the size of domestic animals across Europe has often been characterized as a result of the Second Agricultural Revolution. However, biometrical data from the ninth to the eighteenth centuries suggest that significant increases in the size of caprine and bovine bone dimensions were occurring in the late medieval period. The possibilities of new aDNA data from Icelandic faunal remains are discussed in order to refine our understanding of the change in body size and population of livestock in Iceland throughout the millennium, in comparison to our deeper understanding of similar processes across Europe.

Gibbs, Kevin (University of California, Berkeley)

[89] *Inclusions and Innovations in Late Neolithic Pottery from the Southern Levant*

Discussions of variation over time in early Near Eastern pottery production often focus on linking changes in form or surface treatment to shifts in how pots were being used, either as a functional cooking or storage container or, in some cases, as a symbolic object. More rarely, compositional characteristics (clay, temper) are examined and these too have been considered in terms of vessel use. Some tempers, for example, are thought to be beneficial for the production of cooking pots because of their thermal properties. In this paper I examine developments in the production of Late Neolithic pottery from the southern Levant, focusing on fabric composition and texture. Rather than seeing a straightforward link between these properties and vessel use, I argue for a more nuanced perspective that considers the influence and continued impact of earlier technological innovations. In particular, drawing on evidence from petrographic analyses, the economics of increasing returns, and theories of object entanglement, I consider how similar ceramic fabrics might reflect a range of pottery uses, including expedient vessels that were not made with longevity in mind.

Gibson, Kathleen (University of Texas-Houston)

[33] *Primatology, Developmental Psychology, and the Birth of Cognitive Archaeology*

Charting the emergence of human cognition from archaeological remains requires reconstructing the probable behavioral capacities of the last common chimpanzee/human ancestor and delineating the cognitive, motor, and social abilities that underpin the production of hominin material cultures. Hence, the birth and growth of cognitive archaeology has long depended upon research findings in other disciplines. This paper provides a brief overview of historical perceptions of adult and immature human and non-human primate cognitive capacities, brain plasticity and genetic assimilation. It suggests that the clearest evidence of emerging human cognition derives from archaeological remains indicating the construction of tools, materials, and activities from multiple physical, motor, and/or social units. Even among populations with essentially modern genetically-based neurological capacities, adult cognitive and motor skills would have varied depending on material and social inputs during infancy and childhood.

Gibson, Heather [175] see Dietler, John

Gidding, Aaron (University of California, San Diego)

[402] *Assessing Ancient Vertical Integration: Copper Production in Early Bronze Age Southern Levant*

In the later part of the Early Bronze Age (~2800 B.C.E. - 2500 B.C.E.) the collapse of the first "urban" settlements was beginning. That collapse led to a period predominantly identified with ruralism and pastoralism, the Early Bronze IV (~2500 B.C.E. - 2000 B.C.E.). Within this context, the site of Khirbat Hamra Ifdan (KHI) was founded and sustained as a copper manufactory in the peripheral Faynan district of southern Jordan, unprecedented in scale and close to the source of copper ore. Before the foundation of KHI, copper production had been dispersed across the southern Levant, with multiple sites showing evidence of local production. This revelation highlights a conundrum regarding how an

export-oriented commodity like copper would flourish in the face of the social collapse occurring across the rest of the Levant and neighboring regions as the Early Bronze Age came to a close. Typically one would expect such an intensification to be impossible in the face of urban collapse. This paper will review data for copper production during the Early Bronze Age and present a revised argument describing the relationship of the copper production and distribution system originating in Faynan to the surrounding region.

Giersz, Milosz, Patrycja Prządka Giersz (Faculty of 'Artes Liberales', University of Warsaw) and Wiesław Wieckowski (Institute of Archaeology, University of Warsaw)

[227] *Entangled Encounters in the Wari World: Coast-Highland Interactions during the Middle Horizon as Revealed by the Archaeological and Bioarchaeological Investigations in the Castillo de Huarmey, North-Central Coast of Peru*

Wari (600-1050 A.D.) was the first prehispanic political organization that succeeded in the consolidation of vast lands in the central Andes into one multi-ethnic, cultural, and linguistic realm, creating the conditions of a mini world-system. The products and networks of exchange connected heterogeneous populations from distinct parts of the empire, whose political complexity was reflected in a variety of styles, due to the co-existence of local traditions, with production that imitated foreign styles, and the forced displacement of artisans. This paper shows that the Wari provincial center located at the site of Castillo de Huarmey was an important place of inter-group relationships and new identities established and negotiated by imperial elites. This is reflected not only in the monumental architecture that served as the physical focus of Wari ancestor worship, but also in the results of the bioarchaeological analyses of the human remains and grave goods from the burial chambers of 58 Wari noblewomen, considered to be the most complex set of rare Wari personal effects found to date in the previously undisturbed burial chamber which embraces diverse, and sometimes totally opposite, artistic, iconographic and technological craft traditions that originated from different cultural and technological backgrounds.

Gifford, Chad [411] see Anderson, Amber

Gil, Adolfo [91] see Salgán, Laura

Gilbert, M. Thomas P. [229] see Wales, Nathan

Gilbert, Danielle

[232] *Expressions of Power in Public Architecture in the Lurín Valley*

This paper examines public architecture and expressions of power in the Lurín Valley of central-coast Peru. During the Late Intermediate and Late Horizon Periods adobe pyramids with ramps characterize the public architecture of sites in the valley. Analysis of the architectural configuration of pyramids with ramps in relation to domestic compounds within the public sectors of the settlement indicates a hierarchical arrangement. The conspicuous design and placement of the pyramids suggest a manipulation of physical space to articulate social order. An exploration of the use of public spaces at these sites can lead to a better understanding of the types of power used to create social organization in the Lurín Valley. The comparison of maps of the public structures at contemporaneous sites and information collected during excavations reveals a distinct pattern. This implies that elites used architecture to demonstrate power on a regional scale. Analysis of public and domestic architecture is based on fieldwork conducted during the 2012-2014 field seasons under the direction of Dr. Enrique Lopez-Hurtado.

Gildor, Hezi [368] see Bar-Yosef Mayer, Daniella

Gill, Thomas [6] see Collins, Joe

Gill, Kristina (UC Santa Barbara)

[32] *Gathering Evidence: Terrestrial Plant Resources of California's Islands*

The abundance and diversity of terrestrial plant resources on the islands off the Pacific coast of southern Alta and Baja California vary in terms of island biogeographic distribution, ranging from pine forests and oak/juniper woodlands, to chaparral, cactus scrub and grassland habitats, among others. These plant resources provided food, medicine, and raw materials for island populations. However, island plant resources have long been described in the literature as "depauperate," an idea based largely on direct field observations of a flora decimated by historical overgrazing practices, yet one that has greatly influenced our interpretations of archaeological data. A growing body of paleoethnobotanical research demonstrates that macro- and microbotanical remains recovered from island contexts provide valuable data; however, interpretations vary on the extent to which recovered plants represent island resources versus mainland trade goods. We engage this discussion with a survey of the recovering modern island flora, combined with recent paleobotanical data including macrobotanical and starch grain analyses, indicating that island plant resources were significantly less marginal than previously thought.

[32] *Chair*

Gill, Lucy (Columbia University), Gabrielle Borenstein (Columbia University) and Adam Watson (American Museum of Natural History)

[212] *Life on the Edge: An Investigation of 18th Century Spanish Colonial Subsistence Strategies in the Northern Rio Grande*

The 18th century Northern Rio Grande basin of New Mexico was a politically volatile and contested landscape. Hispano settlers, including those who established the aldea of San Antonio del Embudo (now Dixon, New Mexico) along the Embudo River in 1725, found themselves entangled in a complex web of socioeconomic interactions and, at times, hostilities with diverse indigenous peoples. To what extent did these Spanish colonists adhere to European subsistence strategies or embrace native foodways? Do trends in the relative dependence on wild versus domestic species reflect trade and contact with local indigenous groups or covary with periods of heightened hostility? This study presents the results of a recent analysis of faunal remains recovered during the 2013 excavation of a plaza midden from a residential structure at Dixon, New Mexico. The faunal record not only attests to the population's long-term reliance on European domesticates (sheep, goat, pig, and cattle), but also reveals the considerable importance of wild resources (deer, elk, bison, and bear) to village inhabitants. Further, the presence of worked bone artifacts provides tantalizing evidence for exchange with local native groups or perhaps indicates the presence of genízaro members of the San Antonio del Embudo community.

Gillam, Christopher (University of South Carolina (SRARP-SCIAA))

[4] *Not Your Ordinary Models: Exploring Time and Space with Ordinal Regression and Other Methods*

Advances in Archaeological Geographic Information Science and Informatics have enabled the refinement of archaeological statistics and other quantitative methods in recent years. Along the Central Savannah River of South Carolina, recent research on prehistoric site distributions and multicomponency has resulted in the development of several novel methodologies. Multivariate Analysis of Variance (MANOVA) enables the examination of the environmental context of archaeological sites through time. Likewise, Ordinal Regression analyses enable the development of predictive models highlighting the probability of multicomponency across the cultural landscape. The potential for these methods at various scales of analysis are promising.

Gillenwater, Collin (SUNY Albany) and Marilyn Masson (University at Albany, SUNY)

[413] *From Coast to Coast: Trade Routes and Commerce of Northwest Yucatán's Mayapán*

Late Postclassic Mayapán formed the nucleus of a complex system of trade routes in northwest Yucatán, some of which endured into the Contact Period. The importance of ports and overland trade routes to commerce in late Maya history has long been acknowledged, but landlocked Mayapán's specific connections to towns and exchange facilities has not been systematically considered from an archaeological perspective. Our analysis draws on Postclassic-to-Contact Period

historical and archaeological data with the goal of framing Mayapan's trade network within a regional perspective of connected and interdependent subject and allied towns. We consider settlement pattern evidence in order to identify secondary centers and smaller towns of greatest importance to trade, due to their strategic locations along overland routes that linked Mayapan to its ports. Sourcing of nonlocal artifacts exchanged into the urban center also sheds light on coastal trading towns of greatest importance to this city.

Gillespie, Susan (University of Florida)

[305] *Blocks, Bricks, and Material Practices of Inter-Subjectification at La Venta, Mexico*

La Venta, the Middle Formative Olmec capital, is famous for its unique structured deposits composed of thousands of serpentine blocks. The discovery of these "massive offerings" along with caches of fine jade artifacts was taken as evidence of a powerful ruling class who controlled this wealth and commanded the labor of countless commoners to bring the serpentine to La Venta, shape it into standardized forms, and bury it in a ritual precinct. This paper challenges that conventional interpretation, arguing that specific practices involving certain materials and the places of their use positioned some individuals as particular kinds of subjects in relation to other subject roles. Default categories of social difference, such as "elite" or "craftsman," are insufficient. A community of serpentine block-makers, engaged in hypertrophic production, emerged in relationship with both the stewards of the ritual precinct and with the producers of the more routine objects with which the blocks were juxtaposed: adobe bricks. The physical and design properties of these objects brought to bear in the bodily dispositions of their making made and reinforced subject positions, but these cannot be understood apart from each other or from the historical, material, and political contexts in which they played out.

Gillespie, Rosemary

[339] *Discussant*

Gillette, Donna (University of California, Berkeley, Visiting Scholar)

[30] *The Sacred and the sacred*

The word sacred (or Sacred) can encompass many meanings. Some are tangible – others not. The sacred can exist in the mind or be defined on a map. Are there two sacreds – one with a small "s" and the other with a capital "S"? What constitutes the Sacred and who defines it, and with what parameters? How is sacredness determined, and who decides? Is it a legal term that is defined by the courts? Are there degrees of sacredness? Can sacred and profane co-exist? What role do Native oral traditions play in defining a sacred landscape? Is a sacred landscape static, or can it be fluid and change? From an archaeological perspective, the term sacred can be applied to rock art sites, formations on the physical landscape, rituals, artifacts, evidence of past activities, and even intangible oral traditions. Long before the word sacred entered the lexicon in the 14th century, evidence of the concept of sacredness was present. The papers presented in this symposium will explore the many facets of sacredness focusing on the concept of sacredness from an emic perspective.

[30] *Chair*

Gilligan, Cheryl (Indiana University of Pennsylvania)

[165] *Moravian Ethnic Diversity: A Faunal Analysis of Northeastern Moravian Missionary Towns in Colonial America*

Moravian missionaries in the New World built towns in close proximity to Native American village sites in order to gain and house new converts. Although these Moravian town sites have received some archaeological attention, faunal remains have seldom been studied. A comparative faunal analysis between frontier-settled Moravian mission towns during the mid to late 18th century may reveal important information about the use of animals among the diverse ethnic groups inhabiting Moravian towns. Exploring topics such as wild versus domestic animal use, preferred cuts of meat, and the use of animal bone for tools or adornment can provide new insights into the interactions

between people and animals in Moravian missionary towns. This research provides a unique opportunity to reach an often silent group of people represented in the archaeological record during the tumultuous time period surrounding the power struggle for control of Colonial American lands.

Gilliland, Krista (Western Heritage) and Robin Woywitka (Alberta Culture)

[319] *Bring on the Boreal: Site Formation Processes and Archaeological Interpretation in Northern Alberta, Canada*

Archaeological sites in Canada's boreal forest are frequently difficult to interpret due to several factors, including (1) shallow archaeological stratigraphies, (2) non-diagnostic lithics dominate artifact assemblages, (3) low abundances of preserved organic materials, and (4) high potential for disturbance (cryoturbation and bioturbation). These difficulties can contribute to interpretations based on insufficient understandings of site formation processes, producing conclusions that undervalue boreal archaeological sites. In areas under high developmental pressure, such as Alberta's northern Oil Sands region, this can be devastating, resulting in irrevocable information loss.

However, in some areas of the boreal forest, the depositional context of archaeological sites appears to be largely intact, representing an under-utilized data source with which to better evaluate their cultural, archaeological, and/or paleoenvironmental significance. Here, we present the results from a case study in northern Alberta, employing geomorphology, stratigraphy, portable and formal optically-stimulated luminescence measurements, and soil micromorphology. We demonstrate that a formerly de-valued (i.e. "written off") site is actually largely undisturbed and represents two chronologically distinct occupations that likely pre-date the middle Holocene period. Our work has wider resonance in the fields of cultural resource management and regulating resource development in regions of rapid growth, particularly the north.

Gillispie, Tom [171] see Younie, Angela

Gillot, Celine (University of Montreal, Canada)

[399] *A Geoarchaeological Study of the Ancient Quarries of Río Bec (Campeche, México)*

The stone buildings of the Río Bec archaeological zone are a testament to the emergence of a new architectural tradition in the central Maya lowlands during the second half of the first millennium of our era. To understand this new architecture and the ways it has been conceived, a recent investigation has been carried out on the technological process involved in its production. Since construction practices can hardly be appreciated without considering the materials used by the builders, this investigation began with the study of the stones employed in Río Bec and the places from which they were obtained. Two different approaches have been followed. The first consisted in the lithostratigraphic and petrographic characterization of the limestone deposits that were exploited. The second was based on the examination of the distribution and configuration of the quarries surveyed and excavated during this study, as well as the documentation of all the traces of extraction discovered. The results of these works provided significant new data on building stone procurement in prehispanic times and, in particular, on the strategies and the technological choices adopted in Río Bec to extract stone.

Gilmore, Kevin (ERO Resources, Inc.)

[65] *Excavations at the Hurdy Gurdy Bridge Site (CA-DNO-1028), a Multicomponent Habitation Site in Northwest California*

The Hurdy Gurdy Bridge site (CA-DNO-1028), located 19 kilometers in a direct line and 45 kilometers along the Smith and South Fork rivers from the coast, was excavated because it was within the impact area of the proposed replacement of a bridge over Hurdygurdy Creek by the Federal Highways Administration. Data recovery consisted of geophysical investigations, the excavation of backhoe trenches, shovel probes, and 42 square-meter excavation units. These investigations recovered cultural material from the Early/Middle Period transition through late Contact Period occupations defined by obsidian hydration (OH), AMS, and temporally diagnostic artifacts deposited on the bar and swale surface of a Pleistocene debris flow. A round, expedient, Late Period

semi-subterranean plank house (Feature 10) dated to the late 14th Century may represent an intrusion into the Tolowa homeland by ethnically distinct people from the northern interior for trade. Comparison of OH defined occupations between the sites in the lower Smith River Basin and Hurdy Gurdy Bridge suggest that through time there were periods when upriver sites were occupied more frequently in favor of down-river sites, and vice versa. These population movements may have been in response to periods of drought.

[65] *Discussant*

[65] *Chair*

Gilmore, Zackary (University of Florida), Asa Randall (University of Oklahoma) and Kenneth Sassaman (University of Florida)

[348] *Locating Events in Process: A Multiscalar Examination of Early Pottery in the Southeastern U.S. Using Bayesian Statistics*

One of archaeology's unique strengths is the ability to construct cultural histories that span vast spatiotemporal scales. It is imperative, however, that these so-called "big histories" be balanced with consideration of the actual events through which they were experienced and contributed to by real people occupying diverse contexts. In the southeastern U.S., the initial adoption of pottery technology has been variously portrayed as either a protracted diffusionary process with few discernable cultural impacts or a regionwide "container revolution" that set Archaic hunter-gatherers on an inevitable pathway toward farming, sedentism, and social complexity. In this paper, Bayesian statistics are applied to scores of radiocarbon assays associated with early fiber-tempered wares in South Carolina, Georgia, and Florida. The results are used to examine the adoption and spread of pottery technology at multiple spatial scales, ranging from the subcontinental to the local. Particular focus is directed toward two large, well-dated sites—Stallings Island and Silver Glen—that exemplify the diverse, context-specific manner in which pottery was incorporated into existing traditions and interactions. More generally, these examples help illustrate the complex and often contradictory relationships that exist between localized events and the larger historical processes in which they are implicated.

Gilstrap, William (University of Sheffield) and Peter M. Day

[79] *"A Burden of One's Own Choice Is Not Felt": Observing Ceramic Production Technology, Exchange and Consumption in the Late Mycenaean Saronic Gulf*

It is widely recognized that Mycenaean states varied in their structure and organization, were linked to different types of crafting industries, a range of trade networks and a host of consumer preferences. The Saronic Gulf is a paradoxical space that physically separates Mycenaean geopolitical states/regions, while its waters facilitate the interregional movement of people, goods and ideas. The application of thin section petrography and INAA to observe the movement of pottery, the most archaeologically visible good exchanged in this area during the Late Mycenaean period, has resulted in the identification of a restricted number of pottery production locations and the wide movement of their ceramic products. Taking into account complete vessel assemblages representing different activities within this landscape, we have identified patterns of availability of varied pottery types to ordinary consumers in the area. This paper examines links between the technical choices made during the production sequence of a select group of vessel types and the choices made at the consumer end of the spectrum. In this way, we are able to observe and characterize several key variables of the regional ceramic ecology, economy and social life of the region and to contextualize it within the wider Mycenaean world.

Gingerich, Joseph (Smithsonian Institution/NC State University), William Childress (Archaeological Society of Virginia), Daniel Wagner (Geo-Sci Consultants) and Michael Johnson (Virginia Natural History Museum)

[333] *Archaeological and Geomorphic Investigations of Paleoindian Sites near Smith Mountain, VA.*

Identification of stratified Paleoindian components in eastern North America is rare. Because few stratified sites exist, cultural chronologies and depictions of Paleoindian lifeways have been drawn from large geographic areas and warrant revision. Recent work along the upper Roanoke River in

Virginia has identified several sites that show an almost complete cultural sequence from 8,000 to 13,000 calendar years ago. These sites also show the use of a unique suite of lithic raw materials during the Paleoindian period. This variation in lithic resource use expands our current knowledge of mobility patterns within the Southeast and may highlight specific transportation corridors. A combination of both continuity and change in lithic use between the early Paleoindian and later periods provide insights into shifts in range mobility and variation in landscape use over time. In this paper, we outline our current research strategy along the Roanoke River in the southwestern piedmont of Virginia. We report on new lithic sourcing and efforts to document intact and stratigraphically separate cultural components. This research is also contributing to our understanding of climate change by documenting the localized signature of the Younger Drays and the Pleistocene/Holocene transition, through change in soil development, sedimentation rates, and landscape formation.

Gingerich, Joseph [357] see Widmayer, Elise

Giomi, Evan (University of Arizona)

[273] *Hard Choices along the Rio Grande: Piro Trade Networks and Decision-Making during the 1680 Pueblo Revolt*

The Piro Pueblos along the southern Rio Grande did not join with the rebelling Pueblos in the 1680 Pueblo Revolt and instead left New Mexico with the retreating Spanish or migrated to other Pueblos. The events of the Revolt and the circumstances of Spanish colonialism required that the Piro make political decisions such as these. The same was true for the northern Pueblos organizing the Revolt, who decided not to include the Piro as part of the rebellion. For both groups, these decisions were made within the context of existing intra-indigenous relationships, the character of which is not currently well understood. Archaeology is particularly well suited to examining economic relationships, and the U.S. Southwest is an ideal location for archaeological sourcing. Data obtained through X-Ray Fluorescence of Piro obsidian and optical petrography of Piro ceramics will be the basis for initial characterization of the economic relationships between the Piro and other indigenous groups in New Mexico prior to the 1680 Revolt. These relationships will in turn help to describe some of the context for political decision-making during the Revolt.

Giordano, Celeste [415] see Frink, Liam

Giovas, Christina [164] see Clark, Meagan

Giovas, Christina (Center for Comparative Archaeology, Department of Anthropology), Scott Fitzpatrick (Department of Anthropology, University of Oregon), Osamu Kataoka (College of Global Communication and Language, Kans) and Meagan Clark (Department of Anthropology, University of Oregon)

[233] *Prehistoric Fishing Declines at Chelechol ra Orrak, Palau: Resolving Issues of Anthropogenic Impacts and Long-Term Resource Sustainability*

Previous research at Chelechol ra Orrak in the Rock Islands of Palau has revealed several critical shifts in marine resource exploitation between ca. 3000/1700 – 0 BP. These changes include a decline in fishing, increased reliance on molluscs, particularly *Mactra* clams, and statistically significant size increases in one of the most heavily exploited gastropod species, *Gibberulus* (*Strombus*) *gibberulus*. Commonly invoked explanatory mechanisms, such as broad scale climate change and anthropogenic resource depression, fail to account for these shifts. Here, we present our findings from further investigation into these temporal trends based on analyses of fish size change and marine resource patch use. Results indicate negative evidence for anthropogenic exploitation depression and suggest that fishing declines may be driven by alternative causes that bear no direct relation to trends in mollusc exploitation. We interpret the record for changing subsistence practices at Orrak in terms of interacting, complex sociocultural and environmental variables that altered foraging constraints and opportunity costs, leading ultimately to shifts in the way Orrak's residents interacted with their environment.

Giraldo Tenorio, Hernando (University of Pittsburgh)**[107]** *Prestige Economy and Leadership in Southwestern Colombia (400 B.C.-800 A.D.)*

The capacity of the leaders in the Intermediate Area of the Americas to amass power before 1000 A.D. has been usually explained as a result of the manipulation of a religious ideology or through the creation of social debts in the context of feasting. My dissertation research in the Malagana site, in southwestern Colombia, has provided evidence indicating that these were not the only factors involved in the development of social inequalities in the region. I discuss the importance of prestige goods in the creation of social and political differentiation in the Malagana community during the Early El Bolo period (400 B.C.-800 A.D.), the role of the elite in their production and distribution, and the social context which made their control possible by the elite.

Giron-Ábrego, Mario (Boston University)**[355]** *Architectural Caves and Glyphic Stepped Platforms*

Natural and man-made caves are clearly attested to in myth, iconography and the glyphic corpus as powerful features for the ancient and contemporary Maya. Caves are paramount for they function as entrances into the sacred earth, the most powerful entity of the sacred Maya universe. A third and less explicit category of these subterranean features, although extensively documented in the Maya area, are architectural caves. This latter category, due to their architectural nature, may elucidate an understanding the meaning of the still undeciphered T685 "pyramid" or "stepped-platform" glyph as an architectural CH'EEN "cave" based on the glyphic affixation of this logogram.

Gjesfjeld, Erik (UCLA Institute of Society and Genetics)**[89]** *Archaeometric Analysis of Hunter-Gatherer Pottery from Northeast Asia*

Traditional archaeological analysis of pottery remains in East Asia has often emphasized macroscopic features of pottery including decoration, vessel form and paste composition. While these features are important in characterizing the cultural and technological aspects of pottery, microscopic and archaeometric analyses have the potential for enhancing traditional pottery research in this region by developing novel insights into social processes such as the transmission of information and exchange of resources. In the remote Kuril Islands of Northeast Asia, the use of archaeometric methods is particularly appealing as a majority of the hunter-gatherer pottery remains from this region are surface collected and do not demonstrate diagnostic design elements or vessel forms. Therefore, in order to address meaningful archaeological questions concerning the exchange of information and/or resources in the Kuril Islands, this research utilized a range of archaeometric methods including luminescence dating (TL/OSL), organic residue analysis and elemental composition analysis by ICP-MS and pXRF methods. Overall, results of this research broaden the knowledge concerning the production and use of pottery in the Kuril Islands but also highlight how maritime hunter-gatherers may have used exchange networks and social partnerships to help mitigate the challenges associated with living in this extreme and insular environment.

Glascok, Michael [123] see Boulanger, Matthew

Glass, Dara [336] see Corbett, Debra

Glassow, Michael (Univ of Cal-Santa Barbara) and Jennifer Perry (California State University, Channel Islands)**[32]** *Importation of Deer Bone to the Channel Islands, California, during the Middle Holocene*

Although California mule deer never inhabited the Channel Islands during prehistoric times, deer limb bone fragments commonly occur at Channel Islands sites dated to the Middle Holocene, and fragments of worked deer bone also occur. In addition, mortuary collections obtained in the 1920s dating to the Middle Holocene contain artifacts of deer bone, including ornaments and hair pins. We summarize the evidence of deer bone importation to the Channel Islands and argue that the abundance of deer bone items implies regular and relatively frequent commerce between the

Channel Islands and the mainland, from where the deer bone was derived. We also point out that bone of animals living on or near the islands, such as dogs and sea mammals, also was utilized, perhaps as a substitute for deer bone when not available or when deer bone would not be the most appropriate material. We conclude that although the absence of deer on the Channel Islands may be construed as an indication of "marginality," Middle Holocene occupants were able to overcome marginality through commerce, despite boat technology seemingly less sophisticated than existed during the Late Holocene, and through substitution with bone from local sources.

Glatz, Claudia (University of Glasgow)

[14] *Thinking Through Mountains: A Perspective from the Ancient Near East*

The Middle East and surrounding areas are among the most mountainous regions of the world, where a combination of material and written records provides a unique opportunity to explore highland-lowland interaction in the distant past and over the long-term. This includes issues of relevance to current efforts to document, preserve and protect mountain regions and ways of life, such as the movement of people, goods and ideas, the environmental and resource contexts and consequences of such interactions, as well as issues of mutual perception and processes of identity construction that resonate with more recent popular prejudices and scholarly approaches to mountain regions and communities. In this paper, I take a critical look at the conceptual frameworks through which modern scholarship has come to approach past and present highland people and landscapes, and, using examples from the ancient Near East, explore avenues of investigation, which can provide a more balanced perspective of highland-lowland interconnectivity and the long-term socio-cultural consequences of such interaction.

[14] *Chair*

Glover, Jeffrey (Georgia State University) and Dominique Rissolo (UC San Diego)

[38] *Exploring the Coastal Mosaic of Northern Quintana Roo: The Proyecto Costa Escondida and Scott L. Fedick's Continuing Legacy in the Northern Maya Lowlands*

Glover and Rissolo owe a great deal to Scott Fedick for his mentorship through our graduate school years and for his friendship and counsel as we embarked on our own multidisciplinary project, the Proyecto Costa Escondida. This paper highlights the contributions Scott has made to interdisciplinary research in the Maya area. In so doing, we discuss how our project on the north coast of Quintana Roo builds on this intellectual heritage. We, like Scott, are investigating the dynamic interplay between environmental, social and political forces and how these factors were materialized in the lived experiences of coastal inhabitants over the past three millennia.

Glover, Jeffrey [244] see Vaughan, Andrew

Glowacki, Donna (University of Notre Dame), Kay Barnett (Mesa Verde National Park) and Joel Brisbin (Mesa Verde National Park (retired))

[85] *Spruce Tree House: The Social History of a Thirteenth-Century Cliff Dwelling*

As one of the best preserved ancestral Pueblo sites in the Southwest, Spruce Tree House presents a unique opportunity to examine aggregation during the 1200s; a time fraught with significant social and religious changes, intensifying intraregional violence, and extreme climatic conditions that ends with widespread Pueblo exodus from the region. This paper presents our fine-grained reconstruction of how Spruce Tree House developed over time based on detailed architectural documentation and a complete tree-ring record and discusses important social organizational change to ascertain how stressful periods, such as the late 1200s, impacted settlement development and growth. Our reconstruction shows that much of the expansion and construction occurred in and after the 1240s with significant remodeling that reconfigured social relationships. Village growth in the alcove extended from North-to-South, and vertical expansion was a late development as most second and third story rooms were built years after the first story rooms. Even as the village grew and changed, residents continued to replicate specific architectural configurations, both defensive and ceremonial, indicating the intentional maintenance of key organizational canons regardless of the social changes happening. Evidence of conflict in the mid-1200s centered on important ceremonial structures

suggests some relationships within the village were contentious.

Glowacki, Donna M. [274] see Sluka, Victoria

Glusing, Brian [363] see Simpson, Kay

Gnivecki, Perry, Michael Pateman (Bahamas Antiquities, Monuments, and Museum Corpora) and Ilya Buynevich (Department of Earth and Environmental Science, Tem)

[387] *Archaeological Re-Survey, Contemporary Bahamian Cemeteries, Lucayan Prehistory, and Heritage Management*

In 2013, under the auspices of the Bahamas Antiquities, Monuments, and Museums Corporation, a re-survey of known prehistoric Lucayan sites on the island of Eleuthera was conducted in order to assess coastal storm surge and hurricane damage, as well as other forms of site modification. In addition, two sites were subjected to test excavations in order to recover carbonized material suitable for carbon-14 dating. Ground penetrating radar (GPR) was used to identify subsurface features. Both sites were partially covered by contemporary Bahamian cemeteries and these areas were not tested out of respect for living communities. The intersection of the various interests of heritage management, modern cemeteries, the use of GPR, and relationships between archaeologists and local communities and other stakeholders will be discussed.

[387] *Chair*

Go, Matthew (SFU-JLU Joint Center for Bioarchaeological Research, Simon Fraser University) and Xu Zhang (Research Center for Chinese Frontier Archaeology,)

[49] *Differing Methodologies in Computing for Smith's Mean Measure of Divergence between Chinese and Western Literature*

This paper compares different methods of measuring group biological distance in Chinese and western archaeological practice. In terms of Smith's Mean Measure of Divergence (MMD), which is used to estimate biological distances between groups, majority of recent Chinese publications have used the Grewal-Smith angular transformation method with Bartlett's correction and an MMD formula with the correction factor $1/n_{ik} + 1/n_{jk}$. Most MMD studies in English literature have moved to the Freeman-Tukey transformation and an adjusted $1/(n_{ik}+1/2) + 1/(n_{jk}+1/2)$ correction factor. The goals of this paper were to assess the potential differences between the two methods using raw data from actual Chinese publications. It was found that although not exactly the same, both methods are similar enough that compatibility between Chinese and Western research may still be feasible. However, it is recommended that the latter method be used for small sample sizes, and that statistical tests of significance be standard practice in the future.

Gobalet, Kenneth [105] see Rick, Torben

Gobalet, Kenneth (CSU Bakersfield, Emeritus) and Robert Leidy (U.S. Environmental Protection Agency, San Francisco)

[293] *An Update of the Prehistoric Native American Fishery of San Francisco Bay*

It has been a decade since Gobalet et al. (2004: Trans. Am. Fish. Soc. 133:801-833) summarized the fishes found in archaeological sites on San Francisco Bay. Numerous additional excavations have been completed in the last ten years and this report adds 32,000 bones to the totals from 23 archaeological sites from seven counties. By number of specimens found at the sites collectively, bat ray, sturgeons, herrings and sardines, northern anchovies, salmon and trout, New World silversides, surfperches, and minnows (freshwater) are found in the greatest abundance. This summary, however, obscures some fascinating regional concentrations of fishes. For instance, numerous longjaw mudsuckers dominate a site in the south bay, splittail (freshwater) are abundant at sites in northern Marin County, and Larkspur and Angel Island share characteristics of the fish fauna of the East Bay sites. Because of the attention to fine-mesh screening, it is heartening to see that the tiny bones of true smelt are now being recovered with regularity.

Goddard, Timothy**[5]** *Discussant*

Godsey, Melanie [409] see Erny, Grace

Goebel, Ted (Texas A&M University)**[87]** *The Millennium before Clovis in Alaska*

The early archaeological record of Beringia continues to be left out of most discussions of the peopling of the Americas, partly because of repeated discoveries of older-than-Clovis sites in temperate North America and Beringian archaeologists' own admission that the early northern record looks very different from Clovis technologically. In this paper, I attempt to recast Beringia in a leading role by (1) reviewing new genetic studies of humans and their prey species positing that late-glacial Beringia was the "homeland" of the first Americans, and (2) presenting new archaeological evidence of humans in Alaska 1000+ years before the time of Clovis.

Goebel, Ted [112] see Mueller, Melissa

Góes Neves, Eduardo [326] see Ozorio De Almeida, Fernando

Goff, Sheila**[369]** *Moderator***Gokee, Cameron****[23]** *Beyond the Grave: Regional Interaction in the Senegambian Megalith Zone*

Over the past century, archaeological reconnaissance and survey in the Senegambia region of West Africa has identified more than 2000 megalithic cemetery sites dating to the Iron Age (circa 500 B.C. – A.D. 1500). Although a number of research programs have explored the histories of individual sites, it remains unclear how these related to one another within a regional tradition of mortuary practice and monument construction. This paper begins to address this issue through integrated geospatial and network analyses of data published in the Inventory of Protohistoric Sites of the Senegambia (Martin and Becker 1974). First, these data are compared to the results of two systematic surveys to identify and account for sampling biases. Second, the physical and socio-material distances among megalithic sites are used to trace interactions and the relational production of identities across the regional landscape. The preliminary results of these spatial analyses illustrate how the production of power and identity in the Iron Age depended both on exclusive participation in elite networks and local legitimation through corporate burial practices.

Gold, Claire [19] see Mires, Ann Marie

Gold, Jacob**[407]** *The Negotiated Wild: Khmer-Kuy Relations and the Politics of Habitat in Lowland Cambodia before 1970*

The Lon Nol coup in 1970 marks the beginning of the contemporary era in Cambodian habitat politics. This rupture fundamentally upset the "balance of power" between two symbiotic systems characterized by floodplain agriculture and forest groups. While the Khmer propagated "srok," with its high-yield agriculture and large sedentary populations, the Kuy and other ethnic groups exploited wild animals, the forest, furnishing the Khmer empire, along with a regional Chinese mercantile network, with a wide range of valuable forest products, including metals, elephants, medicine and wide-application resins. Traditionally, the limit of the Angkorian Empire has been delineated by the topography of the Tonle Sap floodplain. However, the contemporary rush of "homesteading" farmers to rapidly deforested provinces proves that wet rice agriculture can thrive in what was once "deep forest" with sufficient labor input. The presence of Angkorian settlements "buried" in the forest is

further evidence that earlier periods of Khmer history saw an ebb and flow of “srok” style settlement. My paper draws upon field data as well as archaeological, historical and climatological evidence from the literature, to argue for the importance of ethno-political interactions in understanding the history of mainland SE Asia's habitat distributions, particularly that of lowland Cambodia.

Goldberg, Paul (Boston University), Vera Aldeias (Max Planck Institute for Evolutionary Anthropology), Dennis Sandgathe (Department of Archaeology, Simon Fraser University), Alain Turq (Musée National de Préhistoire, Les Eyzies-de-Tayac) and Laurent Bruxelles (French National Institute for Preventive Archaeology)

[35] *Aspects of Site Formation Processes at the Paleolithic site of La Ferrassie (Dordogne), France*

La Ferrassie is one of the best-known Middle and Upper Paleolithic sequences in Europe, playing a key role in the question of Neandertal mortuary behavior. Until now, geoarchaeologically-oriented research has focused on the long sequence exposed during the original excavations of Capitan/Peyrony and Delporte (early 20th century and 1968-1973, respectively) in the easternmost part of the site. Our research has exposed intact layers several meters away in the extreme western area of the site, next to the reported location of two adult Neandertal skeletons. We address here some preliminary results on the stratigraphic context of the human occupations in this western area by reconstructing the formation processes of the archaeological record. Our field and micromorphological evidence suggests that sedimentation in the west differs substantially from that that to the east, and the site is much more complex than viewing the eastern section alone. Furthermore, most of the human occupation in the westernmost part of the site was originally located on a topographic high NW of the current excavations, now destroyed by ancient road construction. These backdrops have implications for the context of the Neandertal remains and for understanding occupation strategies in different areas of the La Ferrassie site complex.

Goldberg, Kelly (University of South Carolina) and Kenneth G. Kelly (University of South Carolina)

[50] *Exploration of Exchange Networks in Nineteenth Century Guinea*

For centuries European traders of human capital have impacted the African cultural landscape, resulting in significant consequences that have played a major role in shaping new identities, group memory, and trade relations. This influence did not end with the abolition of the slave trade by European and North American countries in the early nineteenth century; rather it simply prompted traders to explore new networks and more secluded trading establishments. This pattern is exemplified in several locations along the coastal lands of Guinea, where lowland tidewater routes provide access to the mainland resources. In the spring of 2013 an international team of archaeologists excavated known trade lodges in three rural Guinean villages. Through an analysis of artifacts recovered from the 2013 field season, and an exploration of their spatial distribution, this study investigates changes to local networks brought about through contact with Europeans and their goods.

Goldberg, Paul [53] see Patania, Ilaria

Golden, Charles [86] see Schroder, Whittaker

Golden, Charles (Brandeis University) and Andrew Scherer (Brown University)

[344] *Revisiting Bird Jaguar and the Sajal of the Yaxchilan Kingdom*

In “A Forest of Kings,” Linda Schele and David Freidel painted a vivid picture of the lives and relationships of kings, queens and courtiers expressed in images and texts from the Yaxchilan kingdom during the 7th and 8th centuries A.D. In the 25 years since that volume's publication, refinements in epigraphic readings and archaeological research in the rural hinterlands surrounding Yaxchilan and neighboring capitals have greatly enriched our understanding of the political world of the Western Maya Lowlands. In this paper, Golden and Scherer explore changes in our interpretations of the realm of Bird Jaguar and his compatriots, and examine how these political

relationships played out materially on the landscape of settlement, trade, and warfare across the Middle Usumacinta River Basin.

Goldfield, Anna (Boston University) and Ross Booton (University of Bath)

[53] *Modeling the Potential Effects of Cooking on Neanderthal Hunting Efficiency*

It is an enormous challenge to reconstruct the complex and dynamic interactions between Prehistoric human groups, their resources, and their landscape from the archaeological record. This poster presents a unique model for exploring the relationship between Neanderthals and reindeer during glacial phases of the Middle Paleolithic in southwestern France, using data from zooarchaeological assemblages and experimental values for Neanderthal metabolic rates. I have developed a set of calculations that test the effect of cooked versus raw meat on Neanderthal hunting efficiency in terms of available energy from a single kill. These calculations translate potential energy increases from cooked meat into hunting range distance and time spent in a single landscape patch. Initial tests indicate that cooking lean meat increases its caloric value sufficiently to offset up to 3.7 days' worth of locomotion, or 12 kills per year, thus extending the carrying capacity of a landscape patch, particularly during periods of resource scarcity. Ultimately, I will develop differential equations for modeling Neanderthal, early modern human, and ungulate populations. These equations will provide an innovative framework for addressing landscape patch viability, mobility patterns, and adaptive differences in subsistence behaviors between Neanderthal and early modern human populations.

Goldstein, Steven (Washington University in St. Louis)

[23] *Bringing the Mountain to the Mara: The Role of Obsidian Quarrying on Mt. Eburru in Structuring Early Pastoralist Socio-Economic Identities in Southern Kenya*

Despite recent advances in characterizing the socio-economic mosaics associated with early pastoralism in East Africa, how this diversity affected social boundaries and manifested identities remain underexplored. Exclusive exploitation of a single obsidian source on the upper slopes of Mt. Eburru in the Central Rift Valley by communities associated with "Elmenteitan" material culture is a strong line of evidence for dimensions of shared identity linking some of these herding communities in southern Kenya between ca. 3000 and 1400 years ago. Surveys of upper Mt. Eburru have revealed only a single quarry area associated with Elmenteitan material, suggesting it was a central locus for maintaining both the social and economic dimensions of a regional obsidian exchange. Data from new excavations at the Elmenteitan quarry site on Mt. Eburru (GsJ50) supports models for small groups traveling up the mountain and inhabiting short term occupations around the quarry while preparing obsidian cores for transport back to dispersed communities. This evidence of small groups at Mt. Eburru suggests that the exploitation of a geographically fixed resource node by otherwise mobile peoples allowed for the creation, renegotiation, and perpetuation of early herding identities.

Goldstein, Lynne (Michigan State University)

[235] *Digital Public Archaeology Reconsidered: Lessons From Michigan State University's Campus Archaeology Program*

Since 2008, Michigan State University has had an official Campus Archaeology Program (<http://campusarch.msu.edu>) which trains students, engages with a varied public, and mitigates all ground-disturbing activity undertaken by the campus, regardless of whether it falls under state or federal law. I created and continue to direct this unique program. No other campus has the extensive mandate, budget, or administrative support that we have been able to create, and while I oversee all activities, undergraduate and graduate students conduct the bulk of the everyday work. Even with support, we are a relatively small group and employ a variety of social media tools to reach our varied audiences. This paper presents both our successes and failures in social media, and outlines some pitfalls and lessons learned that may help others in their social media work. In particular, we have had to learn that every year, our social media campaign must begin anew since there are continually new people on campus, in town, and around the world who are unaware that we exist. New audiences are great, but it is easy to forget that 5 years ago is another era on a college

campus.

[71] *Moderator*

[71] *Discussant*

Goldstein, Paul [184] see Daniels, James

Goldstein, Paul (UC San Diego)

[184] *"Tiwanaku VI" revisited: Postcolonialism and Ethnogenesis in the middle Moquegua Valley Province*

The Middle Moquegua Valley was home to between 10,000 and 20,000 Tiwanaku colonists during the Tiwanaku IV and V periods. This paper examines what became of these populations in Tiwanaku's postcolonial period. Three decades ago, the name "Tiwanaku VI" was briefly proposed to describe Moquegua's diverse "post-expansive" ceramic styles. Subsequent full coverage survey in the and excavations in the middle valley indicate that after Tiwanaku V settlements, temple, and cemeteries were largely abandoned in the 11th century, they were replaced by only 42 hectares of new Tiwanaku-derived settlement. This supports the partial depopulation suggested by the appearance of refugee populations in other regions, yet also indicates that some 4000 colonists stayed in (or returned to) the Middle Valley. Tiwanaku-derived settlement concentrated in defensible mountaintop or walled locations at Los Espejos, Maria Cupine, Cerro Chamos, Omo M11 and Echenique. This pattern indicates balkanization, conflict, and political insecurity, while the replacement of Tiwanaku V ceramics with distinct local derived styles indicates the rejection of state ideology and the loss of economic contacts and communication across the Tiwanaku realm. Yet peoples of altiplano Tiwanaku origin also curated earlier imported materials and retained Tiwanaku household and mortuary practice, indicating substantial cultural continuity.

[184] *Chair*

Goldstein, David (National Park Service)

[347] *Discussant*

Goldstein, David John [347] see Costion, Kirk

Goldtooth, Grace (THPO)

[195] *Discussant*

Golitko, Mark (Field Museum of Natural History), Ethan Cochrane (University of Auckland), Shaun Williams (University of Canterbury in Christchurch) and Jason Kariwiga (University of Papua New Guinea)

[52] *Archaeological and paleo-environmental investigations in the Aitape area of northern Papua New Guinea, 2014*

We report on archaeological and paleo-environmental fieldwork carried out in the area around Aitape, northern Papua New Guinea during June and July of 2014 targeted at understanding human response to environmental and climatic variability during the mid- to late-Holocene. We employ a multi-proxy approach to paleo-environmental reconstruction including geochemical and paleo-botanical analysis of stream and river bank sediments to examine local manifestations of Holocene climatic variability and geomorphological change stemming from tectonic activity. Excavations carried out at rock shelters on the slopes of uplifted limestone hills provide new data on settlement and subsistence practices during the last two millennia of prehistory in the area, including evidence for connection into wider regional interaction networks.

Golubiewski-Davis, Kristina (University of Minnesota)

[121] *3D Scanning of Bronze: Repeatability and Reliability across Scanners*

As 3D scanning is integrated into the archaeological tool kit, more objects are being captured using a variety of scanning methods and specific scanners. This poster explores how laser scanning, white light scanning, and photogrammetry compare across the Next Engine, Breukmann (300mm and 90mm lenses), David SLS-2 (30mm and 60mm pattern sizes), and photogrammetry (compiled with Agisoft Photoscan) using a Gauge Repeatability and Reliability test. Five objects were scanned five times using each of the methods and compared to measurements taken with a micrometer accurate to +/- .004mm. These tests provide a way to measure the variability of the scan, and thus at what level differences between scanners may be important to the user. Bronze casts were chosen for this test in particular to examine how the glare of the material reacts with the different lighting mechanisms of the scanners. Discussion of the scanners and techniques are included alongside the results of the project and implications for analysis of scans taken with different scanners.

Gomani-Chindebvu, Elizabeth [118] see Davis, Jacob

Gomes Coelho, Rui (Binghamton University)

[394] *Coffee and Captivity in the 19th-Century Paraíba Valley (Rio de Janeiro, Brazil). Landscape Archaeology and Phenomenological Recording*

The expansion of modern capitalism in the 19th century led to higher demands for commodities such as coffee, sugar, and cotton. The production of these commodities, however, was associated to an increasing industrialization of slave labor ("Second slavery"). The Paraíba valley in Rio de Janeiro, Brazil, produced most of the coffee consumed in Europe and North America. The central question is: how was the valley constructed over the 19th century as a landscape of enslavement? Labor routines dominated those who lived there, and they definitely determined the ways people defined their lives. Masters modeled particular architectures so they could try to frame the experience of their captives. Captives, on the other hand, tried to cope with the challenge of forced labor by creating their own sensorial regimes; for example, by producing songs on their labor journeys and using certain areas to perform social events. How can we as archaeologists create a comprehensive narrative that is able to acknowledge for the intersection of slavery's materiality as a productive system and its lived experience? My aim is to examine the possibility of exploring the former coffee plantations of the Paraíba valley archaeologically and discuss methodologies for landscape archaeology and phenomenological recording.

Gómez Ambríz, Emmanuel (INAH - Sinaloa)

[231] *La necesidad del ritual, el movimiento y la regeneración. Interpretaciones desde la información arqueológica en la región chalchihuiteña*

La concepción del mundo como susceptible de representación y reducción a nivel arquitectónico y del objeto dentro de la denominada cultura chalchihuites (microcosmos chalchihuiteño), permite suponer un entendimiento del mundo ligado a la vida material y ritual, de tal manera que esta concepción se ve reflejada en los objetos arqueológicos desde el trabajo de investigación. Así, esta concepción se ve reflejada en la plástica cerámica, en la iconografía, en la estructuras arquitectónicas y en el uso del paisaje como referente natural.

Entendiendo así la concepción chalchihuiteña del mundo se pueden realizar inferencias más profundas sobre sus rituales, su significado y su relación con los materiales arqueológicos, tanto en la zona de estudio como en regiones afines, así como con culturas amerindias contemporáneas.

[231] *Chair*

Gómez Puche, Magdalena [74] see Fernandez-Lopez De Pablo, Javier

Gomez-Gastelum, Luis (Universidad de Guadalajara)

[317] *Notas para el estudio de la niñez en el antiguo occidente de México II: El caso de Chupícuaro*

En esta ponencia se presenta un análisis del trato que se dio a individuos pre adultos en el sitio arqueológico de Chupícuaro, Guanajuato, México. A partir de la recuperación y análisis de la

información disponible y publicada, se observan las características de la población pre adulta y utilizando los marcos teóricos para el estudio de la niñez se ofrecen conclusiones que abordan las particularidades que se dieron a estos individuos según pasaban por las distintas edades. El estudio se enmarca en el periodo temprano del occidente de México, entre los años 700 a. C. y 300 d. C.

Gómez-Valencia, Alejandra M. [257] see Hinojo-Hinojo, Adriana

Goncalves, Celia (Universidade do Algarve - Portugal), Joao Cascalheira (Universidade do Algarve - Portugal), Mussa Raja (Universidade do Algarve - Portugal | Universidade), Omar Madime (Universidade do Algarve - Portugal | Universidade) and Nuno Bicho (Universidade do Algarve - Portugal)

[53] *Mapping the Stone Age in Mozambique: Preliminary Results*

Under the auspices of the Portuguese colonial government, Leren Barradas and Santos Junior (within the Anthropological Mission of Mozambique) carried out field surveys that resulted in a data set that includes a total of more than 100 sites, mostly attributed to the Stone Age. This early research added to the previous work of Van Riet Lowe in the Limpopo Valley, in southern Mozambique. Recently, Mozambique has emerged as a crucial geographic area to understand human evolution. Specifically, its coastal location between southern and eastern Africa is ideal for testing ideas about the appearance of Anatomically Modern Humans and their relation to early coastal adaptations. Nevertheless, the number of researchers and projects focusing on this topic in Mozambique is still limited because of a general predominance of interest in later periods among archaeologists working in Mozambique. Based on the early maps from Santos Junior and more recent data acquired through various projects, we present preliminary maps for the Stone Age prehistory of Mozambique. The map is based on a critical evaluation of the sites, and a review of some of the materials found at many of those sites, that are presently curated at the IICT in Lisbon, Portugal.

Gonçalves, Célia [174] see Bicho, Nuno

Gonlin, Nan (Bellevue College)

[75] *Digging Ceren: Rounding up the Unusual Methods in Mesoamerican Household Archaeology*

The site of Cerén, El Salvador holds a unique place for Mesoamericanists conducting household archaeology. Its extraordinary preservation fuels the imagination like few other sites can. The fragile nature of this archaeological site requires hyper-alertness, combined with methods for properly extracting and preserving information. The material remains of this deep under-earth site come to light with only the most intensive of excavation methods, many of which are unlike those commonly used at other sites. For example, some artifacts and features don't exist at all, save for vacuums that are carefully uncovered and then filled in to create physical evidence of ancient lifeways. This plaster process literally pulls the past out of thin air. Comparisons with methods used at Copan, Honduras highlight the differences and similarities that household archaeologists use to uncover remains of everyday life of the Classic Maya and afford important discussion of the implications of these methodological practices at other archaeological sites.

[270] *Discussant*

Gonzales, Mark [103] see Makovics, Alexander

Gonzalez, Albert (Southern Methodist University)

[15] *Archaeologies of Latinos in the United States*

North-American ethnic archaeologies abound. The last several decades have seen the emergence of African-American and Asian-American archaeologies alongside the initiation of efforts to decolonize the archaeology of Native America. Considering the proliferation of ethnic and revisionist archaeologies, the current absence of any archaeology of Latinos in the historical and contemporary

United States is a striking thing. Why has no such field yet been developed? How might such a field come to be developed? And how might the adoption of the analytical category of Latino archaeology be justified? This talk addresses those questions by drawing together several archaeological and material-culture studies of Latino migration, historical borderlands communities, and of everyday life in Latino households, past and present.

Gonzalez, Toni (California State University, Los Angeles) and Helen R. Haines (Trent University)

[147] *"Forth from this Dark and Lonely Hiding Place": Chultun Excavations at Ka'Kabish*

During three field seasons, chultuns were investigated at three small groups representing the settlement zone, public space, and core near the main plaza of Ka'Kabish. Puleston asserted that chultuns must have a utilitarian function because they are overwhelmingly found in rural, domestic contexts. This very processualist logic denies the possibility of domestic ritual that is so prevalent in Maya ethnography. Furthermore, at Ka'Kabish, Uaxactun, Nakum and other sites, chultuns are regularly reported from public spaces. All the chultuns excavated at Ka'Kabish contained multiple burials and objects that were likely left as mortuary offerings. The mortuary function of chultuns was noted by early investigators (e.g., Tozzer, Gann, and Ricketson) but was described as an "occasional" or "secondary" use. While the use of chultuns for burials is a secondary function that terminated further use of the feature, it occurs more frequently than previously appreciated. The presence of multiple individuals suggests the repeated performance of mortuary rituals, which constitutes a process of sacrilization of that space. The regular use of these spaces as burial sites is consistent with our hypothesis that chultuns served a ritual function, rather than the traditional, and somewhat improbable, idea that they were used as storage chambers.

Gonzalez, Lissandra [189] see Punzo, Jose Luis

Gonzalez, Lourdes (Centro INAH Nayarit)

[189] *Reconocimiento arqueológico en las sierras neovolcánicas nayaritas: dinámicas culturales y patrón de asentamiento*

El conocimiento arqueológico actual sobre la arqueología de la subprovincia de las sierras neovolcánicas nayaritas es bastante limitado, por lo que el proyecto de salvamento con motivo de la construcción de la carretera Jala-Vallarta planteó la posibilidad de efectuar estudios de tipo regional para caracterizar esferas de interacción socio-cultural. Se presenta la clasificación y organización jerárquica de los asentamientos localizados tomando en cuenta criterios como la extensión, número, características de las estructuras y conjuntos arquitectónicos, patrones internos de distribución de elementos, presencia de áreas de actividad especializadas, ubicación en relación al control de recursos estratégicos, temporalidad. A continuación se exponen los resultados del estudio de patrón de asentamiento, estableciendo la jerarquización de los sitios en las diferentes fases de ocupación identificadas. También se mostrará desde una perspectiva diacrónica definir la función social que desempeñaron las comunidades asentadas en esta microrregión en relación a las esferas de interacción establecidas entre los grupos asentados en los valles intermontanos de Ixtlán, Jala y Ahuacatlán y las comunidades establecidas a lo largo de la Costa Sur de Nayarit, específicamente en la cuenca inferior del río Ameca.

Gonzalez, Sara (University of Washington, Seattle)

[195] *Moderator*

Gonzalez Lauck, Rebecca

[198] *On Olmec Niche Figures, Altars and Thrones*

The Olmec site of La Venta in southeastern Mexico has a wide repertoire of sculptures known as "altars". These will be reviewed in terms of form and compared to similar kinds of sculptures in the Gulf Coast lowlands and other regions, in order to thematically and functionally differentiate between them.

González López, Angel (UC Riverside)**[88]** *The Epiclassic from the Mexica Perspective: Stone Sculpture Evidence*

The ways in which human societies create a sense of history and incorporate it into daily life varies through time. In the Late Postclassic Basin of Mexico for example, cultural groups perpetuated, but also abandoned aspects of the stories of their ancestors. The uses, causes, and reasons for this practice depend on a combination of several factors. The use of the past and how it was conceived and incorporated into the perspective of the Mexica is of particular interest. Previous studies have explored this topic, focusing in particular on Mexica objects depicting the “archaizing” Xochicalco style, such as the clear examples of four fire serpent heads, now in National Museum of Anthropology in Mexico City. This topic requires re-examination, principally because recent research has uncovered valuable information about the duration of Epiclassic imagery for hundreds of years. The Mexica perspective informs our understanding of the Epiclassic due to the marked continuities in form and meaning displayed by sculptural works. This paper examines the continuity of these ideas and related concepts through the analysis of a number of examples, specifically unpublished stone sculptures that were recovered from the ancient imperial capital.

González López, Ángel [298] see Matadamas Gómora, Diego

Gonzalez-Licon, Ernesto (INAH-Monte Albán, Mexico)**[410]** *The Elite of Monte Albán as a Biosocial Group: Methodological Considerations*

This paper explores who were the elite in the Mesoamerican world and considers the primary archaeological indicators used to identify and/or define them. Here, the elite is approached as a biologically defined group set apart by different aspects such as demography, gender relations, funerary practices, health conditions, diet and disease, hierarchy and inequality among its members. This information will be presented within the context of the location and characteristics of their residences among other things. This will be an opportunity to better understand the role and implications of this relevant segment of the social structure of the ancient Zapotec society.

Gonzalez-Licon, Ernesto [410] see Marquez-Morfin, Lourdes

Gonzalez-Tennant, Edward (Monmouth University)**[400]** *Anarchy, Archaeology, and the Decolonization of Collaborative Heritage*

This paper explores the relationship between anarchism, collaborative archaeology, and the decolonization of African diaspora heritage in the US and Caribbean. The heart of anarchism as a political theory articulates a robust criticism of hierarchy, and neatly intersects growing interests in collaborative archaeology and heritage. This represents a crucial intersection as the majority of archaeological projects remains rigidly hierarchical, often resulting in the silencing of local stakeholder communities. Anarchism's attention to identifying and addressing hierarchy represents a living theory for the decolonization of archaeological practice. The author grounds these thoughts through two case studies. The first examines the importance of situating scholarly interests alongside, or even below local community concerns as they relate to the 1923 Rosewood race riot in Levy County, Florida. The second case study examines how this approach alerts researchers to new projects revealing the unique interactions between Afro-Caribbean and British soldiers in Nevis, West Indies. The author's ongoing experience with anarchism continues to transform his personal practice of archaeology. This paper concludes by highlighting anarchism's unique ability to address harmful hierarchical posturing, democratize archaeological knowledge, and support our roles as researchers, educators, and advocates.

Gonzalez-Velez, Carol (California State University, Fresno)**[246]** *West Mexico, the Missing Link with South America*

Cultures in the Intermediate Area served as the catalyst for the potential connections between north and south. Maritime trading routes were the most probable form of contact and dissemination of

information and artifact styles. Iconographic evidence points to contact between various people from Chupicuaro to San Agustin. Their styles are but a few of the missing links for the interaction between cultures from north and south.

Goodale, Nathan [10] see Rubinstein, Emily

Goodby, Robert (Franklin Pierce University)

[281] *Herring, Rattlesnakes and More: Recent Research on the Late Archaic in Southwestern New Hampshire*

Sites in Swanzey and Hinsdale, New Hampshire illustrate the dynamism of the Late Archaic period in the Connecticut River drainage of southwestern New Hampshire. Longstanding economic patterns centered around the hunting of timber rattlesnakes at the Wantastiquet Mountain site and the harvesting of anadromous fish at the Swanzey Fish Dam begin during this period, establishing practices that continue throughout the Woodland and even survive the tumult of the early decades of European contact.

Goodman-Elgar, Melissa (Washington State University)

[190] *A Microstratigraphic Perspective on Early Civic and Ritual Architecture: A Case from the Kala Uyuni Site, Bolivia*

This paper brings a microstratigraphic perspective to debates about the origins of sociopolitical complexity through a study of floors from nondomestic structures. Such civic and ceremonial buildings are central to models of community formation and leadership development. In the Bolivian Middle Formative Period I (800-200 B.C.E.) communities became aggregated and expanded the range of civic architecture as populations rose. Demonstrating these trends, the Kala Uyuni site expanded and developed two sectors with notable architecture: sunken courts in the older hilltop KUAC sector, and small nondomestic enclosures in the Kala Uyuni sector, where dense occupation remains are also located. Despite differences between in architecture, microstratigraphic analyses of floors found the practice of frequent reflooring is maintained between sectors. This documents a more frequent investment in the site than that observable from standard stratigraphy. Geochemistry of flooring sequences found that construction materials are also shared between sectors. This evidence challenges the tendency to contrast architectural forms in interpretation by showing that the people who maintained these sectors conserved longstanding practices and materials. This may indicate that founding community members precipitated the shift to smaller, less accessible ritual architecture as the site expanded, thereby entrenching their social positions within the community.

Goodmaster, Christopher (Versar, Inc.) and Erin Helton (Resource Data, Inc.)

[353] *The Panther Cave Digital Documentation and Visualization Project*

Recent digital documentation efforts at Panther Cave (41VV83) have yielded a detailed record of current site conditions and provide a wealth of geospatial data pertinent to the prehistoric art preserved at the site. Three-dimensional laser scanning (LiDAR) and digital photogrammetry were integrated to record a highly accurate digital model of the rockshelter and its immediate environment. This documentation effort provides a robust corpus of data for use in the digital visualization, analysis, and management of the site. This presentation will provide an update of continuing efforts to digitally reconstruct the surrounding Lower Pecos landscape and semi-arid environment of the site. In addition, issues involving the curation and archiving of large digital datasets will be discussed.

Goodwin, Whitney (Southern Methodist University), Kacy L. Hollenback (Southern Methodist University), Fern Swenson (Historical Society of North Dakota), Matthew T. Boulanger (University of Missouri) and Michael D. Glascock (University of Missouri)

[230] *Technological Variability in Woodland and Plains Village Period Ceramics from Central and Eastern North Dakota*

This paper explores technological variability in Woodland and Plains Village period ceramics from central and eastern North Dakota. Research objectives include 1) assessing compositional variability

within Woodland period assemblages, 2) establishing whether or not ceramics could have been produced from local "clays," 3) exploring continuity in pastes from Woodland period to later Plains Village pottery, and 4) comparing Devils Lake "clays" to materials from the Missouri River drainage. This detailed technological study focuses on ceramic characteristics such as paste and temper composition, construction, and firing methods through the use of neutron activation analysis (NAA), performance and workability studies, and basic attribute analysis. It establishes a baseline for the region and technological understandings of resource use, methods of manufacture, and performance qualities of ceramics from the Middle Woodland to Late Plains Village in the Northeastern Plains.

Goodwin, R. Christopher [275] see Pevny, Charlotte

Goralski, Craig [19] see Gray, Alexis

Goralski, Craig (Cypress College) and Alexis Gray (Norco College; The San Bernardino County Sheriff's)

[19] *An Update on the Unidentified Persons Project, San Bernardino, California: The Good, The Very Good, and the Ugly*

In 2014, the Unidentified Persons Project transitioned from being a small scale volunteer-based project to a twenty-three student forensic archaeology field school, allowing for the exhumation and DNA sampling of a much larger number of individuals than had been previously possible. This paper will summarize the opportunities and challenges associated with this transition from the perspectives of multiple stakeholders, and will discuss the evolution of the project's research questions and methodologies during this transition. The paper will present the project's findings and lessons learned to date, concluding with a discussion of future directions in anticipation of additional field seasons.

Gorbahn, Hermann (German Archaeological Institute)

[31] *Pernil Alto – a Preceramic Horticulturalist Village in Palpa, Southern Peru*

In the Central Andes, plants and animals were domesticated during the Middle Preceramic period (8000-5000 BP). The earliest civilizations, like Caral (Shady 1999,2006), arose around 5000 BP. This process of increasing complexity, however, is far from being understood completely. Whereas most sites of the Middle Preceramic Period with early domesticated plants, like Chilca 1 (Engel 1988), La Paloma (Engel 1980, Benfer 1999) and Huaca Prieta (Bird 1985, Dillehay et al.2012) are located on the Pacific littoral and had a subsistence strategy based on the rich marine resources of the Humboldt current, the site of Pernil Alto is located some 50 km inland, in the middle Río Grande valley in Southern Peru. Pernil Alto dates from 5800 to 5000 BP and thus directly before the beginning of Caral. The site presents a six-phase structured village consisting of 19 huts in an arranged settlement system with 33 internal burials. It shows the development from a subsistence based first on plant collecting towards later plant cultivation. Marine resources were unimportant. Thus, in Pernil Alto we are documenting the shift from foraging to a productive plant based economy. The site is important to understand the process leading to early civilizations in the Central Andes.

Gorden, Mary

[352] *Beyond Boundaries: A Discussion of "out-of-place" Yokuts and Chumash Motifs*

Rock art research by Grant (1965) and Heizer and Clewlow (1973) revealed the prolific number of painted images that Chumash and Yokuts cultures produced in South Central California. Previous research (ibid; Lee 1991; Grant 1979) often focused on defining distinctive stylistic components and elements that characterize and differentiate these respective traditions, and define their cultural boundaries. Borderland rock art sites such as Carneros Rocks and Painted Rock have become continued points of discussion in terms of cultural affiliation and patrimony. Yet, many pictograph sites within these defined boundaries show diagnostic traits of the neighboring tribe. These sites have often been overlooked and have remained anomalies. We suggest these anomalous diagnostic elements indicate that cultural boundaries were permeable. This paper discusses a number of sites that possess distinct stylistic components and elements, which suggest extensive cultural

interactions between these two groups. These exceptions are discussed in the context of cultural patrimony, and the cultural identity of rock art sites are placed into a larger context, one that looks at the broader social, historical, and environmental pressures, which influenced the development of this magnificent rock art record.

[352] *Chair*

Gorgues, Alexis (University Bordeaux-Montaigne/Ausonius)

[177] *The Dawn of Iron Age societies: Hillfort Morphodynamics in the NW Mediterranean*

Hillforts are a typical feature of the Iron Age settlement patterns of the north-west Mediterranean (Southern France and North-East of Spain). Their morphology appears as relatively homogeneous and gives a prominent importance to the domestic sphere, the stone ramparts being often the only clearly communitarian building. The development of these agglomerations –quite small according to central European standards- is broadly contemporary with the beginnings of Greek colonization and with the subsequent rise in the seaborne trade it provoked (6th century B.C.). This supposed synchronism has led to the development of models privileging trade as a stimulus leading to the development of a new kind of settlement often qualified as “proto-urban” or “urban”.

But reality seems to be more complex, from a chronological as well as from a “phenomenological” point of view. Relying on case studies, we will show that the emergence of such new settlement patterns is multicausal and that variability is very important from one region to another. We will emphasize the fact that the enclosure of a given settlement is part of a complex dynamic involving economic, sociological and symbolic factors, and is much more progressive than was previously thought.

Goring-Morris, Nigel (Hebrew University) and Anna Belfer-Cohen (Hebrew University)

[16] *Long-term Memory, the Individual and the Community in the Later Prehistory of the Levant*

Shared historical memory is a given feature of every human society as a basic component of group identity and cohesion. With increasing tendencies towards sedentism the material culture evidence for communal memory increases, as reflected in spatial correlates at both the inter- and intra-site levels. It appears that social stress, deriving from increased community sizes and staying together for prolonged periods of time in close proximity, amongst others, raised the need for mechanisms to booster the sense of cohesion. Emphasis upon shared history through repetitive actions became focal in the behavioral repertoire. This would enmesh the entire community through to its individual members in complex webs of activities. Such circumstances would have played a role in the creation and retention of social memory, with historical ties to locations and to ancestors prior to the emergence of agriculture.

Goring-Morris, Nigel [82] see Belfer-Cohen, Anna

Gorski, Linda [43] see Barrett, Jason

Gosden, Chris [348] see Hamilton, Derek

Goshen, Shannon (Nevada Department of Transportation) and Jacob L. Fisher (California State University, Sacramento)

[341] *Bighorn Sheep Processing in the White Mountains, California*

Previous research in the eastern Great Basin using stable isotope analysis of faunal remains suggests that bighorn sheep (*Ovis canadensis*) responded to climate change by shifting their ranges to higher elevations during warm intervals. A shift in sheep ranges would have increased travel and transportation costs for central place foragers based in lower elevation valleys. We expect that hunters responded to the increased costs in a number of ways, including altering settlement strategies and increasing in-field processing of sheep to reduce transport weight. These predictions are tested using a comprehensive analysis of skeletal part representation and taphonomy of faunal

assemblages from high elevation sites in the White Mountains, California. Results focus on differences in sheep processing by elevation, time, and site function.

Gosner, Linda [368] see Harrington, Katherine

Gosner, Linda (Brown University), J. Andrew Dufton (Brown University), Alex Knodell and Catherine Steidl

[385] *Archaeology Underfoot on College Hill: Education, Outreach, and Historical Archaeology at Brown University (Providence, Rhode Island)*

Since 2012, a course on the Archaeology of College Hill at Brown University has undertaken a program of research and education – including pedestrian survey, geophysical survey, and excavation – to investigate the historic Quiet Green in the heart of the university campus. This class serves the dual purposes of promoting the material history of Brown during the university's 250th anniversary celebration and educating undergraduates in the methods, theories, and practices of historical archaeology. This paper presents the results of three seasons of study, including excavations outside of Hope College Dormitory and at the site of the university's first President's House, two of the university's oldest buildings dating to 1822 and 1770 respectively. Furthermore, we will demonstrate how a university campus can serve as an ideal space for training young archaeologists outside the confines of a more traditional field school, and how such an approach can be used to promote local history and outreach at the university and community levels.

[385] *Chair*

Goudge, Charlotte (University of Bristol)

[56] *The Copper Trade of Hatteras Island*

Excavations at the early contact Native American site on Hatteras Island, Outer Banks, North Carolina has yielded a number of copper artifacts in the course of the past six years of excavation. The excavations were run in conjunction with the University of Bristol and the Croatoan Archaeology Society in order to examine historic environment and settlement patterns of the island, as well as analyse the site's material culture of both the local Croatoan natives and the European imports. Analyses of the copper artifacts using a Portable X-ray Fluorescence device indicated that the majority of the copper was actually a smelted alloy that was predominantly of European origin. The lack of everyday native material culture such as fish hooks, harpoons and knives that is characteristic of other sites in North Carolina and Virginia, suggests that the majority of the copper artifacts was brought to the island not by exchange with other Native tribes but by trade with Europeans. This paper will discuss the evidence gained by the analysis of the copper with a view to proving the origin of the copper discovered on Hatteras Island.

[56] *Chair*

Gough, Stan [92] see Galm, Jerry

Gover, Carlton [275] see Frasca, Corey

Gowland, Rebecca (Durham University)

[299] *The Bioarchaeological Evidence for Elder Care in Roman Britain*

The elderly are the most neglected demographic in archaeology. In today's youth-obsessed society the elderly are consistently denigrated, particularly those perceived to be physically or mentally frail. This negative construction is partly a consequence of an unprecedented ageing population, often conceptualized as problematic and burdensome to society. A related and growing concern in contemporary populations is the physical abuse of the elderly, believed to be an escalating, demographically driven, phenomenon. The utility of skeletal evidence in the identification of violent trauma has been detailed in cases of child and intimate partner abuse, both modern and archaeological. Investigating the skeletal evidence for elder abuse is potentially more complex due to the confounding physiological effects of the ageing process, the lack of clinical research, and

contemporary ageist attitudes. This paper synthesizes the available medical and social research on elder abuse and evaluates the potential bioarchaeological evidence for elder mistreatment in Roman Britain. Archaeologists have the potential to provide a long-term perspective on the care and treatment of past elders and are positioned to make significant contributions to important contemporary debates regarding this global issue.

Gradoz, Machal [409] see Erny, Grace

Graesch, Anthony P. [162] see Kasper, Kimberly

Graesch, Anthony (Connecticut College) and Timothy Hartshorn (Connecticut College)

[258] *Identity Performance and Material Culture: Exploring the Limits of Archaeological Inquiry Into Social Group Identity with a Massive Assemblage of Bar-Associated Trash from Urban America*

Social identity is an elusive subject of inquiry of the archaeological past. Even in the contemporary, we know that expressions of identities are temporary and relational, as well as an outcome of socially performative assertions, contestations, and negotiations. Nevertheless, the reconstruction of social identities is a driving aspiration of all archaeological inquiry at one level or another. This paper highlights a multi-year project that explores how discontinuous variation in socially performed identities might be visible in assemblages of consumer goods discarded near bars on an American urban landscape. We focus our analysis on over 41,000 artifacts, most of which are discarded cigarettes collected in a mere 32 days of fieldwork. The cigarette - perhaps the most ubiquitous and tolerated form of trash in urban settings - is ideally suited to the study owing to the fact that it is produced and marketed as an object to be incorporated into socially performed identity expressions. Combining the methodological rigor of scientific archaeological sampling and data collection with ethnographic and sensory anthropological techniques, we consider how reconstructions of past social group identities may be impaired by traditional archaeological methods as well as by the modest sizes and spatial limits of more typical datasets.

Graf, Kelly (Texas A&M University, Department of Anthropology)

[87] *Humans on the Siberian Mammoth Steppe*

The Siberian Upper Paleolithic is divided into three phases: early, middle and late. Middle Upper Paleolithic (MUP) archaeological assemblages are both lithic and osseous in nature. Most processing tools were made on blade and flake tool blanks, whereas projectile and sewing tools were manufactured from osseous materials and an astonishing array of portable art and personal adornment pieces were also made on ivory and bone. Procurement and use of faunal resources centered on a wide array of mammoth-steppe fauna. The Mal'ta site, located near Lake Baikal, was a MUP residential basecamp miraculously preserving semi-subterranean dwellings, a double child burial (one 3-4 years old, other 1-2 years old), lithics, fauna, and mobile art and dating to about 26,000-24,000 calendar years before present. Recent ancient DNA study of the human remains indicates they shared close genetic affinity with modern-day central Asians and northeastern Europeans, contributed to the genetic make-up of first Americans and shared mtDNA with their contemporaries living west of the Urals. The genetic relationship of these dispersed late Pleistocene populations has interesting implications for their behavior. In this paper, I will focus on the Siberian MUP and how this population responded to late Pleistocene conditions on the Eurasian mammoth steppe.

[87] *Chair*

Graf, Kelly [112] see Mueller, Melissa

Graff, Emily Elizabeth (School of Anthropology, University of Arizona)

[332] *Garum and Graves: Bioarchaeological Interpretation of Cremations and Mortuary Architecture*

Mortuary contexts are archaeologically and anthropologically ambiguous. Moreover, multicomponent-use archaeological sites are difficult to interpret as the original purpose of these designated spaces reflects the ever changing living society. The ancient Roman site of Troia is a multicomponent-use site. Originally constructed as a Garum production and distribution center, in fact the largest known in the Western Roman Empire, Troia was also utilized as a cemetery throughout its use from the 1st to the 5th centuries CE. The function of the site's location culturally, socially, and economically in addition to the material artifacts and osteological remains must be considered in order to properly interpret Troia's mortuary behaviors and practices. Associated burial materials, however, often reflect the living population rather than the deceased. This paper considers the anthropological implications of cremation and associated mortuary architecture within a multicomponent-use space. From a bioarchaeology perspective, joint analysis of the osteological material and the mortuary architecture belonging to the cremations from the Necropolis of Calderia at Troia illuminates the true identities of the deceased as well as the function of Troia as a popular cemetery within the Western Roman Empire.

Graham, Shawn

[84] *Many Roman Bazaars: Exploring the Need for Simple Computational Models in the Study of the Roman Economy*

The study of the Roman economy is a battlefield of sometimes conflicting archaeological and historical models. Each model argues for different factors as the driving forces of the Roman economy. Yet, the model creators rarely make explicit how their descriptions of the functioning of Roman trade can be abstracted as concepts that allow comparison with other models. Moreover, the development of these descriptive models has not gone hand in hand with the development of methods that allow for them to be formally represented, tested, or compared. This paper explores the use of simple computational models for exploring the many descriptive models of the Roman economy. It presents two agent-based models developed using different conceptualizations of Peter Bang's (2008) descriptive Roman Bazaar model. It concludes that general patterns in diverse archaeological data types allow one to test different aspects of descriptive models through computational modelling. However, to facilitate this process, authors of descriptive models should provide guidelines of how their models can be expressed using common concepts, as well as describe the expected data patterns that would be the outcomes of their model, which would allow for their models to be tested against archaeological data and compared with other models.

[5] *Discussant*

[200] *Chair*

Graham, Elizabeth [147] see Pierce, Karen

Graham, Elizabeth (Institute of Archaeology) and Scott Simmons (University of North Carolina, Wilmington)

[413] *Balance of Trade, Balance of Power: Marine and Riverine Networks in Belize*

The Caribbean sea, like the Mediterranean, was a facilitator of travel and communication. In the case of Belize, the relatively shallow waters of the coastal shelf sheltered water-borne Caribbean traffic, and the bevy of coral islands or cayes served as way stations for far-flung coastal trade. Essential to communities in the Maya area, however, was the transfer of goods from the coast to river and lake ports for inland distribution. In this presentation, we endeavor to summarize information from the Belize sites of Marco Gonzalez, on Ambergris Caye, and Lamanai, on the New River Lagoon, to explore the role of ports in Maya economy. In the case of Marco Gonzalez and Lamanai, we also examine their occupation longevity as a reflection of a commercial dynamic that seems to have been both dependent on, but in some way separate from, inland politics and power.

Granley, Elisabeth (UW La Crosse and PIARA), Rebecca Bria (Vanderbilt University and PIARA) and Elizabeth Katherine Cruzado Carranza (University of Memphis and PIARA)

[250] *A Lithic Analysis of Food Preparation and Resource Distribution in Recuay Ritual Feasting Contexts at Hualcayán (Ancash, Peru)*

The preparation and consumption of food during feasting rituals is an ancient tradition in the Andes, occurring both on a small scale (participation of one family or kin group) and on a large scale (community-wide involvement). This poster presents a recent analysis of lithic tools from Hualcayán, an ancient Recuay community (1-600 A.D.) in highland Ancash, Peru. Excavations at Hualcayán yielded a variety of ground stone and expedient chipped stone tools and debris from a range of different Recuay ritual contexts—in tombs, patio groups, and enclosures. The analysis and comparison of tool types and the variety of raw materials utilized within each ritual space will be used to identify the different food preparation techniques of Recuay rituals at Hualcayán, as well as examine how resources were differentially distributed amongst members of the community.

Grant, Sarah (University of Calgary), Tristan Carter (McMaster University), Vecihi Özkaya (Dicle University) and Metin Kartal (Ankara University)

[91] *From Hunter-Gatherer to Nascent Farmer: Traditions of Obsidian Consumption At Epi-Paleolithic - PPNA Körtik Tepe (SE Turkey)*

Located on the Upper Tigris River, Körtik Tepe represents one of the earliest sedentary settlements in the Anatolian part of the Fertile Crescent (11th - 10th millennium B.C.). Its occupation spanned from the Pre-Pottery Neolithic A to Epi-Paleolithic, a transitional sequence from hunter-gatherer to farming economies. While the site has a strong local character, there is also clear evidence for interaction with communities at the larger regional level in southeast Anatolia. Using EDXRF to analyze more than 200 obsidian artifacts, we aim to produce a detailed characterization of the Körtik Tepe material, integrating source and techno-typological specifics, to clarify these intercommunity relations over time. Our results demonstrate the exploitation of at least three southeast Anatolian sources, the materials being consumed in multiple traditions, with blades, bladelets and various microlithic tools. Our results support the claimed close relations with Körtik Tepe's neighbors (Çayönü, Hallan Çemi, Demirköy), part of an Upper Tigris regional tradition. We next need to compare how these people were consuming these obsidians, to see if a focus on raw material alone masks community-specific practices (as with recent archaeobotanical / faunal reportage) that enable us to reconstruct the mosaic of cultural traditions within the complex processes subsumed by the term 'Neolithization'.

Grattan, John [210] see Jenkins, Emma

Gratuze, Bernard [401] see Khalidi, Lamya

Gravalos, Marie (Purdue University) and Kevin Vaughn (Purdue University)

[31] *LA-ICP-MS Analysis of Nasca Ceramics from the Residential Sector at Cerro Tortolita, Ica, Peru*

Excavations in 2014 at Cerro Tortolita, an Early Intermediate Period (EIP; ca. 100 B.C.E.-600 CE) site located in the Upper Ica Valley, Peru revealed it to be a local ceremonial center with a dense, residential component. Work at the site revealed a high quantity of Nasca polychrome ceramics from the residential sector, many of which feature technical characteristics (e.g. paint and paste) that are distinct from Southern Nasca Region (SNR) polychromes, suggesting that they are of local origin. In this study, we present the results of Laser Ablation – Inductively Coupled Plasma – Mass Spectrometry (LA-ICP-MS), of the pastes of a sample of ceramics from the residential sector of the site. We compare the composition of Cerro Tortolita's ceramics with that of Nasca ceramics previously analyzed from the SNR. We aim to better understand the production and use of ceramics in the Upper Ica Valley during the EIP, and ultimately hope to inform our understanding of the wider pilgrimage network on the south coast of Peru during this period.

Grávalos, Beth [31] see Vaughn, Kevin

Grave, Alfonso (INAH Sinaloa)

[231] *Llano Grande. ¿Un sitio chachihuiteño de explotación de la obsidiana?*

Durante los trabajos arqueológicos de salvamento con motivo de la construcción de la carretera Durango-Mazatlán se reconoció el valle de Llano Grande, en la parte alta de la Sierra Madre Occidental en el estado de Durango. Diseminados a lo largo y ancho del valle hay nódulos pequeños de obsidiana, desde algunos de escasos tres centímetros hasta los más grandes que apenas rebasan los 10 centímetros; de hecho, por lo general los nódulos no sobrepasan el tamaño de un puño. En los cerros que rodean el valle detectamos ocho zonas con evidencias de la explotación y procesamiento de la obsidiana, cuatro de ellos es las estribaciones del cerro La Bandera, en cuya cima registramos el sitio de mayor complejidad de los 62 ubicados en la zona serrana. Aunque está muy saqueado, logramos identificar las cimentaciones de piedra de ocho cuartos, tres construidos con piedra laja y los otros cinco con piedra braza. Desafortunadamente la escasa cerámica recuperada es monocroma; sin embargo, el tipo de artefactos, nos hacen pensar que su explotación se dio por parte de los grupos Chalchihuites, al parecer durante la fase Tunal-Calera (1000-1300 d.C.).

Gravel-Miguel, Claudine (Arizona State University)

[395] *Using Computer Models and Art Stylistic Similarities to Evaluate the Impacts of Geography and Social Processes on Magdalenian Social Networks*

Anthropological research has demonstrated the influence of climate and environmental resources on the lifestyle of hunter-gatherers. While most previous work has focused on environmental influences on hunter-gatherer economic and ecological behaviors, this research will evaluate the impact of different geographical and social environments on the social networks formed therein. This project will use an agent-based model to generate test expectations related to the processes that shaped the social networks of Cantabrian hunter-gatherers during the Magdalenian. The generated expectations will then be tested through a stylistic study of Cantabrian Magdalenian portable art objects. This study will increase our understanding of the different social dynamics operating during the Magdalenian, and demonstrate the potential of combining computer models with empirical data to further our understanding of the archaeological record.

[395] *Chair*

Graveratte, John

[308] *Discussant*

Graves, William (Statistical Research, Inc.) and Sarah Herr (Desert Archaeology, Inc.)

[13] *Archaeology and Heritage in the United States*

In this paper we consider how the State, through law and practice, affects United States archaeologists' abilities to conduct innovative, humanistic research in the context of cultural resource management (CRM), and may become an impediment to inclusive heritage-management practices. CRM is, perhaps, best known for its accumulation of collections and data and its ability to answer middle-range-theory questions that remain broadly ecological in scope. Here, we consider how CRM can better contribute to a growing field of heritage and identity studies and the seemingly process-based barriers to such studies. We discuss the methods and goals of some projects in the Southwest United States that have attempted to overcome these limitations and the State's role in encouraging more inclusive and more socially relevant CRM and heritage-management practice in this country.

Graves, Michael and Joseph Birkmann (University of New Mexico)

[180] *The Landscape of Agricultural Engineering in Windward Kohala, Hawaii Island*

The Hawaiian Islands are known for extensive irrigation complexes that covered coastal areas of large valleys and were recognized for their high productivity. Hawaii Island, however, had limited areas devoted to irrigated cultivation. In the study area of windward Kohala with its narrow valleys and moderately sloping ridges, the landscape for irrigated farming presented challenges that our work explores. Between A.D. 1300 and 1850 dispersed fields were established as much as 5-10 km inland within narrow valleys and on ridge lands. In these areas stream-fed canals, excavated into

and through bedrock, extended across valley slopes to water a series of pond field complexes on the adjacent ridges and within impermanent drainages. These linked complexes formed agricultural systems reflecting detailed knowledge of the land's geography and Hawaiians' capabilities to engineer gravity fed irrigation. We describe the strategies involved in transporting water over this variegated topography. These systems also crossed contiguous community boundaries, hence integrating them as social communities and centers of production. By the late 18th century, Hawaiians had created an intricate landscape where streams, ridges, valleys, drainages, slopes, and communities were bound together by systems of cooperation and complementarity in settings of intensive food production.

Gravina, Brad [190] see Mallol, Carolina

Gray, Alexis (San Bernardino Cty Sheriff's Dept., Coroner's Div.) and Craig Goralski (Cypress College, Institute for Field Research)

[19] *Forensic Archaeology and Today's Student: Managing Expectations and Providing Rigor While Maintaining Best Practices*

Fueled by the media and uniformed academic advisors, students are flooding into the field of forensics, often with unrealistic expectations of success and future employment. Although careers in forensic anthropology and archaeology are difficult to attain, today's practitioners have the responsibility to prepare and train the field's future members. This paper discusses the 2014 field season of the Unidentified Persons Project, a twenty-three student forensic archaeology field school that took place in San Bernardino County, California. This paper summarizes methods that were used to evaluate and select students for the project, strategies for setting and maintaining realistic expectations, techniques for minimizing emotional and psychological trauma for participants, and methods employed to maintain academic rigor while promoting best practices of medicolegal investigation.

Gray, Alexis [19] see Goralski, Craig

Greaves, Russell (Peabody Museum, Harvard) and Karen Kramer (University of Utah)

[153] *Play, Learning, Games, and Chaos: Ethnoarchaeology of Children's Contributions to Archaeological Site Formation*

Children's activities represent an under-appreciated aspect of the formation of the archaeological record. Unlike many adult behaviors of interest such as hunting, gathering, agricultural work, pastoral activities, trading, or raw material extraction that have significant components performed away from archaeologically visible habitation locations, most of children's effects on the record occur within the confines of camps or villages. Children use and discard a wide variety of toys that shift in popularity on a much more rapid scale than most adult technologies. They employ unique work implements and miniature adult tools used very differently than older people's technology. Children also play with, modify, and break implements from adult tool suites. Children engage in play that involves digging, burning, building, destruction, as well as helpful work and self-provisioning that also structures the archaeological record of habitation sites. Systematic approaches to how children's activities may be distinguished from other formation processes require more than the recognition of children as potential contributing agents. Data from Pumé foragers of Venezuela and other comparative ethnographic data are used to explore behavioral regularities in how children's behaviors influence material and spatial patterns in the archaeological record.

Green, Kirsten (University of Montana), Ashley McKeown (Texas State University, San Marcos) and Rosanne Bongiovanni (University of South Florida)

[206] *Always Facing East...Except When They're Not: Preliminary Analysis of Mortuary Trends at Cahal Pech, Cayo, Belize*

Mortuary patterns and practices change over time and it is the goal of this poster to present preliminary analysis of the evolution of mortuary behavior of the Maya. This poster examines different variables pertaining to mortuary practices of the Maya throughout the Classic and Terminal Classic time periods at the core site of Cahal Pech in San Ignacio, Cayo District, Belize. The analysis

focuses on burial position, orientation, presence or absence of grave goods, temporal period, burial type, grave type, and structure. Basic frequency and distribution analysis will be performed to illuminate general trends in mortuary behavior. A multivariate analysis will be applied to locate clusters and patterns across the burials. This analysis will allow for critical evaluation of the evolution of mortuary practices throughout time at Cahal Pech.

Green, Debra (Metcalf Archaeological Consultants, Inc.), Damita Engel (Metcalf Archaeological Consultants, Inc.), Dante Knapp (Laramie Soils Service) and Kimball Banks (Metcalf Archaeological Consultants, Inc.)

[230] *Rocks in Our Heads: Recent Investigations in Knife River Flint Quarry Area*

The Knife River flint primary source area was one of, if not the primary source of lithic material in the Northern Plains. Knife River flint was a major trade item from the Paleoindian through the protohistoric. Over the past several years, archaeologists from Metcalf Archaeological Consultants, Inc. have conducted projects within the Knife River flint primary source area located in north-central North Dakota. Many of these projects either directly or indirectly have been in support of oil development in the Williston Basin. These projects have resulted in the identification of several new sites as well as updates to a predictive model of Knife River flint natural deposits and site locational/spatial distribution using both archaeological and geoarchaeological methods. These activities have expanded our understanding of the nature and composition of the primary source area. This presentation reviews these projects and summarizes key findings to date.

Green, Scott (California State Parks) and Richard Fitzgerald (California State Parks)

[392] *The National Register Nomination for CA-LAN-1, the Tank Site, a Millingstone Horizon Site in Topanga State Park, Los Angeles, California*

CA-LAN-1, the Tank Site, located in Topanga State Park has been nominated to the National Register of Historic Places. This paper will summarize the unique approach for the nomination because it considers eligibility for the site under both Criteria A and D. The Tank Site is eligible under Criterion A as an event because a major scientific discovery was made there during the archaeological field investigations from 1947-1960. The Tank Site is also eligible under Criterion D due to the fact that it has yielded and still may yield important information about the prehistory of this region of California.

Greenaway , Brendon [392] see Tudor, Jessica

Greenberg, Harris [190] see Arpin, Trina

Greene, Richard and Steve Baumann (National Park Service)

[29] *The Distinctive Archaeological Landscape of the El Malpais National Monument Lava Flows*

El Malpais National Monument, located at the edge of the Colorado Plateau near the southern boundary of the San Juan Basin, was established to protect the rich diversity of volcanic geologic features that produced one of the longest sequences of volcanic activity in the United States – from about 700,000 to 3,000 years ago. Known collectively as the Grants Lava Flow, there are over nine lava flows each creating a new land surface with lava-influenced environmental conditions. The interaction of pre-contact peoples with this distinctive landscape has produced equally distinctive archaeological features: cairn trails with bridges, shrines, caches and other features including elaborate game traps, basalt architectural complexes and large, elaborate structural sites that may have served a particular function, such as water procurement camps. Studying the context of these features within the landscape and their unique architectural aspects provides an opportunity to examine past human adaptation to atypical land forms. Archaeological exploration within the flows is finding a network of trails and features that imply a sophisticated use of the landform going back hundreds of years. These preliminary archaeological investigations suggest that the trails and other site types may have served both economic and ritual functions.

Greene, Lance (Georgia Southern University)**[124]** *Virtual Curation as an Integral Part of the Conservation Strategy at the Camp Lawton Confederate POW Site*

The Confederate POW facility, Camp Lawton, was constructed in the summer of 1864 to relieve the horrendous conditions at Andersonville. Camp Lawton, a 42-acre stockade housing over 10,000 Union prisoners, was only open during October and November 1864. It was abandoned in late November as Sherman's men marched towards Savannah. Recent archaeological excavations by Georgia Southern University (GSU) students and faculty located the prisoner encampment. The area includes intact prisoners' hut features and debris from brick ovens. Hundreds of artifacts have been recovered, most of which need conservation. Many of these artifacts are delicate and require a stable environment for long-term preservation. As part of the curation process, GSU archaeologists are now creating 3D scans of selected artifacts. This process fulfills three goals: 1) creating a more detailed and expanded curation record, 2) enabling researchers around the world access to detailed, scaled 3D models of Civil War-era military artifacts, and 3) providing access to 3D models for the public. By posting a variety of digital formats, including mp4, 3D PDF, and video, we provide several means in which to view, compare, and analyze the material assemblage.

Greene, Alan (Stanford University)**[411]** *Local, Regional, and Supra-regional Political Economies in the Late Bronze Age South Caucasus: Unpacking the Contours of "Interaction"*

The Late Bronze Age (LBA) South Caucasus (ca. 1500-1150 B.C.) has long been understood as an important moment in both the economic and political development of the region's inhabitants. As local political authorities worked to produce formal governmental institutions and maintain social inequalities, they relied on trade networks of disparate lengths and intensities. The consumption of Mitannian cylinder seals from Mesopotamia and bronze weaponry from the North Caucasus can be contrasted with that of more mundane and locally produced products, recovered side-by-side, but embedded within smaller networks of distribution that were equally important to political projects. This paper explores the connections between these multiple scales of socioeconomic "interaction" and examines what they reveal about our conceptions of material flows more generally. Analyses of pottery and faunal data collected by the Project for the Archaeology and Geography of Ancient Transcaucasian Societies (ArAGATS) are used to shed light on the economic dynamics of Armenia's LB Tsaghkahovit Plain and its regional environs, contextualizing them within the broader trends that connected this prehistoric world to the ancient Near East in the south and the vast Eurasian steppe to the north.

Greenfelder, Megan (Texas A&M University)**[206]** *Examination of Mortuary Ritual Associated with Construction Events in Peripheral Sites of the Motul de San Jose polity, Peten, Guatemala*

This poster presents preliminary mortuary and human osteological data from the Proyecto Arqueológico Periferia de Motul de San Jose 2013 and 2014 field seasons, examining several aspects of mortuary ritual associated with periods of construction and site expansion at the sites of Kante't'u'ul and Chachaklu'um, located approximately 2 and 5km from the core of the Motul de San Jose polity, respectively. Occupation at Kante't'u'ul ranged from the Late Preclassic to the Early Post-Classic, while ceramics recovered from Chachaklu'um indicate occupation from the Middle Preclassic through the Terminal Classic Periods. Apparent similarities and differences in mortuary practice from these two sites are highlighted and compared to contemporaneous practices throughout the region, including Motul de San Jose and Tikal.

Greenlee, Diana (U of Louisiana - Monroe), Rinita Dalan (Minnesota State University Moorhead) and Thurman Allen (Natural Resources Conservation Service)**[220]** *More to the (Poverty) Point: Investigation of a Previously Unknown Mound*

Poverty Point, recently inscribed onto the UNESCO World Heritage List, is a monumental earthworks site built ca. 3700-3100 BP by hunter-fisher-gatherers. Until very recently, the original Late Archaic configuration was believed to include four mounds; six concentric, semi-elliptical, earthen ridges; and

a large interior plaza. A fifth mound was added about 1800 years later. In August 2013, a small, suspicious rise in the woods on the northeast edge of the Poverty Point monumental core was confirmed to be an artificial earthwork. Following convention, this sixth mound was named Mound F. Soil development within the mound fill is consistent with it being a Poverty Point-aged earthwork. Radiocarbon dates from a submound A horizon indicate it was likely built late within the Poverty Point chronology. We present the results of initial investigations, including soil coring and geophysical survey (downhole and surface magnetic susceptibility, electrical resistivity, and conductivity), undertaken to better define the limits and internal structure of the mound.

[220] *Chair*

Greenlow, Claire (Simon Fraser University), Ben Raffield (University of Aberdeen), Neil Price (University of Uppsala), Amelia Barker (Simon Fraser University) and Mark Collard (Simon Fraser University)

[57] *Viking Skeletal Remains in Northern Europe: A Survey*

This paper presents the preliminary findings of a systematic survey of Viking skeletal remains in northern Europe. The survey covers Viking Age skeletons from the homeland countries of Denmark, Norway, and Sweden, as well as putative Viking skeletons from several countries subject to Scandinavian colonization, including England, Scotland, Ireland, and Iceland. Among the attributes we are recording are the degree of skeletal completeness, chronological age of the specimens, and the evidence that supports their identification as Vikings. We are also including the results of previous osteoarchaeological work, with a particular emphasis on sex, age, stature, and pathology. Lastly, we are noting whether the specimens have been subjected to radiocarbon dating, isotopic analysis or ancient DNA extraction. The survey is not yet complete, but it is already clear that there are significant gaps in the literature. Perhaps most importantly, in a number of countries little attention has been paid to Viking skeletons. They have been reported as existing, but osteoarchaeological work has either not been performed or not been published. In the talk's final part, we will outline the steps we intend to take in light of the results of the survey.

Greenwald, Alexandra, Jelmer Eerkens (University of California, Davis) and Eric Bartelink (University of California, Davis)

[415] *Childhood Diet and Foraging in Prehistoric Central California*

Ethnographic evidence demonstrates that hunter-gatherer children may forage effectively, where ecology, subsistence strategies, and social organization are conducive to juvenile participation. We hypothesize that, in easily navigated environments with food items accessible to children, juveniles will engage in assistive or independent foraging after a period of exclusive post-weaning parental provisioning, and that differences in male and female diets will reflect the sexual division of labor among adults. We use stable isotope measures ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$) from bone collagen and serial-samples of dentinal collagen extracted from first and third molars to examine childhood diet patterns, and find evidence for independent child foraging in Late Holocene Central California among groups exploiting low-ranking, sessile resources. Our study includes 115 individuals from ten San Francisco Bay Area archaeological sites.

Greer, John [300] see Greer, Mavis

Greer, Mavis (Greer Services, Archeological Consulting) and John Greer (Greer Services, Archeological Consulting)

[300] *Rock Art Research and Ethnohistory on the Northwestern Plains and Adjacent Rocky Mountains*

Ethnohistorical sources in our region are mainly used for rock art explanation relative to warfare scenes, but they are equally important for tribal demographics and travel patterns and often more detailed than other sources. Ethnohistory can also provide support for theories about gender and age of rock art production and use when no other information is available. Such references supply details regarding religious practices and beliefs as they actually happened, not as they were later interpreted in ethnographic perspective as an idealized practice. Ethnohistorical documents can

provide information on clothes and hairstyles that reflect tribal affiliation as well as individual status within the group. Incidents of daily life that might be reflected in rock art can be found in ethnohistorical sources as well as messages that may have been left in that media as warnings to others not only relative to marking territory and warfare but also relative to possible encounters with animals and even diseases, such as smallpox. Various kinds of information are available in ethnohistorical records to answer these and other questions when investigating explanations for rock art.

Grier, Colin (Washington State University), Eric McLay (University of Victoria) and Michael Richards (University of British Columbia)

[80] *In Twos and Threes: Dating Multiple Samples and Materials to Address the Marine Reservoir Effect*

Shell and other marine-derived materials are common in Northwest Coast archaeological sites, particularly shell middens. Yet, uncertainties in the marine reservoir offset have produced a hesitation among some researchers to generate or utilize chronological information derived from marine samples. Clearly, marine-derived dates introduce significant complexities into chronology building that need to be addressed. Here, we present radiocarbon results generated through dating two or three samples of different materials, including shell, bone and wood, recovered from single contexts within archaeological sites in the southern Gulf Islands of coastal British Columbia. We evaluate whether dating two and three-sample sets can allow for a better specification of the marine reservoir offset, and more generally, whether doing so provides for more effective chronology building. We propose that targeted dating of sample sets can be useful in many situations, and that it is critical to find an appropriate balance between budgets, local research priorities and larger radiocarbon methodological objectives.

Grier, Colin [80] see Dolan, Patrick

Griffin, Dennis (Oregon State Historic Preservation Office)

[114] *Sacred Artifact or Personal Totem: Results of an Analysis of a Carved Animal Sacrum Discovered Off the Oregon Coast*

In March 2009, a couple walking along Oregon's central coast found a large, old looking, animal sacrum floating in a tide pool that had been modified to look like the head of an animal with a garnet used as an eye. Where this bone had originated, whether it represented an artifact that could have eroded from a local shell midden, or was placed on the beach to stump local scientists all remained in question. Since its discovery, many scientists have volunteered their time to try and unravel this mystery. Lines of inquiry included an effort to determine what animal the bone originated from; its age and how it arrived on the Oregon coast; the origin of the garnet; type of glue used to attach the garnet to the sacrum; and the type of tool used to modify the bone to hold the garnet. This paper summarizes the findings of a four-year investigation.

Griffin, Robert [199] see Sever, Thomas

Griffin, Robert (University of Alabama, Huntsville), Nicholas Dunning (University of Cincinnati), Tom Sever (University of Alabama, Huntsville) and William Saturno (Boston University)

[350] *Linear Features in the Bajo de Azucar, Guatemala: Multiple Origins and Uses*

Examination of satellite imagery in 2006 revealed a number of linear features of varying lengths in a remote section of the Bajo de Azucar, a large swampy depression in northeast Guatemala. Ground exploration and excavation of several of these features in 2007 and 2008 documented a combination of natural and anthropogenic origins. We argue that the ancient Maya modified and extended natural channels within the bajo for several possible reasons: 1) to facilitate transportation across a difficult landscape; 2) to access agricultural lands; 3) to create a water reserve, and 4) to facilitate aquaculture.

Griffith, Anne (St. Charles Community College)**[261]** *Archaeology Field School at A Community College: An Outreach Opportunity*

In the summer of 2014 St. Charles Community College (SCC) in Cottleville, MO offered, for the second year in a row, an archaeology field school. This project was an opportunity for people outside of a traditional 4-year college or university setting to engage first-hand in archaeological field work. By offering the field school through a community college, students who might not otherwise be able to afford a regular field term got valuable hands-on experience—many St. Charles students (and community college students in general) have children, are working nearly full-time, or have obligations beyond simple school work that make them unable to participate in multi-month-long projects. Additionally, community college field schools may be more financially feasible for those who have the desire but not necessarily the funds to work on digs throughout the US or abroad. This opportunity also served to create a vital connection between the local community and SCC. Field schools such as this can be a bridge to both students and community members who may not otherwise have an opportunity to participate in an archaeological excavation.

Griffith, Cameron (Missouri State University) and Brent Woodfill (University of Minnesota)**[338]** *All the Underworld's a Stage: Ancient Maya Ritual Stages of Xibalba*

Ancient Maya rulers dramatically gave offerings to the gods and ancestors on behalf of the local population, and the spectacle was central to the maintenance of the social hierarchy. Some of these public ceremonies took place in the subterranean realm of Xibalba, from the vantage point of visible, elevated areas within cave sites. The actors using the ritual stages described in this paper, whether from large urban centers or smaller villages in the countryside, would have used the ceremonies and setting to bolster their social standing with the people under their charge. However, the people were not the only perceived audience--supernaturals upon whom the populace depended also had to be present and impressed both with the offerings provided and a successful spectacle.

Griffith-Rosenberg, Jacob [314] see Ausec, Marne

Griffith-Rosenberger, Jacob (Kenyon College), Reagan Neviska (Kenyon College) and Chelsea Katzeman (Kenyon College)**[314]** *Fashioning Meaning through Ceramic Candeleros in the Terminal Classic Naco Valley, Northwestern Honduras*

Candeleros are simply made ceramic artifacts that consist of one or more cylindrical chambers that are usually circularly arranged and often show signs of burning. These objects are found widely across Mesoamerica though they are rare in most locales. The 100 km² Naco Valley in northwestern Honduras diverges from this pattern in that: candeleros are frequently found in Terminal Classic (800-1000 CE) assemblages here; they vary in size from items containing a single chamber to others with upwards of 20 receptacles; and their range of decorative embellishments is considerable, from incised linear designs to examples shaped as various animals. In this poster we summarize research that describes how these items were manufactured, decorated, and what those adornments might have signified to those who used the items. The implications of our findings for understanding the interplay of people and objects within this ancient society are also considered.

Griffiths, David (University of Oxford)**[18]** *Long Distances/ Local Dynamics: Overcoming 'Culture History'*

This paper will begin by reviewing how 'Viking Archaeology' came about in the 19th and 20th centuries. Formed under the influence of a handful of key scholars, with their primary index of recognition based in Scandinavian museum collections, a widely-accepted paradigm of Nordic precedence was created. Aided by a series of influential Scandinavian publications, this stance produced a seemingly fixed series of cultural references, creating a strongly-identified intrusive ethnic grouping in material culture terms. This accorded almost too conveniently with the known proto-historical emphasis on conflict and oppositional cultural development. This paper critiques this approach as unduly systematic and normative, arguing for more attention to be given to intensive and nuanced local interaction in specific situations. The role of ancestral and long-distance cultural

allegiances will be balanced against inter-ethnic relations observable in microcosms of individual settlement scenarios and in human-scaled landscapes. The role of Scandinavian homelands as an ongoing cultural inspiration to diaspora-based communities will be questioned, and reverse and multi-dimensional influences stressed. The paper will examine how we can progress from an archaeology of a 'dominant other' to an archaeology of a fugitive and dispersed actor network embedded in its surroundings.

Griffiths, Seren (Manchester Metropolitan University)

[348] *Modeling the Chronology of Neolithic Ceramics in Eastern France*

The associations of decorative motifs on Neolithic pots from the Alsace region of the upper Rhine valley, eastern France, have been rigorously studied by Philippe Lefranc and Anthony Denaire using correspondence analysis. Separate sequences are available for the Early (LBK) Neolithic pottery and for a series of related Middle Neolithic ceramic styles, running from the later sixth to later fifth millennia cal B.C. Within the 'Times of Their Lives' project, the absolute chronology of this cultural sequence has been formally modelled by combining a suite of radiocarbon dates from graves and articulated animal bones in settlement pits with the partitioned seriations. In this way, much more precise estimates have been obtained for the rate and tempo of cultural change over a millennium or so. This has also thrown up an unsuspected possible hiatus between the late LBK and the Hinkelstein phases, in the early fifth millennium cal B.C. Traditional site-based analysis, close knowledge of the material, seriation and formal modelling in a Bayesian framework make a powerful combination with which to examine in more detail a long cultural sequence.

Griffitts, Janet [55] see Waters, Jenny

Griggs, Carol [21] see Turkon, Paula

Grillo, Katherine [79] see Marzec, Edyta

(Grimes) Parker, Ashley and Brian Coddling (University of Utah)

[362] *Numic Fire: Biogeography of Foragers and Fire in the Great Basin*

Fire is increasingly recognized as a central evolutionary force shaping the earth's ecosystems. This is especially observable in the fire-prone American West, where indigenous populations frequently used low-intensity burns to modify their habitats for myriad purposes. Given the variability of environments within the Great Basin, the effects of anthropogenic burning likely had different impacts depending on local ecological and subsistence contexts. To understand where and why anthropogenic fires may have had a significant impact within the region, we examine (1) the distribution of people across the cultural Great Basin at the time of contact, (2) environmental variation in habitats, and (3) the estimated wildfire frequency.

Grimes, Vaughan [112] see Harris, Alison

Grimm, Sonja (MONREPOS Archaeological Research Center and Museum, RGZM)

[389] *Every End Is A New Beginning. An Adaptive Cycle in North-West Europe during the Weichselian Late Glacial*

Change in human societies is encouraged by innovators and slowed by traditional behavior that provides the security of a running system. However, in times of significant climatic and environmental change traditional strategies might fail and innovations can become the more attractive option. 15,000 years ago, hunter-gatherers in north-western Europe were confronted with the important change from a glacial (Weichselian) to an interglacial period (Holocene) that was characterized by rapid fluctuations between stadial and interstadial conditions. Human groups had to adapt to these conditions. During this adaptive process, the Upper Paleolithic traditions were replaced by the Final Paleolithic way of life. Based on reliably dated archaeological assemblages from northern France, southern Belgium, and western Germany, variations in technical, economic, and spatial behaviors

are documented that reflect this replacement in the archaeological material. The distribution of the appearing variations over the studied time period gives an impression of the process of change in a human society and makes a comparison with the suggested developments in the concept of adaptive cycles possible. Furthermore, the contextualization of this process in the climatic and environmental changes of the Weichselian Late Glacial allows a discussion about the role of these factors in changing human societies.

Groen, Mike (Netherlands Forensic Institute), Nicholas Marquez-Grant (Cranfield University, UK) and Rob Janaway (Bradford University, UK)

[19] *Forensic Archaeology: A Global Perspective*

Forensic archaeology is mostly defined as the use of archaeological methods and principles within a legal context. However, such a definition only covers one aspect of forensic archaeology and misses the full potential this discipline has to offer. This paper will focus on the perception of forensic archaeology as practiced in different countries, intergovernmental organizations or NGO's. It will show that the practice of forensic archaeology differs worldwide as a result of diverse historical, educational, legal and judicial backgrounds.

Groff, Amanda (University of Florida), Tosha Dupras (University of Central Florida) and John Krigbaum (University of Florida)

[205] *Take Me Home Desert Roads...Stable Oxygen Isotope Analysis and Migration in the Dakhleh Oasis, Egypt*

Analysis of stable oxygen isotope ratios in adult bone apatite and tooth enamel from the Kellis 2 cemetery (50-450 A.D.) in the Dakhleh Oasis allows for greater insight into ancient migration between this remote locality and the Nile Valley. Analyses of 45 adult males and 35 adult females are compared against $\delta^{18}\text{O}$ values from three contemporaneous Roman-Christian sites and one New Kingdom site located along the Nile Valley. The average $\delta^{18}\text{O}$ value for the Nile Valley sample is $-31.61\text{‰} \pm 1.84$, while $\delta^{18}\text{O}$ values for individuals recovered from the Dakhleh Oasis average $-26.86\text{‰} \pm 1.31$. Comparison with $\delta^{18}\text{O}$ values from the Nile Valley suggests that 12 individuals from Kellis 2 cemetery spent significant time in the Nile Valley. Specifically, results show 33 of the 35 females sampled were local to the Dakhleh Oasis, while 10 of the 45 males sampled show evidence of extended time spent along the Nile. These results are supported by ancient sources that document males as traveling in caravans or participating in apprenticeships along the Nile and Delta. By evaluating ancient migration of individuals interred at the Kellis 2 cemetery, we can address pertinent questions regarding the social organization and gendered mobility of this ancient community.

Groom, Peter [40] see Bonsall, Clive

Grooms, Michael [112] see Easton, Norman

Grooms, Michael (University of New Mexico), Norman Easton (Yukon College), Mary Samolczyk (Yukon College) and Joel Cubley (Yukon College)

[155] *Geoarchaeology at the Little John Site (KdVo-6), Yukon Territory, Canada*

The Little John Site (KdVo-6), Yukon Territory, Canada, contains the presence of Chindadn complex (East Beringian Tradition), Denali complex (Paleoarctic Tradition), Northern Archaic Tradition, and Late Prehistoric artifacts in unique stratified contexts. The site contains loess/paleosol stratigraphic sequences dating to the Wisconsin Interstadial ca. 44,000 years ago, and cultural deposits from the Late Pleistocene to the recent past. Optically Stimulated Luminescence and Accelerator Mass Spectrometry radiocarbon dates, macro and micro sediment analyses, and consideration of ancient and contemporary peri-glacial processes are presented to illuminate the environmental and depositional history of the site's unique geologic context and archaeological materials.

Grosman, Leore (Institute of Archaeology, The Hebrew University)

[40] *The Late Natufian Culture Dynamics during the Younger Dryas Event*

The Natufian culture coincided with the Terminal Pleistocene, a period of climatic unpredictability. In the Southern Levant the Late Natufian phase corresponds to the global Younger Dryas event and directly precedes the abrupt transition to early Neolithic entities at the beginning of the Holocene climatic regime. The unique cultural dynamics of the Natufian, shifts in subsistence strategies and the environmental setting of various sites are the key for understanding the process of Neolithization. Yet, the effects of the Younger Dryas on the Late Natufian population remain poorly understood. Did the climatic event delay or halt the cultural processes that promoted the shift to agriculture? Did cultural dynamics maintain their course toward Neolithization in spite of the short-lived climatic deterioration? New perspectives on these questions are provided by new evidence from two very Late Natufian sites in Israel—the burial cave of Hilazon Tachtit, and the residential village of Nahal Ein Gev II.

Grove, Matt (University of Liverpool)

[84] *Climatic Variability and Hominin Dispersal: The Accumulated Plasticity Hypothesis*

It has long been known that temporally unstable environments are likely to promote the evolution of plastic adaptations, whilst it is equally clear that such adaptations are characteristic of successful colonizers. These two established findings, however, are rarely related. This contribution bridges this gap using a very simple evolutionary algorithm that tracks the evolution of plasticity under various climatic regimes, allowing for the construction of an index of climate-mediated dispersal potential. Model results suggest populations accumulate high levels of plasticity during highly variable climatic phases and express such heightened plasticity via dispersal in subsequent low-variability phases. This putative scenario is referred to as the Accumulated Plasticity Hypothesis, and is tested using a high-resolution precipitation record from Lake Tana, Ethiopia, together with the dates of the first *Homo sapiens* dispersal out of East Africa. The primary dispersal phase identified in the Lake Tana record between 112ka and 97ka accords remarkably well with the timing of *Homo sapiens* arrival at the Israeli sites of Qafzeh and Skhul, and with dated 'Southern Route' sites in Yemen and Oman. This dispersal chronology is discussed in relation to recent revisions of genetic dates for the origin of non-African modern humans.

Grove, David (Univ of Florida)

[172] *Discussant*

Grove, David [292] see McCall, Grant

Gruhn, Ruth [119] see Hart, Isaac

Grund, Brigid (University of Wyoming)

[12] *Modeling the Replacement of Atlatl by Bow Weaponry: Technological Learning Curves and Task Differentiation in Prehistory*

Understanding technological replacement is a ubiquitous problem in archaeology. Modeling the transition from atlatl to self bow has implications for elucidating the driving mechanisms behind why and how prehistoric culture change occurs worldwide. At different periods of human prehistory, atlatls were replaced by self bows as primary hunting weapons on all continents except Australia. Previous scholars have hypothesized that this shift may have occurred when changes in environment/subsistence strategies and/or a rise in social complexity and warfare favored the bow over the atlatl. Quantitative, diachronic data obtained from atlatl and self bow target shooting suggest that physical constraints and distinct patterns of learning inherent to using each weapon may have acted as causal factors of technological change under shifting environmental conditions when considered under a framework of human behavioral ecology. Furthermore, these data indicate that the transition from atlatl to bow would have necessitated changes in age and sex/gender-based task differentiation for prehistoric children, women, and men.

Gruner, Erina

[364] *Lithic Analysis from the Rainbow Forest Clovis Site*

During the late Pleistocene the Rainbow Forest Playa Paleoindian site at Petrified Forest National Park was an area where Clovis people procured lithic materials and took advantage of a local riparian microenvironment. This poster presents recent research on lithic tool assemblages from the Rainbow Forest Playa site, including microwear analysis from archaeological materials and the results of replicative experiments. Results suggest that while the site was clearly used as a lithic quarry, a high percentage of artifacts such as blades, flakes, and stage four bifaces were expediently produced for local processing activities, then discarded.

Grunwald, Allison (University of Wyoming)

[122] *Bashing Bones – Experimental Archaeology and its Application to the Carter/Kerr-McGee Site*

Thirty years ago, the Paleoindian bison bonebed at Carter/Kerr-McGee, located in northwest Wyoming, was interpreted as a winter kill-butcher locale with possible frozen meat storage. The recent complete analysis of these 9,000 year-old bones, originating from about 50 *Bison antiquus*, and comparisons of the bone fragmentation patterns at this site with those of experimentally broken bones, supports this initial assessment. Preliminary results confirm the presence of 15 regular spiral (fresh) breaks and two irregular spiral (non-fresh) breaks on long bones. Irregular spiral breaks, indicated by either a curvy or angled fragmentation line that follows the normal spiral or helical path around a long bone, is the primary exhibited pattern in bones that were experimentally hammerstone-cracked while frozen or thawed. The presence of this diagnostic feature on bones in the Carter/Kerr-McGee assemblage may indicate the practice of freezing long bones for delayed consumption of marrow as well as meat. This research has implications for interpreting winter subsistence activities of Paleoindians on the North American Plains as well as contributes significant data to our understanding of Quaternary bison morphology and evolution.

Guan, Ying (Institute of Vertebrate Paleontology and Paleoanthropology) and Xing Gao

[179] *Residue Analysis in Chinese Paleolithic Studies: Perspectives and Case Studies*

Archaeological plant residue analysis has developed considerably in China during the last ten years. State of the art technology has been broadly and successfully applied by archaeologists at various Paleolithic sites. Issues about stone tool function, plant use, the origin of agriculture and the like can now be deeply discussed with the direct evidence of residues from stone artifacts. This is the case for either chipped stone or ground stone tools. However, this technology requires archaeologists to follow certain regulations and design the whole project from the beginning, before the artifacts are unearthed from the sediment. Also, the time range in which this analysis can be applied needs to be discussed. The question arises as to how long plant microfossils can remain on the surface of the Paleolithic artifacts. In this paper, we present the results of several case studies concerning the preservation of Paleolithic micro-remains from different sites.

Guanghui, Dong (Lanzhou University), Ying Yang (Lanzhou University), Hui Wang (Gansu Province Institute of Cultural Relics and Ar), Xiaoyan Ren (Qinghai Provincial Institute of Cultural Relics an) and Fahu Chen (Qinghai Provincial Institute of Cultural Relics an)

[345] *The Introduction and Early Utilization of Barley and Wheat in Gansu and Qinghai Provinces, Northwest China*

Barley and wheat are now important cultivated crops in northwest China, especially on the Tibetan Plateau, and are suggested to have been firstly domesticated in West Asia before 10000 cal yr BP. When these two crops were first introduced to China and elsewhere in Eurasia has been widely discussed in recent years. Gansu and Qinghai Provinces are key regions of the "Ancient Silk Road," and may have formed important routes in "Food Globalization in Prehistory." Based on archaeobotanical study and direct radiocarbon dating of charred barley and wheat seeds, along with stable isotopic evidence from Bronze sites in Gansu-Qinghai Region, we discuss the introduction and early utilization of these crops in the area. Our results suggest barley and wheat were introduced into the area around 4000 cal yr BP, and became important cultivated crops and staple foods a few

centuries later.

Guderjan, Thomas [176] see Cook, Duncan

Guderjan, Thomas (University of Texas at Tyler)

[413] *Riverine and Maritime Trade Routes on Caribbean Side of the Yucatan Peninsula.*

Riverine routes from the Caribbean coast from Belize River north to Laguna Bacalar are examined in the context of the major centers, intensive agricultural fields, and patterns of production, transport and centers of power. By contextualizing our understanding of major sites in terms of the opportunities and limitations offered by the riverine transport systems, we can better understand the economic basis of how and why various important centers rose to prominence. Further, these trade opportunities offer insight into how some leaders acting as clever agents were able to orchestrate survival of their cities past the general depopulation of the region.

Gudiel, Lucia

[38] *An Ethnoarchaeological Approach to Understanding the Role of Root-crops in Ancient Lowland Maya Subsistence.*

Dr. Scott Fedick's research goals have always emphasized the importance of understanding the diversity and ingenuity of lowland Maya subsistence. Through his guidance and mentorship my dissertation focus was developed to explore the role of root-crops in ancient Maya subsistence. Recent paleoethnobotanical research has demonstrated that the ancient Maya diet included a wide array of plant foods. Currently lacking is enough evidence for the role of roots-crops. To begin to acquire an understanding of how to best recover evidence of root-crops it is important to understand all the biases that may affect their visibility and patterning in the archaeological record. Cultural and natural processes transform material remains morphologically, quantitatively, spatially and relationally, thereby transforming the archaeological record. My doctoral study examines the presence and significance of root-crops for the ancient lowland Maya by using a multifaceted approach. One such facet is an ethnographic study to document the cultural value of root-crops and the behaviors that would lead to the incorporation of root-crop starch into the archaeological record. Observing their use-history from cultivation through discard in modern communities may provide an understanding of the relationship between these behaviors and the location and condition that root-crop starch might enter the archaeological record.

Gudino, Alejandra [367] see Lippi, Ronald

Guebard, Matthew

[29] *Developing New Interpretations from Old Data at Montezuma Castle National Monument, Arizona*

This paper addresses recent archaeological work at the Castle A site (AZ 0:5:95 [ASM]), located within the Montezuma Castle National Monument boundary in Camp Verde, Arizona. Initially excavated and stabilized in 1934 by National Park Service archaeologists Martin Jackson and Sallie Pierce, the project is a historically significant event in the development of Verde Valley archaeology. Based on Jackson and Pierce's interpretation of stratigraphic evidence, they believed a catastrophic fire destroyed the site long after abandonment, an interpretation that has persisted for over 80 years. A recent reanalysis of ceramic data coupled with archaeomagnetic dating strongly suggests this initial interpretation is incorrect. Instead, evidence points to a large and intentional fire resulting in the abandonment of the site during the last quarter of the fourteenth century.

Guengerich, Anna (University of Chicago)

[78] *Chachapoya Domestic Architecture: Identity and Interaction within, across, and beyond Regional Boundaries*

Recent research among Chachapoya societies, who lived in Northeastern Peru between A.D.900-1500, has drawn attention to the diversity of material culture associated with different sub-regions

spanning this large area. In the face of this diversity, one basis that archaeologists have consistently used for grouping these societies together is domestic architecture. Communities across the Chachapoya region built circular houses out of stone, adorning them with functional and decorative features unique to this region, including platform-bases, cornices, and, in many areas, geometric friezes. At the same time, circular stone domestic architecture was also a hallmark of Late Intermediate Period (A.D.1000-1450) settlements throughout the highland Central Andes. Chachapoyas appears, therefore, to represent a regional instantiation of a much broader phenomenon. In light of this situation, this paper elucidates the relationship between domestic architectural form and cultural, ethnic, or social affiliation at the scales of sub-regions within Chachapoyas, of the Chachapoyas region as a whole, and between Chachapoyans and neighbors in other regions of the Andes. In the process, I pose a number of questions for future research on Chachapoya circular architecture, including the trajectory of its development and the significance of architectural diversity across and within settlements.

[78] *Chair*

Guenter, Stanley (Southern Methodist University)

[306] *On the Fall of Copan, Teotihuacan, and the Origins of the Fate of 8 Ahau*

"A Forest of Kings" was groundbreaking for its integration of epigraphy, archaeology, and ethnohistory. In their book, Schele and Freidel discussed the Early Classic Teotihuacan-Maya cultural and political interaction as well as the fall of Copan, and the larger issue of the collapse of Classic Maya cities, and even the fall of Postclassic Mayapan. In this presentation I wish to expand on and integrate these disparate themes in an effort to answer the question of why the Colonial era Maya associated Katun 8 Ahau with destruction, collapse, and the abandonment of the great cities of their past. I will argue that a number of early major episodes of collapse in the Maya world, falling on 8 Ahau dates, led to this association and that the collapse of the last Maya kingdom, the Itza, in 1697, was an echo of the collapse of the first great Maya kingdom 1500 years earlier, both falling in Katun 8 Ahau.

[408] *Chair*

Guenter, Stanley [408] see Lopez, Oscar

Guernsey, Julia (University Of Texas At Austin)

[151] *Izapa and the Iconography of Water and Economics*

The stelae of Izapa have long been analyzed within a mythic framework, drawing heavily on longstanding interpretations of mythological narratives like those of the Maya maize god. Such interpretations, while fundamental to understanding the complex meanings of such imagery, nevertheless often neglect other salient aspects of the scenes, including elements that speak to more economic concerns, particularly those that revolved around water transport. This paper argues that a re-analysis of the Izapa imagery reveals elements of the iconography that allude to the sophisticated networks of economic productivity and exchange that were undoubtedly critical to the rise of Izapa during the Late Preclassic period, and which were couched in mythic narratives.

[151] *Chair*

Guernsey, Julia [306] see Reese-Taylor, Kathryn

Guerra, Rafael [244] see Hoggarth, Julie

Guerrero, Marcos

[195] *Discussant*

Guevara, Evelyn (Department of Forensic Medicine, University of Helsinki, Finland), Antti Sajantila (Department of Forensic Medicine, University of Hel), Jukka Palo (Department of

Forensic Medicine, University of Hel) and Sonia Guillén (Centro Mallqui, Institute of Bioarcheology, Peru)

[78] *Assessing the Genetic Diversity in the Extant Chachapoya Population from Northeastern Peru Using Uniparental DNA Markers (mtDNA and Y-chromosome)*

The aim of this study is to elucidate the origin and population history of the human communities from northeastern Peru, with both contemporary and ancient DNA data. For the first phase of the study, contemporary Y-chromosomal (23 STRs) and mitochondrial (HVR1 and HVR2 sequences) data from four populations (Chachapoya = 276; Jivaro = 47; Huancas = 21 and Cajamarca = 34) distributed in the northeastern region of Amazonas (Peru), was assessed. At haplogroup level, the markers showed differential proportions of non-native genetic contribution (mtDNA = 11%; Y-Chromosome = 43%). This reflects the history of European colonization that took place during the 16th century, which favored male-mediated European gene flow into the native gene pool. However, even though the Chachapoya area shares a common history of European colonization with several other populations in the Americas, the levels and nature of genetic diversity suggest that the Chachapoya has had a distinctive demographic history, shaped by their geographical position between highlands and jungle. For instance, the Chachapoya population shows a pattern of population expansion seen only in a few other South American populations. Another interesting feature is that the Chachapoya assumes a basal position in mtDNA phylogenetic trees within South American populations, which may suggest an early origin for this singular people.

Guidry, Hannah (TRC Environmental)

[311] *Archaeological Investigation and Relocation of a Slave Cemetery at the Nashville Zoo, Davidson County, Tennessee*

Excavations on Nashville Zoo property, once part of the Grassmere Plantation established ca. 1810, identified and removed 20 individuals from an unmarked cemetery. Evidence from coffin and clothing remains indicates the cemetery dates from the early to mid-nineteenth century. The absence of elaborate coffin hardware common of the time, the cemetery location, and the known slave-holding history of the farm indicate this was a slave cemetery. Most of the wooden coffins were hexagonal with few examples of hardware beyond nails. A trend in button material from only handmade shell and bone to the addition of post-1840 porcelain buttons in the north portion of the cemetery suggests expansion in this direction through time. Additionally, blue and white glass beads were interred with two infant burials. The orderly nature of the cemetery arrangement demonstrates a lasting, organized method to the burial practices. Following excavation, the individuals were moved to the historic farm portion of the Zoo, and reburied in the same arrangement. Information gleaned from these excavations will be incorporated into the existing historic interpretive program at the Zoo. The remains and artifacts from this cemetery provide insight into the life, death, and burial customs of an enslaved population in Middle Tennessee.

Guilfoyle, David (Applied Archaeology International)

[336] *Local Contexts, Global Application - A Comparative Analysis of Collaborative and Community Archaeology Projects in Western Australia, British Columbia and Alaska*

Collaborative heritage management projects requires adaptation to local customary protocols, local structures, and local community goals, and so necessitates a uniquely, localized focus. At the same time, developing, formalized approaches to collaboration that have universal elements – structures and processes - that are applicable in any context, is a goal in the continual evolution and development of a fully integrated collaborative, community archaeology. This means identifying those structures and processes that operate to overcome the specific barriers and/or opportunities that exist within a local community context. The differences (and similarities) between one local context and another are due to contrasting restraints/opportunities derived from government regulations, historical contexts, social structures, land tenure/access, industry impacts, academic agendas, and prevailing land management regimes, among other factors. Using several case studies of projects currently underway in Western Australia, British Columbia, and Alaska, the paper outlines the challenges, opportunities, and outcomes when undertaking collaborative and community archaeology projects operating within different socio-political contexts. The goal of this analysis is to identify the similar mechanisms established that transcend the contrasting, external barriers and

opportunities. In so doing, the paper explores the wider applicability of developing a formalized, structural model of collaboration in cultural heritage management.

Guillen, Sonia, Gilmer Medina and Agustín Rodríguez

[78] *Redefining the Chachapoya Territory*

The number of studies in the ancient Chachapoya territory increased tremendously in the last two decades. It is clear that the concept of a Chachapoya unit does not have a strong basis. This is not a new idea, ethnohistorical documents refer to the differentiated communities included in the common denomination introduced since the time of the Inka conquest. This presentation reviews the distribution of sites referenced in the literature, introducing new data based on speleological studies, ancient agricultural technology, and the differentiation of mortuary practices. This evidence, in light of the ethnohistorical references to the ethnic groups that populated this area, shows a differentiation that is still claimed by local groups and which appears to be more in accordance with local history. The site of San Jerónimo near Pedro Ruiz in Amazonas, discovered in 2011, is used as an example of this complex scenario. Although still lacking a comprehensive study it shows a landscape with great variation in mortuary practices, intense agricultural activity and large settlements. The discussion aims to define whether clear ethnic boundaries are stronger than the association to a Chachapoya denomination.

Guillén, Sonia [78] see Guevara, Evelyn

Güimil-Fariña, Alejandro [409] see Parcero-Oubiña, César

Guiterman, Christopher (Tree-Ring Lab, University of Arizona), Thomas Swetnam (Tree-Ring Lab, University of Arizona), Jeffrey Dean (Tree-Ring Lab, University of Arizona), Nathan English (School of Earth and Environmental Sciences, James) and Christopher Baisan (Tree-Ring Lab, University of Arizona)

[110] *Tree-Ring Sourcing of Great House Timbers and the Plaza Tree of Pueblo Bonito, Chaco Canyon, New Mexico*

Materials arriving in Chaco Canyon from A.D. 900 to 1150 came from many distant sources, and the necessary construction timbers for the great houses are no exception. Here we present tree-ring sourcing of great house construction timbers and the plaza tree of Pueblo Bonito (the “rooted tree”, labeled JPB-99). To source these trees, we compared their tree-ring growth patterns to a network of millennial-length tree-ring chronologies surrounding the San Juan Basin. For JPB-99, we present new documentary evidence regarding its discovery as well as new strontium isotope ratios for the tree and a set of extant ponderosa pine trees in Chaco. Results indicate that construction timbers were primarily brought from the Chuska and Zuni Mountains. The Chuskas only supplied wood after ca. 1020 and then became more important than the Zunis through the early 1100s, coincident with other materials (e.g. stone and pottery) that have been sourced to the same areas. In testing multiple hypotheses about JPB-99, we find that it most likely was brought to Pueblo Bonito from the Chuska Mountains sometime after it died in the early 1100s. Our findings support and expand on earlier sourcing efforts indicating long-distance timber procurement for great house structures in Chaco Canyon.

Gulevich, Rimma [28] see Kukekova, Anna

Gullapalli, Praveena [101] see Abraham, Shinu

Gullapalli, Praveena (Rhode Island College), Shinu Anna Abraham (St. Lawrence University) and K.P. Rao (University of Hyderabad)

[402] *Iron and Glass: Reconstructing (Overlapping) Technologies in Early South India*

Recent survey fieldwork undertaken as part of the ongoing project, Production Landscapes of Southern Andhra Pradesh (PLoSAP), has revealed a complex material landscape. The scale and

variety of the remains seem to indicate that various technologies – and especially pyro-technologies – were consistently present in this area, while the spatial distribution of the remains suggests that these technologies were differentially distributed across the survey areas. A more detailed analysis of the production debris highlights the challenges in correlating technical processes with the recovered artifacts. Technologies such as iron production and glass-working engage with similar high-heat techniques and therefore result in overlapping material assemblages, both in the production apparatus and in the waste produced. Being able to distinguish between potentially closely related production practices is fundamental to delineating the crafting communities that populated the landscape of early South India, and therefore to understanding the relationships that may have existed between them.

Gunter, Madeleine (College of William and Mary), Nathan Goodale (Hamilton College), David Bailey (Hamilton College), Ian Kuijt (University of Notre Dame) and Ryan Lash (Northwestern University)

[56] *Interpreting Ecclesiastical Mobility: A pXRF Study of Medieval Gravestones in Ireland*
Western Ireland's early medieval (700-1200 A.D.) landscape—dotted with stone cemeteries and structures—provides an ideal setting for studying ecclesiastical lifeways through methods of raw materials characterization. Archaeological analyses and oral history suggest that people living in small ecclesiastical communities between the 6th and the 12th centuries exchanged and transported gravestones. While traditional archaeological analysis of the shape and stylistic design of gravestones from five cemeteries in western Connemara, Co. Galway, illustrates clear similarities, this analysis alone cannot define systems of gravestone exchange or transport.

Using portable X-Ray Fluorescence (pXRF), we seek to understand broad provenience patterns for over 200 medieval gravestones from five coastal monastic sites by comparing their elemental signatures with those of local bedrock lithologies. Preliminary data analysis revealed that several gravestone lithologies are non-local to the islands where they were recovered, suggesting that people likely transported gravestones between islands. In light of recent debates surrounding pXRF reliability, this project highlights pXRF's utility as a tool for supplementing conventional archaeological and geological field methods. More broadly, this project offers a better understanding of medieval Ireland's ecclesiastical communities, their mobility patterns, and their interconnected monumental landscapes.

Gurova, Maria (Dr) and Clive Bonsall (University of Edinburgh)

[74] *Environmental Change and the Neolithization of Southeast Europe: a Bulgarian Perspective*
Any discussion of Neolithization on the part of the Balkan Peninsula that lies within the territory of Bulgaria has to confront two seemingly long-established and incontrovertible 'facts' – the abrupt appearance of a fully developed Neolithic 'package' c. 6100/6000 cal B.C., and the virtual archaeological 'absence' of a pre-Neolithic substratum. This paper focuses on two inadequately discussed aspects of the ongoing debate surrounding the spread of farming across SE Europe: 1) the environmental potential of the region for pre-Neolithic hunter-gatherer settlement against the background of substantial climate and vegetational change during the Terminal Pleistocene and Early Holocene, and 2) the appearance of a distinctive raw material ('Balkan Flint') and toolkits that are one of the hallmarks of the supra-regional Karanovo I–Starčevo–Criș–Körös cultural complex.

Gurt, Josep Maria [402] see Torrano, Alexis

Gusick, Amy (University of California, Santa Barbara) and Jon Erlandson (University of Oregon)

[32] *Why Did Paleocoastal People Settle California's Islands?*

Islands have long been viewed as marginal habitats compared to mainland regions where terrestrial resources are generally more abundant and diverse. We examine this concept of island marginality by reviewing evidence for Paleocoastal settlement of islands off the Pacific Coast of Alta and Baja California. If the islands were marginal, we should expect human settlement to occur relatively late in

time and early use of the islands to be sporadic and specialized. For the Northern Channel Islands this is clearly not the case, with human settlement occurring by 13,000 years ago and extensive evidence for Paleo coastal occupations between ~12,200 and 8400 years ago. There is less evidence for Paleo coastal occupation of the Southern Channel Islands, but crescents found on San Nicolas suggest that Paleo coastal people visited this island. Off Baja California, there is evidence for sustained maritime occupation of Cedros Island by 12,000 years ago, although the island was connected to the mainland at the time. Although the earliest human history of California's islands is clouded by sea level rise, coastal erosion, dune building, and differential research, the evidence suggest that the Northern Channel Islands, at least, were optimal habitat for Paleo coastal people, with ample food, freshwater, and other resources.

Gust, John

[38] *Debt Peonage and Free Labor: Post-Caste War Sites in Northern Quintana Roo and Western Belize*

The Caste War left an indelible mark of the Yucatan Peninsula including helping to perpetuate an abusive labor system that continued until the Mexican Revolution. This paper explores the living conditions at sugar production facilities near the north coast of Quintana Roo, Mexico through comparison to a similarly-aged site in western Belize, San Pedro Siris. San Pedro Siris was a free village of primarily Maya families that were pushed south into Belize by refugees as the Caste War ended. Workers from San Pedro Siris worked as lumberjacks but remained independent. In comparison workers at sugar production sites in northern Quintana Roo worked under a system of debt peonage and land scarcity. As lumber and sugar production are of similar physical intensity, and as it appears that the primary source of imported goods for all sites under discussion were ships following a trade route that extended along the north and east coasts of the Yucatan Peninsula, it is proposed that the primary difference in way of life between these two areas was the ownership-labor regime in operation at each site.

Gustas, Robert (University of Alberta)

[320] *Least Cost Analysis of Peopling Events on the Northwest Coast of North America*

The peopling of the Americas continues to be a relevant issue in contemporary archaeology. Due to the small number of discovered sites that predate 10,000 years before present, the chronology and method of these migration events are not well understood. Previous research has been unsuccessful in consistently identifying sites from this time period and better models are needed to successfully locate sites in this landscape, which has gone through radical change over the last 16,000 years. This project developed a new method of modeling migration using least cost analysis (LCA) of Late Pleistocene maritime travel to determine the areas most likely to have been traveled through by Paleo-Indian groups. Using multi-criteria analysis, different cost weighting scenarios, and least cost corridors, possible movement routes along the Northwest coast of North America were reconstructed. These areas were ranked by probability of use and analyzed using spatial autocorrelation statistics. This project is one of the first to apply LCA to seascapes and marine movement and the results have the potential to lead to a better understanding of the Late Pleistocene through the discovery of new early sites.

Gutierrez, María De La Luz (Instituto Nacional de Antropología e Historia, B.C.S, México)

[156] *"El viejo" del cañón del azufre: un posible caso de pareidolia e hierofanía en el sistema volcánico Tres Vírgenes, B.C.S, México*

En Baja California central (México), se eleva el sistema volcánico Tres Vírgenes, el rasgo geográfico más conspicuo de la región. En sus dominios han sido encontrados yacimientos de pigmentos minerales, material esencial para la elaboración de la pintura con la que los indígenas que habitaron las montañas aledañas, decoraron sus cuerpos y pintaron sus moradas y recintos sagrados. Uno de los lugares que muestra evidencia arqueológica de extracción de óxidos de hierro y yeso es el Cañón del Azufre. Aquí se sitúan además, otros dos rasgos del paisaje excepcionales: un manantial de aguas termales y un abrigo rocoso que contiene un arte rupestre insólito. Adicionalmente, este abrigo rocoso manifiesta un fenómeno extraño: si se observa desde ciertos ángulos y ciertas

condiciones de luz, su parte frontal nos recuerda un rostro, cuyos “ojos” “observan” el manantial. La ponencia analizará este caso a partir de los postulados que surgen de la Pareidolia y la Hierofanía. Se propone que este rostro “se mostró” a los indígenas, quienes lo reconocieron como un ente divino, consagrando el lugar a través de la imaginaria rupestre.

Gutierrez, Gerardo (University of Colorado at Boulder, Department of Anthropology)

[182] *Acrobatic Games of Mesoamerica*

In this paper I examine the context and performance of acrobatic games in Mesoamerica using archaeological, ethnohistorical, and ethnographic representations of contortionists, tightrope walkers, equilibrists, dancers on stilts, jugglers, and participants in rotational devices, like the Palo Volador and the Huahua. I underline the importance of acrobatic games in ritual festivities and secular events where improvisational and professional performers staged spectacles and played tricks designed to amuse large audiences. Acrobatic games are part of a larger complex of ludic Mesoamerican practices that included theater and illusionism. I argue here that acrobatic games were an essential form of socialization and community-building that provided necessary moments of relaxation during the agricultural and ritual calendar.

[409] *Chair*

Gutierrez, Maria (CONICET, INCUAPA), Gustavo Politis (INCUAPA-CONICET, Facultad de Ciencias Sociales, Un), Daniel Rafuse (INCUAPA-CONICET, Facultad de Ciencias Sociales, Un) and Thomas Stafford (Department of Physics and Astronomy, Aarhus Univer)

[250] *New Radiocarbon Dates Confirm Late Pleistocene Human Occupation in the Pampas of Argentina at ca. 12,170 14C yrs BP: Evidence from Extinct Horse at the Arroyo Seco 2 Site*

The Arroyo Seco 2 site (AS2) is a multi-component open air hunter-gatherer site located in the Pampean Region of Argentina. A recently published monograph summarized the current interpretations of the site, which contains bone remains of 11 extinct Pleistocene mammals, including *Eutatus seguini*, *Glossotherium robustum*, *Megatherium americanum*, *Paleolama cf. wedelli*, *Toxodon platensis*, *Equus (Amerhippus) sp.*, *Glyptodon sp.*, *Hemiauchenia sp.*, *Hippidion sp.*, *Macrauchenia sp.*, and *Myodontinae*. While there is a concentration of selected anatomical parts of Pleistocene species and a spatial and stratigraphic association between them and lithic artifacts, the evidence of anthropic processing marks on the Pleistocene fauna bone surface remained scarce. Taphonomic analysis identified a proximal ulna bone fragment of *Equus (Amerhippus) sp.* with conclusive processing marks (two impact points with their respective negative flake scars on opposite sides of the shaft as well as notches produced by impact failures). A new AMS 14C analysis of this specimen yielded a date of 12,170 ± 45 14C yrs BP; which is consistent with a previously-obtained determination on *Megatherium* remains averaged to 12,172 ± 42 14C yrs BP (4 averaged dates). This date confirms the validity of the late Pleistocene human occupation chronology at the Pampas of Argentina.

Gutierrez, Gerardo [409] see Pacheco Gonzalez, Marco

Gutiérrez Martínez, Maria de la Luz [156] see García, Carlos

Gutiérrez-Zugasti, Igor [185] see Risetto, John

Guzman, Amanda

[164] *The Breaking and Making of Ceramics in the Precolumbian Caribbean: A Technological Approach to Grog Identification*

Grog is a technological phenomenon present in archaeological assemblages spanning widely across time and space. Traditionally defined as a grounded down, previously fired ceramic used as temper during clay preparation, grog belongs to a wider category of additives, which increase porosity and reduce shrinkage, thereby lessening the likelihood of vessel crack progression during the drying and firing stages of ceramic production. Beyond this basic description of its functional properties, the

addition of grog has not received adequate scholarly attention as a complex, highly variable technological practice. Through the application of an array of technical methods including fabric analysis, petrography, microprobe study (EMPA), and experimental reconstruction, this study aims to refine overly-generalized, classic characterizations of grog and to develop an adjustable range of selection criteria, which can differentiate grog types with greater resolution. Building on a growing corpus of ceramic characterization studies in the Caribbean region, the project explores a micro-scale analysis of an assemblage of decorative lugs ('adornos') from the Precolumbian site of El Cabo (A.D. 800-1504) in the Dominican Republic. Preliminary research suggests an under-reporting of grog in the archaeological record and an under-representation of its potential compositional diversity. Together, these findings challenge normative definitions distinguishing natural and culturally occurring tempers.

Guzman, Rodrigo (SMU)

[287] *Advances and Changes in the Surveying and Mapping of Guatemalan Archaeology Aided by New Information Technologies*

Guatemalan archaeology is benefiting from new technologies for the monitoring and measurement of spatial information. Traditionally, archaeologists have relied on specialists in mapping and surveying to record spatial data and use it as the basis for the study of distribution of cultural traits. However, advances in mapping technology which allow non-specialists to collect multiple data points in shorter amounts of time is greatly aiding archaeologists working at sites in Guatemala. Other advances include the introduction of the new information technology, which provide users with free software, geographic navigation programs, and tutorials. Likewise, access to base maps in analogue and digital format have been improved, which in terms of accuracy, are presented in a local projection supported by a relatively new geodetic network. Institutions and projects that conduct archaeological research are increasingly using such technologies, with individual users being non-specialists or local specialized archaeologists. In this paper, I discuss the use of some of these new technologies by archaeologists working at specific sites in Guatemala, as well as the impact this technology is having on our interpretations of architecture and landscapes in the past.

Guzmán, Ana

[298] *Peces de las ofrendas asociadas a Tlaltecuhltli*

Se describe el contenido ictiológico de tres ofrendas asociadas al monolito de Tlaltecuhltli (1486-1502 d. C.). y se dimensionan los resultados comparándolos con otras ofrendas del mismo sitio (Complejo A: 1440-1469 d. C.). La Ofrenda 120 contenía escasos elementos de siete taxa; la Ofrenda 125, ocho taxa con un individuo cada uno (excepto un caso), con ejemplares completos y taxidérmicos; y la Ofrenda 126, siete taxa con uno a dos ejemplares, tanto completos como taxidérmicos. Las ofrendas a Tlaltecuhltli son poco diversas, pero muestran la continuidad del uso ceremonial para casi todas las especies, algunas con valor de importancia alto (Complejo A: *Hyporhamphus* sp., *Tylosurus crocodilus*, *Pristis pectinata*, *Diodon hystrix*). *Bagre marinus* es un elemento atípico (no arrecifal) y probablemente sea incidental. La alta abundancia de *Hyporhamphus* sp. de la Ofrenda 125 es equiparable a la de la Ofrenda 13, pero es anormal la ausencia de *Pristis* spp. Los peces tuvieron formas de preparación similares a lo hallado en las ofrendas de cista del Complejo A, excepto en la Ofrenda 120. Ante la falta de suficientes datos etnohistóricos, una adecuada comprensión del papel ceremonial de los peces y de su evolución requiere de continuar contrastando los datos de tipo arqueológico.

Guzmán, Eulogio (School of the Museum of Fine Arts, Boston)

[346] *Fabricating Political Constituencies, Artistic Production at the Templo Mayor*

The excavation of the Templo Mayor yielded a plethora of objects that testify to the supreme ideological importance this edifice held for the Mexica confederacy. While the offerings unearthed within the foundations of this structure comprised a variety of portable objects placed in intimate settings, larger sculptures seem to have articulated more public iconographic programs. My analysis of both portable and monumental sculptures shows these works emphasized the bricolage of incorporated and coerced Mexica political constituents. This talk outlines the emergence of politically

savvy, complementary, iconographic themes rendered on portable and monumental sculptures set onto the Templo Mayor that functioned as Mexica political stratagems. A contextualization of iconographic themes in relation to reported historical events adumbrates the role visual culture held in issues of statecraft for the Mexica. This paper contextualizes my findings with recent materials research, which shows many objects that referenced a number of the diverse cultures deposited at the Templo Mayor were created locally, to argue that this co-opted fabrication of materials provided a political representation in art. This successful artistic production, I argue, yielded high political dividends, was a materiality of Mexica authority, and proved seminal in contributing to the rapid rise of this powerful conglomerate.

Guzmán Aguirre, Marisela [156] see Gallaga, Emiliano

Gyucha, Attila, William A. Parkinson (Field Museum), Richard W. Yerkes (Ohio State University) and Paul R. Duffy (University of Toronto)

[47] *Long-Term Changes in Settlement Patterns and Local Land Use on the Great Hungarian Plain*

Regional-scale archaeological surveys can reveal long-term patterns in human settlement in the landscape. However, many survey projects focus solely on defining the extent and age of settlements. A combined use of various methods is required to develop more nuanced understanding of changes in settlement patterns over time.

This paper presents the results of a multidisciplinary research project on the settlement history of the Szeghalom microregion in the Körös Region of SE Hungary. During our long-term investigations in the region, the Körös Regional Archaeological Project conducted high-resolution systematic field collection, paleoenvironmental studies, geophysical prospection, targeted excavations, and analysis of historic sources to model changes in settlement patterns and land use from the Neolithic to recent times.

Gyucha, Attila [211] see Yerkes, Richard

Haas, Jennifer [190] see Mandel, Rolfe

Haas, W. (University of Maryland)

[328] *Forager Mobility in Constructed Environments*

As obligate tool users, humans habitually reconfigure material-resource distributions. It is proposed here that such resource restructuring may have played an important role in shaping hunter-gatherer mobility decisions and the emergent macro-structure of settlement patterns. This paper presents a model of hunter-gatherer mobility in which modifications of places, including the deposition of cultural materials, bias future mobility decisions. With the aid of an agent-based model, this simple niche-construction model is used to deduce hypotheses for the structure of hunter-gatherer settlement patterns. The predictions are tested against archaeological data from a hunter-gatherer settlement system in the Lake Titicaca Basin, Peru, 7,000-5,000 cal. B.P. Good agreement is found between the predicted and empirical patterns demonstrating the model's efficacy. Moreover, the model suggests an explanation for key structural properties of hunter-gatherer settlement systems that, in some cases, may have facilitated the emergence of socioeconomic complexity in human societies.

Haase, S.K. [72] see Surface-Evans, Sarah

Haber-Uriarte, Maria [397] see Rhodes, Sara

Habiba, Habiba (University of Konstanz), Jan Athenstädt (University of Konstanz) and Ulrik Brandes (University of Konstanz)

[229] *Social Shifts in the Late Prehispanic US Southwest*

The Brainerd-Robinson (BR) index is frequently used as a measure of similarity among disparate archaeological entities. We propose a number of novel alternative methods to gauge similarity among such entities. We base our analysis on similarity among sites (locations) inhabited in the US Southwest during A.D. (1200-1450) using a large corpus of artifacts excavated at those locations and maintained as a comprehensive database by Archaeology Southwest. In this work we first identify some vital limitations of the BR index. We believe these shortcomings significantly impair the actual picture of historical shifts in the US Southwest during that period. We propose a range of measures that have the potential to overcome those shortcomings while providing us with a more nuanced explanation of demographic movements. We define sites' similarities as a function of types and counts of wares found on each site. We further supplement the measures with factors such as containment, asymmetry, and relative ranking of wares as parameters. We build networks of probable movements and shifts within 50 years of time windows over the 250-year time period. Moreover, we compare the changes in population demographics across the 50-year time windows to get better insights into long distance movements.

Habicht-Mauche, Judith [274] see Burgess, Hunter

Habicht-Mauche, Judith (UC-Santa Cruz)

[406] *Chair*

Habu, Junko (University of California Berkeley)

[82] *Jomon Pit-Dwellings, Sedentism, and Food Diversity*

Archaeological data from the prehistoric Jomon period of the Japanese archipelago indicate that, by the middle of the Early Jomon period (ca. 6000 cal. BP), the presence of large settlements with dozens of pit-dwellings became common. Some of these pit-dwellings are quite deep, measuring more than two feet in depth. The residents of these settlements are considered to have been relying primarily on hunting, gathering and fishing. Environmental management may have been an important part of their subsistence strategies. What were the causes, conditions and consequences of the appearance of this type of large settlement with substantial pit-dwellings? Did it affect the resilience and sustainability of Jomon communities? Were these pit-dwellings occupied throughout the year, or were they the houses of seasonally sedentary hunter-gatherers? Was the development of these large settlements related to the emergence of social inequality? The large amount of settlement and subsistence data from the Jomon period provides an excellent opportunity to pursue these questions. Using archaeological data from northeastern Japan, I argue that long-term changes in Jomon subsistence, settlement and society do not fit into the classic, progressivist view of cultural evolution from simple to complex.

Hackbarth, Mark (Logan Simpson Design Inc.)

[304] *Canal System 2's Architecture, Chronology and Irrigation during the Pioneer Period*

Recent excavations at Pueblo Patricio and La Ciudad have uncovered Pioneer Period components that provide new insight about early Hohokam chronology, settlement, and irrigation in Phoenix. Red Mountain phase occupation at Pueblo Patricio began before the fifth century A.D. with seasonal use of small structures exhibiting highly variable architectural forms and small groupings of structures. A dramatic change in Pueblo Patricio settlement patterns occurred by the middle of the mid-sixth century A.D. when large P-3 and P-4 structures were constructed, whereas late seventh century A.D. structures at La Ciudad are forerunners of pit houses that have a typical Hohokam forms and groupings of houses. This paper reviews these architectural changes in terms of implications for irrigation, land use, and settlement organization within Canal System 2 before the late eighth century A.D.

Hackenberger, Steven [8] see Urban, Thomas

Hackenberger, Steven (Central Washington University, Department of Anthropology), James

Brown (Central Washington University, Department of Anthropology) and Patrick McCutcheon (Central Washington University, Department of Anthropology)

[360] *Resource Intensification, Sedentism, Storage, and Ranking: A Visual Synopsis of Pacific Northwest History and Theory*

Resource intensification is a concept used in explanations of sedentism, storage, social ranking and hierarchy. Within the Pacific Northwest treatment of these concepts has developed through three orientations: evolutionary-ecology, political economy, and social agency. We compare performance criteria (dynamic and empirical sufficiency, and tolerance limits) for both synthetic works and archaeological studies. Our poster-sized visual synopsis is intended to elicit comment and revision that maybe supported on-line. Source works are diagramed with cog symbols showing interaction between different theorists. Lighter cog symbols indicate theoretical perspectives with less data evaluation. The darker cogs indicate theoretical models supported by data analysis. The larger cogs depict works with broader geographic scopes. Cog symbols with red outlines are used to highlight works that emphasize competition or conflict. We are also experimenting with cladistics analyses and graphs that may yield more formal models of theoretical and archaeological contributions. Given that almost all treatments of resource intensification and sedentism focus on the development of households (plank houses and house pits) and larger house settlements, our review shares a critical synopsis of major approaches in the anthropological archaeology of the Pacific Northwest.

Hacker, Stephanie (The University of Tennessee) and Howard Cyr (The University of Tennessee)

[120] *An Integrative Archaeological and Geomorphological Approach to Understanding Site Distributions and Prehistoric Settlement Patterns along the Little River, East Tennessee*

Over 15 years of archaeological research at the University of Tennessee's East Tennessee Research and Education Center, Blount County, Tennessee, has uncovered a number of archaeological sites that range in age from Early Archaic to Mississippian. Located within a complex alluvial system at the confluence of Ellejoy Creek and the Little River, the study area was part of a prehistoric trail system through the Great Smoky Mountains. Research at the University of Tennessee's Archaeological Research Laboratory integrates geomorphologic and archaeological approaches to better understand landscape development and its effects on temporal and spatial site distributions and prehistoric settlement selection in the area. These studies offer new insight into human-environmental interactions, site preservation, and landscape evolution in the inter-mountain Southeastern United States.

Hadden, Carla (University of Georgia), Maran E. Little (University of Georgia), C. Frederick T. Andrus (University of Alabama) and Gregory A. Waselkov (University of South Alabama)

[152] *Stable Oxygen Isotopic Evidence of Mobility and Site Seasonality on the Northern Gulf of Mexico, USA*

Stable oxygen isotope analyses are commonly used in archaeology to assess the seasons-of-death of fishes and molluscs, and to make inferences about seasonal aspects of human mobility and resource use. We present stable oxygen isotope sequences from 33 bivalve shells, representing four taxa, and eight fish otoliths, representing two taxa. These were recovered from two sites located on the Gulf Coast of Alabama: Plash Island (A.D. 325–642) and Bayou St. John (A.D. 650–1041). Specimens recovered from small, well-dated pit features were targeted for sampling. The stable oxygen isotope data indicate that shellfishes and fishes were collected at both sites during all seasons of the year, though frequency or intensity of site occupation may have declined during the fall. Most of the pit features included in the study appear to represent multi-season living and working areas. Although it is unclear whether these sites were occupied by a permanent year-round population or by groups who returned to these sites intermittently throughout the year, the results of this study do not support the hypothesis that the coastal landscape was vacated seasonally as part of a shifting settlement pattern.

Hadden, Glade [386] see Gardner, A. Dudley

Hadel, Patrick, Terendagva Yadmaa (Mongolian Institute of Archaeology), Joan Schnieder

(Anza-Borrego Foundation & Denver Zoo) and Jennifer Farquhar (Ikh-Nart Cultural Heritage research team)

[418] *Working Towards an Exportable Indigenous Heritage Management and Cultural Ranger Program in the Ikh Nart Nature Reserve, Mongolia.*

The creation of an exportable indigenous heritage management program for developing nations responds to a growing concern about the rapid effects of globalization and industrialization on the natural and cultural landscape. In 2010 an international partnership was formed between the Mongolian Institute of Archaeology, Denver Zoo, Anza-Borrego Foundation, and California State Parks with the goal of establishing a cultural heritage management program in the Ikh Nart Nature Reserve in the Northern Gobi region of Mongolia. Baseline resource assessment conducted by this cooperation was completed in 2014. This cooperation has produced a Cultural Ranger pilot program that provides funding, equipment, and a standard archaeological methodology for recording and monitoring cultural resources. The program utilizes a model of stewardship based on the California Archaeological Site Stewardship Program. The ranger is hired from one of the reserves local nomad families and has been charged with protecting the rich Cultural Landscape found in Ikh Nart. This program is designed to be copied and exported to any of the other protected areas within Mongolia allowing the Institute of Archaeology to establish management programs throughout the country in the future.

Hadley, Dawn (University of Sheffield)

[18] *Identities in a Viking Winter Camp*

From 865, Viking raids on England intensified with the arrival of an army much larger than any previously known. This so-called 'Great Army' (micel here) raided northern and eastern England, spending the winter at a number of sites recorded in the Anglo-Saxon Chronicle, but which, until recently, have remained archaeologically elusive. Recent fieldwork at a handful of these sites, some of which were first identified by metal detectorists, has now begun both to identify their precise locations and also to characterize them in terms of their landscape setting and the range of material culture that they have produced. This paper draws on the evidence from this recent fieldwork to characterize the impact of this period of raiding and associated interactions with the local populations on the formation of identities. The evidence from these briefly occupied overwintering sites presents a unique opportunity to explore identity - ethnic, gendered, social - in a very specific and chronologically precise context, offering a counterpoint to discussions of identity in the context of Viking-Age England which have hitherto tended to explore the subject by drawing on evidence that spans decades or even centuries; here, in contrast, identity formation over a period of months is addressed.

Hadlock Seeley, Robin [61] see Watson, Jessica

Haertel, Kirstie

[83] *The WHY and HOW of integrating archaeological findings into wildlife management efforts*

The relevance of archaeology to contemporary social issues has become a topic of concern for many in the discipline. Zooarchaeologists in particular have focused some effort in highlighting how archaeological interpretations can assist with wildlife management and conservation biology. While this work helps to amplify the social value of archaeology, the approach to date has been somewhat disparate. In order to implement the vision of integrating archaeological findings with wildlife management and conservation biology, a basic understanding of the appropriate scale and scope of available archaeological data and an avenue for effectively communicating the findings is needed. This paper will outline the potential value added to the management of species in National Parks in the west and provide a framework for integrating relevant findings into natural resource management decisions. A case study that merges archaeological information with the potential for reintroducing bighorn sheep to Lava Beds National Monument will illustrate how the data integration can be useful to those managing wildlife.

Hagen, Mary [230] see Hollenback, Kacy

Hager, Lori (Pacific Legacy, Inc and ARF, University of California, Berkeley)**[297]** *Who Will Remember the Dead? Embodying the People of the Past in Novel Ways*

Archaeologists encounter the people of the past as skeletons with some frequency, yet attempts to reconstruct the life histories of the dead have often been ordinary and predictable. As a scientist and a storyteller, Ruth Tringham's consideration of the dead, inspired by empiricism and imagination in equal measure, imparts multiple truths through multiple voices in novel ways, with a particular focus on visualization. The people of one house at the Neolithic site of Çatalhöyük, for example, are embodied, and ultimately remembered, as fleshed bodies, as avatars, as storied individuals with complex lives, and as operatic actors in gripping tales of survival and death. The dead come alive in Ruth's versions of the past, and guide us to a more complete vision and deeper understanding of each life recovered through the archaeological process. Ruth's rendering of the dead assures their remembrance through time in a manner like no other, providing models of interpretation that are expansive and creative, real and not real, and always within the realm of possibility.

Haggard, Alyssa (Humboldt State University) and Casey Hegel (Humboldt State University)**[7]** *A Geospatial Analysis of Landscape Modification in Relation to Burials and Social Control*

This poster examines burial construction in relation to landscape modifications in the Rio Bravo region of northwestern Belize. A geospatial analysis was conducted on burials and surrounding features, such as shrines, to determine the Maya social hierarchical system established during the Middle Preclassic, Late Preclassic, and Late Classic periods. This research addresses the interrelationship between altered landscapes and burial locations, which can yield insight into social control. Poor preservation of human remains in studied areas is a factor in the loss of burial and population data. For the scope of this research, population estimates for each time period were compared to the burial data collected from selected sites. The objective of this study is to compare population estimates to the burial data to see if the number of burials found correlates to these estimates. By analyzing this comparative data, we hypothesize most individuals were interred outside of the perimeters of selected sites, perhaps in communal burials. More investigation of the landscape outside of site centers is needed to determine the locations of other burials and how those are interred in relation to the landscape.

Hagin, Jason [310] see Everett, Mark

Hailey, Tommy (Northwestern State University of Louisiana)**[284]** *Archaeology as the CRO Flies, 2002-2014: A Retrospective of Twelve Years of Powered Parachute Aerial Archaeology*

After considering a number of alternatives for acquiring aerial images, in 2002 the Cultural Resource Office at Northwestern State University of Louisiana received a National Center for Technology and Training Research Grant to assess the suitability of the powered parachute as an archaeological aerial reconnaissance vehicle for site discovery, for detailed site investigation, and for cultural landscape studies. Since that time, this unique aerial platform has been successfully employed to acquire imagery of a wide variety of prehistoric and historical sites across the United States using a range of techniques, including digital still photography, digital videography, and thermal imaging. These images have been integrated successfully with aerial images from other sources, with historical maps, and with GPS, total station, geophysical, LIDAR, and 3-D laser scanning data by CRO staff members and by other researchers to provide a means of conducting detailed spatial analysis of archaeological sites and the landscapes in which they are located. This paper will present an overview of the equipment, the methodology, and the results, as well as other considerations involved in employing this extremely mobile, efficient, and cost-effective method of acquiring low-altitude, large-scale, high-resolution aerial images in a wide range of archaeological applications.

Haines, Julia (University of Virginia)**[116]** *Boundaries and Networks on the 19th Century Bras d'Eau Sugar Estate*

This paper discusses research on the most complete and well-preserved 18th and 19th century sugar estate on Mauritius and how communities and identities were constituted under the conflicting conditions of both physical control and local/regional connectivity. Established in 1786, the Bras d'Eau Sugar Estate (now a national park) grew in the following century when the island shifted from French to British colonial rule. The slave trade and the institution of slavery were later abolished across the British Empire, though industrial sugar production increased. Indian indentured laborers with different castes, religions and skill sets, came to Mauritius to work on plantations. Vagrancy laws were designed to reengage laborers legally to plantations beyond their five-year contracts. Preliminary research at Bras d'Eau revealed extensive road and railway networks, and the ruins of industrial structures, enclosure walls and houses. Roads are positioned as both passages and boundary markers that divide, for example, living quarters from industrial workspaces and cultivated areas. I argue that space on the plantation was simultaneously controlled by wall and road boundaries and strategically connected to intern and external exchange networks. Within this context, archaeological research will help us to understand the diversity of identities performed in the past.

[116] *Chair*

Haines, Helen [147] see Lockett-Harris, Joshua

Haines, Helen (Trent University)

[147] *"A Mischief that is Past and Gone": Situating Ka'Kabish in the Larger Ancient Maya Political*

Discussions of ancient socio-political interactions are most productive when site-specific archaeological data is incorporated into a multi-scalar analysis that includes centers of different distinction. The ability to integrate centers into a nuanced landscape is a luxury derived from a long legacy of archaeological work by different researchers. This work draws upon the increasing large corpus of data created for north-central Belize over the last 50 years. In this paper, we present a preliminary synthesis of data from Ka'Kabish and speculate about possible inter-site interactions in the region. Our goal is to situate what we currently know about the culture history of Ka'Kabish into the larger ancient Maya political landscape of North-Central Belize and to shed light on the political dynamics of this region.

[147] *Chair*

Haley, Bryan [172] see Henry, Edward

Hall, Tegan [36] see Penny, Dan

Hall, Tegan (University of Sydney) and Dan Penny (University of Sydney)

[407] *Regional Settlement Responses of the Khmer Empire to Environmental Stress and Angkor Abandonment*

The Khmer Empire dominated Southeast Asia between the ninth and fifteenth century, but had all but collapsed by the time Portuguese explorers began documenting their discoveries of the jungle-strewn temple ruins over a century later. Historical sources, in conjunction with new paleoclimatic evidence, suggests that the royal court abandoned the central and administrative city of Angkor sometime in the mid-fifteenth century and migrated south to the Phnom Penh region after (among other things) a series of sustained droughts, interspersed with particularly intense monsoon seasons, caused irreparable damage to the city's water infrastructure system. It is undoubted that this event caused a disruption to the geographical and political dominance of the predominantly agricultural Khmers in Southeast Asia from which it never recovered, however the individual responses of the kingdom's regional agricultural settlements to these dramatic climatic fluctuations remains unclear. Was there a simultaneous or cascading collapse of populations in these secondary cities, or were they more resilient than Angkor? Paleoenviromental evidence, analyzed from sedimentary cores retrieved from two of these peripheral settlements, indicates that population dynamics throughout the

kingdom are far more complex than traditional collapse studies of Angkor suggest.

Haller, Mikael (St. FX University)

[246] *The Quest for Gold: An Examination of Socioeconomic Exchange and Autonomy in the Parita River Valley, Panama*

Through the Parita Archaeological Research Project (PARP), we have investigated socioeconomic change in the Central Region of Panama using several different scales of analysis. More specifically, we examined the relationship between episodes of social change and the following factors: sociopolitical organization, craft specialization and economic interdependence, and control and manipulation of trade goods, subsistence resources and ritual space. Despite the presence of some long-distance trade goods, the majority of goods, high-status and utilitarian, appear to have been acquired locally. Our results do not support the existence of chiefdoms with great disparities in wealth and power, as detailed by the chroniclers in the sixteenth century for Panama and suggested by excavation of elaborate burials. On the other hand, we argue that there was more socioeconomic autonomy than previously thought.

Hallett-Desguez, Emily and Curtis Marean (Institute of Human Origins, School of Human Evolution)

[356] *A Comparison of Two African Mediterranean MSA Adaptations: The Cape Floral Region and the Maghreb*

Our lineage evolved in Africa when the earth was in the MIS 6 glacial phase, ~190 thousand years ago (kya). At the continent scale, it has been demonstrated that Africa became arid during glacial phases. However, Mediterranean climates within Africa offered humid refugia during past glacial phases. There are two regions within Africa that are characterized by Mediterranean climate: the Cape Floral Region (CFR) of South Africa and the Maghreb of northwest Africa. These two regions also have Middle Stone Age (MSA) archaeological sites that reveal the earliest proxies for symbolic and complex behavior. These proxies include shell beads, regionally distinct stone and bone tool technologies, and the incorporation of coastal resources into the diet. The appearance of these proxies in the archaeological records of the CFR and the Maghreb is roughly contemporaneous, despite being separated by a distance of over 8,000 km. Here we compare the African Mediterranean MSA adaptations and chronologies with a focus on two archaeological localities: Contrebandiers Cave, Morocco and Pinnacle Point, South Africa. Both were excavated with comparable advanced field technologies and excellent contextual control, and therefore allow the first methodologically controlled comparisons to be made between the MSA of Morocco and South Africa.

Halligan, Jessi [119] see Perrotti, Angelina

Halligan, Jessi (University of Wisconsin La Crosse), Michael Waters (Texas A&M University, CSFA) and Morgan Smith (Texas A&M University, CSFA)

[192] *Preserved Paleoindian Site Potential and Regional Geological Patterns in Florida's Karst Rivers*

Hundreds of Paleoindian artifacts have been found in northern Florida, mostly by avocational archaeologists and collectors. Many archaeologists have noted the correlation between Paleoindian artifact locations and known chert outcrops. Further, many of these finds were recovered from Florida streams by SCUBA divers, often in displaced contexts or in areas with no sediment. Extensive research in portions of the Aucilla River has allowed archaeologists to arrive at some understanding of site formation processes and Paleoindian activities in that river. This research was extended into other portions of this discontinuous karst stream system and five other Florida rivers to determine if local trends could be used to understand regional site formation processes and Paleoindian site potential in other nearby systems. To this end, we conducted targeted sonar and diver surveys of portions of rivers known for Paleoindian finds and conducted Livingstone coring, test excavation, geologic profiling, or augering in areas with sediment accumulations to explore subsurface sediments and to look for areas with the potential for preserved archaeological sites. This exploration has allowed us to reach a greater understanding of the extreme heterogeneity found in

Florida's fluvial systems and has refined our ability to predict Paleoindian site locations.

Hallihan, Melissa (University of Notre Dame) and Jenny Fucillo (University of Notre Dame)

[311] *The Hidden Life of Notre Dame: A Study in Library Graffiti*

On the graffiti-covered desks and walls of the eighth through eleventh floors of the University of Notre Dame Hesburgh Library lies a study in duality—highly public expressions of students' most private thoughts. Studying samples of graffiti left behind by decades' worth of college students allowed us to examine aspects of life at Notre Dame that were not normally visible. An analysis of 107 pieces of graffiti yielded that 47% were sexual in nature and 53% pertained to non-sexual topics (e.g. religion, sports, school, race, current events). The greater the distance from the entrance to each floor, the higher the frequency of graffiti, and the higher the floor, the more risqué the content—suggesting students view graffiti as a private confessional for the expression of personal thoughts and exploits not deemed “appropriate” for day-to-day conversation.

Studies of graffiti in public areas of present and historical communities can lend archaeologists insight into aspects of life that don't make the history books; it can show us what the voiceless truly experienced as it is an anonymous outlet for opinions free from authoritative restrictions. In this case, students use library graffiti as a tool to voice opinions and frustrations without fear of retribution.

Hallinan, Stephanie [311] see Trigg, Heather

Halling, Christine [19] see Seidemann, Ryan

Halling, Christine (Louisiana Department of Justice) and Ryan Seidemann (Louisiana Department of Justice)

[220] *Maxillary Lateral Incisor Agenesis: A Case Study of Hypodontia from the Smith Creek Site, Mississippi*

Human skeletal remains recovered from the Smith Creek Site in Adams County, Mississippi came to the Louisiana Department of Justice for analysis. Twenty-six individuals recovered required a full bioarchaeological analysis to inventory the remains and document as much information as possible before final disposition. Of particular interest, one individual displayed the relatively uncommon trait of missing permanent maxillary lateral incisors. In order to determine whether the missing incisors resulted from congenital absence, ablation through intentional removal, or antemortem loss, further analysis of the maxilla was conducted. The use of x-rays in addition to metric and macroscopic observation imparts specific data supporting an argument of agenesis of the incisors for this individual. Additionally, the larger context from around the region where the human remains were recovered and the prevalence of this abnormality are discussed.

Halmbacher, Alexandria (University of Colorado)

[75] *What Does Their Storage Say About Them? An Interpretation of Domestic Storage Practices at the Classic Period Maya Village of Cerén*

Around A.D. 650 the Loma Caldera eruption entombed the Classic Period Maya village of Cerén in 4-6 meters of volcanic ash. This resulted in the exceptional preservation of structures, artifacts and botanical remains, providing archaeologists with a unique opportunity to study the household complexes and their related activities. However, much of the previous research concerning the households at Cerén has primarily focused on its economic activities. As a result, archaeologists have yet to address the socio-cultural aspects such as status, wealth, authority and moral order of the household and its members. Part of the reason for this emphasis on the economic is a narrow conceptualization of the domestic space and materiality. Therefore, this paper proposes the use of domestic storage practices to better understand the socio-cultural aspects such as status, wealth, authority and moral order of household complexes at Cerén. Storage provides an ideal medium to evaluate these dimensions because it represents a confluence of the spatial, symbolic, social and material worlds. Interpretations of the domestic storage practices of households at Cerén suggest its inhabitants lived within a complex and dynamic social heterarchy.

Halperin, Christina (Princeton University)**[88]** *Cosmopolitanism: New Theoretical Considerations of the Mesoamerican Epiclassic*

Previous theoretical considerations of the Mesoamerican Epiclassic period have situated social change as part of social evolutionary processes of state collapse, the networking of a few religious and political-elites (e.g., cult of Quetzalcoatl), the proliferation of market economies, and the beginning of an "International Style." This paper considers notions of cosmopolitanism as a new theoretical framework for thinking about Epiclassic processes. It has long been suggested that Epiclassic art styles were eclectic and cosmopolitan wherein artisans creatively selected from and incorporated various foreign influences into their own local political and religious expressions. This paper, however, proposes new ways of thinking about cosmopolitanism that broadly incorporates three key factors: migration, political-economy, and social identity expressions. It evaluates this framework within the context of the Classic Maya collapse and the emerging presence of previously small, frontier polities in Peten, Guatemala.

Hambacher, Michael (CCRG, Inc.), James Robertson (Michigan Department of Transportation) and Randall Schaetzl (Department of Geography, Michigan State University)**[280]** *Late Prehistoric Food Choices in the Upper Great Lakes Region: Evidence from 20OT283 and 20OT3 in the Lower Grand River Valley of Michigan*

Research into Late Prehistoric subsistence strategies used by residually mobile hunter-foragers in the Upper Great Lakes region indicate that there is a complex interplay in the choices made between the exploitation of natural resources and the incorporation of maize and other domesticated plants into those economies. Recent excavations of food processing and storage features coupled with soils analysis elucidating their depositional histories at two Late Prehistoric sites have provided new insights into the nature of these adaptations. Paleobotanical, phytolith, organic residue, and faunal analysis indicate that wild rice, aquatic tubers, and sturgeon are also important components of the traditionally assumed dominance of deer, nuts, and maize as key subsistence resources during this period.

Hambrecht, George [154] see Gibbons, Kevin

Hambrecht, George (University of Maryland College Park)**[339]** *Discussant***[288]** *Chair*

Hamilton, Nathan [61] see Watson, Jessica

Hamilton, Derek (Scottish Universities Environmental Research Center), Colin Haselgrove (University of Leicester) and Chris Gosden (University of Oxford)**[348]** *British Iron Age Settlement Chronologies: A View from Danebury Hillfort*

Traditional approaches to the Iron Age have constructed complex chronologies based on artifact typologies, mainly pottery and metal, with radiocarbon dating being long neglected. Such views are now untenable, with recent Iron Age research showing that typological dating produces sequences that are regularly too late. Furthermore, regional syntheses anchored by chrono-typologies fail to provide a robust analytical methodology for better understanding the nuances of the settlement landscape and social dynamics. This paper will explore the interim results of the Leverhulme-funded "(Re)Dating Danebury hillfort" project, which aims to use radiocarbon dating and Bayesian modelling to gain better understanding of the timing of construction, remodeling, and abandonment of Danebury hillfort and nearby sites, and to investigate how the archaeologically visible transformations at the different Iron Age sites relate to one another chronologically across the region. This new artifact-independent chronology is being used critically to reassess the existing pottery sequences and the social interpretations produced by the original Danebury project, and secondly, to develop fresh perspectives on the settlement dynamics of the area.

Hammer, Emily (University of Chicago)**[14]** *Mobile Pastoralists and Lowland-Highland Interconnectivity in Southeastern Turkey*

In Turkey and other mountainous parts of Eurasia, archaeologists have primarily targeted lowland sites for investigation, leaving highland areas relatively unexplored. Drawing on ethnography of twentieth-century tribes, scholars have assumed that mobile pastoralists were one of the major agents connecting lowlands and highlands in all post-Neolithic periods. However, little data has been collected on such people or on mobility practices. In this paper I briefly review empirical evidence for the origins of vertical transhumance in Turkey, and present a recent analysis of survey data showing how mobile pastoralists of the last 500 years in southeastern Turkey moved through and improved their local landscapes. The data suggest that vertical transhumance may not have been as widespread in the ancient past as archaeologists have traditionally assumed, but this could be due to biases in the collected evidence. More surveys and excavations focused on upland areas, like the presented case study, are necessary for understanding the role of pastoralism in long-term connections between highlands and lowlands, and for shifting the conversation concerning highlands and mobility away from common tropes such as such as the exteriority of mobile groups to state level societies, the “invisibility” of pastoralists, and pastoral degradation of the environment.

Hammerstedt, Scott (University of Oklahoma), Patrick Livingood (University of Oklahoma) and Amanda Regnier (University of Oklahoma)**[173]** *Recent Excavations and Current Research at Spiro Mounds*

Geophysical survey at Spiro provided evidence for dozens of contemporaneous structures near the well-known Craig mound. Over the last year, four of those structures were excavated by University of Oklahoma field crews. This paper will discuss the results of those excavations and discuss whether the evidence supports James A. Brown's recent interpretation of an early 15th century 'Event' at Spiro.

Hammerstedt, Scott [229] see Domeischel, Jenna

Hammond, Krystal (University of Nevada, Las Vegas)**[136]** *Research with an Agenda: Creationist Media on Archaeological Discoveries*

Young Earth creationists view the natural world in a manner far different from the average anthropologist. Very little secular media support a Young Earth creationist perspective. Therefore, pursuant to conveying the world in a manner that is in keeping with their worldview, Young Earth creationists have produced magazines and other forms of media that specifically address science and theological topics relating to the age of the earth as well as archaeological finds relevant to the veracity of biblical texts. From Angkor to the American Southwest, Young Earth creationists have used archaeological discoveries to attempt to validate the first ten chapters of the book of Genesis. Additionally, art and figurines from a number of sites have been used to support Young Earth arguments for human coexistence with dinosaurs. This paper discusses how those with a Christian religious identity, paired with Young Earth creationist views, interpret archaeological discoveries.

Hanchar, John [215] see Zipkin, Andrew

Hancock, R.G.V. [140] see Hawkins, Alicia

Hand, Bianca (College of Wooster) and P. Nick Kardulias (College of Wooster)**[51]** *Hellenistic and Roman Votive Sculptures as Markers of Foreign Influence on Cyprus*

The Hellenistic and Roman periods on Cyprus (310 B.C.- A.D. 330) were times of transformation. Drastic changes in politics such as the movement of the island capital to Paphos, new coinage, and the introduction of Christianity into the region had pervasive and deep consequences throughout the island. These changes can be traced through the artistic record, specifically through votive statues, since these can be seen as a reflection of social and political conditions in the region. As one of the

premiere forms of expression and identity, art can be used to gauge the level of foreign influence a culture has been exposed to. As values and social structures change, so does their visual representation. By tracking these changes, one can determine different styles and discern vital information about past foreign interaction. By interpreting terracotta figurines found in religious sanctuaries at Athienou-Malloura and surrounding sites such as Golgoi, Arsos, and Salamis, this study seeks to determine the level of foreign influence in the region and whether or not it had an impact on the religious and/ or ritualistic practices of the sanctuaries and the types of people giving these offerings.

Handley, Jordan [112] see Easton, Norman

Haney, Jennifer (Penn State) and Martin Welker (Penn State)

[162] *Subsistence and Site Function in Historic Contexts*

The empirical integration of large, composite, datasets drawn from published sources has seen recurring interest among archaeologists seeking to trace trade, cultural influence, and subsistence patterning. Following Landon's call for increased data comparison in historic archaeology we investigate the potential to integrate zooarchaeological and ethnobotanical metadata from Anglo-American contexts in the 16th to 19th centuries in the Northeastern United States and Canada. This poster presents our findings on the influence of cultural and environmental patterning in subsistence practices using floral and faunal datasets from forts, farmsteads, and villages. Results highlight the inter-related nature of cultural and environmental factors on human subsistence and present a holistic view of subsistence patterns within the Anglo-American colonies. Statistical comparison of sites by function increases our understanding of the influence of local environments on colonial diets and may inform upon future investigation of social status, chronological subsistence change, agricultural niche construction, and cross cultural comparisons.

Hanks, Bryan [6] see Canaday, Timothy

Hanks, Bryan (University of Pittsburgh, Department of Anthropology), Chuenyan Ng (University of Pittsburgh, Department of Anthropology), Roger Doonan (University of Sheffield, Department of Archaeology), Elena Kupriyanova (Chelyabinsk State University) and Nikolai Vinogradov (Chelyabinsk State Pedagogical University)

[345] *Redefining Subsistence Practices and Strategies at the Local and Micro-regional Scales in the Context of Late Prehistoric Trans-Eurasian Food Globalization*

The diffusion of metalworking, horse-drawn transport, and use of domesticated plants and animals across the Eurasian steppes and forest-steppes have dominated recent scholarly discussions of second millennium B.C.E. socio-economic development. The term "globalization" is routinely used to characterize these early processes and key horizons of technological development. This paper draws on recent archaeological field research in the Southern Ural Mountains of the Russian Federation to emphasize the importance of modeling local trajectories of trade and exchange in addition to the resilience of local and micro-regional scale ecological adaptation and socio-economic strategy. This seven-year program of field research has provided the foundation for examining more effectively complex practices of food use as embedded within broader trends of subsistence practice, conflict and warfare, and pan-Eurasian technological development. Data from regional survey, settlement patterning, zooarchaeology, paleobotany, and stable isotopes from human and faunal remains will be drawn on to redefine late prehistoric subsistence practices and strategies in north central Eurasia.

Hanratty, Colleen (Maya Research Program), Thomas Guderjan (University of Texas at Tyler), Sheryl Luzzader-Beach (University of Texas at Austin), Timothy Beach (University of Texas at Austin) and Samantha Krause (University of Texas at Austin)

[350] *Understanding the Paleogeography and Maya Ditched Fields along the Rio Hondo, Belize and Mexico*

In recent years, we have identified numerous sets of ditched agricultural fields along the Rio Hondo

floodplain. In this paper we examine the paleogeographic and archaeological contexts of these fields. The commonalities of their settings offer perspective on their social functions and insight into who controlled them and how this control was manifest into settlement patterns. We discuss the geography of the riverine zone, the settings in which ditched fields are found and known related archaeological data, which in some respects is still too limited. Finally, we turn to our work in identifying and confirming intensive agricultural systems, their extent and importance in the political economy of the ancient Maya.

Hanselka, Kevin, Leslie Bush (Macrobotanical Analysis) and Phil Dering

[256] *The Archaeobotany of Kelley Cave (41VV164): A Glimpse of Prehistoric Plant Use in the Lower Pecos Region of Texas*

Sheltered sites in the Lower Pecos region of Texas are renowned for their spectacular plant preservation. Recent excavations in Kelley Cave (41VV164) in Eagle Nest Canyon yielded abundant well-preserved plant remains within Feature 4, a large pit thought to represent an earth oven facility with a complex history of use and abandonment. Most of the plant materials from Feature 4 probably represent the accumulation of waste products of plant foods prepared in other nearby earth ovens, intermingled with manufacturing waste produced as agave and sotol leaves were stripped into fiber for twisted twine or for weaving mats or baskets. These materials illuminate ecological interrelations between the prehistoric site occupants and the surrounding natural landscape, and have implications regarding: preferences and selection of local plants for food and fuelwood; behavioral patterns of food plant harvesting and processing; modification of plant parts into material culture such as tools, cordage, and textiles; seasonality of site use; and the nature of past environments surrounding the shelters at time of site occupation. In this paper we present the results of an ongoing archaeobotanical analysis of the plant materials from Feature 4 and from other contexts within Kelley Cave.

Hanselmann, Frederick (Texas State University, The Meadows Center for Water and the Environment), Christopher Horrell, Melanie Damour-Horrell and Bert Ho (National Park Service Submerged Resources Center)

[170] *Guns, Shipwrecks, and Investigations of Spanish Colonial Trade and Privateering in the 17th Century: The Chagres River Maritime Borderland, Panamá*

For more than 500 years, Panamá's Chagres River has been a nexus for maritime activity. The river served as the original trans-isthmian passage between the Caribbean Sea and the Pacific Ocean where precious metals, gems, and other commodities were transported in support of Spain's empire and mercantilist policies. The wealth created by this trade led to the establishment of Spanish cities, ports, and fortifications on either side of the isthmus protecting the maritime borderland of Spanish holdings from the rest of the world. Panamá City became a strategic and geographic focal point connecting the Caribbean and the Pacific and the promise of wealth attracted many to seek their fortunes in this borderland. In 1670, the English privateer Henry Morgan amassed the largest fleet of privateers and pirates in the history of the Caribbean to attack Panamá and disrupt Spain's trade network. Using the Chagres River to cross the isthmus, he sacked Panamá City and dealt a substantial blow to Spain's control in the New World. Recent archaeological investigations have resulted in the study and interpretation of material culture related to Morgan's lost ships and a shipwreck whose remains and cargo symbolize Spain's economic hegemony within this maritime borderland.

Hansen, Craig [29] see Sturdevant, Jay

Hansen, Tiffany (Central Washington University, Department of Anthropology) and Steve Hackenberger (Central Washington University, Department of Anthropology)

[205] *Bioarchaeology, Barbados, Eastern Caribbean: Isotopic Analyses of Teeth and Bone from Human Remains*

Bioarchaeological studies have grown in sophistication and are now helping test assumptions about island garden agriculture (palm, cassava and/or maize) and the relative contributions of marine proteins. Bone and teeth samples from five sites on Barbados were processed by Center for Applied

Isotopic Studies, University of Georgia and data are reported for $\delta^{13}\text{C}_{\text{co}}$, $\delta^{13}\text{C}_{\text{ca}}$, $\delta^{15}\text{N}_{\text{co}}$, and $\delta^{18}\text{O}_{\text{ap}}$. Stable isotope ratios, adjusted ratios, and apatite-collagen spacing correspond with results from elsewhere in the Lesser Antilles. After adjustment, all of the $\delta^{15}\text{N}$ bone and teeth samples are within the food web range for marine protein resources. Adjusted values for samples from Heywoods, Chancery Lane, Goddard, and Light & Power sites are indicative of a mollusc diet. A Shell Oil site sample has a value indicating terrestrial resources (fauna or C3 plants). Shell Oil and Goddard site samples $\delta^{18}\text{O}_{\text{ap}}$ values suggest use of brackish coastal springs. The $\delta^{18}\text{O}_{\text{ap}}$ values for Chancery Lane, Heywoods, and Light & Power match values expected for springs originating from upland coral terraces on Barbados, or might indicate off-island origins.

Hansen, Richard

[408] *The Mirador Basin: A Synthesis of Research and Conservation Programs in northern Guatemala*

Major research programs in the Mirador Basin of northern Guatemala and southern Campeche, Mexico, have provided new data relevant to the origins, dynamics, and collapse of complex societies in the Maya Lowlands. Data suggests that the origins of sedentary societies began earlier than previously thought, and that the dynamics of complexity included complex agricultural sophistication, elaborate communication and trade systems, logistics development, and vast political, economic, and social dominance within the circumscribed region primarily in the Middle and Late Preclassic periods of Maya civilization. Furthermore, the factors that gave rise to socio-political complexity were damaged by a multitude of issues, including climate change, inept leadership, and a conspicuous consumption of resources resulting in the collapse of the major centers of the Basin near the end of the Late Preclassic period (ca. A.D. 150). Subsequent research has demonstrated the roles and activities of subsequent inhabitants in the monumental sites within the Basin and clarified the settlement distribution and formation of Maya societies living within the ruins of the ancient Kan kingdom. New conservation strategies for art and architecture at several major sites within the Basin have also provided protective measures and consolidation practices that have proven useful and productive.

[408] *Discussant*

[408] *Chair*

Hanson, Katharyn (UPenn Cultural Heritage. University of Pennsylvania)

[254] *Intentional Destruction of Cultural Heritage: Evidence in Syria and Iraq*

The current conflict in Syria and Iraq serves as a dramatic case study of intentional damage to cultural heritage during conflict. This paper details examples of damage that can be detected using high-resolution satellite imagery in coordination with local ground documentation and verified media reports. These examples are part of the analysis done by the American Association for the Advancement of Science's (AAAS) Geospatial Technologies Project "Developing a Research Community and Capacity for the Study of Cultural Heritage in Conflict" funded by the National Science Foundation and in connection with the Smithsonian Institution and the University of Penn Museum's Penn Cultural Heritage Center. The type of damage varies according to the site, location, and degree to which it has seen active conflict, sectarian strife, and population displacement. As the extent of destruction caused by ISIS (ISIL or Da'ash) increases, and the violence in Syria and Iraq expands, it is vital to better understand the link between ethnic or sectarian violence and damage to cultural heritage sites. This paper illustrates this link using satellite imagery coupled with traditional and social media reports of incidents to contribute to the much-needed systematic documentation of human rights violations in this conflict.

[254] *Chair*

Hanson, Katharyn [254] see Wolfinbarger, Susan

Hanson, Casey (University of Texas)

[311] *Illicit Trade Networks in Spanish Texas*

This poster presents the results of an investigation of the contraband market and frontier trade networks that existed in Spanish Colonial and Mexican Texas. The archaeological record dating to the late 18th and early 19th centuries in San Antonio is defined by the appearance of English-made goods, predominately refined English earthenwares, illegally imported from New Orleans. This investigation compared artifact collections and documents from the Bexar Archives spanning the Colonial Period through Mexican Independence to examine the origins of contraband trade in Spanish Texas and to document the changes in the illicit goods market during this period. The results suggest that although the French/Spanish illicit trade networks in the mid-1700s are widely considered to constitute the “golden age of Spanish smuggling on the Texas-Louisiana frontier,” (Galan 2008: 203), significantly more evidence of contraband trade exists in both the archaeological and archival records following the Louisiana Purchase in 1803. The evidence recovered through this study highlights the complex social relations and trade networks involving Tejanos, Anglo-Americans, indigenous groups, and a wide range of other players who had a significant role in the development of the region’s identity in the 19th century.

Hanus, Kasper Jan and Emilia Smagur (Institute of Archaeology, Jagiellonian University)

[286] *“Reconstructing” an Archaeological Landscape of NW Cambodia beyond the Borders of the Greater Angkor Using Satellite Imaging*

Prehistoric and historic societies have established the material dimension of space through either the physical alteration of the landscape or the formalized recognition of space. Although the latter aspect is rather difficult to trace archaeologically through the use of aerial images, physical modifications of the landscape are often still visible. The northern part of Tonle Sap basin were subjected to intensive survey using satellite imaging in order to identify anthropogenic adjustments on the surface. As a result, a wide range of archaeological features, primarily occupational mounds, moats and field systems, were recognized. Documented structures reveal a populated landscape of rice farmers who cultivated their fields radiating from the circular, inhabited mounds. At substantial parts of several sites, past inhabitants took a further step to alter their environment by digging a moat. The current issue that is under an extensive investigation is to understand how this landscape contributed the cultural processes that shaped the Greater Angkor as a low-density urban complex.

Hard, Robert (Univ of Texas at San Antonio), Jacob Freeman (University of Texas at San Antonio) and Raymond Mauldin (University of Texas at San Antonio)

[167] *Considering Robustness and Vulnerability in Texas Hunter-Gatherer Social-Ecological Systems Using Stable Isotope Data*

We analyze stable carbon and nitrogen isotopic data from over 200 foragers from inland, riverine, and coastal settings on the Texas Coastal Plain. Prehistoric foragers on the Texas Coastal Plain faced the challenge of maintaining a robust supply of food despite constant changes in their environments, including seasonal changes and changes that occurred over decades-to-centuries, like climate change and sea level rise. Given that coastal estuaries and inland river valleys had resources that peaked during different seasons, the best strategy for maintaining a consistent supply of food should have been to move between both settings on a seasonal basis. However, this strategy may have engendered vulnerabilities to longer term climate changes and periods of rapid sea level rise. The generally high productivity of coastal settings was, at various points, reduced by rapid sea-level rise, while inland climate change, such as periods of aridity, affected productivity of terrestrial ecosystems. Therefore, were subsistence regimes established by foragers on the Texas Coastal Plain sensitive to periods of aridity and rapid sea level rise or were subsistence regimes robust to such long-term environmental changes? Our study has implications for understanding the ability of human societies to cope with environmental change at multiple scales.

[262] *Chair*

Hard, Robert [229] see Kemp, Leonard

Hardy, Thomas [250] see Heikkila, Raija

Hardy, Thomas (University of Pennsylvania)**[411]** *Hybridized Objects and Colonization Practices: Ceramics from Minaspata, Cuzco, Peru*

In recent years, archaeologists studying ancient colonialism have shifted from a top-down view, emphasizing “colonizers” and “colonized,” to a more careful consideration of how local social practices are situated in global colonial structures and dynamics. Material cultures and technologies play a crucial role in this colonial encounter, as material objects manifest and actively transmit signs of ideology, power and resistance. Minaspata, a local site located in the Cuzco Valley of the south-central Andes, provides an interesting case study to explore the role of material culture in colonization processes, particularly as these objects change due to cultural interaction and hybridization practices. This paper will present evidence from ceramics recovered during recent excavations at Minaspata, focusing primarily on surface decoration and paste composition, in order to explore certain facets of the materiality of these objects, and the social dynamics which such apparent cultural transference and appropriation might entail. In this discussion, I will explore two potential examples from Minaspata and the larger Cuzco region, both of which involve the social dynamics of colonialism, but in different ways: one involving the Wari colonization of the area during the Middle Horizon, and the other involving the consolidation of the Inca state.

Hare, Timothy (Morehead State University) and Marilyn Masson (SUNY, University at Albany)**[194]** *Tracking Luxury Craft Production across Mayapán's Physical and Social Landscapes*

Considering luxury production activities in Mayapán's urban landscape reveals new data regarding a complex and diverse economic system. We explore the evidence for luxury production activities at households attached to elite palaces at this Postclassic Maya capital city. Surplus crafting at Mayapán varied according to scale, intensity, and the value of surplus items. Crafting of valuables such as effigy censers, figurines, copper objects, and stucco sculptures, was more closely supervised (or performed by) elites compared to the majority of the city's workshop goods that were independently produced and circulated freely via marketplace exchange.

Hare, Timothy [344] see Masson, Marilyn

Hargrave, Eve [235] see Bollwerk, Elizabeth

Harke, Ryan**[223]** *Discussant***Harkey, Anna (University of California - Berkeley)****[237]** *Walls Speak: Architectural “Neighborhoods” in Late Intermediate Period Peru*

In the Yanamarka Valley in central Peru, the Late Intermediate Period saw dramatic changes. Whole villages moved from the valley floors to dense, defensible hilltop settlements, and were still living there when the Incas colonized this region a century later. The remote locations of many of these sites – both those forcibly abandoned under Inca rule, and those which continued on into the early Colonial Period – mean that numerous domestic round houses, storage spaces, patio walls and pathways still stand relatively undisturbed. At first glance their pirka architecture may seem uniform, but a closer look shows variation ranging from subtle differences in stone shapes, sizes, or mortar thickness, to more striking decorative embellishments. Morphometric and spatial analyses of these attributes reveal both the wide range of stylistic choices made by their makers, and the subtle ways in which those choices varied from one area of a site to another as well as through time. These patterns offer a glimpse into the community of those who built and used these houses, reflecting neighborhoods of shared practice, possible kinship ties, or perhaps even the areas where residents of Middle Horizon villages had settled and, together, built their new homes.

[117] *Discussant*

Harkins, Kelly [384] see Buikstra, Jane

Harkleroad, Eric**[131]** *A New Approach to Warfare*

Lines of evidence, such as weapons, skeletal remains of victims of trauma, iconography, fortifications, etc., that are typically used to argue for the presence or absence of warfare in a society are often ambiguous. As a result, researchers frequently reach contradicting conclusions from the same data. In situations where there are few material remains this problem is magnified, making it hard to draw conclusions about warfare. I put forward a new approach to the discussion of warfare that shifts the focus away from the presence or absence of armed combat and instead looks at the spatial distribution of the material remains in society, circumventing some of the problems with previous approaches. I utilize Practice theory, focusing on the idea of habitus, to look at the place of warfare in everyday life. While I am primarily concerned with the difficulties of identifying warfare through material remains and the application of Practice theory to the study of warfare I discuss these topics using Maiden Castle in Dorset England during the Iron Age as an example of how this approach can meaningfully implemented.

Harkness, Rebecca (Arizona State University)**[273]** *Social Diversity and Public Interaction Space in Classic and Postclassic Mimbres*

In the Mimbres region of the US Southwest there is a substantial increase in the diversity of ceramic wares between the Classic (A.D. 1000-1130) to the Postclassic (A.D. 1250-1450) periods. As an increase in ceramic diversity could indicate the presence of a more diverse community, it is possible that Postclassic settlements would experience greater challenges in creating and maintaining social relationships within a settlement. Weissner (1983) suggests that people's sense of predictability of others behavior can be contributed to similarities in material culture. I am interested in understanding whether the diversity indicated in the pottery is associated with efforts to manage social interactions. In this study I quantify the diversity of painted ceramics at Classic and Postclassic villages along with the extent of enclosure of plazas which are main areas of social interaction in the villages. Taking ceramic diversity as a measure of social diversity and potential social unrest, I expect that where ceramics are most diverse, plazas will be more enclosed such that people can observe each other on a day-to-day basis.

Harle, Michaelyn [187] see Sullivan, Lynne

Harman, Jon (DStretch)**[352]** *Using Rock Art to Infer the Migration of Peoples*

The Great Mural rock art region of Baja California is unique in several ways. The content and style of the art is severely constrained and well differentiated from other nearby rock art styles. Within the Great Mural region there is some variation over time and space. This variation combined with the overall conservative nature of the art allows for inferences about the movement of people making the art. There are stylistic elements of Great Mural panels in the Sierra de San Borja that indicate that the painters migrated from the Sierra de Guadalupe, rather than the closer Sierra de San Francisco. Superpositions in the Sierra de Guadalupe indicate that the Sierra de San Francisco painters also migrated from the Sierra de Guadalupe in a separate event.

Harmand-Lewis, Sonia [53] see Duke, Hilary

Harmansah, Omur (University of Illinois at Chicago) and Peri Johnson (Independent)**[47]** *Landscape Archaeology and Political Ecology in Anatolia: The Yalburt Yaylasi Project 2014 Season*

Since 2010, Yalburt Yaylasi Archaeological Landscape Research Project has been investigating the politics of Hittite borderlands in a region known as Pedassa in antiquity, currently located within the Turkish province of Konya. In the 2013 and 2014 seasons, the project focused on the Kuru Gol Basin, a dried lake basin within the survey region, where Turkey's largest coal-operated power plant

and its open pit mine is planned in the next few years. Due to recent marginalization of this waterless landscape of resilient pastoral communities, previous archaeological projects assumed the Kuru Gol Basin and the highlands around Yalburt Yaylasi to be archaeologically empty, therefore supporting the decision to build the power plant. Instead, the Yalburt Project team's work in the last two seasons documented a rich archaeological landscape of settlement mounds, cemeteries, fortresses, caves, and lowland settlements in the Kuru Gol basin. Following the Yalburt Project's recommendation, the regional preservation council of Konya Province has registered numerous sites as first degree archaeological sites, thereby slowing down the imminent construction plans of the power plant. In this paper, the authors present the preliminary results of the 2014 season as well as the political ecology of the Kuru Gol Basin.

Harrington, Lucy and Natalie Clark (Bureau of Land Management Grand Junction Field Off)

[260] *Predicting Archaeological Site Locations in the McInnis Canyons National Conservation Area in Colorado*

Archaeological predictive models are used in two main applications to 1) identify areas of cultural resource sensitivity in an unsurveyed area and 2) better understand historic and prehistoric use of a landscape. The model created here straddles these two applications, serving to predict cultural resource sensitivity in the primarily unsurveyed McInnis Canyons National Conservation Area (MCNCA), and to understand the distribution of known sites in that area. The Bureau of Land Management (BLM) manages the NCA and its resources. The goal of this predictive model is to aid the BLM in the management of the cultural resources within the MCNCA and better understand which areas may have been important prehistorically and historically. McInnis Canyons is a relatively new national conservation area, less than 10% of it has been surveyed for cultural resources. A predictive model is extremely useful to the land managers in this case. Hopefully it will aid in decision making processes and facilitate the creation of new recreation facilities. Predictive models have been met with varying success rates. The predictive model created here was at least partially successful during initial testing, further inventory will prove its utility.

[260] *Chair*

Harrington, Katherine (Brown University) and Linda Gosner (Brown University)

[368] *Daily Deeds and Practiced Patterns: Using Interdisciplinary Collaboration to Advance the Study of Daily Life in the Classical Mediterranean*

The patterns of daily life are vitally important to our understanding of the past. What people do to make ends meet, to worship their gods, and to take care of their families and property help define a culture and create identity. However, the routine practices of non-elite people, often occurring in non-monumental spaces, have often not received significant scholarly attention, especially in Classical Archaeology. However, since 2013, an interdisciplinary group of graduate students from six departments at Brown University has met bi-weekly to discuss recent advances in the study of daily life in the past worldwide and to "workshop" dissertation chapters and other student work. The research of our workshop participants spans four continents and 4,000 years of human history. Our workshop has covered topics such as settlement and household archaeology, rural archaeology, resource acquisition, agriculture, and craft production in our various fields of research. We, the two workshop organizers, here present the ways in which a comparative focus on these themes can help re-conceptualize and reinvigorate the study of daily life in our own field of research, Classical Archaeology.

[368] *Chair*

Harris, Matthew (URS Corporation) and Grace Ziesing (URS Corporation)

[48] *Pennsylvania Predictive Model Set – Realigning Old Expectations with New Techniques in the Creation of a Statewide Archaeological Sensitivity Model*

Sponsored by the Pennsylvania Department of Transportation (PennDOT), this project endeavored to create a statewide Archaeological Predictive Model (APM) based on the known locations of over 18,000 recorded pre-contact archaeological sites within the Commonwealth. The purpose of this

project was to create a set of sensitivity maps to aide in transportation planning and assist in the cultural resources management process. The creation of an APM covering 46,000 square miles required the development of a new set of computational and statistical tools for the storage and management of massive datasets, the use of parallel and “cloud” computing to apply modern statistical methods, and the adaptation of data science techniques developed in fields such as biology, ecology, and medicine. While the resultant approach was grounded in the lessons of nearly 40 years of APM study, the project demanded a fundamental rethinking of our field’s approaches and expectations. This presentation will explore the project’s mission, outline the computational framework and statistical methods used, evaluate the findings, and discuss the benefits and challenges of such an approach.

Harris, Susan, Rainer Schreg (RGZM, Mainz), Corina Knipper (Curt-Engelhorn-Center, Archaeometry) and Lynn Fisher (University of Illinois Springfield)

[93] *Communities of Archaeological Inquiry: Documenting a German Neolithic Landscape in Cooperation with Avocational Archaeologists*

This poster explores the history, methods, motivations, and contributions of three avocational archaeologists whose lifelong legacies helped to shape an international research project on the Neolithic settlement of the southeastern Swabian Alb in Germany. Their efforts to document site locations and build significant private collections span three generations, from the 1920s to today, and led to the discovery of a rich archaeological landscape previously unrecognized by professional archaeologists. In the context of cultural heritage preservation law in the state of Baden-Württemberg, we consider the history of relationships between avocational and professional archaeologists and the benefits and pitfalls of scientific cooperation between these groups. We argue for the importance of documenting private collections and developing such partnerships for the success of regional settlement pattern studies. For example, due to local knowledge of the landscape, access to community networks, and opportunity for year-round observation, most site locations were identified by avocational archaeologists. Also, larger and more diverse surface collections were amassed than was possible for our short-term systematic surveys. At the same time, communication between professional and avocational archaeologists can lead to more systematic documentation and reporting of private collections. We reflect on strategies for improving and strengthening such cooperative efforts.

Harris, Matthew (University of Queensland), Weisler Marshall (School of Social Science, The University of Queens) and Ariana Lambrides (School of Social Science, The University of Queens)

[105] *Small is not Necessarily Bad: 2000 Years of Sustained Habitation on Ebon Atoll, Marshall Islands*

Islands have long been extolled as ideal ‘laboratories’ where comparative analyses between high volcanic, continental, makatea (or raised limestone) and low coral islands or atolls have provided insights into the speed and tempo of social, technological, and economic change of insular societies over centuries to millennia. The severity and chronology of human impacts on pristine landscapes is a common theme in island archaeology. Ironically, the diminutive atolls—most only a few square kilometers in land area—exhibit some of the best evidence for ancient societies living sustainably. Totalling less than 6 km² in land area, Ebon Atoll, southern Marshall Islands, consists of 22 islets that surround a 104 km² lagoon. At nearly 2 km long, Ebon has the largest pit agricultural system of any atoll that parallels a near-continuous habitation zone. A multi-year archaeological program resulting in more than 100 m³ of excavations is used to examine a 2,000 year record of continuous occupation. Here, we key on the records of shellfish and finfish exploitation to show that, unlike other island types, atolls may exhibit some of the best evidence for humans living sustainably.

Harris, Alison (Dept. of Archaeology, Memorial University of Newfoundland) and Vaughan Grimes (Dept. of Archaeology, Memorial University of Newfo)

[112] *Exploring Human-Canid Interactions among the Dorset Using Stable Carbon and Nitrogen Isotope Analysis*

The scarcity of clearly identifiable dog bones and artifacts associated with dogsled traction has led many archaeologists to posit that the Dorset did not keep domestic dogs. While this statement has

implications for the ability of the Dorset to cope with the variability of the arctic environment, it may also be an oversimplification of the problem. Canid remains do occur on Dorset sites, albeit in low numbers, but they are not identifiable to species based on skeletal morphology alone due to the similar size of large domestic canids and wolves. We apply stable carbon and nitrogen isotope analysis to the remains of large canids recovered from Groswater and Middle Dorset sites in Newfoundland, Canada, in order to determine the major sources of protein consumed by the canids. The stable isotope data indicate that, like the Dorset humans, the Dorset canids consumed a significant amount of marine-derived protein. The results are also consistent with stable isotope data from other domestic canids kept by archaeological, marine-adapted populations. This suggests the occasional, idiosyncratic possession of domestic canids by the Dorset in Newfoundland.

Harris, Megan

[122] *Replication of Stone Disk Beads from the Salish Sea Region, British Columbia*

This poster presents the methods and results of experimental replication of stone disk beads from the Salish Sea region along the south coast of British Columbia. This particular type of beads is abundant across the region and found in a variety of contexts. Despite their ubiquity, little is known about their production.

Through this poster, I discuss the methodology of the four experiments I conducted to replicate these types of beads using similar lithic raw materials, tools, and methods to those used in the past. Experimentation involved the alteration of production techniques (individual vs. mass production) and production tools (stone vs. bone and stone). The purpose of bead replication seeks to provide suggestions for methods and strategies in production.

Harris, J.W.K. [174] see Hlubik, Sarah

Harris, Kathryn (Washington State University)

[300] *The American Falls Obsidian Source: Near, Far, or Unknown?*

Harris' 2011 Master's thesis sourced obsidian artifacts from the Kyle Canyon Spring site (10-BT-8). Obsidian source characterization suggested a large circulation range for the prehistoric people using site 10-BT-8, with strong emphasis placed on the American Falls obsidian source. This result was unexpected, given that it is 120km from 10-BT-8 and a nearer, arguably higher quality obsidian source is only 50km away. In my thesis, I concluded that the people occupying 10-BT-8 over the last 3,000 years were utilizing both distant and local obsidian sources while moving over a wide area of southeastern Idaho. However, newer evidence points to multiple outcrops of the American Falls obsidian source with unique geochemical signatures near the site. Using a Correspondence Analysis of trace element data recorded during obsidian sourcing, I show that there is strong statistical support for other outcroppings of the "American Falls" obsidian source. Ultimately, this could drastically change interpretations made in my thesis as well as influencing future interpretations of obsidian sourcing results from other Idaho archaeological sites.

Harrison, Ramona (City University of New York)

[351] *The Gásir Market and the Möðruvellir Farm: A Cross-Disciplinary Approach to the History of Human Ecodynamics in High Medieval Iceland*

This paper reconciles the results of the long-term Gásir and Hinterlands Project with the underpinnings of historical research of the area. The harbor and trade site complex at Gásir and the monastic estate at Möðruvellir were central areas in the region. Zooarchaeological and environmental data from these sites and hinterlands sites suggest that Hörgá Valley as closest supplier of animal products, may have changed its livestock management strategies, potentially to partake in increasing internationally oriented exchange. Archaeological data from Hörgá Valley farming sites, from the Siglunes fishery in Siglufjörður, and the central sites will be evaluated. Historical data will provide a general idea of site status, land ownership, and livestock numbers. Evidence from both disciplines serves to address the following research questions: 1) Can the historical evidence together with the zooarchaeological/environmental evidence demonstrate sustainability of Hörgá Valley farming economy? 2) Is it possible to evaluate the degree of the

economic effect that international exchange had on the economy in comparison with the size of peasant subsistence farming?

[351] *Chair*

Harrison-Buck, Ellie [58] see Tibbits, Tawny

Harrison-Buck, Eleanor (University of New Hampshire)

[350] *Ancient Maya Wetland Features in the Eastern Belize Watershed*

The Belize River East Archaeology (BREA) project is examining the wetlands of the eastern Belize Watershed. Within this 6000 km² study area, there exists 122 km² of perennial wetlands (28% of all wetlands in Belize). Here we report on the beginning stages of our investigations of an expansive wetland area in the northern part of the BREA study area. Through aerial survey we have identified ditched and drained fields and other canal features that resemble ancient wetland features found elsewhere in Belize and the Gulf Lowlands. Our long-term research goals are: 1) to document the history and aerial extent of wetland use and surrounding Maya settlement; 2) to examine the relationships that exist between wetland agriculture and climate change; and 3) to understand the local and regional economy of wetland agriculture and aquaculture, specifically during the Late-to-Terminal Classic Transition (ca. A.D. 750-900)—a period characterized by long-term drought, political collapse, and shifting political economies in the Maya Lowlands. With attention focused on the associated settlement, this project will shed light on the populations wetland environments were able to support and the role wetlands may have played in both local and regional economies through time, particularly during periods of extended drought.

[350] *Chair*

Harrod, Ryan [202] see Martin, Debra

Harrod, Ryan (UAA)

[229] *No Big Dudes Here: Bioarchaeology of Social Control at Aztec Ruins*

The discussion of elite leaders in the Greater Southwest has primarily focused on Chaco Canyon. This project extends that discussion to the later site to the north called Aztec Ruins. Because of its size and some architectural similarities to sites in Chaco Canyon, it has also been suggested to be a regional center with considerable political-economic power. Morris recovered a number of human skeletal remains from Aztec Ruins between 1916 and 1922. One burial in particular is of interest because Morris suggested in 1924 that this male might represent a warrior based on the items that he was buried with. The characterization of warrior status has led some to argue he was an elite leader of the community. The intent of this research was to assess the validity of the warrior/leader hypothesis by comparing this individual to all other burials recovered from Aztec Ruins and then to compare Aztec Ruins with Chaco Canyon burials. Analysis of 55 individuals recovered from Aztec Ruins, as well as prior research conducted at Chaco Canyon, indicates how social control may have been carried out within a number of different social processes that do not fit a model of powerful elites and passive servants.

Harrower, Michael (Johns Hopkins University), Kathleen M. O'Meara (Maryland Institute College of Art), Ioana A. Dumitru (Johns Hopkins University), Clara J. Hickman (Maryland Institute College of Art) and Jacob L. Bongers (University of California, Los Angeles)

[287] *3D Modeling – Breakthrough or Fad? Bronze Age Towers in Oman and Excavations of an Aksumite Town in Ethiopia*

Three-Dimensional modeling is rapidly transforming reconstruction, visualization and conceptualization of ancient architecture. Many archaeologists are enthusiastic about 3D modeling and implementation of 3D methodologies has been rapid; others remain skeptical that the outcomes of 3D modeling justify the time and resources expended. This paper considers the strengths, weaknesses, and future prospects of 3D models. We discuss results of two projects that used photogrammetry and advanced GPS to model a Bronze Age tower monument in Oman, as well as

stratigraphy and sub-surface architecture of an Aksumite town in Ethiopia. Major issues considered include the role 3D models play in: 1) cultural heritage management, public outreach and archiving a digital record of archaeological remains, 2) revealing the design of ancient architecture and monuments as compared to more traditional methods of drawing, and 3) illuminating the social and political dynamics of ancient societies.

Harrower, Michael [379] see Perlingieri, Cinzia

Harry, Karen [48] see Van Alstyne, Benjamin

Hart, Isaac (University of Utah), Jack Broughton (University of Utah) and Ruth Gruhn (University of Alberta)

[119] *ENSO and the Rabbits of Baja California*

The El Niño/Southern Oscillation (ENSO) is a major source of climatic variation worldwide, with significant impacts on modern human and animal populations. However, few detailed records exist on the long-term effects of ENSO on prehistoric vertebrate populations. Here we examine how lagomorph deposition rate, population age structure and taxonomic composition from Abrigo de los Escorpiones, a well-dated, trans-Holocene vertebrate fauna from northern Baja California, Mexico, vary as a function of the frequency of wet El Niño events derived from eastern Pacific geological records. Faunal indices vary significantly in response to El Niño based precipitation and sea surface temperature, with substantial moisture-driven variability in the middle and late Holocene. The late Holocene moisture pulse is coincident with previously documented changes in the population dynamics of other vertebrates, including humans. As the frequency and intensity of ENSO is anticipated to vary in the future, these results have important implications for change in future vertebrate populations.

Hart, Thomas (University of Texas at Austin)

[271] *Moderator*

Hart, Sharlot (University of Arizona)

[273] *When Do You Stop and Why? Site Boundary Definitions at University Indian Ruin, Pima County, Arizona*

Not much is found in the scholarly literature regarding site boundary definitions: boundaries defined for management purposes may be different from precolumbian geographical boundaries. This is the case at University Indian Ruin (UIR), a 13-acre parcel listed on the National Register of Historic Places, and owned by the University of Arizona. Homeowners in the neighboring community, also listed on the National Register as Indian Ridge, routinely retrieve sherds while performing yard maintenance showing that the UIR site extends past its current managerial boundaries. Survey and test pits in Pima County rights-of-way help Pima County understand what subsurface deposits they have to manage. The juxtaposition of the two testing methods also inform on the usefulness of Class III survey in such heavily disturbed contexts. Finally, a new site boundary for UIR is suggested.

Hartford, Alexis [366] see Brunson, Katherine

Hartford, Alexis (Harvard University), Katherine Brunson (University of California, Los Angeles) and Barbara Fash (Harvard University)

[366] *Re-discovering the Copan Sub-Stelae Caches: A Collection Stewardship and Re-Identification Project*

Beginning in 2013, the authors have engaged in an archaeological collection stewardship project at the ceramic artifact repository in the Centro Regional de Investigaciones Arqueológicas at Copan, Honduras. Responding to a request from the Instituto Hondureño de Antropología e Historia to address a serious concern that the contextual information had become separated from hundreds of

objects, we initiated a re-identification process to ensure the long-term care, access, and use of the ceramic collections. Focusing first on the famous Copan sub-stelae and altar caches, the authors established a protocol that can be carried forward to numerous other objects from excavated contexts. As a result of the work, the objects and their ritual context are being re-analyzed seventy-five years after their discovery in light of new technological breakthroughs. The work underscores the importance of collection stewardship coupled with archaeological training both for archaeologists and local institute managers.

Hartley, Corey (Kleanza Consulting Ltd.) and Lap Kwan Tang (Kleanza Consulting Ltd.)

[121] *Utilizing Tablets for Mobile Data Recording in a CRM Context*

This poster session illustrates the effective utilization of tablet computers in archaeology using a cultural resource management (CRM) case-study. CRM in British Columbia requires rapid turn-around times between site identification, investigation, reporting, and project development. This dynamic makes tablets ideal for generating complex datasets from archaeological sites in short periods of time. Digital data can be imported into GIS or database management systems immediately, without transcription or data processing. We were able to make alterations to project footprints day-by-day that effectively avoided archaeological site boundaries and management zones. During our 2014 field season, we customized FileMaker, a relational database application useable on both PC and iPad tablets to collect typological, metric, geographical, and photographic image data. The tablet enables users to control, share and store data in the field. This creates fewer inconsistencies in reporting and allows for more accessibility, making it possible for informed management decisions to be made in the field. This accessibility of data through the use of tablets can transfer to all aspects of CRM and allow for data sharing on the macro scale.

Hartshorn, Timothy [258] see Graesch, Anthony

Haselgrove, Colin [348] see Hamilton, Derek

Hassett, Brenna (Natural History Museum London), Suzanne Pilaar Birch (University of Georgia), Rebecca Wragg Sykes (Université Bordeaux 1) and Victoria Herridge (Natural History Museum London)

[322] *Where Does Your Community Live? The Trowelblazers Experience*

The TrowelBlazers project is a community-sourced digital archive of short biographies and images of women whose significant contributions to the fields of archaeology, geology, and paleontology have often been overlooked. Originating in a conversation on Twitter between four early-career researchers, the project began life as a Tumblr blog designed to share inspirational images and stories of women researchers in the past. Different social media accounts allow us to interact with a number of communities, including students, academics, professional archaeologists, archivists, and museum staff, as well as members of the general public and professional organizations. We have had coverage in mainstream media, hosted a Wikipedia editathon, coauthored a chapter in an ebook, and written several guest posts on blogs of like-minded collaborating organizations, such as institutional archives. By not only focusing on individual women but also identifying the networks in which they worked, we have been able to develop a uniquely connected approach with multiple partners in real-world engagement with advocacy groups and the wider public. This paper explores how understanding how multiple audiences engage with different social media, online, and real-life aspects of the TrowelBlazers project is key to maintaining interest, creating new content, and building awareness of women's contributions.

Hastorf, Christine (University of California-Berkeley)

[414] *Agriculture Is a State of Mind: The Andean Potato's Unending Domestication*

Most scholars agree that territoriality and commitment to a landscape participated in the domestication syndrome and agriculture. The geophyte *Solanum*, the potato, is a particularly engaging crop to study domestication origins, being a stem tuber, with wild species growing throughout the Andes of South America, it is only with recent genetic research that we know its likely

location of domestication. Wild potatoes continue to be found in potato fields today, aiding the diverse varieties still being domesticated in the Andes. When we study early potato farming in the Andean highlands we rely upon archaeological evidence. The early dates we have suggest a long engagement with the potato, even before farming. While the archaeobotanical data are still scant for early geophytes in the Andes, the archaeological evidence allows us to conclude that *Solanum* was collected, processed and eaten from an early time, at least by 7000 B.C. Through digging and disturbance, geophytes were encouraged to produce and thrive. This harvest-while-planting farming provides a unique agricultural trajectory for the domestication syndrome. Recent genetic work on the origins of potatoes suggests a long and continuous process of domestication.

[41] *Discussant*

[226] *Chair*

Hatfield, Virginia (University of Kansas, Biodiversity Institute), Kale Bruner (University of Kansas) and Dixie West (University of Kansas)

[302] *Geological Hazards, Climate Change, and Human Resilience in the Islands of the Four Mountains of Alaska: Preliminary Archaeological Findings*

Archaeologists with the NSF-funded research project "Geological Hazards, Climate Change, and Human Resilience in the Islands of the Four Mountains" conducted their first season of fieldwork on Chuginadak and Carlisle Islands, Aleutian Islands, Alaska, in 2014. Preliminary results identified multiple component village sites. These include the Ulyagan site on Carlisle, with a Russian period and one or more prehistoric period occupation. Large, rectangular houses and metal artifacts represent the Russian occupation. Lithic artifacts recovered from below the Russian occupation represent the prehistoric component in possibly two or more cultural lenses, and include bullet shaped style points similar to those found at the Margaret Bay site on Unalaska, Alaska. The U.S. BIA previously dated the lower components at this site to 3200 ± 70 radiocarbon years before present (RCYBP), $1940 \pm$ RCYBP, and 1690 ± 70 RCYBP (Cooper 1991). Archaeologists also identified prehistoric occupations at three sites (Blue Cove, Black Peak, and Applegate Cove) on nearby Chuginadak Island. Confirmation of the ages of these occupations is awaiting radiocarbon results, and further excavations will occur in 2015.

Haubt, Robert (Griffith University)

[149] *The Rock Art Database: Centralizing and Streamlining Heritage Data Using the CIDOC Reference Model*

The Rock Art Database is a rock art heritage project at the Place, Evolution and Rock Art Heritage Unit (PERAHU) at Griffith University. It is designed to bring members of the greater rock art community together in one centralized global network to discuss and share rock art information. The platform functions as a hub including data repository and data visualization tools to curate and share digital data sets and encourages members to contribute to the system to improve and streamline rock art data management frameworks. This paper discusses the implementation of the CIDOC Reference Model in the Rock Art Database. It looks at data ontology, metadata management and technological advancements in collaborative cyber environments within the greater rock art community. Exploring relational and hierarchical structures of planning, recording, managing, monitoring and disseminating data from World Heritage to national and local projects the paper is concerned with identifying knowledge gaps within the CIDOC Reference Model and existing rock art management systems. The project currently focuses on but is not limited to Australian rock art management.

Hauer, Craig and Sean McMurry (Enviroscientists, Inc.)

[392] *Constructive Monitoring: Finding Successful Solutions for Environmental, Engineering, Cultural Resources, and Public Relations Challenges in the Constructed Landscape of the Presidio of San Francisco, California*

In 2012-2014, AMEC successfully balanced the needs of the National Park Service (NPS), the Presidio Trust, and regulators to preserve historic resources, maintain public relations, engineer safe and effective solutions, and address environmental concerns during remediation activities to remove

contaminated soil at the Presidio of San Francisco, a NHL and NRHP-listed property. For over 150 years, the Presidio, located near the Golden Gate Bridge, was used by the U.S. Army to protect San Francisco. Remedial activities removed approximately 14,800 cubic yards of contaminated soil. Working with NPS staff, AMEC archaeologists developed an archaeological monitoring, sampling, and excavation strategy that preserved archaeological resources while keeping the project on schedule and budget. The 32 features recovered included a buried 1870s ammunition magazine and large, intact 1870s and 1890s coastal defense battery features. This presentation discusses how the features recorded during monitoring fit with the history of the Presidio.

Haukaas, Colleen [302] see Hodgetts, Lisa

Hauser, Neil (ATSAA), Jenny Milligan (Paleo Research Institute), Lynley Wallis (Wallis Heritage Consulting), Alan Watchman and Wayne Wilson (ATSAA)

[3] *Evaluating NAA, pXRF, and LIBS from the Perspective of Ochre from Gledswood Shelter 1, Queensland, Australia*

Gledswood Shelter 1, Queensland, Australia was utilized by prehistoric people for 40,000 years. As part of the investigation of ochre from Gledswood Shelter 1, several samples recovered from different levels of the shelter were subjected to NAA (neutron activation analysis), pXRF (portable X-ray fluorescence), and LIBS (laser induced breakdown spectroscopy) to identify which samples might have come from the same quarries. Actual sources for the ochre are not known. These analyses provided an opportunity to compare and contrast the information obtained from each of the three elemental analysis methods. In addition, information obtained from all three methods was leveraged to better understand the nature of the samples. Each method has its strengths and weaknesses but together provide more robust characterization of the samples than any one method alone.

Hauser, Neil [185] see Wilson, Wayne

Hauser, Mark (Northwestern University)

[305] *Water, Hospitality and Difference in Everyday Life*

Water has generally been viewed as a basic metabolic need whose capture and distribution provides a nexus through which power flows. The household becomes a place of water consumption where subjectification was achieved in other domains and subsequently inscribed into the container. In this paper I take a slightly different approach. Specifically I ask the question, at what point does water become a convenience and how does its status as a convenience inflect both material practices of the household and social reproduction of governance in everyday life? This paper draws on recent trends examining the relations of power in everyday life focusing on daily rituals of hospitality. I rely on a case study from the eastern Caribbean. Perhaps no resource was more precious to 18th century Caribbean colonies than fresh water. Seasonality of weather, land modification to grow cash crops, and the demands of factories to process those crops made water a precarious resource. Here I examine water as a vector of social reproduction in the settlement and household. As such water, and the containers that store it, become less a marker of distinction, but active agents in the creation of difference.

Hauser, Sheila Jon (Wichita State University)

[373] *Were the Wichita Using Ilex Vomitoria while Living along the Arkansas River In Kansas*

Were the Wichita consuming Ilex vomitoria in a ritual context while living in the Arkansas River basin in Kansas? Prior to moving into the Arkansas River basin, the Caddoan speaking tribes of Wichita were located further south in Oklahoma and Texas, where Ilex vomitoria grows naturally and was consumed; however it is not a plant that naturally thrives in Kansas. To determine if there is evidence of Ilex vomitoria use, FTIR testing was performed on pottery sherds found at the Paint Creek site (14MP1). FTIR testing has also been performed on laboratory created teas from Ilex vomitoria, Mescal beans, and Yerba Mate for comparison. The results of this testing can provide great insight into the lives of the Wichita while they lived in Kansas.

Häusler, Werner [9] see Wagner, Ursel

Hauther, Kathleen [264] see Snow, Meradeth

Havelkova, Petra [207] see Veleminsky, Petr

Haverstock, Gregory [138] see McDonald, Josephine

Hawkes, Kristen

[296] *Ethnoarchaeology plus a Theory of Behavior: Jim O'Connell's Hadza Work*

O'Connell's Hadza work shows how combining behavioral ecology with ethnoarchaeology magnifies the power of ethnography to help interpret the past. O'Connell's systematic observations and analyses of Hadza hunting and treatment of big game gave us robust falsification of received notions about our ancestral past, including ideas about scavenging, variation in faunal assemblages, and prey transport. His vision as both an archaeologist and ethnographer extracted the richest kind of evolutionary anthropology from our Hadza project. Without O'Connell as a guide I would have learned so much less from the Hadza. And so would you.

Hawkins, Alicia (Laurentian University), Joseph Petrus (Laurentian University) and R.G.V. Hancock (Anthropology Department, McMaster University)

[140] *LA ICP-MS Analysis of Glass Beads from 17th Century Huron-Wendat Sites in Ontario*

We present the results of a preliminary study of glass bead chemistry from several contact period Wendat sites in Ontario. Much important work on the chemistry of glass beads found in Ontario was carried out by Hancock and colleagues using Instrumental Neutron Activation Analysis in the last several decades. We compare our results with theirs. In some cases we were able to analyze the same beads that had been previously examined using INAA. We consider our results in terms of insights they may provide on early contact period dynamics in the Great Lakes.

Haws, Jonathan [8] see Zinsious, Brandon

Hayashida, Frances (University of New Mexico)

[180] *Agriculture and Empire in the High-Altitude Atacama Desert*

How did prehispanic farmers make a living in the hyperarid, high-altitude Atacama Desert, and how did their lives and landscapes change under different political regimes? In this paper, we discuss our ongoing project on irrigated landscapes in the interfluvial region between the Upper Loa and Salado rivers in northern Chile. Research has focused on two sites (Paniri and Topaín) with remarkably well preserved spring-fed canal and terrace systems and a residential and administrative center (Turi) that were occupied in the Late Intermediate (ca. 1000–1400 A.D.) through Inka (ca. 1400–1540 A.D.) periods. How did Late Intermediate farmers manage water, crops, and labor and how were these practices transformed under the Inka? Our interdisciplinary effort to address these questions has included mapping, test excavations, attempts to date agricultural features, examination of agricultural soils, archaeobotanical analysis, and paleoenvironmental studies based on geological survey and pollen and diatom analyses. We report on our preliminary findings, analytical and interpretive challenges, and planned future research.

[180] *Chair*

Hayden, Brian (Simon Fraser University) and Suzanne Villeneuve

[153] *The World of Secret Societies: Dynamics from the Northwest*

Secret societies are one of the most under-theorized and ignored aspects of prehistoric societies in

archaeology, yet they may be pivotal in understanding major developments in sociopolitical complexity in the past. Probable prehistoric examples of secret society remains include the elaborately painted caves of Upper Paleolithic France, the communal structures or caves of the Early Near Eastern Neolithic (Gobekli Tepe, Jerf el Ahmar, Nahal Hemar, and others), and the kivas and caves used in the American Southwest. In order to develop a sound theoretical foundation for the role of secret societies in the past, it is essential to understand how they functioned ethnographically. Some of the best ethnographically documented examples of secret societies among complex hunter/gatherers come from the Pacific Northwest and California (e.g., the hamatsa society). We will focus on the exclusive recruitment techniques and strategies that were ethnographically used to create control over politics and economics by secret society members, and the evident goal of such societies to promote the self-interests of their highest ranking members.

[342] *Discussant*

Hayden, Brian [171] see Villeneuve, Suzanne

Haynes, Gary [87] see Wriston, Teresa

Haynes, Gary (University of Nevada-Reno)

[150] *The Inglewood Mammoth (Maryland) and Others Like It*

The Inglewood mammoth site near Largo, Maryland - radiocarbon dated in 1982 to 20,000 rcybp - shares features with other mammoths recovered in North America and Mexico: It has no lithics associated with the bones, and some of the elements have been fragmented. Over 25 years ago I interpreted the bone-breakage as recently done by heavy equipment, but another researcher now interprets it as done by humans in antiquity. I provide a first look at the site's bone maps, sediment profiles, and other essential information, and compare the data from Inglewood with other sites having broken proboscidean bones and (usually) no lithics. These finds have been variously considered as kill, butchery, and bone-quarrying locales. Taphonomic logic (and occasionally illogic) in the interpretations of these sites is an important part of ongoing debates about the timing of the peopling of the Americas.

[150] *Chair*

Hays, Christopher and Richard Weinstein (Coastal Environments, Inc)

[220] *A Tale of Two Sites: The Connections Between Poverty Point and Tick Island*

Poverty Point and Tick Island were two of the most important sites in the southeast during the Late Archaic period. Previously we have demonstrated a probable connection between the sites, which are separated by over 700 miles, through the identification of Lower Mississippi Valley loessal PPOs at Tick Island, and St Johns pottery, likely from the area of Tick Island, found at Poverty Point. In this paper we identify an additional set of artifacts that are found at both sites but are not known to be present at any other Late Archaic sites between them, except for the Poverty Point culture site-Claiborne. The most plausible explanation for their co-occurrence at the Poverty Point and Tick Island is through some type of interaction. The items include perforated baculum bones, PPO style plummets, stylized human faces made from clay, clay tubular pipes, toy or miniature pots, decorated bone pins, and a distinctive decorative pattern on PPOs that is unique to both sites. We attempt to explain the purpose and nature of this connection using anthropological theory on symbolic gift exchange and the political and symbolic importance that tribal societies attach to acquiring esoteric knowledge of distant lands.

Hays, Maureen [333] see Franklin, Jay

Hays-Gilpin, Kelley (Northern Arizona University)

[303] *Ancient, Modern, and Post-Modern: Pueblo Mural Painting of the Southwestern U.S.*

Over a period of centuries between about A.D. 1000 and 1540, Ancestral Pueblo communities in

what is now the southwestern U.S. developed elaborate, iconic mural painting traditions. The most detailed and best-known murals were excavated in kivas (ceremonial structures) at the sites of Awat'ovi and Kawayka'a on the Hopi Mesas, Arizona, and at Pottery Mound and Kuaua near Albuquerque, New Mexico. These murals not only express ritual and worldview in the 15th century but inspire contemporary artwork by Hopi artists such as Fred Kabotie and his son Michael Kabotie.

Hayward, Michele (Panamerican Consultants), Frank Schieppati (Panamerican Consultants) and Michael Cinquino (Panamerican Consultants)

[352] *Lesser Antillean Rock Art of the Caribbean: A Regional Perspective*

Dubelar's 1995 compendium of rock art sites including sketches and photographs of the petroglyphs from the Lesser Antilles remains a critical resource for the study of the region's prehistoric images. The work has been supplemented in recent years with additional documentation efforts of known and newly discovered sites. The focus of this paper is on the characterization of Lesser Antillean rock art by detailing site and image distributional patterns across the arc of various islands. The Hofman et al 2007 investigation, among others, of shifting trade and sociopolitical networks during the area's prehistoric period provides an interpretive context.

Hazard, Rebecca and John Dudgeon (Idaho State University)

[233] *Developing a Microfossil Key for Fiji from Modern Herbarium Specimens*

Microfossil analysis provides a valuable proxy for inferring prehistoric environmental conditions, as well as direct evidence for the presence of agricultural domesticates and other important subsistence cultigens. However, the body of reference material for identifying individual plant morphotypes is lacking. Here we present our preliminary efforts at assessing the efficacy of modern herbarium specimens as a key for identifying archaeological sedimentary and calculus-derived microfossils. We present a simplified method for extracting phytoliths, calcium oxalates and starches from modern plants and compare frequencies recovered from specific plant parts, which may provide insight into differences in relative abundance observed in Fijian archaeology.

Hazard, Rebecca [233] see Dudgeon, John

Headrick, Annabeth (University of Denver)

[306] *Empire at Chichen Itza Revisited*

In the chapter on Chichen Itza within the *Forest of Kings*, Schele and Freidel masterfully redirected a half century of research that had largely pressed the foreignness of the site. Instead, they revealed the city's Maya impulses and explored how Classic period strategies of conquest warfare transformed to integrate a type of inclusive diversity. Their suggestions of Chichen's willingness to incorporate their enemies into a grander regional system redefined Epiclassic conversations over Maya or Toltec dominance, offering a new model for Epiclassic Maya cities that drew from Classic period kingship but were less concerned with one, unified vision of identity. In particular, their model for militant strategies may be extended beyond the regional to distant lands outside of Mesoamerica. By coupling economic strategies that used the military for trade and the acquisition of exotic prestige goods with the integrative model of Schele and Freidel, we can better see how the city not only had aspirations for regional dominance, but made calculated efforts to use its military for economic purposes in lands much further away. Evidence for the military's economic functions comes from the deposition of exotic goods throughout the site and the visual evidence recorded in murals and sculpture.

Healan, Dan (Tulane University)

[141] *The Obsidian Industries of Altica, Mexico*

Preliminary analysis of obsidian artifacts recovered from survey and excavation at the Early/Middle Formative site of Altica in the Teotihuacan Valley indicate the presence of several distinct modes of raw material acquisition, reduction, and utilization. These various modes are described from a

technological perspective, and possible logistical, social, economic, and political correlates are considered.

[39] *Discussant*

Healan, Dan [292] see McCall, Grant

Healey, Elizabeth [401] see Ford, Renee

Healey, Elizabeth (University of Manchester, UK) and Stuart Campbell (University of Manchester, UK)

[412] *More than just a Shiny Stone? The Sources and Significance of Obsidian Found in Early State Contexts in the Near East*

Obsidian is a visually attractive material. Artifacts made of obsidian are regularly documented in early state contexts in the Near East (for example Atij, Gudeda, Mari, Ras Shamra, Atchana, Mozan) and its use for vase manufacture is well known at sites such as Acem, Kultepe, Atchana, Warka, Ur and so on. It is also used to make beads and other personal items (Ur, Assur and elsewhere). Less well known though, are the origins of the obsidian from which these objects are made. In our paper, after an overview of the range of objects made of obsidian, we will focus on those for which we have geochemical data. Our evaluation of this data will allow us to discuss whether the origin of the obsidian as a material was taken account of by contemporary society or whether its appearance was the main reason for its selection. We will consider whether its origins affected how and where it was used or whether its exotic nature had ceased to be significant.

Hearth, Nicholas

[38] *A Forgotten Facet of Fedick: Scott's Contributions to Maya Lithics Research*

Scott's body of multidisciplinary and collaborative research resists categorization to a single rubric, even in ones as broad as historical ecology or cultural geography. However, many archaeologists I've met who haven't worked directly with him only understand his long-term research projects within these two paradigms. Few remember or realize that Scott began his graduate school career examining the lithic economy of the Tikal-Yaxha survey transect and that he has continued to facilitate and involve himself lithics-related projects as a professor. A brief review of his work and the work that he facilitated and collaborated with his students reveals a substantial body of literature on the roles of stone tools in social complexity, economy, food-ways, and agriculture in the ancient Maya world. It illustrates his long-term interest in lithic studies as a vehicle to get to the "nuts and bolts", so to speak, of ancient Maya society, as well as an alternative area of research to his more widely-read research of ecological-based approaches in Maya studies.

Heath, Joshua (American University) and David Witt (SUNY Buffalo Grad Student)

[63] *Reshaping Identities through the Destruction of Artifacts*

Archaeological artifacts can be used to foster a powerful feeling of national pride, or they can be held up as a sign of previous degeneracy and destroyed to 'purify' a populace. For example, artifacts such as Egyptian pyramids, Mesopotamian Lammasu, Afghani Buddhas, and Malian Sufi Shrines represent cultures and conditions that do not fit the fundamentalist identity of Islamists groups. While modern states have often—and rightfully—raised these artifacts as evidence of equality with Euro-American cultures, fundamentalist Islamic groups are not simply spurning this connection to their cultural heritage, they are destroying the remnants of those cultures to make it more difficult for those connections to be made. By contrasting case studies where states explicitly tie themselves to the ancient world against states or other actors that wish to destroy artifacts that connect to a non-fundamentalist past, it is possible to see how these different approaches lead to the creation and curation of different identities. Through this examination of the intersection of agency, history, and belief, it will be possible to show the roles archaeological artifacts and previous cultures play in modern identity creation.

Heath, Margaret (Bureau of Land Management) and Maureen Malloy (Project Archaeology)**[236]** *Project Archaeology's Role in the Rise of Heritage Education in the United States*

Archaeology education has been a part of archaeological practice in the U.S. for the past 30 years and is firmly rooted in the discipline's widely shared belief that public education about archaeology is key to protecting and preserving sites. But archaeology education has broadened to encompass educational goals and cultural heritage values that are much broader than only site protection. The goals of Project Archaeology—which began collaboratively in Utah to combat site looting and destruction—have evolved to include “use(ing) archaeological inquiry to foster understanding of past and present cultures; improve social studies and science education; and enhance citizenship education to help preserve our archaeological legacy.” This paper provides an overview of the history of heritage education as it has evolved in the U.S. since the 1980's, with an emphasis on the role and development of Project Archaeology within this broader context.

Heath, Laura (Boston University Department of Archaeology)**[249]** *Pottery on the Periphery: Postclassic Ceramics from La Laguna, Tlaxcala, Mexico*

This poster examines life at the periphery of the Postclassic Mesoamerican World System, discussing the access that rural or peripheral people may have to the larger economic, political, and informational networks of their region. It addresses these questions by presenting an analysis of the Epiclassic and Postclassic period ceramic assemblages from the site of La Laguna, Tlaxcala, Mexico. Almost all of the sherds come from Feature 185, a sheet midden context deposited during the late Postclassic period (c. 1300-1521 CE). During this period, many small *āltepēmē* (central Mexican city-states) coalesced economically and culturally into a system described as the Postclassic International World System by Smith and Berdan, and the Aztec Triple Alliance emerged as dominant. Although La Laguna was a small rural settlement on the periphery of this society, the wares and iconography present in the ceramic assemblage show that its inhabitants were involved with the regional economic and intellectual interactions of the time. I present the assemblage in terms of ware, vessel form, and iconography, and suggest avenues for future research on Postclassic ceramics in Tlaxcala.

Hechler, Ryan (McGill University) and William Pratt (Texas State University - San Marcos)**[307]** *Representing Difference in the Precolumbian Andes: An Iconographic Examination of Physical "Disability"*

This paper will review iconographic representations of physical disabilities and differences from several Andean societies from different time periods, such as the Inka, Chimú, Wari, Tiwanaku, and Moche. People with physical disabilities were actively included in many societies throughout the Precolumbian Andes. Many cultures developed their own social perceptions that benefited people with physical disabilities and differences and they often thought the disabled were more intimately connected to spiritual worlds. People with differences were rarely depicted in a manner of despair, or being helped by others; quite the opposite, people with disabilities were virtually always operating independently even when depicted with a larger group. Artistic depictions of people with disabilities and physical differences often presented such individuals as being active – frequently participating in ritual, playing music, and even appearing content. People with physical differences and disabilities are some of the most overlooked individuals in current Andean research.

Hedenstierna-Jonson, Charlotte (Stockholm University, Sweden)**[18]** *Identity, Self-Image and Cultural Expression in Viking Age Sweden*

The people of Viking Age Scandinavia shared a common culture and could as a group be regarded as Northmen or people from the North. It is clear, however, that contemporary Northmen recognized differences between, and divisions within, their own cultural and political sphere. In order to advance in our interpretation and understanding of the Northmen and their geographical expansion during the Viking Age, we need to recognize these differences, which they themselves were well aware of. The Viking Age was a time of transition when an older societal structure gradually formed into Medieval society. In this formation process symbols were chosen and altered to represent the desired self-image of the members of that society. The manipulation of cultural behavior, symbols

and material culture is one of many mechanisms used by societies to distinguish themselves vis-à-vis others. As archaeologist we can study these material remains. Reaching the individuals tend to be more difficult. This paper is part of the Swedish research project the Atlas, where archaeology is supplemented by osteology, isotope analyses and genetics to reach a further understanding of Viking Age identities.

Hedlund, Jonathan (ERO Resources)

[65] *Lithic Material Sources and Implications for Trade and Travel through the Smith River Basin in Northwest California*

Excavations at the Hurdy Gurdy Bridge site (CA-DNO-1028) recovered a collection of lithic artifacts representing both local and exotic sources of material. Identification of both probable and definitive source locations indicates transportation of lithic material occurred from coastal, Klamath Mountains, south-central Oregon, and north-central California regions. Obsidian subjected to OH and XRF analysis from Hurdy Gurdy Bridge site along with sites located at the confluence of the Middle and South forks of the Smith River, (CA-DNO-89/H) and downstream from the confluence at Jedidiah Smith State Park (CA-DNO-26, CA-DNO-332, CA-DNO-333, CA-DNO334, and CA-DNO-XX13) confirms occupation of the region from the Early Holocene to the Contact period, and representation of the different lithic source locations varies through time. While the confluence sites have a nearly bivariate split between south-central Oregon and north-central California the obsidian from the Hurdy Gurdy Bridge site is almost entirely sourced from north-central California. This disparity, coupled with source locations of non-obsidian material, has implications regarding not only the settlement differences and external trade relationships between the Hurdy Gurdy Bridge site and the confluence sites, but also regional implications regarding trade, movement, and settlement between the interior and coastal regions.

Hedquist, Saul (University of Arizona)

[343] *Ritual Practice and Exchange in the Late Prehispanic Western Pueblo Region: Insights from the Distribution and Deposition of Turquoise at Homol'ovi I*

Archaeological and ethnographic evidence demonstrate the importance of turquoise among past and present Pueblo groups. In this paper I examine the social uses of turquoise and other blue-green minerals at Homol'ovi I, a late prehispanic Hopi village and the most intensively excavated site within the Homol'ovi Settlement Cluster. I explore intra-site patterns of deposition (i.e., the content and context of turquoise deposits) and stylistic variation among objects in an effort to identify differential practices and material expressions within the pueblo. In addition, I assess the geologic provenance of turquoise from the site using high-precision measurements of lead and strontium isotopes. Recent studies indicate turquoise from at least two geologic locales—the Cerrillos Hills (New Mexico) and Canyon Creek (Arizona)—was acquired and consumed by Homol'ovi I inhabitants. These source investigations, coupled with those from other contemporaneous sites in the region, clarify the flow of turquoise across the late prehispanic Western Pueblo landscape and illuminate regional patterns of acquisition and exchange.

Heffner, Sarah (PAR Environmental Services, Inc.)

[45] *Exploring Healthcare Practices of Chinese Railroad Workers in North America*

Chinese laborers on the North American transcontinental railroads performed dangerous and labor-intensive work, and many died or were seriously injured as a result of explosions, cave-ins, and severe and unpredictable weather. These workers received meager wages and may have faced additional health risks from ethnic violence and malnutrition. Little is known about how these individuals treated their injuries and ailments and, to this date, not a single document written by a Chinese railroad worker has been discovered. Analysis of medicinal artifacts recovered from railroad sites in Idaho, Nevada, and Utah, dating from 1869-1910, combined with research on existing documentary and archaeological sources on Chinese medicine in 19th-century North America, can provide us with a better understanding of the healthcare practices of Chinese railroad workers.

Hegberg, Erin (University of New Mexico)

[128] *Making Ends Meet in Frontier New Mexico*

In 19th century frontier New Mexico consumer relationships reflected important social networks that were essential to the survival of Hispanic settlements. These relationships played a vital role in the formation and maintenance of modern Hispanic identity during the Mexican and American Territorial Periods. Visually and functionally similar plainware ceramics were produced and used by many different cultural groups on the landscape in New Mexico in the 19th century. Hispanic residents were able to acquire their pottery from several sources. Using close statistical analysis of technological styles in the New Mexican plainware ceramic assemblages of four 19th century residential sites, this paper examines personal relationships Hispanos cultivated with neighboring Pueblo and nomadic Native American groups to acquire their pottery, and the implications of these relationships for Hispanic identity. Preliminary results indicate that social identities and ethnicities on the frontier were becoming more binary as a widening division opened between Hispanic and Native American groups. Hispanos sought to minimize the social markers of their hybrid histories and Native American relationships in response to American prejudices. However, it appears that Hispanic identity also grew to encompass a wide range of settled lifestyles and personal histories.

Hegel, Casey [7] see Haggard, Alyssa

Hegel, Casey (Humboldt State University)**[131] *Depopulation and Massacres: Bioarchaeological Evidence of Violence within the Ancestral Pueblo of the Southwest Region of North America***

This paper investigates forensic data within the Southwest region of the United States for indicators of violence, conflict, and warfare related events. The main focus is the Mesa Verde region of the Southwest and other sites inhabited by the Ancestral Pueblo. In this area, I examine forensic evidence supportive of trophy-killing and cannibalism; both have documented evidence at other sites in the Southwest area. Different types of trauma, such as, cut marks and blunt force trauma are also examined. Information about the human remains will be examined and incorporated in the analysis, including the condition, location, placement, and patterns of violence. The age and sex of the human remains found within this region are also documented when that data has been determined from the remains. The data are used to examine how depopulation and warfare events in this region affected burial patterns and treatment of the dead.

Heidkamp, Blair (College of Wooster) and Olivia Navarro-Farr (College of Wooster)**[205] *Tomb of the Goblets: Revisiting a Middle Bronze Burial from Pella in Jordan***

Pella is among the longest inhabited sites in the Southern Levant, with first occupation in the Paleolithic and down through the late Islamic phase. Robert Smith began The College of Wooster excavations there in 1967. In the first season, excavations were focused on the Western Church Complex and the Eastern Cemetery. One of the tombs excavated, Tomb 1, possessed in excess of 100 artifacts, mainly ceramic vessels. Publications of that season's work contain only a short report on the tomb. Published reports offers limited interpretation about the possible significance of the material that dates to the Middle Bronze period and that has the potential to inform us about this transitional phase at the site. The present study undertakes a detailed reexamination of Tomb 1 contents curated at the College of Wooster. The examination encompasses a broad range of artifacts, including the four carinated feasting goblets that served as the basis for the label Smith applied to the tomb. In revisiting this specific tomb, I plan to broaden the coverage of the artifacts, including the four carinated goblets. Another goal of this study is to encourage the re-examination of previously excavated materials, which can lead to new discoveries.

Heidke, James (Desert Archaeology, Inc.)**[55] *Figurines and Farmagers***

Two temporally-sensitive fired clay figurine styles were identified among the 282 fragments recovered from the Early Agricultural period archaeological site known as Las Capas, located in Tucson, Arizona. The earlier style was only recovered from the 1220-1000 B.C. stratum, while the later style was just recovered from the 930-730 B.C. strata. Virtually all fragments were found in

domestic trash deposits. Previous interpretations of similar figurines relied on the assumption that they represent anthropomorphic beings and were used in practices or ceremonies related to ancestor veneration. However, the cross-cultural approach that led to that conclusion is insufficiently sensitive to the historical specifics of Early Agricultural period figurine use. Figurine manufacture began at the time when people started growing some of their food while continuing to hunt and gather the rest. Multiple lines of evidence indicate that predominantly male, Uto-Aztecan-speaking migrants brought maize farming to the Sonoran Desert. The evidence from Las Capas suggests that they also introduced a ceremonial complex involving maize symbolism, that botanomorph human or anthropomorphic plant figurines/effigies were an essential part of that symbolism, and that those objects played an important role in reciprocal obligations between human and non-human beings that would have led to successful harvests.

[55] *Chair*

Heidke, James [304] see Ownby, Mary

Heikkila, Raija (Bryn Mawr College), Kaitlyn Laws (University of Delaware, Newark) and Thomas Hardy (University of Pennsylvania)

[250] *Zooarchaeology of the Late Intermediate Period in Minaspata, Cuzco, Peru*

Minaspata, a site located in the Cuzco Valley of the south-central Peruvian Andes, contains evidence of occupation spanning continuously from the Early Horizon through the end of the Inca Empire. In 2013, several units were excavated in order to better understand the social transformations which occurred in local populations due to colonial practices, both under the Wari state in the Middle Horizon and in the early consolidation of the Inca heartland. Analysis of the faunal remains of the excavations can shed light on the shifting patterns of food consumption, butchery practices, and bone tool manufacture which occurred during the transition from the beginning of the Late Intermediate Period (LIP, A.D. 1000-1400) to the terminal Inca occupation at the end of the Late Horizon (LH, A.D. 1400-1532). The results of the securely dated faunal remains from the 2013 excavations will be presented and placed within a larger cultural and regional context related to the transition from the LIP to the LH and the consolidation of the Cuzco region under the early Inca state.

Hein, Anno [25] see Kilikoglou, Vassilis

Hein, Anke (Ludwig Maximilians University Munich)

[286] *Environmental Preconditions and Human Response: Subsistence Practices at Prehistoric Settlement Sites in the Liangshan Area, Southwest China*

The Liangshan Area in Southwest Sichuan is known for its great diversity both in geographic layout and ethnic composition. It is furthermore characterized by a highly diverse archaeological assemblage, whose date and cultural affiliation is in large parts still unclear. To solve this problem, in recent years archaeological fieldwork has focused on settlement sites, whose stratigraphy promises to aid in establishing a local chronology and furthermore provides insight into the daily life of past people. This paper focuses on the lithic and ceramic assemblages from prehistoric sites in the Liangshan area, introducing raw material, object form, and technical details. Furthermore, the nature of the ceramic material and building features are taken into account to conclude on past subsistence practices and modes of living. The main objective is to identify the major differences and similarities between the assemblages from different sites and sub-regions, and draw conclusions on site functions and location choice, which in turn can help to highlight the interplay between the complex environment of the Liangshan Area and its past inhabitants.

[286] *Discussant*

[349] *Chair*

Heindel, Theresa (University of California - Riverside)

[75] *Xanthosoma violaceum and the Maya Diet: Root Crop Use in Ancient Maya Agriculture*

Research on ancient Maya agriculture has historically been focused on seed crop cultivation, but the

recent discovery of a Classic period manioc field near the site of Ceren, El Salvador has shed new light on the possibility of intensive root crop cultivation by the ancient Maya. Another root crop, however, *Xanthosoma violaceum* (colloquially known as “malanga”), was also encountered in a household garden. Through the use of multiple lines of evidence, I have compiled a summation of malanga’s possible agricultural roles and opportunities for future research. Ethnographic studies suggest that malanga was most likely processed in a similar way to manioc, and ethnohistoric evidence has been helpful in understanding whether malanga could have been used as famine food or as a supplementary crop. Iconography has also indicated that malanga may have had religious and cultural importance. Finally, in conjunction with current archaeological evidence, I argue that malanga probably was grown in swampy, inundated soils in kitchen garden settings. More broadly, I believe that my research on malanga will provide new and important information on the ancient Maya diet, and how to further investigate past root crop use.

Heinrich, Adam [405] see Veit, Richard

Heins, Sarah (University at Albany - SUNY) and Jordan Karsten (University of Wisconsin Oshkosh)

[166] *Fauna from the Eneolithic Mortuary Site of Verteba Cave, Ukraine*

Animals associated with human burials provide insight into mortuary rituals of ancient groups. This study is the examination of faunal remains from Verteba Cave (3,951- 2,620 cal B.C.), a site in western Ukraine associated with the latest period of Eneolithic Tripolye-Cucuteni (TC) culture. Relative abundances of taxa were compared to published data from other TC sites. Remains from red deer and cattle are the most frequent fauna of the Verteba Cave assemblage. The sample also has a high percentage of dog, fox, hare, and bird relative to assemblages from settlement sites. Osteological remains of birds are rarely found, suggesting their lack of importance in subsistence economy. Their presence at Verteba Cave, along with relatively high frequencies of fox, hare, and dog indicate that these fauna may be important to mortuary ritual of the TC. Clay figurines of bulls, sheep, pigs, and birds, and ceramic depictions of dogs, bulls, deer, and birds are commonly reported in middle and late TC periods. These results suggest the importance of birds in TC mythology, and also highlight the significance of dogs in mortuary context. Fox and hare may also be important to mortuary rituals, but less important symbolically.

Heitman, Carrie (University of Nebraska-Lincoln)

[235] *Creating Communities of Collaboration through Digital Archaeology and the Digital Humanities*

Over the last 10 years, I’ve been involved in various forms of “digital archaeology” with different forms of public and community outreach. In this paper I profile the more and less successful forms of public and community engagement entailed in these digital efforts. I also discuss current efforts to concurrently engage in humanistic and scientific forms of digital archaeology through communities of collaboration.

Heller, Abigail (North Carolina State University) and Mary Schmidt (North Carolina State University)

[94] *Combatting the Curation Crisis in North Carolina*

Archaeologists have an obligation to ensure the long-term survival and accessibility of collections that embody the tangible remains of community heritage and collective history. This study presents two examples of collaboration between state- and university-based archaeologists that address the current curation crisis and provide much needed training for future professionals. The North Carolina Office of State Archaeology Research Center (OSARC) is the state’s repository and steward for archaeological materials that are owned or maintained by the state. OSARC faces funding and staffing challenges due to increasing demands of curatorship and recent economic downturns. OSARC and North Carolina State University Anthropology graduate students are collaborating in efforts to mitigate the statewide curation crisis by working with two collections from historic sites that were lost to time for nearly 40 years. The study demonstrates how student involvement in solving the

curation crisis also helps future archaeologists develop a sense of responsibility for the collections they produce. These cases exhibit how collaborative work can give emerging professionals an understanding of how to evaluate and prioritize collection restoration/conservation needs, technical skills in collections management, curation and conservation techniques, research potential assessment, and familiarity with the state and federal standards that collections must meet.

Heller, Eric (University of California Riverside)

[130] *Ancient Maya Elite Political-Economic Practices at La Milpa North, Northwestern Belize*

Archaeological research has increasingly revealed the role of elite labor and influence in ancient Maya political economies. Rising awareness of the complexity of ancient Maya socioeconomic organization and attention to households as loci of production has led to new understandings of the structures and practices of production within elite households and the position of elite individuals in relations of production that extend beyond their households. Status-enhancing material goods of elite manufacture were often essential to the performative legitimization of social difference while the physical practices of elite production were themselves socially and materially transformative processes. Based on recent excavations at the Late to Terminal Classic site of La Milpa North, a hinterland palatial compound in Northwestern Belize, this paper explores various political-economic strategies employed by palace residents. These strategies include both the organization of non-elite production and the direct production of material goods necessary for the expression of identity and the socioeconomic reproduction of the household. In directing the labor of others and engaging in the manufacture, use, and exchange of status-enhancing objects, elites of La Milpa North produced and reproduced social and economic difference.

Helmke, Christophe (University of Copenhagen), Jesper Nielsen (University of Copenhagen) and Ángel Iván Rivera Guzmán (Instituto Nacional de Antropología e Historia)

[88] *Tracing the Footsteps of the Mapa Tradition in the Central Mexican Highlands*

More than four decades ago H.B. Nicholson compared the so-called Palace Stone from Xochicalco to a page in a Late Postclassic or Early Colonial manuscript. Showing numerous calendrical dates and toponymic signs connected by a path marked by footprints the monument readily recalls the mapa tradition that is so well documented in the central Mexican highlands at the time of the Spanish conquest. In this paper we explore the Epiclassic evidence of this tradition, discussing not only central features of the Palace Stone, but also additional monuments from Xochicalco and sites in the vicinity, such as the recently discovered Tetlama stela, that belong to the same genre. Thus, we provide a preliminary analysis of the formal features and contents of these fascinating monuments that record an important narrative history and founding myth of Xochicalco and some of its satellite communities. Furthermore, we shall also introduce the evidence that suggests that the conventions of this tradition can ultimately be traced back to Early Classic Teotihuacan.

Helmke, Christophe [88] see Nielsen, Jesper

Helton, Erin [353] see Goodmaster, Christopher

Hemmings, C. (Mercyhurst Archaeological Institute MAI) and J. M. Adovasio (Mercyhurst Archaeological Institute MAI)

[192] *Preliminary Investigations at Brownstone, an Underwater Site Adjacent to the Inundated Paleo-Suwannee River Channel, Florida*

Underwater exploration and excavation of target loci along the inundated Paleo-Suwannee River Channel has recently focused on the Brownstone site. The western edge of the paleo-channel in the study area contains several grades of cryptocrystalline chert and dolomite. Materials recovered and attempts to access underlying stratified deposits are detailed. Further, correlation of the inundated Pleistocene landscape and known riverine features with timing of human occupation and utilization of adjacent terrestrial areas has led to some novel insights regarding the early occupation of Florida. Recent observations of storm driven, and sea level rise, salt water incursions in the GOM are discussed within the context of the ever shrinking, now submerged Pleistocene landscape.

Henderson, Lucia (Fellow, Metropolitan Museum of Art)

[196] *All in Good Time: the "New Highland Chronology" and the Sculptures of Kaminaljuyú, Guatemala*

This paper considers the impact of the new highland chronology proposed by Dr. Inomata on prevailing interpretations of the stone sculptures of Kaminaljuyú. The revised chronology moves the archaeological record of Kaminaljuyú approximately 300 years forward, shifting the site's sculptures to a wholly new cultural and chronological framework. This paper begins the process of re-contextualizing the art of Kaminaljuyú by investigating the ways in which the new chronology disrupts and/or supports prior interpretations and analyses of sculpture from the site. It focuses on two major sculptural styles: full-round sculptures known as "potbellies" and bas-relief sculptures carved in a Maya style. The former, now dated to ca. 400B.C.-100A.D., appear to reflect localized belief systems about sacred landscape and power, while the latter, now dated to ca. 100B.C.-250A.D. reveal new and evolving concepts about kingship that crossed broad cultural and regional divides. By re-positioning these two sculptural traditions in time, the paper serves as a preliminary consideration of the ways in which the new highland chronology forces us to reframe our interpretations of art and ideology at ancient Kaminaljuyú.

Henderson, A. Gwynn (Kentucky Archaeological Survey)

[236] *What Could Archaeology's Impact Be on Education?*

Twenty-five years from now, as America's educators put into place yet another "new" set of standards, and classroom teachers endure yet another pedagogical adjustment, will archaeology be at the table, included as an appendix, or invisible? Predicting the future is risky business, but the intrigue of the past never fails to engage learners. It's our responsibility as educators to nurture that engagement and channel it toward understanding. Drawing from the preliminary results of a piloting project in four Kentucky schools, we discuss the strengths and weaknesses of using Project Archaeology: Investigating Shelter as a vehicle for inquiry-based teaching and deep conceptual understanding of diverse humanities subjects, and offer suggestions for what archaeology's impact can or could be in the social studies of the future.

[236] *Chair*

Henderson, T Kathleen

[304] *Archaeology at the Head of Canal System 2, Phoenix, Arizona*

Recently, Desert Archaeology, Inc. has had opportunity to conduct several archaeological projects for the City of Phoenix west and northwest of the Park of Four Waters, near where the main trunk canals that fed prehistoric Canal System 2 originate and diverge from the Salt River. Seven of these trunk canals have been encountered, along with numerous distribution and lateral canals, water control and catchment structures, seasonal and semi-permanent habitations, and the first irrigated Hohokam fields to be exposed in plan. Establishing the ages of these features, especially the canals, has been a primary focus of research. The numbers, types, and ages of the features documented by these projects illustrate that people were using the canals and locale terrain in a variety of ways across time. Highlights from these projects, summarized in this paper, reveal the Hohokam's intimate knowledge of their landscape and how to manipulate it to best advantage. Conditions that might eventually have contributed to their collapse are also discussed. The findings highlight why study of the irrigated spaces between prehistoric settlements is crucial to fully understanding how the Hohokam managed to thrive for so many centuries in their desert environment.

Hendrickson, Mitch (University of Illinois at Chicago)

[286] *Hydraulic Nodes of Empire - Redux: Evaluating the Role of Artificial Water Tanks as Indicators of Territorial Control in Cambodia's Medieval Landscape (6th to 15th Century CE)*

Elaborate water management systems in the form canals, bridges and massive reservoirs (baray) are a defining characteristic of medieval Khmer occupation across their former territories in mainland SE Asia. Beyond the cities, hydraulic control is further manifest in the widespread distribution of smaller water tanks (trapeang) visible across Cambodia and southern Laos. Found variously in

association with temples, road infrastructure and settlement mounds these reservoirs represent a key data set for understanding the religious, political and socio-economic structure of the Khmer landscape. Using high-resolution imagery from GoogleEarth, this paper re-examines the formal and spatial variation of these hydraulic nodes with a particular focus on identifying temporal trends associated with specific architectural phases during the Angkorian period (9th to 15th c. CE). The results provide a more holistic view of Khmer settlement patterns that interrelate directly with the periods of development, expansion and downfall of the Khmer Empire.

Hendrix, Jillian (Central Washington University), Steven Hackenberger (Central Washington University, Department of Anthr), Diane Ward (Department of Chemistry and Biochemistry, Millsaps), Amanda Kaminski (Department of Chemistry and Biochemistry, Millsaps) and Timothy Ward (Department of Chemistry and Biochemistry, Millsaps)

[164] *Analysis of Fatty Acids in Precontact Ceramics from Barbados, West Indies*

Analyses of organic residues on ceramics complement other types of archaeological evidence used to characterize diets of populations colonizing and adapting to Caribbean islands. Gas Chromatography-Mass Spectrometry (GC-MS) was used to identify compounds sampled from 20 sherds excavated from two households, the Goddard Site 200 B.C.- A.D. 300 and Chancery Lane Site A.D. 800-1500 located on the island of Barbados. Measurable peaks of fatty acid residues are present on six samples from the Goddard Site. Smaller traces of fatty acids are present on Chancery Lane sherds. A comparison is made of fatty acids by sherd type and characteristic (rim/body, size, decoration), and visible types of residue (black and/or white substances). The specific composition of the observed fatty acids might yield evidence for garden crops (e.g., maize, cassava, and/or palm lipids) and animal resources such as fish and turtle. Results contribute to the growing field of molecular archaeology and environmental archaeology in Caribbean archaeological studies.

Hendy, Jessica [332] see Warinner, Christina

Heng, Piphai [349] see Carter, Alison

Henry, Edward (Washington University in St. Louis), Bryan Haley (Tulane University), Andrew Shensky (California State University Fullerton) and Carl J. Wendt (California State University Fullerton)

[172] *Subsurface Spatial Signatures of the Quotidian from the Olmec Heartland: Insights from Ground-penetrating Radar Surveys of the Los Soldados site, Veracruz*

Archaeological examinations of the Olmec civilization in the tropical lowlands of Mexico have focused largely on the elite and grandiose aspects of the society. Research conducted through the PAAP instead chose to explore non-monumental aspects of the Olmec. Investigations of the Los Soldados site in southern Veracruz included ground-penetrating radar (GPR) surveys of four areas. Although GPR is a geophysical method not often successful in tropical lowland settings, it proved successful in the delineation of several features that are interpreted as refuse pits and living surfaces. We present these findings within the broader interpretive context of domestic features at Los Soldados and the Olmec region.

Henry, Amanda G. [415] see Salazar-García, Domingo Carlos

Henry-Gambier, Dominique [181] see Nespoulet, Roland

Henshilwood, Christopher [356] see Thompson, Jessica

Hensler, Rachel (University of Kentucky)

[311] *Ceramic Variability in the Ocmulgee River Big Bend Region of Georgia, Post 1540*

Spanish colonization of the South Atlantic coast in the 16th and 17th centuries had wide reaching effects on the greater Southeast. The Big Bend region of the Ocmulgee River Valley lies about 160

km from the coastal mission effort. However, Native Americans in the area were in contact with Coastal Native groups both prior to and after European contact, making the area a good case study to better understand how changes in the social structure of Native groups on the coast affected the interior of Georgia. This poster will present preliminary results of ceramic analysis from two Native American sites in the Big Bend Region, one which is characteristic of the local Lamar pottery, and one which is characteristic of pottery local to the coastal mission area, though not made there. Macroscopic analysis of changing tempers and styles will be compared to pottery made in the mission influenced area. Understanding changes in vessel forms and construction techniques, along with changes in style will show the nature of interaction between the Native groups in the Big Bend region and groups in coastal Georgia. These analyses will give insight into the nature of social change after European contact in the region.

Hepp, Guy (University of Colorado), José Aguilar (San Diego City College) and Paul Sandberg (University of Colorado)

[410] *Death on the Early Formative Oaxaca Coast: The Human Remains of La Consentida*

The initial Early Formative period site of La Consentida was occupied between 1950 and 1550 cal B.C. This early village community on the western Oaxaca coast has produced evidence of some of Mesoamerica's oldest known ceramics, mounded earthen architecture, and musical instruments, but the site's human remains have received little attention thus far. The people of La Consentida lived and died during a period of social and economic transformations, including the establishment of sedentary villages, a gradual shift toward agriculture, and reorganization of communal interactions that ultimately produced hierarchical social complexity. In this paper, we present information regarding the archaeological context, bioarchaeological analysis, and isotopic dietary indicators offered by these early Mesoamerican burials. Skeletal analyses indicate variations in health, pathology, and dietary practices. Isotopic indicators are still under analysis, but may indicate significant early maize consumption. Features associated with the human remains, including a ritual cache containing faunal remains, ceramics, and a musical instrument, indicate some of La Consentida's mortuary practices, as do offerings interred with individual burials. As some of Oaxaca's earliest known human remains, the burials of La Consentida offer a rare opportunity for multidisciplinary investigation of the mortuary practices, diet, and lifestyles of initial Early Formative period Mesoamerica.

Herbert, James (Stantec Consulting Ltd.) and Sean P. Connaughton (Stantec Consulting Ltd.)

[336] *Minding the Ideological Gap in Consulting Archaeology*

This paper discusses recent results from an anthropological research program within a large archaeological consulting firm, highlighting some key ideological differences between consulting archaeologists and Indigenous archaeologists. Using interviews with a cross-section of archaeologists, the study combines results with previous research to illuminate the gap between these two groups with a focus on goals, practices and concerns. We attempt to shed light on areas for improvement and we challenge consulting archaeologists and their clients to move towards equitable partnerships developed through collaborative practices resulting in meaningful projects and deliverables. Acknowledging that the road is long, this paper seeks to move past discussing the issue by identifying the disparity between consulting archaeologists and Indigenous community members. This research provides a starting point to develop creative and sustainable relationships that meet the complex needs of large scale consulting archaeology.

Herdrich, David and Christopher Filimoe hala (University of Hawaii)

[391] *A Comparative Analysis of a traditional Western Polynesian Tupua at Swains Island, American Samoa*

In 2013 an archaeological survey was conducted on Swains Island, American Samoa, a remote atoll in western Polynesia. This paper presents a comparative analysis of a traditional Polynesian religious structure known as a tupua that was identified and documented during the survey. The tupua is a unique structure when compared to other religious structures that have been described in the archaeological and ethnohistorical literature. However, analysis shows that individual structural

features are similar to other religious structures in western and eastern Polynesian. Accounts of traditional voyaging to Swain Island support the idea of interaction between Swains Island and the islands of western Polynesian and eastern Polynesia and raise questions as to the influences on, and the development of, the design of this religious structure, and others in the region.

Heredia Espinoza, Verence [26] see Perez Rodriguez, Veronica

Heredia Espinoza, Verence (El Colegio de Michoacan)

[26] *I Don't Do Mountains: Regional Survey in the Tequila Valleys of Jalisco*

Steve Kowalewski has created the largest full-coverage survey block in the entire world. He has championed survey because of the information it provides on regional and macro-regional processes. This can only be done by walking transect after transect covering large amounts of land. There is neither magic nor trick; it only takes hard work. Steve's leadership and teachings on survey methods have benefited even the most peripheral areas of Mesoamerica. Based on the methods I learned from Steve, I implemented a full-coverage regional survey in the Tequila valleys of West Mexico covering nearly 1000km², assembling an important corpus of data. The implementation of full-coverage survey has enhanced our understanding on diverse anthropological problems such as increasing social complexity, the dramatic sociopolitical changes at the end of the Classic period and how these changes are linked to larger macro regional processes. Finally, the Postclassic, a key period that had been neglected, is now beginning to be understood. The survey has opened thousands of years of occupation that can and are contributing to the development of anthropological theory on early states, and it has provided a diachronic, dynamic perspective on the prehispanic history of the valleys (long durée).

Herklotz Balam, Daniel [24] see Fernandez Souza, Lilia

Herlich, Jessica (College of William and Mary)

[268] *Algonquian Coastal Gardens and Landscape: Interpretations from Archaeobotany*

This paper explores how coastal Algonquian and shell midden sites in Tidewater Virginia relate to the greater Virginia Algonquian landscape. Through archaeological plant remains (including macrobotanical, starch grains, and phytoliths), ethnographic records, and historical documents, I am exploring landscape and garden designs along the shores of the coastal plain. The project's archaeological sites span a combined 1,600 years (early Middle Woodland period to the early Colonial era), and the archaeological and archaeobotanical remains offer a window into transformations and uniformity of landscape management and cultivation throughout this time span's historical and temporal transitions. The evidence suggests that coastal sites fit into a diversity of roles related to subsistence and population movement and that the landscape's ecology was entwined with community and traditions.

Hermann, George R. [256] see Frederick, Charles

Hermenegildo, Thiago [326] see Zimpel, Carlos

Hermes, Taylor (University of Kiel)

[403] *Bronze Age Mobility in Montane Ecosystems of Eastern Kazakhstan: A Preliminary Isotopic Investigation*

The nature of mobility carries significant implications for social interaction in pastoral societies. This paper presents a preliminary analysis of radiogenic strontium and stable oxygen isotopes of domesticated fauna remains excavated from Bronze Age sites across the mountains of eastern Kazakhstan. Results are contextualized with the ecological and geographic backdrops surrounding the sites and placed into a diachronic perspective of pastoral interaction and herding strategy. This research helps to investigate how the Bronze Age herding populations of Central Asia seem to have driven larger social and cultural processes across the region while materially appearing to maintain

insular community organization.

Hermitt, Elijah (Pennsylvania State University) and Kirk French (Pennsylvania State University)

[248] *The Palenque Pool Project: Sourcing the Sand from the Main Picota Pool*

Many sites in the Maya Lowlands relied heavily on water storage features in order to sustain the annual dry season. However, in Palenque the opposite challenge was presented, as there was an abundance of perennial water flowing through the city. Palenque's ancient name of Lakamha' or Big Water was indicative of this issue. In response, there were intricate water management systems constructed in order to divert the water underground through aqueducts. In May of 2014, the Palenque Pool Project began excavation and consolidation of the largest pool in the Picota Group, about 1 kilometer west of the site center. Although the function of the pool will likely forever remain a mystery, its placement adjacent to one of Palenque's two stelae and its similarity to modern Maya examples suggest ceremonial use. Beneath an approximate 40 cm of mud and debris lies a 10 cm layer of sand atop the bedrock floor. Being that Palenque is devoid of the granular material it must have been imported. A series of tests, including X-ray fluorescence (XRF), were utilized in determining the sand's origin. This poster outlines our results.

Hernandez, Nicole (The Ohio State University), Julie Field (The Ohio State University), John Dudgeon (Idaho State University) and Christopher Roos (Southern Methodist University)

[52] *Starch and Ceramics: Dietary Transition and Technology in the Sigatoka Valley, Fiji*

Food production and manipulation, as well as associated technologies during Fijian prehistory are understudied archaeologically. Human colonization of Fiji occurred circa 2640 BP. Colonists subsisted on a diet composed of marine resources (fish, shellfish), and terrestrial fauna (bats, birds, tortoises). In contrast, 1,000 years later, most Fijians had transitioned to a fully agricultural diet. The contemporary Fijian diet centers on cultivated starches, imported originally by Fiji's colonists, and is based on low-level food production (small gardens). Starchy foods (i.e., taro, yam, cassava) require intense cultivation to become viable. They also require cooking before becoming edible. Undecorated ceramic fragments recovered from the Sigatoka Valley, Viti Levu, Fiji, were analyzed for presence of adhered starch, either modified or unmodified. Dating to the Post-Lapita period, identification of starch residues provides evidence of rapid subsistence change in Fijian prehistory. Results will reveal technological aspects of this dietary transition, especially the use of pottery as a cooking tool, and will answer methodological questions regarding starch extraction and identification.

Hernandez, Hector (Universidad Autonoma de Yucatan)

[76] *Capitalism and Material Culture of the Poor: Consumption, Reuse, and Discard of Glass Bottles at Hacienda San Pedro Cholul, Yucatan*

In Yucatan at the turn of the twentieth century, industrialization of henequen production and the export of binder twine heightened socioeconomic inequality and encouraged consumption of non-local manufactured items within native communities. Yet, the official history of capitalist expansion and globalization in Latin America has been written by and for the dominant class. Often, the material record shows that new and traditional technologies were appropriated in particular ways by poor people and offers a more balanced view of indigenous response to global capitalism. This paper focuses on the analysis of the archaeological remains from the workers' house lots at Hacienda San Pedro Cholul, Yucatan. I examine the hypothesis that the henequen workers were not conspicuous consumers, but conservative recyclers. The disposal of materials within the domestic compounds informs interpretations of different activities, economic issues, and foodways from these historic households. Based on the distribution of glass bottle remains and their use, discard and recycling patterns, I will discuss the consequences of shifts in labor organization and consumption patterns among classes at the regional and household scales. Economic growth and rapid industrialization had drastic social and cultural repercussions within Yucatec indigenous communities in the first half of the twentieth century.

Hernandez, Shayna [355] see Moyes, Holley

Hernandez, Enrique (Mirador Basin Project-FARES), Richard Hansen (Fares - University of Utah), Francisco Lopez (Mirador Basin Project-FARES), Thomas Schreiner (University of California, Berkeley) and Marvin Prado (DEPIC-Mirador Basin Project)

[408] *Tintal, a Late Preclassic Maya City in the Mirador Basin, Peten, Guatemala*

Tintal is an ancient lowland Maya city of the Kan kingdom located 28 km southwest of El Mirador in the north central Peten, Guatemala. Preliminary data from fieldwork conducted by the Mirador Basin Project establish that Tintal was a major urban center contemporaneous with similar large centers within the Mirador Basin such as El Mirador and Nakbe. These and other cities of the Basin were linked by a system of wide elevated causeways during the Middle and Late Preclassic Periods (ca. 600 B.C.– A.D. 150). Investigations to date have focused upon site mapping and excavations of monumental structures and significant features. These include the Henequen and Mano de Leon pyramids, the large Central Ball court, the Jade Causeway, an impressive defensive moat which encircles the epicenter of the city, a royal tomb from the Early Classic Period (A.D. 300 – 400), and Stela 01, a large Preclassic stela carved from red sandstone imported from a distant source. Results of the investigations allow for a greater understanding of the occupational history of the site, which collapsed at the end of the Preclassic Era and was re-occupied during the Late Classic and Terminal Late Classic Periods (A.D. 600–900).

Hernández, Rubén (Universidad Nacional Autónoma de México)

[129] *La interacción cultural en la cuenca alta del río Lerma: las subcuencas de Ixtlahuaca-Atlacomulco y Temascalcingo*

El río Lerma representó el escenario ideal para el asentamiento de poblaciones desde el periodo Preclásico. Estos habitantes primigenios de las subcuencas de Ixtlahuaca-Atlacomulco y Temascalcingo establecieron vínculos con diferentes regiones culturales, por lo menos desde el periodo Preclásico hasta el Posclásico y aprovecharon todos los recursos disponibles en un medio privilegiado por el paso del río Lerma, con el que establecieron un equilibrio respetuoso y un nivel de desarrollo similar a las de las regiones vecinas. Se evaluarán los vacíos de información determinados por la carencia de estudios regionales que no ha permitido comprender las estrategias de los pueblos para la sobrevivencia. Se discuten los mecanismos a partir de la evaluación de los indicadores arqueológicos, que posibilitaron la interacción tanto con el occidente de México, como con el vecino valle de Toluca y la cuenca de México. De particular interés, será el examen de recursos como la cerámica que permita reconocer la diversidad cultural y, en determinados casos, la posibilidad de asociar ciertas tradiciones cerámicas con una filiación étnica.

[129] *Chair*

Hernández, Valeria [298] see De Anda Rogel, Michelle Marlene

Hernández Álvarez, Héctor [24] see Matos Llanes, Carlos

Hernández Escontrías, Pilar (Northwestern University)

[117] *Discussant*

Hernandez Espinoza, Patricia (Centro INAH Sonora)

[257] *La Cueva de la Colmena: Bioarchaeological Analysis of a Funerary Context from the Sonora – Sinaloa Project / R. A. Pailes 1967*

In the past six years the Centro INAH Sonora has turned its gaze to the Archaeological Collections under its charge, keeping priority on conservation, research, documentation, and registration of such collections. Key to these collections are the results of the archaeological research conducted by Dr. Richard Allen Pailes in 1967 as part of the Sonora-Sinaloa Project. The main goal of the project was the recognition of different surface locations in the basin of the Mayo and Fuerte Rivers and excavations at two sites or locations "type". This research was his doctoral thesis. One of the sites excavated, La Cueva de la Colmena, resulted in the discovery of a funerary context, including an

adult and an infant, the latter with a personal outfit consisting of a snail shell necklace, earrings and a pendant, and with both presenting intentional cranial modification. The focus of this paper is the bioarchaeological analysis of this feature to answer the following questions: Is there a biological-cultural relationship between these two individuals? Are there social status differences between them? How does this finding fit into the current landscape of research in this area?

[217] *Discussant*

Hernández Espinoza, Patricia Olga [217] see Martínez, Estela

Hernandez Garavito, Carla (Vanderbilt University)

[227] *Interaction and Ethnic Boundaries in the Lurin valley: Yauyos and Yschmas in the Archaeological Record*

The Peruvian central coast is widely known in the archaeological literature as the locus of small polities that co-existed in environments of limited resources through cooperation and competition. However, most archaeological research has been greatly influenced by ethnohistoric accounts which populated the Late Intermediate Period in the Andes with a number of warring societies, and not on direct archaeological evidence. Recent research points towards a more complex scenario, in which the Inka Empire played a key role in shaping these societies into the chiefdoms recorded by the written sources. In this presentation, I will focus on the Lurin valley, in the central coast of Peru, where the lowlands were inhabited by the Yschma, a chiefdom-level group organized around the central oracle of Pachacamac. In the upper valley, the Yauyos were considered as foreign invaders that encroached on the Yschma lands and were later allied to the Inka. This presentation builds on a continued program of research in the Yauyo territory, focusing on the material correlates of the Yauyos in their core region, possible indexes of interaction with their coastal neighbors, and the ultimate role of the Inka Empire in defining the ethnic boundaries and relationships between Ychsma and Yauyos.

[227] *Chair*

Herndon, Kelsey [4] see Houk, Brett

Herr, Sarah [13] see Graves, William

Herr, Sarah (Desert Archaeology, Inc.)

[273] *Pithouses and Placemaking on the Southern Colorado Plateau*

Pithouse period settlement on the southern Colorado Plateau was the subject of vibrant research in the mid-twentieth century as Southwest archaeologists explored the validity of the Mogollon and Anasazi archaeological culture areas. In subsequent years the region became a laboratory for anthropology, as the rich data lent itself to studies of population dynamics in the famously heady days of New Archaeology. Since the mid-1970s, research on these first millennium A.D. sites has been confined to cultural resource management projects. In this poster we revisit earlier research – particularly excavations by Rogge and the Southwest Expedition at the Connie Site (A.D. 400-600) and Webb Tank site (A.D. 600-850) -- and introduce new excavations by Desert Archaeology at the Beethoven site (A.D. 600-850) in the State Route 77 right-of-way to explore what pithouse settlements can tell us about settlement, mobility, and aggregation and place-making in a region that challenges simple interpretations about the transition to village life.

[71] *Discussant*

Herrera, Roberto (HDR Inc., Hunter College C.U.N.Y)

[246] *The Best of All Worlds: Exploring Exchange and Interaction with Nicoyan, Caribbean Costa Rican and Panamanian Societies at the Southern Costa Rican site of El Cholo*

Recent work at the mid to late Formative site of El Cholo reveals that from at least the third century A.D., occupants of this mound complex interacted with Costa Rican Caribbean watershed social groups, as well as western Panamanian Chiriquí societies. Evidence also demonstrates contact from

as far north as the Guanacaste Nicoya region in place by the tenth or eleventh centuries A.D. Further analysis of the site suggests that interaction was likely initially predicated on trans-cordilleran ethnic and ritual affinities with the Caribbean watershed, a dynamic still observable in the present day Talamanca Mountains of Costa Rica. Data also suggest a gradual adjustment to an increasing southern influence from the seventh century towards the end of El Cholo's occupation. The presence of intermontane movement along with previously documented Panamanian links highlights the particular position inhabitants of the Upper General Valley occupied, allowing them to access and integrate northern and southern influences into their own particular expression. This tropical verticality, linking spatially disparate social groups into a viable if loose network is a key point of investigation as more research suggests the over 3000 meter high Talamanca Range served more as a conduit rather than obstacle .

Herrera López, María Claudia (Programa Arqueológico San José de Moro)

[203] *An Approach to the Tombs and Rituals in Area 49 in San José de Moro*

San José de Moro (SJM) is one of the most important Moche cemeteries studied on the North Coast of Peru. It is recognized by the presence of several elite tombs and strong evidence of rituals that took place along with these burials. SJM also has its own style of pottery manufacture which is easily differentiated from southern styles. It is important to mention that the Moche society was divided between those who inhabited the north and south areas of their territory. In this context, during the last field season, we excavated a boot shaped tomb associated with a Moche V stirrup bottle, which is the first evidence of the presence of Southern Moche recorded at the site. Furthermore, a concentration of infant pit tombs stands out, among which a particular context shows different characteristics from the mortuary practices usually displayed in infant burials as we plan to show in this poster.

Herrera Malatesta, Eduardo [199] see Sonnemann, Till

Herridge, Victoria [322] see Hassett, Brenna

Herries, Andy [139] see Stammers, Rhiannon

Herrmann, Edward (Indiana University Department of Geological Sciences) and Matthew Rowe (Indiana University)

[35] *The Rockhouse Hollow Rockshelter, Ohio River Valley*

Recorded within the sediments of Rockhouse Hollow rockshelter in the Hoosier National Forest in southern Indiana is a rich history of prehistoric occupation spanning 10,000 years. Unlike any other site in Indiana, Rockhouse Hollow has produced artifacts from all prehistoric cultural time periods, with the notable exception of the Paleoindian Period. Although the site had already been looted for decades, excavations in 1961 produced a wealth of lithic and faunal data that have not yet been published. Because of extensive roof fall within the rockshelter, looting both prior and subsequent to the 1961 excavation, and a fire that destroyed some field data, questions remain regarding the stratigraphic profile within the rockshelter. During the summer of 2014, an Indiana University Geology Department field school reopened the 1961 units to better understand the stratigraphic context of artifacts recovered in 1961, and test whether Paleoindian-aged sediments might be preserved. This paper discusses the archaeological, faunal and geoarchaeological data recovered during the 2014 excavations. These data indicate that this important rockshelter in the Ohio River Valley was used for many purposes by people exploiting multiple ecosystems through the millennia.

Herrmann, Nicholas P. [220] see Mathena, Sarah

Herrscher, Estelle (Aix Marseille Univ), Adrian Balasescu (National History Museum of Romania, Bucharest, Rom), Modwene Poulmarc'h (Archéorient, CNRS, Lyon France), Valentin Radu (National History Museum of Romania, Bucharest, Rom) and Roman Hovsepyan

(Institute of Archaeology and Ethnography, Armenia)**[401]** *Isotope Diachronic Changes in Armenia during Neolithic and Chalcolithic Period: Environment, Herding Strategies, Human Dietary Practices*

The Caucasus, at the crossroads of Europe, the Middle East and Central Asia, is a key region to investigate the modalities of the distribution of plants. Our study aims at documenting the presence of C4 plants, wild and domestic as millet crop and detecting their management and consumption through this area using stable isotope analysis of human and animal remains. Two Armenian archaeological sites, Aknashen (Late Neolithic) and Godedzor (Late Chalcolithic), allowed a detailed sampling of 95 terrestrial, domestic and wild, animals and freshwater fishes and 5 humans. High carbon values for the wild Neolithic animals indicate a variable but significant consumption of C4 plants, whereas no C4 plants intake is detected for the Chalcolithic animals. Different positions of domestic animals in the food chain between Neolithic and Chalcolithic suggest different herding management linked to the environment. Human Neolithic carbon isotope values suggest a consumption of wild animals and freshwater fish, not detected in the Chalcolithic humans. Pooled with our other data from the Caucasus area, results suggest a heavy consumption of wild C4 plants along the Kura River since the Neolithic as well as the consumption of millet at the end of the Bronze Age.

Herschend, Frands (Uppsala University, Sweden)**[57]** *In Search of Something Better*

In the 7th and 8th century CE, Scandinavian societies developed a stratified social structure based on ownership of land dominated by relatively few people. When the population grew during the 8th century this created a society with few opportunities not least among the landless who were partly engaged in handicraft at rural production sites linked to the urbanized European economy. This created a situation in which raiding, conquest, colonization and state formation became attractive opportunities.

Herzog, Nicole (University of Utah) and Anne Thomas (University of Utah)**[362]** *What Can Hogup Cave Starches Tell Us about Diet That We Don't already Know? Context, Preservation, and the Comparison of Archaeobotanical Analyses*

Starches preserved on prehistoric artifacts including ceramics, ground stone and other lithic tools have assisted archaeologists in better understanding the relationships between technologies and food products, food processing, activity areas and tool function. However, little research has been done to identify differential starch preservation across these artifact types. In order to test whether starch preservation is uniform across tool types, and to examine whether starch records are congruent with other types of archaeobotanical records, we examined ground stone tools, basketry and sediment samples from three strata within the Hogup Cave site. Using diagnostic starches recovered from both ground stone and basketry, a species list of plant foods was generated. This list was compared to a list of plant foods recovered from fecal and macrobotanical analyses to determine whether they reflect a similar dietary assemblage. Results highlight the mismatch between the two, and suggest that starch analysis is an invaluable tool in identifying the presence of plant foods otherwise undetected in macrobotanical or fecal assemblages. Additionally, starch research can shed light on the specific uses of twinned and coiled basketry by providing evidence of the types of cooked and raw foods commonly handled with this technology.

Hess, Karen [162] see Kasper, Kimberly

Hester, Thomas (Emeritus) and Harry J. Shafer (Professor emeritus, Texas A&M University)**[292]** *Ancient Maya lithic Craft Specialization at Colha, Belize*

Beginning in the Middle Preclassic, the rise of small centers in the agricultural area of Northern Belize gave impetus to the intensive manufacture of stone tools at Colha. Craft specialization, mass production and export of stone tools and symbols were deeply entrenched by Late Preclassic times. Examples will be provided on the use of certain tool forms in agriculture and construction throughout the region. Additionally, some artifacts were made mainly for caches, lithic symbols, and locally, for

bloodletting. Wide export of some of the latter categories has been demonstrated. By the Late Classic, some modified tool forms are seen, though the "Colha School" utilizing raw materials and ongoing techniques clearly continues. The Terminal Classic flintknappers maintained many facets of the long-lived technology, although a series of workshops have been studied that focused on blade cores and blade projectile points. This may well reflect the wars among centers that are reported at this time. To be briefly noted in this paper are the changes in population and technology that appeared in the Early Postclassic, marking an end to the "Colha School" of lithic production and distribution.

Hickman, Clara J. [287] see Harrower, Michael

Hicks, Megan (City University of New York), Árni Einarsson (University of Iceland, Faculty of Life and Environ), Kesara Anamthawat-Jónsson (University of Iceland, Faculty of Life and Environ), Ágústa Edwald (University of Aberdeen, Department of Archaeology) and Thomas H. McGovern (City University of New York)

[288] *Long Term, Community Level Protection and Management of Waterfowl in Mývatn N. Iceland*

Archaeological, paleo-environmental and ethnographic research in the lakeside community of Mývatn, N. Iceland, is uncovering the millennium-long history of interactions between people and seasonal populations of waterfowl. Protection of waterfowl from hunting seems to have been applied in tandem with annual, managed egg harvesting as a common resource management strategy. The interdisciplinary investigation underway seeks to understand long term norms and local traditional knowledge (LTK) governing wild bird management while investigating the specific components of these economic practices that contributed to their apparent long term ecological sustainability. As the Mývatn region experiences economic and spatial changes that could interact with views concerning conservation, we aim to understand the changing context of birds as a natural resource and to explore the potential discursive implications of this long term narrative of sustainable paleoeconomy.

Hidalgo, Marta [170] see Mendizabal, Tomas

Higelin Ponce de Leon, Ricardo [188] see Frazier, Mechell

Higelin Ponce De Leon, Ricardo (Indiana University Bloomington)

[410] *The Bioarchaeological Paradigm of Human Remains Decay in the Zapotec Mortuary and Funerary Rituals*

Archaeological, iconographic and ethnohistorical sources have been used to examine diverse cultural practices of Zapotec society before European contact. Cultural practices related to violence and warfare, such as captive taking for ritual sacrifice and slave labor, played an important role in Zapotec imperial expansion during the Late Formative through the Classic period. In the Valley of Oaxaca research has been done to understand these cultural practices. Whatever, bioarchaeological data to corroborate these cultural practices, such as intentional cutmarks in the cranium, mandible, cervical vertebrae and ribs, traumas, and other bone lesions, as demonstrated by the carved stones from Monte Albán, are lacking. Thus, this paper is going to provide a series of explanations of why human remains within the Valley of Oaxaca do not show marks from decapitation, acts of violence, or other cultural practices related to the Zapotec imperial expansion. Furthermore, using bioarchaeological approaches to body decomposition and skeletonization, I will address another cultural practice related to body disarticulation in both the mortuary and funerary contexts. This result is going to align the paradigm of how other lines of evidence vary from what has been suggested by from the archaeological, iconographic and ethnohistorical evidence.

[410] *Chair*

Higgins, Richard (University of Arizona)

[91] *Pre-Classic Obsidian in the Northern Tucson Basin*

This poster focuses on the investigation of sourced obsidian artifacts found in and around the Cañada del Oro Valley in southeastern Arizona. The goal of this study is to understand the evolution of social interaction and obsidian distribution during the pre-classic Hohokam periods (ca. A.D. 700-1150) and how they compare to patterns in neighboring areas. There are no obsidian sources immediately adjacent to the Cañada del Oro Valley or Tucson Basin regions. Therefore, investigation of obsidian distribution allows for a better understanding of the social interactions taking place. Previous studies have indicated that obsidian artifacts are small in number during these periods, but later proliferate. Examination of the patterns during these earlier periods will allow for a better understanding of obsidian distribution as it underwent a major change in the Hohokam Classic period (ca. A.D. 1150-1450).

Higgins, Steven [294] see Potts, Alastair

Higgins, Howard (TRC Environmental Corp.)**[336] *Consultants Are People Too: Meaningful Consultation and Archaeology***

Gaining meaningful information from traditional community consultants can often be difficult. Furthermore, exactly what constitutes such information has changed over time. Recently the focus in archaeology has shifted from a point-based search for specific locations to a landscape-based approach aimed at information that can be used to define the attributes of traditional cultural properties, so that areas which could contain them can be managed. This paper explores the elements needed to obtain such information. It is argued that the archaeological researcher needs to be sensitive to the goals and cultural perspective of the consultants, as well as be knowledgeable about the cultural limitations imposed upon these individuals. It is further argued that honesty and true sharing are essential elements- the researcher must be honest about why the questions are asked, to what uses the information will be put, and the likely outcomes of the action for which the consultation is occurring. Consultation, in the view of the author, is two sided and can't be successful if otherwise. The paper concludes with an example of consultation with a Navajo family concerning a strip mine. Discussed are the purpose of the consultation, the results, and why it was a success.

Higuelin, Ricardo [249] see Navarro, Mariana

Higueras, María (Alejandra Higueras)**[172] *Las figurillas cerámicas de Los Soldados, Veracruz: Una evidencia de la relación cultural y de identidad de una comunidad Olmeca.***

En el sitio arqueológico Los Soldados en el estado de Veracruz, México se recolectaron 450 fragmentos de figurillas de barro, fruto de 4 temporadas de investigación del Proyecto Arqueológico Arroyo Pesquero. El sitio Los Soldados pertenece al periodo Formativo Medio (900-500 a.C.), es un sitio Olmeca situado a 11km al suroeste de La Venta y a 5km al norte de la localización del sitio Arroyo Pesquero. Las figurillas de barro como material arqueológico han aportado información para poder observar e identificar cronologías, así como las relaciones culturales entre sitios vecinos, contemporáneos o de la misma etnicidad y tradición cultural. Sin embargo se ha decidido abordar a las figurillas cerámicas desde la perspectiva de su función la cual está cargada de un discurso ideológico de la sociedad que habitó este sitio. Dentro de este trabajo se propone que las figurillas cerámicas contienen un discurso que puede ser dependiente de la cultura a la que pertenecen (Olmeca) y a veces un discurso individual y propio de la sociedad que las reproduce con fines específicos como: ritual, económico, de propaganda política o propaganda religiosa.

Higueras, Alvaro (MIRAS Azerbaijan)**[279] *Alternative Strategies in Confronting Looting and Trafficking in Defense of Peruvian Portable Heritage.***

In this presentation I aim to address two issues: first, the state of looting and trafficking of monumental and portable heritage in Peru today, and, second, to propose new strategies to contribute to solving the problem of looting and trafficking. The novel strategies I propose are only

part of the solution: they should be compounded and should help strengthen the effectiveness of old, tried and partially successful enforcement strategies. The diversification of options is urgent amidst critical scenarios which Colin Renfrew, among others, has unequivocally delineated and decried in the last decades. I propose that cultural authorities and managers in Peru should focus its efforts to safeguard cultural heritage along three principles to establish its policies, strategies and future laws: (1) Shared responsibilities; (2) Patrimonial sovereignty; and, (3) Appropriation of heritage. I would also suggest two strategies that would be dynamic engines to the above principles: (1) Renewing ancestrality; and, (2) Innovation beyond the laws. These novel options to address the present two issues affecting cultural heritage aim to diversify parallel endeavors towards that goal and make more open, public and understandable the consequences of looting, and, ultimately, commit the public to a central role in participating in this task.

Hildebrand, Elisabeth (Stony Brook University) and Anneke Janzen (University of California – Santa Cruz)

[414] *The Nile vs. the Rift: Exploring Contrasts in the Spread of Food Production in Africa ca. 4200 BP*

Characterizing the patterns and processes of early food production across Africa is difficult because the continent's large landmass, diverse physiography, and regionally specific environments and crops hinder generalization. Due to these challenges, accounts of early food production in Africa tend to be narrative syntheses: they either present a detailed sequence of developments in one specific region, or 'follow' the spread of food production from the earliest herding in the eastern Sahara <7000 BP to the arrival of livestock and crops at the southern tip of the continent ~2000 BP. Trans-regional comparisons present an alternative way to make sense of Africa's tremendous diversity, but are seldom employed in an explicit manner. They can use similarities and contrasts between different areas to help explain variation in the causes and consequences for the spread of food production in distinct contexts. This paper compares two such instances ~4200 BP: the spread of southwest Asian crops and farming methods up the Nile Valley within areas where herding was already practiced, and the spread of herding as the initial form of food production in the eastern African rift system.

Hildebrandt, William (Far Western Anthropological Research Group)

[341] *Middle Archaic Expansion into High Elevation Habitats: A View from the Southwestern Great Basin*

Several researchers have hypothesized that high elevation habitats were not intensively used until after 4000 cal BP when lowland settlements became more stable and logistical hunting organization emerged. This paper evaluates this hypothesis by comparing the relative frequency of Pinto versus Elko/Humboldt series projectile points across a variety of lowland and upland settings in the White Mountains/Owens Valley area.

[1] *Discussant*

Hildebrandt, Tod (Far Western Anthropological Research Group)

[341] *Divergent Histories: Prehistoric Use of Alpine Habitats in the Toquima and Toiyabe Ranges, Central Great Basin*

Alpine villages are extremely rare in the Great Basin. To date, villages located at elevations above 10,000 ft. are only known to occur in the White Mountains and the Toquima Range. Demographic forcing and climatic change has been used to explain the existence of these villages, but these propositions do not identify more specific selective pressures that led to the establishment of high-elevation villages in some ranges but not others. Comparison of artifact distributions and environmental structure in the Toquima Range, where a village exists, and the Toiyabe Range, where one does not, supports the notion that alpine villages may have been subsidized by intensive exploitation of mid-elevation pinyon groves associated with low-cost travel corridors, which facilitated transport of pine nuts to upland village locations. This study also reveals that limber pine may have played a role in alpine village subsistence, and identifies the need for further research on the value of this resource.

Hilditch, Jill (University of Amsterdam)

[25] *Fabrics of Space and Time: Multiscalar Analytical Approaches to Social Process in the Middle Bronze Age Aegean*

Acknowledging analytical scale, or emphasizing the importance of moving coherently from macro to micro to elemental, is not a new concept within ceramic analysis. The work of David Peacock since the 1970s has demonstrated the necessity of a multiscalar approach, yet our attempts to combine techniques that bridge these various scales of analysis have met with mixed success, particularly when confronted by assemblages that include a spectrum of fine to coarse wares. This paper highlights recent studies in automated scanning electron microscopy with linked energy dispersive spectrometers (SEM-EDS) that have created an opportunity to integrate data from multiple analytical scales in a more robust way by offering a seamless combination of textural and mineralogical data. The case study of pottery production during the later Middle Bronze Age at Akrotiri on Santorini is used to investigate issues of social process and interaction across spatial and chronological boundaries. The results show that the integration of multi-analytical datasets across whole assemblages offers huge potential for investigating ancient ceramic technologies and their communities of practice, as well as their development through space and time.

Hill, Mark [9] see Nolan, Kevin

Hill, Erica (University of Alaska Southeast)

[28] *Thinking through Dogs in the Arctic*

Canids are among the most commonly encountered animals in archaeological assemblages worldwide. Using examples from the Arctic, I discuss some of the key ways that humans employ dogs to think about their relationships with other humans, animals, and the world around them. While dogs were often treated similar to human persons, they were also used to distance and distinguish “real people” from others. Ethnohistoric evidence suggests that a dynamic tension existed in the Arctic between humans and dogs. With this evidence in mind, I argue that the ubiquity of dogs at many archaeological sites reflects 1) the symbolic potentiality inherent in dog behavior; and 2) the ambivalence and fluidity of dog-human relations.

Hill, Rebecca (Logan Simpson Design), M. Scott Thompson (Arizona State University), Holly Young (Pueblo Grande Museum) and Cory Breternitz (PaleoWest Archaeology)

[123] *It Takes a (Big) Village: Preserving the Legacy of Pueblo Grande*

Archaeology can marshal new digital infrastructure not simply to rescue endangered legacy information, but to revive and enhance those data for innovative research approaches. Over the course of two decades, Soil Systems, Inc. (SSI), collected vast amounts of archaeological information and digital data during the company's work at Pueblo Grande, one of the largest and most centrally-located of the Classic period Hohokam villages in the Salt River Valley. This poster highlights efforts to reawaken SSI's invaluable archaeological data and physical collections from Pueblo Grande, and collaborations toward synthesizing these resources incredible research potential for Southwestern archaeology. It describes an ongoing initiative that uses the Digital Archaeological Record (tDAR) to reconstruct and publish aggregated digital data sets for much of SSI's data recovery projects at Pueblo Grande. In addition, it discusses Pueblo Grande Museum's endeavors to work with recently donated physical collections from SSI's projects on privately-owned parcels of the site and to tie those collections to the digital data. Together, these efforts are integrating one of the largest bodies of data available for a single prehistoric settlement in the American Southwest to foster new understandings of Pueblo Grande and Hohokam archaeology.

Hill, Allison (California State University, Northridge) and Julienne Bernard

[143] *Assessing the Use of Lithic Artifacts in the Manufacture of Fiber Technologies at Cach Cave*
Cache Cave exhibits one of the most significant in situ assemblages of basketry and cordage recorded within the Chumash culture area. The abundance and quality of the unique items preserved in this cave system attest that caching served as one important aspect of site function. The presence

of utilitarian lithic artifacts, identified during excavations at the cave in 2012 and 2014, suggest that this site may have served additional functions throughout the duration of its use. The association of these lithics with fibrous technologies such as cordage, nets, and baskets suggests the cave may have functioned as a locale for textile manufacture. To determine if Cache Cave was a locus for the manufacturing of fibrous materials, we compared the results of a lithic microwear analysis with experimentally replicated wear patterns of plant processing to determine how the lithic artifacts from this assemblage were used. This paper presents the preliminary results of these analyses with the intention of enhancing our understanding of how Cache Cave was utilized by the local Chumash community in the past.

Hill, Mark (Ball State University) and Kevin Nolan (Ball State University)

[280] *Portable X-Ray Fluorescence Analysis of Copper Trace Element Composition: A Methodological Pilot Study*

Copper artifacts are widely represented in prehistoric sites of eastern North America and their presence in any particular region is often used in reconstructing exchange and social networks. Early interpretations were predicated on assumptions that native copper from which materials derived from the extensive copper deposits in the Lake Superior region. However, as early as 1903, assessment of copper trace element composition has been used to test such hypotheses. A number of methods have been used, including traditional assay, various forms of spectrography, and, more recently, instrumental neutron activation analysis (INAA) and laser-ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Of these, LA-ICP-MS has become the most powerful, effective, and widely used, yet the method suffers from high costs and restricted access to limited facilities. In recent years, the availability of portable X-ray fluorescence (pXRF) systems has made elemental studies more readily available for a number of archaeological applications. We explore the use of pXRF for copper composition studies by comparing results from several copper samples of known upper Great Lakes provenance analyzed by both LA-ICP-MS and pXRF methods. Early tests indicate that pXRF analyzers exhibit sufficient sensitivity and precision to potentially discriminate some sources of native copper.

Hill, Kim (Arizona State University), Marco Janssen (Arizona State University), Eric Fisher (Arizona State University) and Curtis Marean (Arizona State University)

[294] *Agent Based Models of Ache Foraging and Grouping*

We show using detailed environmental and behavioral data from the Ache of Paraguay that agent based modeling can simulate correctly many aspects of human foraging behavior. We then show how this modeling technique can be used on projected paleolandscapes in the Cape Coastal Region between Blombos Cave and Pinnacle Point to predict diet, movement patterns, group size, population density, and other aspects of the behavioral ecology of human foragers in the region.

Hill, Austin (University of Connecticut) and Andrew Petersen

[409] *UAVs at Ruwayda, Qatar: Photogrammetry and Thermal Imaging for Feature Detection and Site Recording*

As part of the "Visualizing Qatars Past" project, drones are being used at the Islamic Period site of Ruwayda, on the north coast of Qatar, to document extant structures and investigate buried features. A Microdrone equipped with visible light, near infrared, and thermal sensors was used to document the fort and surrounding areas. By combining thermal imaging of the site with photogrammetric mapping, it was possible to identify architecture in and around the site that is difficult or impossible to identify from the ground. This novel aerial survey methodology is guiding ongoing excavation decisions at the site.

Hillerdal, Charlotta (University of Aberdeen, Scotland)

[337] *Nunalleq Past and Present – Discovering a Yup'ik Archaeological Heritage*

The Yup'ik, the Indigenous people of the Yukon-Kuskokwim Delta, have since the 19th century been in the center of ethnographic research in the Arctic. Yup'ik customs and material culture have been collected and investigated with the pretext of preserving a 'vanishing' traditional lifeway. Today

Yup'ik culture is vibrant with a strong connection to traditional subsistence strategies and ways of life. However, Yup'ik history is very much the history of the 'Other', retold and written from a post-contact Western perspective. Yup'ik history, however, has much deeper roots than that, and archaeology can provide an insight to this neglected part of the Yup'ik past. This paper presents the Nunalleq ('old village') archaeology project, built in collaboration between archaeologists and the Yup'ik community of Quinhagak, Alaska. Focusing on a Bering Sea pre-contact village site, it strives to bring together archaeological investigations and local traditional knowledge to recover a forgotten Yup'ik past. The intersection between past and present created by the archaeological process shapes a meaningful material heritage, embedded in the local culture and animated by scientific discoveries. When in true partnership with local stakeholders, archaeology can contribute to strengthen Indigenous heritage.

[337] *Chair*

Hinojo, Adriana [257] see Hernandez Espinoza, Patricia

Hinojo-Hinojo, Adriana (Centro INAH Sonora), Alejandra M. Gómez-Valencia (Centro INAH Sonora), Blanca E. Contreras-Barragán (Centro INAH Sonora) and Jesús R. Vidal-Solano (Departamento de Geología, Universidad de Sonora)

[257] *Research and Curatorial Work on the Archaeological Collections Recovered in Sonora by Dr. Richard A. Pailes*

Since 2009, following Instituto Nacional de Antropología e Historia (INAH) implementation of new public registration protocols for cultural material heritage, we started intensive work inventorying, cataloging and registration of the archaeological artifacts recovered during the Sonora – Sinaloa Project/1967 and the Economic Networks: Mesoamerica and the American Southwest between 1975 – 1978 project, both conducted by Dr. Richard Pailes. These studies provided the foundations for new insight into Sonoran Serrana prehispanic cultural dynamics and make a breakthrough in the archaeological research of Northwest Mexico. These collections are now a substantial part of the cultural resources under the custody of Centro INAH Sonora (CIS). The collections are currently being revalued as they constitute a testimony of archaeological research history in Northwest Mexico with a great deal of contextual value. Under this vision, we have been working on several lines of research, including the technological processes and their contexts analysis and interdisciplinary work on the search for raw material sources, development of virtual catalogs, and the association of the results to the current regional research scene.

Hinojosa, Mark [363] see Mt. Joy, Kristen

Hinojosa-Balino, Israel (CIESAS) and Henrik Brahe (Freelance photographer)

[409] *Unearthing a Town from the Sky: Kom Wasit, the Bird's Eye Archaeological Point of View*

In this presentation we will show the way we used an Unmanned Aerial System (UAS) to reproduce an accurate map of Kom Wasit, an archaeological site of the Nile Delta located in the province of Beheira. An orthophoto was generated using photogrammetry and GIS, which combined layers of information such as the magnetometry results and the topography survey. It was therefore possible to recreate what can be dug in the future and to understand the settlement pattern of this Late Dynastic town.

Hinthorne, James [378] see Nicholson, Daniel

Hirth, Kenneth (Penn State University)

[194] *The 16th Century Merchant Community of Santa Maria Acxotla, Puebla*

Although merchants were an important component of the prehispanic and post-conquest landscape, not much is known about the internal organization of merchant groups and the structure of their respective communities. This paper examines the size, composition, and internal organization of the small merchant community of Santa Maria Acxotla located in the Puebla-Tlaxcala basin of highland

Mexico. Census data collected 39 years after the conquest suggests that specialized merchant communities operated relatively unchanged well into the 16th century. The information from Santa Maria Acxotla is summarized and compared to the Aztec period site of Otumba, Mexico, that is known to have contained a pochteca merchant community in the Basin of Mexico. The data from Santa Maria Acxotla provide new data on how merchant communities may have been organized prior to Spanish Conquest.

[88] *Discussant*

Hirth, Colin [194] see Hirth, Kenneth

Hishida, Tetsuo (Kyoto prefectural University)

[145] *A Religious Perspective on State Formation Process in Seventh Century A.D. Japan*

Religion played an essential role in the state formation process in seventh century Japan. After Buddhism was introduced from Korea in the sixth century, more than 600 Buddhist temples were erected by the middle eighth century. There are some distinctive layouts of temple complexes, and the central authority greatly contributed to temporal change in the layouts. A considerable change took place in the middle seventh century, which marks the beginning of the national policy to adopt Buddhism as a state religion. At the same time, indigenous Shinto rituals also became formalized. Shinto rituals came from the primitive worship for the mountains and springs, but a considerable change in patterns of Shinto rituals occurred in the middle seventh century. New ceremonial goods appeared at the Naniwa Palace in Osaka. Typical Shinto ritual sites from the late seventh to early eighth centuries in local regions were located next to Buddhist temples. Although provincial government offices were maintained by local elites, a set of Buddhist temple and Shinto ritual in a local region suggests that Buddhism and Shintoism were used by the central authority to gain more control over local regions.

Hitchings, Philip [47] see Banning, Edward

Hitchings, Philip (University of Toronto) and Edward Banning (University of Toronto)

[401] *Predict and Confirm: Survey and Excavation at Three Candidate Sites for Late Neolithic Occupation in Wadi Quseiba, Jordan*

In 2012 and 2013, a team from University of Toronto surveyed the Wadi Quseiba drainage in northwest Jordan. The survey had two goals. The first was to discover evidence of Late Neolithic habitation and landscape use. Many large villages declined or were abandoned at the end of the Pre-Pottery Neolithic and we sought to augment our knowledge of Late Neolithic sites to help learn why this might be. The second was to increase the efficiency and reliability with which sites are located. To this end we experimented with Bayesian optimal-allocation methods. Following the survey, small-scale excavations in 2014 on three "candidate sites" revealed convincing evidence of Neolithic occupation. One site, WQ335, had surfaces and possible architecture along with many diagnostic artifacts from the Late Neolithic Wadi Rabah phase (ca. 7.5ka BP). Another, WQ117, revealed round pit structures along with many diagnostic Yarmoukian phase (ca. 8.5ka BP) artifacts, including a pebble figurine. A third site, WQ120, revealed later (Iron Age and Roman) remains over probable Pre-Pottery Neolithic elements. This paper will discuss results of the 2014 excavations and their role in confirming predictions based on survey results.

Hixon, Sean (University of Oregon, Clark Honors College), Carl Lipo (California State University Long Beach) and Terry Hunt (University of Oregon, Clark Honors College)

[52] *The Colossal Hats (Pukao) of Monumental Statues: An Analysis of Shape Variability among the Pukao of Rapa Nui*

As part of monumental statue (moai) construction during the prehistory of Rapa Nui, islanders quarried bodies of red scoria, carved them into hats (pukao), and placed them atop statues measuring up to 10 meters tall. Despite overall great interest in moai and the improbable magnitude of pukao that were raised to reach their positions on the heads of statues, few studies have investigated pukao production and transport. This study seeks to analyze three-dimensional

variability of pukao using 15,000 photos of 50 pukao found near statues and 13 red scoria cylinders located in quarries. These models are used to evaluate which surface features are stylistic with related temporal and spatial variability and which are functional and relate to construction and transport of these multi-ton objects. The functional detail has the potential to shed light on how prehistoric islanders designed pukao to be placed atop moai. To this end, additional three dimensional models of statue platforms (ahu) and moai are combined with the models of pukao to test the feasibility of the conventional hypothesis that the pukao were placed atop moai using stone ramps.

Hlubik, Sarah (Rutgers University), J.W.K. Harris (Rutgers University), David Braun (The George Washington University), Francesco Berna (Simon Fraser University) and Craig Feibel (Rutgers University)

[174] *Potential 1.5 Million Year Old Phantom Hearth at FxJj20 AB, Koobi Fora, Kenya*

Identifying the control and use of fire in domestic spaces in the Early Pleistocene is contentious, due to the lack of physical evidence preserved in the record. The ephemeral nature of fires results in a sparse archaeological record. Further, the evidence for fire may degrade quickly depending on the depositional context of the burial environment. The potential for identifying fire in the early Pleistocene archaeological record, where accepted hearth features are unknown, relies heavily on the ability to recognize in situ patterns, which indicate the presence of fire. New work at the site of FxJj20 AB, Koobi Fora, northern Kenya, has revealed spatial evidence indicating a potential 1.5 million year old hearth feature. Further testing of the deposits is required, but the initial spatial analysis of chipped stone and fossil bone indicate at least one locus of activity on the site. Combined with the presence of thermally altered stone and sediment, this indicates that a hearth feature may be present. Work is continuing, geochemically and micromorphologically, to determine the presence of combustion feature residues, and whether the evidence of fire can be behaviorally associated with the abundant evidence of hominin occupation at FxJj 20AB.

Hlubik, Sarah [174] see Cutts, Russell

Ho, Bert [170] see Hanselmann, Frederick

Hockett, Bryan (Bureau of Land Management)

[415] *Primitive Economic Man: R.I.P.*

Primitive Economic Man (PEM) paradigms have been popularly applied in economics, nutrition science, sociology, psychology, and anthropology to explain human behavior for almost two centuries. PEM contains two general assumptions: (1) that most humans make cost-benefit decisions to further their own personal economic or political condition; and (2) Darwinian selection favors these cost-benefit trade-offs; in other words, the children of selfish, cost-benefit oriented individuals differentially survive in greater frequencies through time. Regarding subsistence practices, the application of PEM paradigms has led to the development of a host of models that suggest Darwinian selection has acted upon human behavioral choices to favor those that lead to the maximum caloric intake possible relative to work effort. These models remain popular in archaeology despite the fact that nutrition science falsified this assumption a century ago in 1915. This paper explores more specifically why PEM deserves a proper burial if we ever hope to fully understand and appreciate diachronic trends in human subsistence practices. At the same time, there are components to PEM paradigms that should become important pieces to broader, more holistically based models of human dietary choices through time.

[415] *Chair*

Hodder, Ian (Stanford University)

[146] *Discussant*

[16] *Chair*

Hodges, Charles (Pacific Geoarchaeological Services) and Brandy Rinck (SWCA)**[10]** *Geoarchaeology of the Bear Creek Paleoindian Site, King County, Washington: The Stratigraphic Framework*

The Bear Creek site (45KI839) in Redmond, Washington, has yielded important information about Native American settlement, subsistence, and technology in the Puget Lowlands during the Late Pleistocene-Holocene transition (LPH). The depositional sequence within the site represents a well-preserved stratigraphic and archaeological record extending from the postglacial and early Holocene, and is characterized by several clearly expressed shifts in depositional environments. The high amount of lithological variability characteristic of deposits in glaciated terrains can result in difficult-to-interpret unit-to-unit heterogeneity if a strictly lithostratigraphic approach to the classification of depositional units is employed. In order to reduce place-to-place variability, and yet retain the capacity for detailed characterization of the depositional sequence in individual archaeological units as well as refer to major regional postglacial environmental shifts, we grouped facies types into discontinuity-bounded allostratigraphic units. This allowed us to correlate and compare deposits both vertically and laterally across the site within single depositional environments, including those that often produce heterogeneous sets of facies. We have organized our observations of the site stratigraphy utilizing a combination of data derived from distributions of lithofacies types, the geometry and character of the allostratigraphic bounding contacts, and most importantly, micromorphological analyses of both allostratigraphic and lithofacies contacts.

Hodgetts, Lisa [25] see Moody, John

Hodgetts, Lisa (University of Western Ontario), Colleen Haukaas (Archaeological survey of Alberta) and Laura Kelvin (University of Western Ontario)**[302]** *Delivering on the Promise: Mobilizing Knowledge in the Ikaahuk Archaeology Project*

Partnerships between local communities and academics are becoming increasingly important in addressing a range of research questions in a warming Arctic. These approaches hold great promise for archaeology, but community participation in research demands that archaeologists rethink the aims and outcomes of our work. Here, we reflect on the ways in which our efforts to engage the Inuvialuit community of Sachs Harbour in our archaeological research project on Banks Island, NWT have shaped the project aims and desired outcomes. Our efforts to democratize archaeological recording and reporting through the use of photogrammetry, 3D modelling and Facebook could facilitate community-based documentation of archaeological sites threatened by coastal erosion and other climate change-related impacts on the Arctic archaeological record.

Hodgkins, Jamie (University of Colorado Denver)**[356]** *Variation in Butchering Intensity between Glacial and Interglacial Cycles at Pinnacle Point 5-6*

The archaeological assemblage and long stratigraphic sequence at the site of Pinnacle Point 5-6 in Western Cape, South Africa affords the opportunity to explore temporal (and possibly environmentally-mediated) changes in human behavioral regimes in the late Pleistocene. Here, examination of butchering intensity is used as a preliminary test of the hypothesis that humans would have intensified the processing of terrestrial prey in times of cooler, dryer climates, when sea levels were low and the coastline and marine resources were further from the Pinnacle Point sites. To do so, faunal remains were sampled from three stratigraphic levels corresponding to different MIS stages: 1) the top portions of level LBSR (81 ± 4 ka); 2) level ALBS (72 ± 3 ka); and 3) the lowest portion (Thandesizwe) from level SA.D.BS (71 ± 3 ka). The LBSR is contemporaneous with the interglacial MIS 5A high sea-level stand, whereas the ALBS and SA.D.BS correspond to the beginning of the MIS 4 glacial period. Although the results of the zooarchaeological analysis are somewhat consistent with intensified butchery in the MIS4 levels based on the frequency of cutmarks on the bone fragments, no such pattern was discerned for percussion marks, suggesting that increased marrow extraction was not a part of the strategy.

Hoefler, Dani [98] see Simon, Rebecca

Hoff, Aliya (Arizona State University), Dominique Meyer (University of California, San Diego), Michael Hess (University of California, San Diego), Fabio Esteban Amador (National Geographic) and Dominique Rissolo (University of California, San Diego)

[355] *Integrative 3D Visualization for Spatial Analysis and Interpretation of Rock Shelters in Quintana Roo, Mexico*

The integration of multimodal and multiscalar 3D imaging and visualization techniques can be used to explore ritual and non-ritual uses of rock shelters by analyzing potentially meaningful relationships between natural and constructed features. Situating rock shelters within the greater context of Maya subsurface ritual practice may in turn help further define the Maya concept of caves. LiDAR and SFM can be integrated with traditional mapping techniques and ArcGIS to rapidly and precisely document the architectural and natural attributes of a cave. The resultant models of multiple scales and resolutions are combined to facilitate seamless and uninterrupted movement between distinct domains of the cave in its entirety and within the context of the surrounding landscape. Whereas the aforementioned techniques permit the visual and quantitative analysis of spatial relationships between features, stereo panoramic photography equips us to view different spaces within a single 3D photorealistic image and enables analysis and interpretation of visual details that point clouds and maps oftentimes fail to convey. When visualized in a 3D immersive environment, integrated digital techniques produce the most accurate and realistic recreations of the physical and experiential space and facilitate collaborative, accessible, and holistic interpretations regarding both ritual and quotidian utilization of caves.

Hoff, Aliya [409] see Meyer, Dominique

Hoffman, Brian (Hamline University), Chelsea Starke (Hamline University), Forest Seaberg-Wood (Hamline University), Kevin Reider (Hamline University) and Liesl Weber Darnell (Hamline University)

[30] *Inyan: Towards Understanding Sioux Quartzite and a Sacred Landscape*

Both archaeological and ethnographic evidence supports the idea that the locations of petroglyphs and pictographs are considered sacred. In the Northern Plains of North America, the Jeffers Petroglyphs and similar petroglyph sites along the Red Rock Ridge are part of a landscape which includes habitations, petroforms, lithic reduction sites, and quarries. We report on the results of archaeological fieldwork at four sites along the Red Rock Ridge near the Jeffers Petroglyphs: a habitation site (21CO34), two quarry sites (21CO53, 21CO56), and a smaller petroglyph site (21CO55). Our focus is the material evidence which reveals the range of activities at these sites and the use of lithic raw materials, including Sioux Quartzite. The diversity of the habitation site tool kit suggests a wide range of activities for the site's occupants. The quarry site assemblages are more enigmatic, but demonstrate that the Red Rock Ridge was an important source of stone. Shovel tests at the petroglyph site produced lithic artifacts, including non-local raw materials and abundant fractured Sioux Quartzite suggesting quarry activity was widespread. This material evidence tells us about the complexity of human activity on the landscape and adds to our understanding of how people experienced this sacred place.

Hoffman, Amy [85] see Winstead, Christy

Hoffman, John, Teresa Rodrigues (Gila Indian River Community Cultural Resources Man), Emery F. Manuel (Gila Indian River Community Cultural Resources Man) and Alan Sinclair (Bureau of Indian Affairs, Pima Agency)

[225] *Gila River Indian Community's Wildland Fire Archaeology Program*

Wildland fires have the potential to impact a variety of resources, and cultural remains are among those most vulnerable. Unlike most natural resources, archaeological sites including structures, artifacts, and sacred places are irreplaceable once damaged or destroyed. Over the past three decades, archaeologists have increasingly served as technical specialists on wildland fire incidents. Cultural resource specialists are now included in strategic planning and implementation of fire

suppression and post-fire recovery efforts. In order to adequately manage or avoid negative impacts to cultural resources during wildland fires as well as other emergency events, the Gila River Indian Community Cultural Resource Management Fire Archaeology Program was created in 2008 in collaboration with the Bureau of Indian Affairs, Pima Agency. Through participation in the Fire Archaeology Program, staff archaeologists are trained in a variety of cultural resource management activities that are undertaken before, during, and after fires. These include Federal, State and Tribal regulations, fire safety training, fireline surveys, evaluation of potential impacts, and the incorporation of protection measures. The latter include a variety of strategies to protect archaeological sites from the effects of fire, fire suppression, and subsequent erosional threats within severely burned environments.

Hoffman, Brian [7] see Hornbeck, Bobbi

Hoffmann-Ihde, Beatrix (Rheinische Friedrich-Wilhelms-Universität Bonn)

[411] *Identifying Transcultural Processes: The Wayana-Apalai and Tiriyo Example*

The majority of ethnographic museum-collections were generally created to show a distinct indigenous culture based on examples from the material culture. These collections were created to give the impression that the features of a certain material culture, recognizable in form, design and material, are essential and genuine to a particular indigenous group. My research in the field of Museum-Ethnology, investigating transcultural processes reflected in objects of material culture, refers to transformations caused by contact to other indigenous groups living in the same region and to representatives of western cultures. These contacts are reflected in the material culture: not only regarding the used materials, like metal, fabric, glass, or even plastic, but also ideas, introduced from the outside. The latter concerns for instance western concepts about the elements that the material culture of a certain indigenous group should contain. Using the example of the Wayana-Apalai and the Tiriyo, two Carib-speaking indigenous groups from the Guyanas, I would like to discuss this topic, based on ethnographic collections from German, Swiss and Brazilian Museums.

Hofman, Corinne L. [199] see Sonnemann, Till

Hofman, Courtney (University of Maryland), Torben Rick (Smithsonian Institution) and Jesus Maldonado (Smithsonian Institution)

[339] *Tracking Translocations: Interdisciplinary Approaches to Animal Translocations on the California Channel Islands*

One of the greatest human impacts on the environment has been the intentional and unintentional introduction of plants and animals around the world. Islands are particularly susceptible to ecological change following introductions, but distinguishing between natural and cultural introductions of wild taxa is often challenging. Here we present our interdisciplinary approach to investigating the origins of California Channel Island terrestrial mammals that can serve as a framework for helping distinguish natural and cultural translocations around the world. This approach integrates archaeological, isotopic, genomic and radiometric data to explore the role of human agency in island biogeography. Focusing on deer mice (*Peromyscus* spp.) and island fox (*Urocyon littoralis*), we examine the timing, origins, and evolutionary history of these species and how humans have influenced their biology and biogeography. This approach allows us to evaluate natural events from ancient hunter-gatherer environmental interactions to inform island conservation and management.

[339] *Chair*

Hogg, Erin and John R. Welch (Simon Fraser University)

[95] *Research Excellence + Business Competence = Success: A Proposed New M.A. Program in Heritage Resource Management at Simon Fraser University*

Many cultural/heritage resource management professionals struggle to boost research excellence in an increasingly competitive global marketplace. The new master's level professional program in Heritage Resource Management (HRM) under development at Simon Fraser University provides junior C/HRM practitioners with opportunities to enhance their professional tool kit and boost their

research credentials. Our survey of traditional and online HRM master's offerings identified 16 comparable programs. We review these programs in terms of admission standards, course offerings, and graduation requirements. We also surveyed recent M.A. graduates from SFU archaeology, prospective students for the proposed program, and likely employers to identify their specific interests and preferences. The survey results provide the guiding principles for a proposed M.A. program that integrates a) online and traditional classroom instruction; b) recent B.A. graduates and more seasoned professionals; and c) coursework in HRM research design, professional practice, and business management.

Hoggarth, Julie (Pennsylvania State University), Jaime Awe (Northern Arizona University), Richard George (Pennsylvania State University), Rafael Guerra (University of New Mexico) and Claire Ebert (Pennsylvania State University)

[244] *Territorial Organization in the Upper Belize River Valley: Multi-Scalar Settlement Patterns at Baking Pot*

Evidence suggests that the influence of regional polities in the Upper Belize River Valley shifted through time, with political centers ascending and declining in power. Archaeological research by the Belize Valley Archaeological Reconnaissance (BVAR) project utilizes a regional approach to understand the political development and disintegration of three major centers: Cahal Pech, Baking Pot, and Lower Dover. This paper uses a multi-scalar settlement approach to understanding territorial organization in the Upper Belize River valley through time. Regional perspectives utilize LiDAR data supplemented by systematic surveys and excavations, focusing on spatial patterns that distinguish territories between sites. Extensive settlement research at Baking Pot allows for more fine-grained analysis of political and economic interaction through time. At the site level, we focus on distinguishing settlement clusters and their relationships with natural and constructed features. We present the geochemical results of an XRF analysis on obsidian artifacts to understand patterns in resource procurement and exchange networks. At the community level, we focus on Settlement Cluster C to examine strategies of community interaction and integration. At the household level, we assess patterns of household production, ritual, and political interaction. We contrast Preclassic, Classic, and Postclassic patterns to identify major changes in organization through time.

Hoggarth, Julie [248] see Ebert, Claire

Holcomb, Justin [9] see Sawyer, Alicia

Holdaway, Simon (University of Auckland)

[228] *Discussant*

Hole, Frank (Yale University)

[401] *Processes of Immigration and Adaptation in Late Chalcolithic Northeastern Syria*

An incursion of immigrants into the Khabur River drainage of northeastern Syria exemplifies a set of historical processes that are sometimes suspected, but often discounted as unrealistic or unprovable. The principal processes are (1) emigration from a homeland and immigration into a new land, (2) selective transmission of culture traits to a new locale, (3) divergent adaptation, (4) assimilation of new traits, and (5) formation of a new cultural tradition. These processes are exemplified by six Late Ubaid sites in the Khabur and one in southern Anatolia.

Holeman, Abigail (University of Virginia)

[22] *Levels of Hierarchy in Northern Mexico: The Color of Ritual at Paquimé, Chihuahua, Mexico*

In societies across the ancient world, incipient leadership and centralization were founded on connections to the cosmological through ancestors, origins, and other ritual practices. At Paquimé in northern Chihuahua, Mexico these ritual practices were expressed through the language of color symbolism. Color/directional symbolism is a cosmological principle that acts as a deep structure for societies in the Puebloan U.S. Southwest and Mesoamerica. Red, black, yellow, white, and

blue/green become the language through which the world is created and differentiated. I contextualize the oft-discussed exotic goods found at Paquimé with the more locally available material to argue that color/directional symbolism was operative during the Medio Period. Emerging leaders at Paquimé used color to inscribed links to the supernatural onto the architecture, both public and private as part of a new political strategy during the Medio Period. Looking at the interplay between household ritual and community ritual elucidates how ritual action becomes an arena for political change.

Hollenback, Kacy L. [230] see Goodwin, Whitney

Hollenback, Kacy (Southern Methodist University), Christopher Roos (Southern Methodist University), Fern Swenson (State Historical Society of North Dakota), Andrew Quicksall (Southern Methodist University) and Mary Hagen (Southern Methodist University)

[230] *A Tale of Two Houses: Soil Chemical and Floor Assemblage Evidence of Domestic Activities at the Menoken Site, North Dakota*

Although they are often used by archaeologists to identify activity patterns within domestic spaces, floor assemblages are influenced by a variety of cultural and natural formation processes, especially those related to abandonment. By contrast, soil chemical traces are thought to be less vulnerable to alteration by subsequent activity and, therefore, are treated as primary residue of activities in their original location. Although the formation histories of these two types of evidence differ, the integration of these independent data sets improves our ability to generate holistic inferences about the structure, use, and perception of domestic space. Here we compare geoarchaeological and floor assemblage data to identify and map traces of domestic behavior through the life histories of two Late Woodland period (ca. A.D. 1200) lodges at Menoken Village (32BL2) in central North Dakota. Excavations by Stanley Ahler in 1997-1999 and 2005 reveal that the two structures have markedly different styles of architecture despite a similar oval-shape, size, and penecontemporaneity of occupation. We integrate the two lines of evidence to compare the patterns of use and abandonment of these domestic structures to evaluate whether or not the uses of these spaces were comparable despite the architectural variation.

Hollinger, Eric

[42] *Discussant*

Holmberg, Karen (New York University)

[412] *The Vast and Secret Museum of Chiriqui: Stripping the Sharpness and Beauty from obsidian*

Prominent, recent explorations of the role of sensory data in archaeology detail the linkages of bodily senses, material objects, and remembering or forgetting to invoke the 'vast and secret museum of historical and sensory absence' in analyses. In this paper, I examine the residues and associations of chthonic power and senses that can cling in social memory to volcanic materials. This serves as a query for why an entirely useful material was not in use in the Chiriqui culture area that spans present-day western Panama and eastern Costa Rica; obsidian is rare to nonexistent in Chiriqui artifact assemblages. The closest obsidian sources were likely Honduras and Guatemala to the north or southern Colombia and eastern Ecuador to the south. Given the vast distances that other artifact classes traveled in the precolumbian past, this should have provided little impediment. Standard archaeological considerations of utility or access, I argue, are insufficient explanations for this absence. In the area of the Barú volcano, in particular, perhaps the role of 'obsidian' (i.e., 'useful stone powerfully linked to the volcano') was played by dacite slabs, basalt columns, and even tephra that circulated widely in the Chiriqui past.

Holmes, Charles (University of Alaska Fairbanks), Ben Potter (Anthropology Dept., University of Alaska Fairbanks), Josh Reuther (Museum of the North, University of Alaska Fairbank) and Barbara Crass (Shaw Creek Archaeological Research, LLC)

[360] *Archaeology of the Shaw Creek Catchment, Central Alaska*

Research begun in the 1990s focused within a small valley system, Shaw Creek Catchment (SCC),

within the middle Tanana valley. Investigations show that long-term habitation and resource exploitation began about 14,200 cal. BP at Swan Point, the oldest site in Alaska. Both Swan Point and Mead date to the terminal Pleistocene. Together they constitute key sites for interior Alaska archaeology with their distinct multi-component records illustrating changes in environment, technology, fauna, and behavior throughout the Holocene. The 13,000-11,500 cal. BP period, with multiple radiocarbon-dated hearths and associated fauna, is well-represented at SCC sites. Items of carved bone (personal adornment) occur at Mead. Large animals, e.g., elk and bison, were important; however, a broad based economy, consisting of smaller mammals, birds, and fish, is clearly evident in the inventory. The Northern Archaic, while less remarkable in artifact counts, hearth features, and fauna, is represented at most SCC sites. Obsidian, unavailable locally, is common to all time periods and found in nearly every site. Five obsidian sources (one unknown) chart the distant geographic regions where, diachronically, SCC inhabitants acquired this valued material, by travel or trade. In 2014, we began a multi-year program to identify new sites and better understand those already known.

Holst, Irene

[186] *Human and Natural Processes Affecting Starch Grain Morphology in Archaeological Contexts*

Over the past decade an increasing number of archaeological starch grain studies have made important contributions to our understanding of prehistoric diets and subsistence strategies. The research has also generated a number of questions concerning the identification and interpretation of starch grain records from the Neotropics and elsewhere. Some of them involve possible modification of archaeological grains from cooking and grinding. Starch may also be susceptible to damage or degradation from natural processes such as heat, drying, and fungi and enzymatic activity. We examined this issue systematically in manioc (*Manihot esculenta*), maize (*Zea mays*), squash (*Cucurbita moschata*) and beans (*Phaseolus vulgaris*) by describing and quantifying the natural structure and modifications of starch from fresh samples and samples air or sun dried before and after grinding. Our findings will lead to a better understanding of the human-induced and natural processes that contributed to the morphology of starch grains recovered from human teeth, grinding stones, and sediments.

Holtkamp, David (Los Alamos National Laboratory), Sandi Copeland (Los Alamos National Laboratory), Alan Madsen (Los Alamos National Laboratory), LeAnn Purtzer (Los Alamos National Laboratory) and Jennifer Payne (Los Alamos National Laboratory)

[276] *Ancestral Pueblo Site Distribution Data from Los Alamos National Laboratory on the Pajarito Plateau*

The Pajarito Plateau of northern New Mexico has been a place of significant archaeological study for over one hundred years. Situated just north of Bandelier National Monument, Los Alamos National Laboratory (LANL) is situated on 25,395 acres of the northern Pajarito Plateau, 90.9% of which has been surveyed for heritage resources. LANL manages over 2,000 archaeological sites, 1,505 of which are affiliated with the Ancestral Pueblo culture. This study has two primary objectives: the first is to present an overview of Ancestral Pueblo sites located at LANL using GIS data for three Ancestral Pueblo periods: Developmental (600 to 1200 A.D.), Coalition (1200 to 1325 A.D.), and Classic (1325 to 1600 A.D.). The second objective is to look at occupation on the Pajarito Plateau more broadly by comparing the distribution of LANL sites with site location data from Bandelier National Monument for these three Ancestral Pueblo periods with a focus on formation and reconfiguration of social organization and cultural-linguistic groups. The goal is to put the data from Ancestral Pueblo sites at LANL into conversation with previous archaeological research from the National Park Service to expand our understanding of site distribution on the Pajarito Plateau for Ancestral Pueblo populations.

Homburg, Jeffrey (SRI/University of Arizona), Fred Nials (Desert Archaeology) and James Vint (Desert Archaeology)

[55] *Anthropogenic Effects on Soil Quality of the Las Capas Irrigation System*

A soil quality study was conducted at the Las Capas site to document and evaluate the soil

productivity and hydraulic soil properties of this ancient agricultural irrigation complex. This site presents an unprecedented opportunity to study the complete configuration and evolution of the oldest irrigation system documented in the Southwest to date. Mechanical stripping permitted earthen berms around small field grids to be identified so that soil samples could be collected in relation to nearby uncultivated control samples. Long-term indicators of agricultural soil quality, such as organic carbon, nutrient content, and hydraulic soil water properties, indicate that anthropogenic changes were favorable for agricultural production and that the Las Capas irrigation system was sustainable. Canals regularly supplied water to the fields, but they also supplied nutrient-rich sediments that continually renewed soil fertility, enough to counter nutrient losses resulting from crop uptake, volatilization, leaching, and oxidation. Fields have significantly elevated organic carbon, nitrogen and available phosphorus levels relative to the borders, and levels that are slightly below but comparable to the control soils. Sodium and sodium adsorption ratios, though elevated in the Las Capas fields, are far below levels that could have had a serious detrimental effect on crop production.

Homburg, Jeffrey [180] see Sandor, Jonathan

Homko, Margaret (University of New Mexico)

[166] *Variability in Neolithic Cattle Populations: A Case Study from the Orkney Islands*

The Orkney archipelago, at the northern end of Scotland, has a rich and well preserved record of Neolithic settlement. Radiocarbon dates from northern Scotland indicate the establishment of farming communities quite soon after those in southern England. However, the process by which agriculturalists reached these far northern territories is still not well understood. Faunal analysts (Watson 1931, Noddle 1983) have drawn attention to an apparent distinction in morphology between the cattle imported into Orkney and those found in Neolithic settings in southern England. This study examines size characteristics of Orkney cattle, comparing them with published data from southern England to test the hypothesis that they represent a separate and distinct population. If true, the inference might be that the initial agriculturalists in each region originated from different points on the European continent. Additionally, cattle from the Early and Late Neolithic stages on Orkney are compared to evaluate the possibility of new livestock introductions at the transition between cultural phases. The analysis of livestock remains from the Orkney Neolithic can potentially address issues regarding the arrival and establishment of agriculture in the northern regions of Great Britain, and, by implication, the migration patterns of the Neolithic inhabitants of northwestern Europe.

Homsey-Messer, Lara [162] see Johnston, Janene

Honda, Kaoru [31] see Sakai, Masato

Honeychurch, William [234] see Wright, Joshua

Honglin, Ran

[349] *The Settlement Remains of Sanxingdui -- A Preliminary Study of Chronology and Site Development*

From its initial discovery in 1929, much research has been conducted on the site of Sanxingdui, making it the most famous and most important Bronze Age site in all of Sichuan if not Southwest China. While the sacrificial pits with their singular bronze objects have already been discussed in great detail by many scholars, the settlement of Sanxingdui, its structure and development are still poorly understood. Based on a consideration of the stratigraphic sequence and comparative analysis of the content of the various layers, this paper argues that considerable changes took place throughout the development of the site, especially between Phases I and II and also between Phases III and IV. Considering the limited amount of published material currently available, this paper cannot completely solve the issue of the chronology and development of the settlement of

Sanxingdui, but it points out some of the major unresolved issues and suggests potential avenues for further research.

Hood, Larkin (University of Washington)

[94] *"A True Sign of Learning": What College Students Learn About Teaching and Learning from a Museum Docent Program*

Burke 101 is a museum program developed to provide undergraduate students at the University of Washington an opportunity to share their knowledge in a particular discipline. The program is organized around a course in which students work together to create hands-on, interactive activities for visitors using museum specimens. Observations of students' interactions with visitors as well as analysis of student oral and written reflections indicate that initially students find their teaching experiences students in the museum galleries challenging and very different from teaching and learning practices in traditional classroom settings. Yet by the end of the course, many students report increased confidence in assuming a facilitator role, assessing visitor knowledge, and adjusting task challenges. These behaviors are associated with best practices in classroom teaching, as well as museum settings. Some student responses indicate that in teaching museum visitors, they have become more aware of their own learning in classroom settings. These reported changes have implications for students and instructors in the college classroom.

[270] *Discussant*

Hoogland, Menno [199] see Sonnemann, Till

Hoopes, John (University of Kansas)

[411] *Imitating from Memory: Hybrid Vessels and Attempted Replications of Stylistic Elements from Central Panama in the Prehispanic Ceramics of Costa Rica*

The ceramics of Central America are replete with examples of stylistic influence that represent attempts by local potters to reproduce foreign styles from distant lands. Examples include attempts to reproduce elements of Late Classic Maya styles in ceramics of the "southern periphery" of Mesoamerica. This paper presents evidence for attempted but imperfect and even inept reproduction of elements from the opposite direction—territories far to the south and east—by identifying elements of Coclé-style designs typical of central Panama in both bichrome and polychrome vessels of northwestern and eastern Costa Rica between ca. A.D. 300 and 1300. The specific divergences between these part-imitation, part-local objects and the vessels from whose styles they borrow suggest that these hybrids were not the products of permanent migrants, itinerant potters with practiced knowledge of their own ceramic styles, nor direct copies from imported models, but rather reproductions from memory of elements that had been observed during long-distance interactions between ceramic artists of Costa Rica and Panama. They are interpreted as evidence for inter-ethnic appropriation of ideas and symbolism between distinct communities in the Isthmo-Colombian area.

[246] *Discussant*

Hoover, Anna (Pechanga Band of Luiseno Indians)

[38] *Preparing for the Future through Rock Mounds and Research*

Mentoring and strong teaching methods are the hallmarks of Scott Fedick's career. When just an undergraduate, Fedick took a chance on Anna Hoover and guided her into studying an ancient agricultural technique that is actually still practiced today. Chi'ich mounds, or small rock/pebble mounds, are utilized where surface soils are thin of temperatures are dry and arid. Serving as both mulch and root stabilizers for vines, shrubs and trees, these little features can be found in archaeological contexts and in modern communities in the Yalahau region.

Hopkins, Maren (Anthropological Research, L.L.C.)

[153] *From Orioles to Airplanes: O'odham Traditional Cultural Properties and Traditions of Travel through the Western Papaguería*

Ethnographic research conducted on Barry M. Goldwater Range East with members of the Tohono

O'odham Nation identified a series of ancient and historic travel routes relevant in O'odham history and contemporary traditions. These routes range from ancient foot trails leading to the Sea of Cortez to historic wagon roads and modern highways connecting O'odham communities. The O'odham commemorate important places in their history through place-naming, storytelling, songs, and traditional cultural practices. These traditions show how places associated with memory and experience deeply influence the way people use the land, and how communities interact. Furthermore, this work gives insight to land managers, archaeologists, and other researchers about O'odham cultural memories of landscape, and demonstrates how preservation of and access to the land is significant for the retention and transmission of O'odham cultural values and practices.

Hoppa, Kristin [32] see Ainis, Amira

Hoppa, Kristin (University of California, Santa Barbara) and Kristina Gill (University of California, Santa Barbara)

[41] *Plant Use at Diablo Valdez, Santa Cruz Island: Evidence from Macrobotanical and Starch Grain Remains*

This paper considers both macrobotanical and starch grain evidence for terrestrial plant use at Diablo Valdez (SCRI-619/620) on Santa Cruz Island, California. This inland site consists of a rock shelter as well as an open-air living space, and was occupied from ca. 5900 years ago and into the Historic period. Macrobotanical remains were recovered from 140 liters of soil, while starch grain analysis was conducted on six bowl fragments. This paper contextualizes these results within a broader discussion of combining macro- and microbotanical evidence from four other sites on Santa Cruz Island. Starch analysis reveals a number of plants not represented in the macrobotanical record, demonstrating the importance of using combining these analyses.

Hora-Cook, Elizabeth (Utah State University) and Judson Finley (Utah State University)

[362] *Fremont Farming at the Margins: Assessing Horticultural Potential in Jones Hole Canyon, Utah*

Jones Hole Canyon, east of the Uinta Basin, experienced a population increase during the late Formative Period (between A.D. 1000 – 1300), roughly coincident with reductions in farming populations in the Uinta Basin. The subsistence economy of these Fremont-era occupants of Jones Hole remains unresolved: did they acquire food primarily through foraging like the canyon's Archaic Period predecessors, or did they supplement foraged foods with horticultural products in a manner reminiscent of earlier Uinta Basin populations? This poster takes the first step toward answering this fundamental question by modeling environmental constraints on maize cultivation in Jones Hole Canyon. A GIS model of horticultural suitability indicates that Jones Hole Canyon can presently support maize cultivation, based on historic records of temperature and precipitation, and further work is underway to adapt this model to prehistoric climate data. Additionally, above-ground granaries in the canyon point to seasonal storage of horticultural products. Taken together, these two lines of evidence suggest that maize cultivation was a viable option for late Formative occupants of Jones Hole Canyon.

Horcajada Campos , Patricia [242] see Vázquez De Ágredos Pascual, Marisa

Horn, Sherman (Tulane University), Terry Powis (Kennesaw State University) and David Pendergast

[147] *Of Watery Rocks and Slumbering Crocs: A Reappraisal of the Middle Preclassic at Altun Ha and Lamanai*

A half-century of targeted excavations in northern Belize has generated one of the most detailed databases of Middle Preclassic (900 – 350 B.C.) settlement in the Maya Lowlands. Information from sites such as Cuello, K'axob, and Colha has provided the basis for economic and political models of Preclassic development in northern Belize and the eastern Maya Lowlands in general. The comparatively modest Classic-period architecture at these sites permitted extensive exposures of early occupations, which pose logistical problems at larger urban centers like Lamanai and Altun Ha. Middle Preclassic occupations at large centers in northern Belize remain poorly understood and

understudied, despite the potential insights they may offer into the emergence of social complexity and the development of political hierarchy in the area. In this paper we review extant and unpublished data from Lamanai and Altun Ha to compare aspects of Middle Preclassic architecture, material culture, and burial practices. We evaluate how this evidence relates to existing models of early community development in northern Belize, and use these data to explore the nature of interaction networks that linked these communities to other Middle Preclassic settlements within and beyond the surrounding area.

Hornbeck, Bobbi (SUNY at Buffalo), Caroline Funk (SUNY at Buffalo), Brian Hoffman (Hamline University), Debra Corbett (Nanutset Heritage) and Nancy Bigelow (University of Alaska)

[7] *Shaping identities through Physical and Cognitive Landscape Modifications in the Rat Islands, AK*

Low mound groupings were defined during the multidisciplinary Rat Islands Research Project during the summer of 2014. These mounds are clustered in at least three areas on Kiska Island and Segula Island. Traditionally interpreted as “bird mounds” by non-Aleuts, these mounds were thought to be places where birds habitually sat over millennia and where the resulting enriched soils fostered exaggerated vegetation growth relative to the surrounding landscape. While various bird populations do in fact make use of these mounds, the test excavation of Mound 14 in KIS-051 produced lithic evidence supporting the notion that these mounds are the result of human modifications of the landscape. Prehistoric Aleut populations had a complex notion of identity. One hypothesis for these mounds is that they represent a dynamic relationship between prehistoric Aleut group identity and the physical landscape. Geographic information systems provided an avenue for a deeper understanding of the complexities behind Aleut social constructs on the physical landscape through spatial analysis.

Horne, Joseph

[375] *Maya Ceramic Production along the North Coast of the Yucatan Peninsula: Diagnostic Attributes Associated with Unslipped Wares at Viste Alegre*

Along the northeastern portion of the Yucatan Peninsula prehistoric ceramic production practices included a variety of utilitarian forms. During recent work at the Maya coastal site of Vista Alegre, Jeffrey Glover and Dominique Rissolo recovered a high volume of unslipped plain and striated sherds. Due to the absence of complete vessels as well as the mixing of materials stratigraphically, classifying the sherds typologically has proven problematic. This paper examines and compares unslipped ceramic material from Vista Alegre with other diagnostic material recovered within the northern Maya Lowlands and the Yalahau region specifically. This comparative analysis is essential in further clarifying the chronology at Vista Alegre along with addressing the distinguishable traits that embody the ceramic wares of the region. Understanding the variability of the unslipped wares of this region will supplement further archaeological research in this part of the Maya world.

Horneman, Rennie (California State University, Long Beach), Carl Lipo (California State University, Long Beach), Terry Hunt (University of Oregon) and Vincent Bonhomme (School of Mathematics and Statistics, University of)

[412] *Morphometric Analysis of Stemmed Obsidian Tools from Rapa Nui (Easter Island, Chile)*

Of the few resources available to prehistoric people of Rapa Nui (Easter Island, Chile), obsidian was plentiful. Yet out of the countless surviving shaped obsidian artifacts that are found on the island, virtually all of them are of the same general class, the mata'a. Mata'a are flaked obsidian stemmed tools formed from a hard-hammer primary flake. As relatively simple stemmed obsidian tools with wide blades, their form is similar to artifacts known as mata'a found on other Polynesian islands such as the basalt artifacts found on New Zealand, Pitcairn and the Chatham Islands as well as New Britain, Papua New Guinea. Remarkably, all of the mata'a from Rapa Nui are of a single form with no apparent functional differentiation. Here, we have undertaken a morphometric outline analysis of a large collection multiple mata'a obsidian tools from Rapa Nui and compared similar obsidian tools known elsewhere in the Pacific. Relative to other locations, we show that that statistically distinct shape classes suggest that Rapa Nui obsidian tools are part of an as yet unknown social or technological function.

Horning, Audrey (Queen's University Belfast)**[340]** *Empirical Honesty and the Ethical Role of Archaeologists in Divided Societies*

Negotiating the politics of the present while staying true to the evidence of the past is the central challenge of responsible, ethically-engaged archaeological practice: the line between the archaeologist and the citizen is never clear cut. Questions of moral obligation and the imperative to respect multiple perspectives are of particular resonance when dealing with contested histories in conflict-ridden and post-conflict societies. Archaeology in these contexts carries risks, but also the potential for transformative social benefit. In post-Troubles Northern Ireland where society remains divided into two communities, broadly drawn as Catholic/Nationalist and heir to the Gaels, and Protestant/Unionist/ heir to 17th-century settlers, archaeology is playing a critical role in conflict resolution through bringing evidence for a shared past to discourses over a shared future. But mobilization of this past for the benefit of the future involves choices over the exploration and interpretation of archaeological evidence, and explicitly destabilizes oppositional community identities, making cross-community collaborative practice essential. As an archaeologist working with local groups across the community divide, the need to balance issues of evidence, ethics, and respect for individual and community narratives is the subject of constant negotiation but is core to the development of an empirically informed, ethically-engaged archaeological practice.

Horowitz, Rachel (Tulane University)**[292]** *The Organization and Economic Activity Related to the Extraction and Production of Utilitarian Tools in the Mopan Valley, Belize*

A major topic of recent study about the ancient Maya is the role of elites and non-elites in the ancient Maya economy. Such studies have illustrated that different types of objects operated within varying economic modes; therefore the methods of production and distribution of diverse types of objects should be examined individually. This paper will examine the economic role of utilitarian chert tools in the Late to Terminal Classic Maya economy. This paper will utilize an examination of the chaîne opératoire, or lithic production sequence, of the lithic materials from Callar Creek Quarry, a chert quarry and production site located in western Belize, to study the control of raw material sources and lithic production in the Mopan Valley. The materials from Callar Creek Quarry will be compared with those from two other chert quarry/production sites in the Mopan Valley. Through these data this paper will argue that access to chert raw materials, and the production of utilitarian chert tools, was controlled by non-elite households adjacent to the quarry/production areas.

[292] *Chair*

Horowitz, Rachel [292] see McCall, Grant

Horrell, Christopher [170] see Hanselmann, Frederick

Horsburgh, K. Ann (Southern Methodist University)**[296]** *Integrating Archaeological and Genetic Data*

Over the span of his career, Jim O'Connell has shown us by example how advances in genetics can help us better model prehistory when considered alongside archaeological evidence. In this paper I reflect on his career to highlight the way in which science currently considers genetic and archaeological evidence together to (1) create or refine culture historical models of population movement and demography, and (2) to develop insight in to the relationship between hunter-gatherers and their food producing neighbors. To do this I draw on research by O'Connell and others in Africa and in the former continents of Sunda and Sahul that became the islands of modern Melanesia and Australia. Finally I discuss how this work has set the stage for new research agendas that would not have been possible without O'Connell's influence on how we look at prehistory.

Horsley, Timothy [173] see Schubert, Ashley

Horsley, Timothy (Horsley Archaeological Prospection, LLC), Michael Conner (Dickson Mounds Museum) and Jodie O'Gorman (Department of Anthropology, Michigan State University)

[365] *Understanding Settlement Organization through Geophysical Survey at the Morton Village Site, IL*

Geophysical surveys at the Morton Village site are revealing the nature and distribution of occupation across this landscape and helping to guide the excavation program. Magnetometer surveys undertaken between 2010 and 2014 of 7.3 ha have identified numerous structures and pits. Results indicate a densely occupied village covering about 3.5 ha with more dispersed facilities outside this core. No evidence of a stockade has been found. By targeting specific magnetic anomalies, excavation is providing essential dating evidence and cultural material, thereby improving the geophysical interpretation as well as our understanding of the spatial organization and evolution of the site as a whole. This poster presents an overview of the magnetometer results to date, and includes a recent test of high resolution ground-penetrating radar survey that demonstrates the potential of this method for detecting additional features and adding further detail.

Horton, Elizabeth (National Park Service)

[43] *Connecting Communities to Place: Public Archaeology at Fort Vancouver National Historic Site*

The National Park Service (NPS) pursues multiple opportunities to partner with community organizations and engage the public in our ongoing archaeological and historical research program at Fort Vancouver in southwest Washington. Our focus is to increase our understanding of the people who lived at this multicomponent historical archaeological site. The park forms a large portion of the Vancouver National Historic Reserve, which is significant for its role as the headquarters for Hudson's Bay Company (1829 to 1860) and U.S. Army (1849-WWII) operations in the Pacific Northwest, as well as traditional Pre-Contact use of lands along this stretch of the lower Columbia River. Our Cultural Resource staff use archaeological compliance activities, undertaken during long-term rehabilitation/adaptive reuse of historic structures throughout the Reserve, to engage with park visitors. Our programs are designed to involve a wide range of visitors, from primary, secondary and university students, to youth organizations, family groups, community groups, and individuals. This paper will discuss various educational outreach strategies used by park staff to connect with public by creating a sense of place, which is crucial to public stewardship and long-term management of these resources.

Horton, Mark (University of Bristol)

[56] *Ethics and In-situ Science*

The process of archaeological excavation is in itself destructive and excavators can and do cause irreparable damage and the demolition of site context. Archaeological ethics reacts to protect artifacts and sites that are in danger of destruction or loss. The desire to protect cultural heritage causes many ethical theorists to suggest that artifacts must not be recovered at all from their contexts. However to allow the find to remain in the ground opens it up to theft, destruction and loss just as much as the successful retrieval and cataloguing of the artifact. The simple answer is the retention of artifacts by local guardians of history and the supervised study of the archaeological record by scientific methods that do not cause the destruction or degradation of said artifacts. This paper discusses the nuances of in-situ scientific study as it relates to such fieldwork-friendly instruments as the PXRf, whose genesis have allowed the lab to travel to the artifact and has greatly reduced the danger to artifacts and increased the power of local Archaeological societies but allowing them to retain their local heritage.

[56] *Chair*

Horton, Mark [105] see Faulkner, Patrick

Horton, Shannon (University of Nevada, Las Vegas) and Karen Harry (University of Nevada, Las Vegas)

[274] *Utilizing Corrugated Wares to Explore Regional Variations in the Virgin Branch Puebloan Culture*

This poster will examine the variation of corrugated ceramics from the Virgin Branch Puebloan sites located on the Shivwits Plateau and in the lowland region of the Moapa Valley. Variation between these two regions is examined, as well as changes in corrugated designs over time and differences between wares. These data allow us to evaluate patterns of social interaction, trading networks and learning interactions between sites and regions.

Hosking, Nada (UC Berkeley)

[395] *Simulating the past - The use of 3D technologies in archaeology*

To deal with the destructive nature of archaeological excavations, today's archaeologists are using new technologies to create 3D records of not only the archaeological sites, but also the archaeological process. This project explores how photogrammetry and 3D modelling can support theoretical approaches to the phenomena and processes by which Paleolithic out-of-context imagery, especially that which is engraved, is produced. Using 3D technologies can allow researchers to simulate a variety of scenarios, including placement, shading, and relief. A light source, such as a flickering hearth fire, from a certain angle can give an engraving a three-dimensional quality, and cause the depictions to "project" from the cave walls. This study will help us rethink how such imagery has been reproduced for study purposes, and hopefully, will propel scholars in the field to move ahead towards using 3D technology to explore the phenomenology of the Paleolithic imagery in its spatial context.

Houk, Brett (Texas Tech University), Mark Willis (AGA, LLC), Kelsey Herndon (University of Alabama) and Chester Walker (AGA, LLC)

[4] *The Structure A-15 Maneuver: A Novel Application of Structure from Motion Mapping at Chan Chich, Belize*

The Chan Chich Archaeological Project (CCAP) has been utilizing Structure from Motion (SfM) technology to document investigations at various scales ranging from individual artifacts to landscapes for the past two field seasons at Chan Chich, Belize. SfM is an imaging analysis algorithm that creates 3D models from a series of overlapping digital photographs, and the resulting data can be exported as a digital elevation model, an orthorectified image, or a 3D model. In 2013, the CCAP successfully experimented with a methodology that combines ground based and pole aerial photography to map an entire mound. Structure A-5, however, is relatively low and grass-covered mound that is devoid of tree cover and represents ideal conditions for testing the methodology. In 2014, the project employed the same methodology on a much more challenging and prototypical case: a badly looted, 15-meter tall temple-pyramid entirely covered in large tropical trees and low undergrowth. Our goals with the Structure A-15 investigations were to produce a topographic map of the mound, map the looters' tunnels and trenches in three-dimensions, and merge both datasets into a single 3D model. In this paper we present the results of this novel application of SfM mapping at Structure A-15.

Houk, Brett [244] see Garrison, Thomas

Houkes, Wybo [191] see Vaesen, Krist

Houle, Jean-Luc [403] see Byerly, Heather

House, Ernest (Colorado Commission of Indian Affairs)

[369] *Discussant*

Houston, Stephen [158] see Scherer, Andrew

Hovers, Erella (The Hebrew University of Jerusalem) and Anna Belfer-Cohen (The Hebrew

University of Jerusalem)**[33]** *Prehistoric Perspectives on 'Others' and 'Strangers'*

A point that we want to emphasize is that "cognitive archaeology" is a catch-all phrase that covers pretty much every aspect of human existence. To truly discuss cognitive archaeology, we need to define the specific areas of interest in each case. Given our position that cognitive capacities as such existed from at least the late Middle Pleistocene, we are interested in questions about evolution of social cognitive constructs. These constructs portray the plasticity of cognitive mechanisms and how they interacted with the changing circumstances that shaped and modified perceptions of self and society through prehistoric time. Here we specifically examine the concepts of 'others' and 'strangers'. While this may be preliminary and rather speculative, we suggest that this issue can be addressed from contextual archaeological data, to the effect that we can trace changes in the perception of social identities.

[181] *Discussant*

Hovers, Erella [64] see Ekshtain, Ravid

Hovsepian, Roman [401] see Herrscher, Estelle

Howard, Jerry**[304]** *Modeling Water Allocation and Scheduling in Canal System 2*

A great deal of progress has been made in understanding the physical layout, paleohydraulics and sociopolitical organization of Hohokam Irrigation systems. A relatively comprehensive database now exists for Canal System 2 identifying the location of main canals and the configuration and size of canal channels. Models of the available discharge, or the quantity of water available at points along the main canals, have been constructed. However, our understanding of the sequencing and nature of water deliveries is limited at best. How did the Hohokam organize the delivery of water to individual fields and lateral canals? This paper examines possible models of water allocation and water scheduling in Canal System 2. The water requirements for individual fields, including the quantity of water for specific irrigation cycles for maize agriculture, are established. The duration and sequencing of water deliveries to fields along a lateral canal are examined. The potential patterns in the sequencing of water deliveries to the series of lateral canals along a main canal are explored. Finally, potential patterns of water distribution and scheduling for the entire irrigation system are suggested. The implications of these models for system operation, agricultural success and social organization are discussed.

Howe, Mark (US State Department - USIBWC)**[282]** *The International Boundary Commission (IB.C.) and Projects along the U.S. – Mexico Border (1928 – 1941)*

The International Boundary Commission (IB.C.) conducted many projects along the entire U.S. – Mexico border during the Depression. Many of the projects were in cooperation with the Mexican Commission (Mexico) as per treaty stipulations. These projects were conducted under funds from agencies such as the Public Works Commission (PWC), Works Progress Administration (WPA) and others. Examination of the original documents and maps at the present International Boundary and Water Commission (IBWC) offices in El Paso, Texas has shown an interesting range of individual and Commission attitudes to structures and projects. Discussion will focus on the projects along the border, pertaining to repairs, repainting and costs to the historic monuments defining the border that were established in the 1800's. Additionally, a comparison of the monuments and those down the Rio Grande to the Gulf of Mexico will be examined and discussed.

[282] *Chair***Howell, Ryan (Bureau of Land Management), Meghan Forney (University of Oklahoma), Holly L. Andrew (University of Oklahoma) and Stephanie Stutts (University of Oklahoma)****[98]** *Trials, Tribulations, and Triumphs of Bringing Project Archaeology to Oklahoma*

In conjunction with Secretary of the Interior's new Play, Learn, Serve and Work Initiative, the Bureau of Land Management's Oklahoma Field Office in Tulsa, Oklahoma has vastly expanded its archaeological outreach program by partnering with Project Archaeology. This partnership marks the first occasion Project Archaeology has been represented in the state of Oklahoma. Initially, we felt creating a new Project Archaeology Program in a state that has had none before would present a monumental task to overcome. However, this turned out not to be the case. Upon announcing our intention to bring Project Archaeology to Oklahoma, we were met with a flood on interest and willing partnerships. Oklahoma presented itself as a great case study in the creation of a Project Archaeology program from scratch. Through the process, we uncovered several tips and techniques for helping to bring Project Archaeology to a new state.

Howell, Cameron (University of South Carolina)

[131] *Mississippian Conflict and the Role of the Fission-Fusion Process: An Example from East Tennessee*

Increasing intensity and frequency of conflict over time is a noted characteristic of the Mississippian Period in the southeastern United States. To examine the question of why violence increases, researchers have examined many cultural institutions and environmental mechanisms that can defuse tensions as well as those that exacerbate chances for warfare. A key theoretical construct is the use of bufferzones that help to lower tensions by creating separation between competing groups. However when applying a Fission-Fusion model to Mississippian cultural growth and spread, bufferzones are replaced by frontiers that bring groups into greater contact and increase the chances of conflict. How these concepts can potentially play out are illustrated with an example from East Tennessee which incorporates Blitz and Lorenz's modified Fission-Fusion framework with landscape approaches to examine the question of why and how conflict increases during the Mississippian period.

Howerton, Sarah, Anna Prentiss (The University of Montana), Thomas Foor (The University of Montana), Kristen Barnett (The University of Montana) and Matthew Walsh (The University of Montana)

[312] *A Demographic History of Housepit 54, Bridge River Site, British Columbia*

Demographic change can have significant impacts on socio-economic and political strategies employed by complex foraging and fishing peoples. Recent research at the Bridge River housepit village, located near Lillooet, British Columbia, has demonstrated that two short periods of rapid demographic growth followed by a period of decline led to significant changes in food acquisition and storage, settlement arrangements, and social relationships. While these patterns are well understood on a village-wide scale, shifts in household demography have not been adequately addressed. This poster presents the first analysis of intergenerational demographic change at Bridge River drawing data from excavations of Housepit (HP) 54, a long-lived medium-sized residential structure. More specifically, we develop data from at least seven superimposed anthropogenic floors at HP 54 dating ca. 1100-1400 cal. B.P. to test hypotheses regarding relationships between demographic patterns and subsistence decision-making, storage behavior, and patterns of social competition and cooperation. We expect to draw implications from this research that can enhance our understanding of village-wide trends.

Howey, Meghan (University of New Hampshire), Karen Alexander (University of Massachusetts- Amherst), Courtney Mills (University of New Hampshire), Adreinne Kovach (University of New Hampshire) and Beverly Johnson (Bates College)

[81] *Seas of Change: Overfishing and Colonial Encounter in the Gulf of Maine*

This paper looks at the story of the colonization of New England from the perspective of the Ocean. It was the Ocean, and its marine resources, that first brought Europeans to the Northwest Atlantic and into contact with the region's indigenous communities in the 16th and 17th centuries. As Europeans expanded their colonial presence on land, they likewise expanded their presence on the sea, increasing commercial fishing in the Northwest Atlantic. During this early colonial period, New England colonists valued the ocean as a commercial highway, a rich source of commodities, while also fearing it as a place that could display God's Providence directly to men. Indigenous

communities had a well-developed relationship with the ocean based on millennia of subsistence-level resource extraction (non-commercial) and they appreciated the ocean and its marine resources within their traditional religious frameworks (including as animate). In this paper, we explore how indigenous communities at one local maritime site in the Gulf of Maine, the Seabrook Site, were impacted by the views of the ocean developing among European colonists during the 1600s, how this changed their physical relationship with the ocean, and how they expressed internal conflicts about changing relationships in material culture.

Howie, Linda [25] see Moody, John

Howie, Linda (The University of Western Ontario)

[25] *New Faces, New Pressures, New Pots: Collective identities in action in the ceramic record at Lamanai, Belize*

For the ancient Maya residing at the urban center of Lamanai, the period encompassing the Maya Collapse and its aftermath (A.D. 750-1150) was a time of significant changes in the fabric of day-to-day life. Widespread economic and political instability across the Lowland region seriously impacted both community and extra-local affairs. Networks of socio-economic interaction and affiliation were disrupted and people were on the move, seeking to relocate to more stable environs. The strong evidence at Lamanai for the presence of migrants indicates that significant changes in community make-up did occur. Ceramic change during this period indicates shifts in manufacturing priorities, patterns of demand, and ritual and ceremonial practice that reveal a new emphasis on fostering a shared sense of community 'oneness'. Although Lamanai's story is ultimately one of community resilience, this paper examines the social dynamics of the process of community integration that enabled this outcome. Drawing from the extensive stylistic, petrographic, geochemical and microstructural data on the development of local ceramic manufacturing traditions, this paper examines: 1) how individual and collective social identities and relationships changed, and 2) how these social dynamics of community integration may have contributed to successful mitigation of real and perceived pressures on multiple scales.

Howland, Matthew (UCSD Anthropology Department), Brady Liss (UC San Diego Levantine and Cyber-Archaeology Labor), Craig Smitheram (UC San Diego Levantine and Cyber-Archaeology Labor), Mohammad Najjar (UC San Diego Levantine and Cyber-Archaeology Labor) and Thomas E. Levy (UC San Diego Levantine and Cyber-Archaeology Labor)

[241] *Investigating the Social Dynamics of Iron Age Copper Production: Preliminary Results from New Excavations at Khirbat al-Jariya, Jordan*

This paper presents preliminary results from the 2014 Edom Lowlands Regional Archaeology Project (ELRAP) excavation at Khirbat al-Jariya (KAJ), an Iron Age copper production site in southern Jordan's copper ore-rich Faynan region. To complement earlier work on copper production activities at KAJ, industrial and administrative areas were sampled. Stratigraphic excavations in both these areas applied a cutting-edge cyber-archaeology workflow in order to ensure the best-possible spatial precision, accuracy, and detail in documentation and recording strategies. An intensive program of real-time GIS data recording (ArchField), Structure from Motion (SfM), and other techniques were applied. Ongoing research with the data, collected from these areas aims to investigate the social dynamics of copper production in the southern Levant during the early Iron Age, just prior to the peak of industrial copper industry during the period as exemplified by nearby Khirbat en-Nahas – the largest IA copper factory in the southeastern Mediterranean region. By combining investigation of a non-industrial area at the site and one of the industrial slag mounds, we aim to complement knowledge gleaned from past and present excavations of copper production contexts at KAJ in order to develop a more complete picture of life at the site.

Howland, Matthew [321] see Knabb, Kyle

Hristova, Polina [93] see Forringer-Beal, Anna

Hristova, Petya (UCLA (alumna))**[368]** *In the Twilight of a Brave New World: From Multimedia Work Areas to Material Transformations in the Late Chalcolithic and Neolithic in Bulgaria and North Greece*

Putting together gold and graphite to decorate a pot, did not become a widespread practice in Balkan later prehistory but it was rather a mark of an intriguing entanglement of innovation and tradition, materials and images. This paper considers evidence of specialist production according to Costin's model as it can be surmised on the basis of data from Chalcolithic and Late Neolithic contexts in Bulgaria and northern Greece. It reflects on how mixing materials and techniques in search for a particular visual effect imbues familiar shapes with transformative agency in possible efforts not only to maintain but also to expand existing social networks. Specialists created conduits of technological advances in multiple media, while pursuing innovations within regional symbolic repertoires of prestige, using traditional forms such as graphite decorated ware with other kinds of elaborated objects. By studying the dynamics of specialized crafts, we can learn eventually how the later prehistoric societies in the Balkans operated and ultimately transformed into a mosaic of various forms of sociopolitical organization and cultural expression at the onset of the historical epochs.

Hronec, Laura (Bureau of Land Management, Roswell Field Office), Jeremy Iliff and Philip Watts (Bureau of Land Management)**[358]** *Quad Maps: Integration of Archaeological Data in GIS*

For most federal agencies, using GIS has become standard practice. Hardware and software, such as mobile GPS units and ESRI products, are incorporated into archaeological work flows around the country. These are used to collect information pertaining to artifacts, sites, and surveys; however, this has not always been the case. Prior to these innovations, compasses and topographic maps were used to track this information. At the Bureau of Land Management (BLM) Roswell Field Office (RFO), two hundred plus quad maps contained information regarding artifacts, sites, and surveys that had yet to be incorporated into a digital system. Using ArcMap, these quad maps were scanned, georeferenced, clipped, and incorporated as layers starting in the summer of 2012; however, this approach caused ArcMap to slow and crash often. As a means to avoid complications, the clipped georeferenced maps were made into a mosaic dataset. The dataset was updated as quad maps were scanned, georeferenced, and clipped. In the summer of 2014, all quad maps with archaeological data had been incorporated into the mosaic dataset with minimal issue. Through digitizing these maps, the BLM RFO has provided a more comprehensive view of the archaeological resources and inventories within the resource area.

Hruby, Zachary (Northern Kentucky University) and Jason W. Barrett**[292]** *Pride and Prejudice in the Maya Lowlands*

Although they represent the foundation on which ancient Maya economies were predicated, Mayanists traditionally have ignored non-obsidian lithics in their entirety. We present an historical overview of how artifacts made of chert and related stones have been traditionally analyzed and documented in the archaeological literature of the Maya Lowlands, then examine the important contributions lithic studies have made in the past few decades. The institutionalized neglect of this material class has been perpetuated by several long-held assumptions, which are inaccurate. Contrary to entrenched belief, chert resources are neither homogeneous nor are they homogeneously distributed across the Maya lowlands. The idea that measurable and informative technological, and stylistic, variation exists both spatially and temporally among tool classes also runs counter to traditional dogma. We conclude with a discussion of how the intricacies and regional variability of ancient Maya economic organization remains in a nascent state by ignoring one of their most critical resources. Non-obsidian lithic analysis can inspire a new era of enlightenment in ancient Maya research through systematic incorporation into project agendas and institutional course offerings.

Hsieh, Ellen (Cotsen Institute of Archaeology, UCLA)**[238]** *Early Spanish Colonialism in Manila: A Historical Archaeology Viewpoint*

The establishment of Spanish Manila in 1571 marked a turning point in global history. Historians

have extolled the roles of Manila as a hub of global trade networks and a key locus of cultural exchange between the East and the West. Nevertheless, the power relationships that defined colonial life in the Manila area were taken for granted by scholars. The major ethnolinguistic groups of colonial Manila - the Spaniards, the indigenous Tagalog, and the Chinese - formed a specific urban landscape during the early colonial period. This ongoing archaeology project aims to reevaluate the power relationships between these ethnic groups through an analysis of consumption in colonial and global contexts. The preliminary analysis of excavated materials from sites in Manila area since 1960s is showing that archaeology offers an alternative perspective of colonial history in Manila. This presentation provides an important reference in terms of cultural change in East and Southeast Asian waters and the Spanish empire in the New World during the early modern period.

Hsu, Yiu-Kang (University of Oxford), Peter Bray (University of Oxford) and Mark Pollard (University of Oxford)

[402] *A Novel Method to Hypothesize the Movements of Archaeological Metal: A Case Study on Bronze Metallurgy in the Central Eurasian Steppe Belt by the Second Millennium B.C.*

Traditionally, archaeometallurgists have focused on the provenance of metal, which assumes a direct linkage between the chemistry of metal ores and metal objects. On the basis of this assumption, they have attempted to reconstruct the flow of raw material across regions/cultures. However, this approach is potentially flawed, since the recycling of metal would alter the initial composition of objects, making the straightforward comparison of metal and ore chemistry problematic. Rather than associating metal with ores, a new method proposed here treats the chemistry of objects as the records of their life history. The chemical composition encloses the information concerning bronze recycling and recasting, suggesting the possible circulation of metal across space and time. Certain metallic elements, with predictable thermodynamic behavior, may indicate the flow of metal between different bronze-producing societies. This model is applied to the bronze assemblage in the central Eurasian Steppe Belt between 2200 and 1700 B.C., ranging from Siberia to Don River Basin. The chemical results show that the tin-bronze production, possibly from the Altai region, moved westward to the Volga River Basin. On the other hand, major copper resources potentially concentrated on the Minusinsk Basin in the east and Cis-Ural/Volga regions in the west.

[402] *Chair*

Hu, Di (University of California, Berkeley)

[117] *Discussant*

Huang, Jennifer (Bureau of Reclamation) and Jane Kolber (Chaco Rock Art Reassessment Project)

[149] *What the Imagery Offers: Rock Art in the Study of Ancient Chacoan Culture*

More than a hundred years of archaeological investigation have been focused on Chaco Canyon and, more recently, the Chaco World. Most of that work has been related to Great Houses, Great Kivas and the related material culture found therein. Exhaustive analyses of the archaeological data has brought much to light in our understanding of the Chaco phenomenon, and raised many more questions that are currently being researched. The authors of this paper contend that a wealth of information has yet to be tapped from a prolific Chacoan artifact – the rock art imagery. Thousands of rock art images exist throughout the canyon, some directly associated with the Great Houses and many more spread along cliff faces and boulders between and beyond the impressive architecture. Now that a majority of the carvings and paintings within the Chaco Culture National Historical Park boundaries have been documented, it is time to bring rock art into the mix. This paper shows that Chacoan rock-art played an important role in the development of Ancient Chacoan culture, as well as influenced the imagery of surrounding—and farther flung—Ancient Puebloan communities.

[149] *Chair*

Huang, Weijin [179] see Ge, Wei

Huang, Tsuimei (Professor at Tainan National University of the Arts)**[234]** *The Bead Strings with Jade Huang Pendants of the Zhou Period of China: Revived Tradition or Adopted Fashion*

Among the numerous neck/chest ornaments consisting of jade huang pendants (arc-shaped jade pieces) in Chinese archaeological finds, two distinct groups are most noteworthy: the Neolithic (5th-3rd millennia B.C.E.) necklaces from the lower Yangzi valley and the early 1st millennium bead strings of Western Zhou period in the mid and lower Yellow River Valley. Because the huang pendant is mentioned in Chinese texts as important ancient ritual paraphernalia, these unique artifacts have become topics of scholarly interest with regard to their origins, evolution, and ritual meanings. Moreover, archaeological studies suggest that aside from reflecting the rekindled interests in past cultural traditions, the bead strings with jade huang pendants of Western Zhou period likely have witnessed communications and stimulus from outside cultures. The use of multi-colored body ornaments that prevailed during the 2nd Millennium B.C.E. in Gansu/Qinghai and the Loess Plateau of Northern China, such as those consisting of carnelian, turquoise beads, and arc-shaped pendants in metal materials, possibly have acted as a catalyst for the emergence of a new fashion in Western Zhou.

Hubbard, Emily (University of Toronto)**[401]** *Storage, Surplus and Wealth at a Chalcolithic Site in Israel*

Excavations at Tel Tsaf, Israel have provided evidence of large mudbrick silos, animal pens and potential feasting activities. Tel Tsaf dates to the earlier part of the Chalcolithic period which spans from c. 5200-3600 B.C. and marks a transition from egalitarian villages to the eventual cities of the Early Bronze Age in the region. Towards the end of the Chalcolithic period social stratification becomes more visible within the archaeological record as evidenced by hoards of copper items in caves, formal off-site cemeteries, and shrines or ritual sites. Large-scale storage also becomes visible during the Chalcolithic period. In this contribution, I combine micromorphological analysis from Tel Tsaf, with published architectural, faunal and botanical evidence, to discuss and clarify the interconnectedness of storage, surplus and wealth. Social and economic theories play key roles in this discussion. A clearer conceptual framework of the complex relationships among storage, surplus and wealth contributes to our understanding of the changes seen in the Chalcolithic period of the region, and also has important implications for addressing similar issues in pre-historic societies elsewhere.

Hubbe, Mark (The Ohio State University) and Christina Torres-Rouff (University of California - Merced)**[384]** *Morphology and Culture among the Middle and Late Intermediate Period inhabitants of Catarpe (San Pedro de Atacama, Chile)*

Catarpe Tambo represents one of the clearest pieces of evidence for an Inca presence in north Chile's Atacama oases. The tambo was built and used north of the oases, in the San Pedro river canyon. Catarpe was chosen by the Incas as the local administrative center, however the valley was already densely occupied since at least the Late Intermediate Period (A.D. 1000-1400). Here, we study morphological affinities and the distribution of cranial vault modification among over 300 individuals from the two largest Catarpe cemeteries with the objective of exploring whether the occupation of Catarpe is associated with the presence or influx of groups with different biological and/or cultural identities when compared to other settlements in the area. Our results show that there are no significant differences among the Catarpe cemeteries, nor any strong differences between Catarpe and several other contemporaneous local sites. However, the later, and much smaller, cemetery of Catarpe 1, which includes Inca objects among the grave goods, does demonstrate an increase in morphological variation, suggesting the influx of foreign individuals close to the arrival of the Incas in the area.

Hubert, Erell**[187]** *Representing and Negotiating Moche Identity in Everyday Life*

Material culture used in daily practices plays a crucial role in mediating personal experiences, social

identities, and wider socio-political phenomena. Based on my doctoral dissertation, I more specifically explore the ways miniature anthropomorphic figures used mostly in domestic contexts participated in the negotiation of the identities of Moche colonists settling in the Santa Valley (north coast of Peru) between the fifth and the ninth century A.D. Figurines in particular seem to have played an important role in uniting Moche colonial communities through both imagery and the practices in which they were used. Indeed, they contributed to the construction of a normative image of a Moche body distinct from that of indigenous people, underlined the importance of women as intercessors in the lives of Moche people, and created a sense of belonging through their ubiquitous use in the daily lives of all colonists. Unlike ritual objects such as finely painted and sculpted vessels materializing a religious and political ideology centered on social hierarchy and warfare, figurines responded to daily concerns of Moche colonists in the Santa Valley for their cultural identity and for social cohesion, concerns born from their position as colonial actors.

Huckert, Chantal (Universidad Veracruzana)

[198] *Imágenes en la Vestimenta de las Figurillas Sonrientes de la Costa del Golfo*

La investigación que realizo actualmente conduce al análisis formal e interpretativo de los glifos cefaloformes de reptiles híbridos representados principalmente en la vestimenta de las Figurillas Sonrientes en custodia del Museo de Antropología de Xalapa, Veracruz. En este sentido, propongo exponer una ficha señalética por cada referente reptil, que incluya los rasgos determinantes, realistas e híbridos, su campo de acción definido por los pictogramas que lo acompañan en la vestimenta, y vinculados con otros reptiles de Mesoamérica.

Retomando las pautas y metodología que propuso, en su momento, el arqueólogo mexicano Alfonso Medellín Zenil para realizar una tipología de los tocados y establecer las conexiones estilísticas con el arte teotihuacano, zapoteco y maya (1960; 1987), en esta ocasión mostraré múltiples lecturas que tienen los significados y discursos transmitidos por los glifos y pictogramas, desde el ángulo de la iconografía y de la historia del arte en el contexto general de las culturas del Golfo en el periodo del Clásico tardío, confirmando que las imágenes, pictogramas y glifos en las figurillas, esculturas y fragmentos cerámicos del Centro-Sur de Veracruz, son también testigos directos del pensamiento religioso y filosófico de las sociedades que los manufacturaron.

[198] *Chair*

Huckleberry, Gary (Geoarchaeological Consultant)

[304] *Stratigraphic Evidence for Large Floods in Canal System 2, Phoenix, Arizona*

Recent excavations conducted downstream from Park of Four Waters have provided new evidence of damaging floods within System 2 between A.D. 1050-1400. Two main canals contain stratigraphic evidence of uncontrolled Salt River. One canal (Hagenstad) contains evidence for two floods, the last one causing the alignment to be abandoned. The other canal (Woodbury's North), contains a flood deposit that filled the channel and led to its abandonment. A combination of ceramic, ¹⁴C, and luminescence ages indicate that the two Hagenstad Canal floods occurred A.D. 1050-1300; the Woodbury North Canal flood occurred A.D. 1300-1400. These floods correspond in time to an overall period of low discharge variability on the Salt River based on tree-ring reconstructions. An exception is the possibility that the flood terminating Woodbury North Canal may correlate to high annual discharge in the Salt River during the A.D. 1380s. Tree-ring reconstructions of annual discharge do not adequately capture individual floods of cultural significance. Combined geological and dendrohydrological methods are needed to better understand the timing and impact of large floods on Hohokam canal settlements.

Huddlestan, Stephanie (Kleanza Consulting Ltd.), Amanda Marshall (Kleanza Consulting Ltd.) and Jenny Lewis (Kleanza Consulting Ltd.)

[336] *On the Front Line: Collaborative Archaeology between CRM Archaeologists, Academics and First Nations Communities*

First Nation's heritage concerns are at the forefront of many large-scale and controversial development projects across the province of British Columbia. How developers and Cultural Resource Management (CRM) Archaeologists choose to address these concerns can significantly

impact working and political relationships. CRM archaeologists are on the front lines balancing and navigating complex, and sensitive socio-political heritage issues. Our small CRM company, Kleanza Consulting Ltd. (Kleanza), has found success conducting collaborative research in this challenging environment. We have found that in order to conduct meaningful work, archaeologists must be sensitive, adaptable, flexible, and above all must practice a community based and community driven approach. This approach requires a large investment building relationships between competing CRM companies, academics, contractors, and clients. Researchers must be locally based to gain specialized community knowledge and understand how to work within complex current and traditional socio-political frameworks. This presentation focuses on a selection of projects that demonstrate the changing dynamics of CRM archaeology and community collaboration in the face of considerable development.

Huebert, Jennifer (University of Auckland)

[52] *Anthropogenically Driven Decline and Extinction of Sapotaceae on Nuku Hiva (Marquesas Islands, East Polynesia)*

The native forests of the central and eastern Pacific Islands were extensively modified by Polynesian settlers, but our understanding of these processes is generalized. In the first large study of anthropogenic forest change in the Marquesas Islands, the identification of two members of the Sapotaceae family in archaeological charcoal assemblages was notable. Plants from this taxonomic group are poorly represented in Eastern Polynesia today, and the findings of *Planchonella* and another species (cf. *Sideroxylon*) indicate the geographical distribution of trees in this family was once more extensive than it is today. They further suggest that some Sapotaceae may have been common elements of the indigenous lowland forests of the eastern Polynesian high islands. Both taxa were found in early cultural contexts at sites in three valleys, and decline to almost undetectable levels by the late prehistoric period. These declines could be attributed to habitat destruction, overexploitation of the wood, and seed predation by introduced rats. Other data suggests links with reductions in native frugivorous bird populations should also be explored. This study has informed on a group of plants that are not well-represented in pollen spectra in the region, and highlight the usefulness of archaeobotanical data in studying paleoecological processes.

Huerta, Edgar (Cal State Fullerton)

[172] *Observations Concerning Ash-Tempered Pottery from the Archaeological Site of Los Soldados*

The use of volcanic ash as temper in Olmec pottery is generally known, unfortunately its temporal and spatial distribution at the site and regional levels remains poorly understood in the Gulf lowland regions. This paper presents the results of conventional microscopy and thin section petrographic analysis identifying the distribution of ash temper within the Los Soldados' pottery assemblage. This is done with an attempt to illustrate the relationship of ash temper in proportion to other paste components and pottery types. Results indicate that ash-tempered pottery from Los Soldados, possibly represents similar trends identified at Sierra de Los Tuxtlas underlining the importance of ash temper as a marker of technological, cultural and behavioral changes influencing the manufacturing, distribution, and use of pottery. Taking a domestic economy and household archaeological perspective, the results of this research addresses implications regarding typological, chronological, and polity influence perspectives in the Olmec lowlands.

Huertas, Geraldine [134] see Marcone, Giancarlo

Huff, Jennifer (University of Washington)

[52] *Holocene Transitions in Highland Papua New Guinea: Linking Climate Change to Changes in Subsistence and Mobility with New Models and Data*

Highland Papua New Guinea (PNG) is a region of independent invention of non-cereal-based agriculture. Consequently, the transition from a mobile lifestyle to a sedentary residential pattern, and the transition from a forager/gatherer subsistence practice to the adoption of agriculture by the past peoples of highland PNG have been a subject of considerable interest for archaeologists. Models of

these transitions have changed through time with the arrival of new evidence such as palynological paleoecology reconstructions and improved radiometric dating techniques. The research presented here will add a statistical meta-analysis of site use changes through the archaeological record of the PNG highlands and the results of an ongoing reanalysis of the largely expedient lithic assemblages of multiple highland sites. Theory and methods for lithic analysis that have been developed since the original analysis of this collection provide new data to test models of residential pattern and subsistence change especially relative to global climate changes during the Holocene.

Huffer, Donelle

[97] *Ceremonially and Ritually Associated Archaeofaunal Remains from Two Sites Near Wide Ruins, Arizona*

Zooarchaeological analyses of faunal bone assemblages often focus on the role of animals in human diet and subsistence and as sources of raw materials. Yet animals also fill social and symbolic roles in human societies, and ceremonially and ritually associated archaeofaunal remains have significant interpretive potential. Recognizing the special emphasis accorded to certain animals and their remains and the social factors that shape faunal bone assemblages permits explanation within broader frames of reference that transcend strictly utilitarian-centered interpretations. Investigations conducted by Northland Research, Inc. at two sites near the community of Wide Ruins, Arizona on the Navajo Nation recovered ceremonially or ritually associated taxa. This poster presents these remains as archaeological evidence of the social significance of animals in the prehispanic Pueblo region and interprets their occurrence within a framework that incorporates contextual analysis, ethnohistoric research, and descendent community perspectives.

Huffer, Damien [279] see Chappell, Duncan

Huffer, Damien (Smithsonian Institution), Christine France (Smithsonian Institution), Bruno Frohlich (Smithsonian Institution) and Michelle Machicek (Cornell University)

[403] *Stable Isotopic Insights into Changing Diets, Population Mobility and the Origins of Pastoral Nomadism in Early Bronze Age Mongolia*

This paper presents human and faunal bone, dentine and enamel stable isotopic data from a small ($n = 30$) Bronze Age skeletal assemblage excavated from a large burial mound (khirigsuur) complex ($n = 2000$) located in northwest Mongolia (ca. 3,500-2,700 BP). Covering 900 sq. km and spanning 600 years, osteological and mortuary data suggest no strict correlations occurred between individual age and sex estimates, and the size or form of burial mound, suggesting instead that khirigsuur variation signifies nascent social stratification over time. With numerous human bone AMS dates at hand, we examine if increased enrichment of nitrogen and depletion of carbon over time reflects the increased consumption of specific plants and terrestrial protein by certain individuals (of either sex), suggestive of nascent inequality amongst so-called egalitarian nomads. Furthermore, we query whether or not temporal variation in strontium and oxygen values reflects at least low-level exogamy during the Early Bronze Age, and how extra-local origin may or may not be reflected in mortuary treatment. This data adds to previous research conducted in 2007, allowing further assessment of how social organization changed over time, and add anthropological context to studies of early pastoral nomadism within the mixed C3/C4 steppe biome.

Huffman, Thomas (University of the Witwatersrand)

[23] *Salvage Excavations on Greefswald: Leokwe Commoners and K2 Cattle*

The relationship between Leokwe and Leopard's Kopje people represents the first known ethnic interaction in pre-colonial southern Africa. As the subordinate partner, Leokwe had roles befitting their 'first people' status. Salvage excavations at the Leokwe Main Rest Camp uncovered 'extra' cattle kraals, while Leokwe faunal assemblages there and elsewhere contain high percentages of low-status cattle bones. Thus, Leokwe herdsman were probably tending the cattle of K2 elite. Two sites on Schroda and one on Little Muck suggest that Leokwe people were also ritual specialists: they appear to have been involved with rites-of-passage and rainmaking. Evidently, the ethnic distinction of Leokwe people disappeared as Mapungubwe became a state under a sacred leader.

Huges, David [260] see Fox, Keri

Huggins, Kathleen [184] see Sitek, Matthew

Huggins, Kathleen (UC San Diego), Matthew Sitek (UC San Diego) and Paul Goldstein (UC San Diego)

[250] *From Trash Pile to Temple Wall: The distribution of Formative Period Sherds in Adobes at the Omo M10A Tiwanaku Temple*

This project addresses site formation and construction processes in the Omo M10A provincial Tiwanaku temple in the Osmore drainage of southern Peru (ca. A.D. 500-1100). We will test the hypothesis that this structure was constructed using adobes made from soil deposits containing cultural materials from local, Formative Period Huaracane occupations (ca. 1750 B.C.–A.D. 600). This will be done by detailing the manufacture of Tiwanaku adobe bricks and charting the association of Huaracane style ceramic sherds with adobe materials in the temple's architectural collapse levels. Despite the extensive occupation of the Huaracane culture in the Osmore drainage, previous research suggests that the interaction between the indigenous Huaracane and the Tiwanaku colonists was minimal. However, abandoned Huaracane village middens would have been readily available sources for organic clays used as the principal material of adobe. In the Omo temple, Huaracane cultural materials are found embedded in mudbricks, and statistical analysis of ceramic collections indicates that these sherds are rare on temple floors and in activity deposits. Detailing the distribution of Huaracane ceramics at Omo M10A, and relating clusters to floor-levels and architectural features, will contribute to a more complete understanding of construction techniques and site formation processes at this important Tiwanaku center.

Hughes, Richard [171] see Arkush, Brooke

Hughes, Erin and Lindsay Johansson (University of Colorado, Boulder)

[260] *Gunnerson Revisited: A Reconsideration of Plains Promontory Relationships*

On the basis of new excavations within the Promontory caves, archaeologists are beginning to gain a better understanding of when and how Promontory people lived (Ives et al. 2014; Johansson 2013). Some preliminary data also gives credence to Steward's (1937, 1940) argument that Promontory people were Athapaskan and that the caves represented one stop on a route taken from Dene lands in Canada to the Plains and Northern Southwest where Athapaskan speakers (Apache and Navajo) were first encountered by Euroamerican explorers. To connect the Promontory to Apache groups on the Plains, Gunnerson (1956) suggested ties with the Dismal River aspect. However, similarities between the two groups were discounted for chronological reasons. Using new dates on Promontory as well as a different understanding of the relationship between Promontory and Fremont, we reexamine the possibility that Gunnerson was correct in suggesting a relationship, but incorrect in which group preceded the other.

Hughes, Richard

[341] *Looking at High-Altitude Obsidian Use in the Great Basin*

Until recently, most of what was known about the prehistoric use and conveyance of obsidian in the Great Basin was derived from analysis of time-sensitive artifacts recovered from caves and rockshelters. Over the past 35 years, however, archaeological research conducted in high-altitude settings has provided new insights about synchronic and diachronic patterning unique from many lowland assemblages. This paper will present the results of obsidian provenance analysis from sites in the White Mountains of central eastern California and sites atop Mt. Jefferson in central Nevada, highlighting similarities and differences between the temporal patterns in obsidian use identified in both areas.

Hull, Kathleen (University of California, Merced)

[175] *Communal Ritual, Communal Feasting, and the Creation of Community in Colonial-Era Los Angeles*

This paper examines archaeological and ethnohistoric data that speak to the role of communal events and practices in the creation and maintenance of real and imagined communities during the colonial era for native people in the Los Angeles Basin. Communal ritual and associated feasting had a long tradition in this region, and persisted into the colonial era despite the incorporation of many native people into Mission San Gabriel and the Pueblo of Los Angeles. Archaeological data suggest such communal activities served to sustain native communities, in part by creating persistent places of memory and commemoration in the rapidly changing colonial landscape revealed especially by mission records.

[1] *Discussant*

[175] *Chair*

Hull, Kathleen [175] see Douglass, John

Hulse, Eva (Archaeological Investigations Northwest)

[289] *A Geoarchaeological Approach to the Interpretation of Incomplete Spatial Data*

As in all archaeology, geoarchaeologists sample discrete loci and use those data to make generalizations about broad areas. When interpolating and extrapolating from known data points, errors may be introduced which can bias interpretation. Here, examples from CRM illustrate some of the challenges of analyzing discontinuous or otherwise incomplete spatial data.

Hung, Ling-yu (Indiana University)

[102] *Migration, Diffusion, and Trade: Potting in Neolithic NW China*

Painted pottery traditions in Neolithic Northwest China emerged through diverse processes of human migration, technical transmission, style imitation, and material exchange. Starting around 6000 years BP, Yangshao farming communities expanded incrementally farther upstream along the Upper Yellow River drainage and westward along the Hexi Corridor. The painted pottery tradition introduced by Yangshao immigrants developed into different chronological and regional styles in Northwest China over the course of several thousand years. Additionally, as exemplified at the famous Liuwan site, our inter-disciplinary study demonstrates that cultural assimilation and material exchange played important roles in the spread of painted pottery known as Majiayao, Banshan, and Machang. These multiple lines of evidence support a new synthesis about the production and circulation of Neolithic painted pottery in Northwest China.

[102] *Chair*

Hung, Ling-yu [102] see Carlucci, Eric

Hunt, Alice (University of Georgia), David Hurst Thomas (American Museum of Natural History) and Robert Speakman (University of Georgia)

[9] *Provenance of Archaeological Copper Alloys by pXRF*

Recently, there has been significant interest in the use of portable x-ray fluorescence devices (pXRF) for cultural materials applications, particularly the non-destructive provenance determination of archaeological materials. Historic copper alloys, typically brasses and bronzes, can often be sourced using elemental analysis to reveal regionally and temporally specific impurities and trace element signatures. We investigate the analytical performance of five different pXRF spectrometers for the non-destructive quantitative analysis of historic copper alloys both as prepared samples and field specimens.

Hunt, Terry [52] see Hixon, Sean

Hunt, Terry (University of Oregon) and Carl Lipo (California State University Long Beach)

[233] *The Evolution of "Hyper-Locality" on Rapa Nui (Easter Island)*

The archaeology and prehistory of Rapa Nui (Easter Is.) reveals a paradox. Despite the island's diminutive size and the lack of natural barriers preventing social interaction, prehistoric populations on the island show patterns of "hyper-locality." Evidence from ancient human genetics and multiple artifact classes show significant co-variation with space on an enigmatically small scale. Such spatial autocorrelation is likely explained by the structure of interactions in the context of Rapa Nui's environment; however, it is unclear why such localized interaction would be so prevalent on such a small island. We explore conditions leading to the evolution of "hyper-locality" and consider the implications for Rapa Nui and beyond.

[330] *Discussant***Hunt, Robert and Scott Ingram (University of Texas at Arlington)****[304]** *Towards a Food Production Calendar for the Lower Salt Valley*

A food production calendar for the Lower Salt River Valley would amplify our understanding of the largest prehistoric irrigation system in the New World. Hunt and Ingram have assembled a food production calendar for the Akimel O'odham (Pima) and Hohokam of the Middle Gila River valley (Kiva 2014). A question is whether this calendar can be extended to the Lower Salt River valley. The environmental variable for which we have the most information is air temperature. The historical records of agriculturally relevant air temperature for the Phoenix Basin are presented. Analysis of the temperature data supports the extension of the Middle Gila calendar to the Lower Salt. Two crops of maize per solar year are often possible. Last freeze is a not infrequent problem in March for the first corn crop. First freeze is not a problem for maize. The growing season is sufficiently long to permit a cotton crop to mature. What little is known of the Salt River flow regime is articulated with the proposed cropping calendar for the Lower Salt valley. The implications of the Middle Gila and Lower Salt food production calendars for carrying capacity and trade are discussed.

Hunter, Ryan (National Park Service, Midwest Archeological Center) and Dawn Bringelson (National Park Service, Midwest Archeological Center)**[120]** *Site Distribution Patterns at Indiana Dunes National Lakeshore*

Recent work at Indiana Dunes National Lakeshore has increased survey coverage, allowing for consideration of site distribution patterns within the dunes. Specifically, we focus on Native American short-term habitation sites located within the Tolleston dune formation. Although the eastern and western units of the park are separated by only approximately 5 miles of private land with industrial development, site densities differ significantly between the two units. These differences remain even when one controls for differences in survey intensity, types of sites identified, and general dune types. Several forms of soil analysis, including analysis of sediment particle size and optically stimulated luminescence, are considered at both site and non-site locations across the park to explore possible differences in dune formation and stability. Movement of sediments as dunes stabilize and destabilize can be seen through particle size sorting patterns and dates from optically stimulated luminescence. Through this, small-scale differences in environment are considered as explanations for habitation patterns, as well as for depositional processes affecting site identification.

Huntington, Yumi (Jackson State University)**[187]** *Head Motifs on Cupisnique Style Ceramics: Emblems of Cultural Identity in Early Andean Art*

The term "Cupisnique" is applied to the culture and artifacts found in the Cupisnique ravine located between the Jequetepeque and Chicama valleys of northern Peru. Most Cupisnique-style ceramics were created between approximately 1200 and 200 B.C.E. These artifacts are characterized by stirrup spouts, dark black or brown hues, and engraved head motifs on well-polished surfaces. Previous scholars have emphasized religious interpretations of these ceramics, arguing that Cupisnique head motifs depict the supreme deity, images of a sacrificial head, or a shaman portraying in the midst of a transformative trance. This paper argues that the engraved head motifs on Cupisnique-style ceramics can instead be understood as emblems of cultural identity and socio-political power in the Cupisnique region. During the Initial Horizon period, traders from Ecuador

brought items such as spondylus shells to the northern coast, and people from the northern highlands introduced the San Pedro cactus and potatoes to this region in return. Since different ethnic groups mingled along the northern coast of Peru, the Cupisnique people likely felt the need to distinguish themselves and claim ownership of their land, a task that they performed in part through the language of engraved ceramic motifs.

Huntley, Deborah (Archaeology Southwest), Suzanne Eckert (Arizona State Museum) and Karen Schollmeyer (Archaeology Southwest)

[34] *Finding the Balance: Case Studies in Collaboration and Community Engagement from the American Southwest*

In this paper we explore the challenges and benefits of conducting archaeological field work in rural communities where many stakeholders have vested interests in our research. Doing work in such situations can often feel like a complicated juggling act as one seeks to build relationships with local landowners, diverse community members, and various government agencies, while at the same time meeting the needs of student participants and achieving research goals. The benefits to all parties, however, can be substantial. Our paper highlights two ongoing multi-institutional collaborations that are engaging the public, training young scholars, and answering “big picture” archaeological questions. We focus particularly on balancing public outreach with student education as we strive to raise awareness of the importance of cultural resources and the ethics of responsible archaeology.

Huntley, Deborah [278] see Lyons, Patrick

Hurcombe, Linda, Alison Sheridan (National Museum of Scotland, Edinburgh, UK) and Fiona Pitt (Plymouth City Museum and Art Gallery, UK)

[201] *Touching the Past in Museums: Issues of Authenticity and Identity for Crafted Replicas and 3D Print Facsimiles of Rare, Perishable and Iconic Artifacts*

Traditional museum presentations of rare or fragile archaeological artifacts are dominated by displays behind glass; vision dominates the sensory experience. The emotional connections built by more multisensory engagement with artifacts offer a better appreciation of the ancient objects and an enhanced museum visit. The research focused on icons of identity which were too precious to allow handling and items which were too fragile to touch, such as ancient perishable textiles and basketry. The modern audience is shifting its expectations from passive viewer to active participant and the project offered ways of adapting to this change using a range of media to connect past and present and overcome the emotional and physical distance between ancient objects and their modern audience. Ideas were drawn from a range of sources and disciplines and installations were developed to deliver a range of touch experiences within a variety of museum and outreach settings. Crafted replicas were used alongside very new technologies such as 3D prints in a series of museum trials. The results showed that visitors had an enriched museum experience using these techniques because interactive and multi-sensory displays using these methods resulted in closer engagement with the ancient objects.

Hurst, Winston [85] see Till, Jonathan

Hurst, Heather (Skidmore College)

[303] *Revisioning the Relationship between Man and Jaguar: A Reassessment of the Olmec Paintings of Oxtotitlán, Guerrero, Mexico*

The rock art of the Oxtotitlán and Juxtlahuaca caves are among the earliest known examples of Mesoamerican figurative wall painting. As part of the recent research initiative examining the Oxtotitlán cave paintings, re-illustration presents new images of the ancient artworks. Detailed field drawings are combined with multispectral imaging data and analysis of painting technology to precisely record the art, even when lines are no longer visible to the naked eye. Increased clarity of the calligraphic linework, better documentation of the uneven rock surface, and refinement of iconographic details significantly alters the style and content of some well-known images. The Oxtotitlán paintings are the work of experienced artists who were proficient in complex iconographic systems and talented in representation. This paper presents the rock art at Oxtotitlán in context both

within the cave site and among the stratigraphy of multiple painting events, as well as considers how previous archaeological documentation of these artworks has shaped notions of Olmec belief systems.

Hurst Thomas, David [9] see Hunt, Alice

Hurtubise, Jenna (Louisiana State University), Haagen Klaus (George Mason University), José Pinilla (Museo Nacional Sicán, Peru) and Carlos Elera (Museo Nacional Sicán, Peru)

[187] *Sacrifice and Social Identity: Untangling Identity from a Mass Burial at Matrix 101, Huaca Las Ventanas, Peru*

Typically, burials are laden with symbols of social identity such as age, sex, and wealth of grave goods. However, conceptualizing individual or group identity can become problematic when examining non-modal or deviant burials.

During the 2011-2013 field seasons, the National Sicán Museum and the Lambayeque Valley Biohistory Project recovered over 200 individuals from a Late Middle Sicán (A.D 1050 - 1100) sacrificial context designated Matrix 101. Constructed in three separate phases during a protracted El Niño event and just before Sicán political collapse, Matrix 101 involved burial characteristics well outside normal Sicán burial practices. Burial reopening and manipulation, body position, burial placement, and lack of grave goods all deviate from modal Late Sicán burials and sacrificial contexts. What were the victim's social identities? Why were they buried in an elaborate funerary context? Were they elites or commoners? Utilizing a compiled database of contextualized Sicán burials, we examine age, sex, health, and burial patterns of the victims. Preliminary results indicate that most of these individuals were Sicán elite buried in a non-modal fashion, though a few may have been members of the local Muchik ethnic group. This information allows a better understanding of events leading to Sicán political collapse.

Huster, Angela (Arizona State University)

[253] *Patterns of Postclassic Ceramic Exchange in the Toluca Valley and Surrounding Areas of Central Mexico*

In Central Mexico, the Late Postclassic period encompasses the expansion of both a robust market system and the growth of the Aztec Empire. However, increasingly refined chronologies in multiple subregions have made it clear that changes in economic and political organization did not happen simultaneously, nor did they happen consistently across the region. This poster presents data on the changing geographic patterning and intensity of ceramic exchange at the site of Calixtlahuaca, in the Toluca Valley during the Middle and Late Postclassic periods (A.D. 1130-1530). The discussion of exchange incorporates both type-based ceramic classification and INAA. The pattern observed at Calixtlahuaca is then compared to patterns of ceramic exchange at contemporaneous sites in the Basin of Mexico and Morelos.

[253] *Chair*

Hutchings, Rich (Institute for Critical Heritage and Tourism)

[13] *Lies, Damn Lies, and CRM—Archaeology as White Power and Neoliberal Statecraft*

In 1989, anthropologist Bruce G. Trigger (1937-2006) successfully showed archaeology to be a conduit for social power. What he did not elaborate on was that archaeology largely represents a racialized form of power insofar as most archaeologists are white and those whose past they "study" are largely minority Indigenous peoples. Further, while Trigger considered archaeology a bourgeois pursuit, he did not adequately account for the near wholesale commercialization of archaeology in the form of cultural resource management (CRM) (2006:544-5). As such, Trigger never developed a complete theory of archaeology as statecraft, let alone one of neoliberal statecraft. In this paper, I reimagine Northern American (USA/Canada) archaeology as a tool of the racialized neoliberal state. A technology of government, archaeology permits the clearance or erasure of Indigenous heritage from the landscape in advance of capitalist development. Insofar as archaeologists are "making money out of misery," the practice constitutes disaster capitalism. As a state tool (or "craft"),

archaeology is on the wrong side of history. Archaeology is ultimately about state governance, not apolitical “scientific exploration”—about environmental racism, not ethical “conservation.” The way forward is complicated, but it must include public shaming, for only then will archaeologists act.

Hutchinson, Vance [112] see Easton, Norman

Hutchinson, Vance (Simon Fraser University), Norman Easton (Yukon College), David Yesner (University of Alaska - Anchorage), Lauriane Bourgeon (University of Montreal) and Blaine Maley (Marian University)

[112] *Inter and Intra Site Patterns of the Late Pleistocene Fauna from the Little John Site (KdVo6), a Multi-Component East Beringia Site in Yukon Territory, Canada*

The Little John site holds an extensive record of human occupation spanning 14,500 years ago to the most recent past. Due to a combination of taphonomic factors, the Late Pleistocene deposits are particularly rich in culturally modified faunal remains related to the subsistence economy of the founding and early human occupants of the upper reaches of the Tanana River Valley of interior Alaska and Yukon. In this presentation we report on the current results of our analyses of the Little John fauna, including identified species and element distribution, evidence of taphonomic and cultural modification, and apparent changes in subsistence through time at the site within the context of the dynamic climatic fluctuations of the Late Pleistocene – Early Holocene transition. We conclude with a comparison of the Little John fauna with faunal remains from a set of contemporary Late Pleistocene sites in East Beringia.

Hutira, Johna (Northland Research, Inc)

[97] *The Public Benefit of Archaeology: An Economic Perspective from the Wide Ruins Community.*

A re-occurring theme in current Cultural Resource Management activities involve the term “Public Benefit”. A majority of the discussions using that term refer to archaeological contributions to our understanding of a shared cultural patrimony. A lesser known aspect of Public Benefit is the direct monetary gain a community sees as a result of CRM work. On a general level, archaeological projects contribute via payroll and sales taxes. On a local level, area businesses benefit from spending by the field crew and contractor. Additionally, when local labor is used, particularly in an area of high unemployment, the added influx of wages can alter the economic status of the community members. Finally, using local labor provides on-the-job training for area residents. In the summer of 2014 Northland Research, Inc. undertook a large data recovery project in the Wide Ruins community located on the Navajo Nation. Eighty percent of the crew was Native American, many from the Wide Ruins Chapter. This paper presents an analysis of the economic impact of that project to the Wide Ruins Community as well as the benefits Northland realized having a primarily Native Crew.

[197] *Chair*

Hutira, Johna [197] see Swidler, Nina

Hutson, Scott R. [75] see Lamb, Céline

Hutson, Jarod (Monrepos Archaeological Research Center for Human Behavioral Evolution)

[87] *Assessing Hominin Involvement with the Faunal Assemblages from Bundu Farm and Pniel 6, Northern Cape, South Africa*

The transition from the Early Stone Age (ESA) to the Middle Stone Age (MSA) represents an important technological shift in hominin behavioral evolution in southern Africa. Subsistence behaviors during this transition, however, are relatively unknown due to a lack of faunal preservation or insecure associations between lithic and faunal accumulations. Often, these sites originate from riverine, lakeshore, and spring deposits, locations that likely attracted hominin hunters and other carnivores in search of prey. Distinguishing features of these open-air faunal accumulations that relate directly to hominin activity from those produced by other natural processes is critical for

assessing hominin subsistence behaviors during the ESA/MSA transition in southern Africa. Here I present an analysis of the faunal assemblages from Bundu Farm and Pniel 6, two transitional ESA/MSA open-air sites located in the Northern Cape, South Africa. This analysis is supported by a neotaphonomic study of modern bone accumulations surrounding a complex of seasonal waterholes at Ngamo Pan, Hwange National Park, Zimbabwe. Comparisons between the fossil and modern assemblages suggest primary access to animal carcasses at Bundu Farm fauna, but only secondary access at Pniel 6. Overall, there exists a variable signature of hominin subsistence during the ESA/MSA transition in southern Africa.

Hutson, Scott (University of Kentucky)

[142] *Inter-site Causeways as Political Infrastructure in the Northern Maya Lowlands*

In the Maya lowlands, several polities oversaw the construction of long causeways that connected regional centers with smaller settlements. As infrastructure, such causeways have been shown to facilitate exchange of basic goods between people at different sites. Archaeologists also view these causeways as political statements that materialize the extent of a polity and emphasize hierarchical relations between settlements on the causeway. Recent research along the 18km long causeway between Uci and Cansahcab, Yucatan, Mexico, suggests that Uci's leaders attempted to use the causeway as part of strategies for administering rural villages. This research also shows that the causeway did not, however, have much of an effect on regional settlement patterns. The causeway certainly outlasted the Uci polity, and it was re-used in a variety of ways, none of which evince a particular reverence for its original purpose.

[183] *Discussant*

Hutson, Scott [24] see Kidder, Barry

Hwang, Jae Hoon [80] see Seong, Chuntaek

Hyde, David M. (Western State Colorado University)

[248] *A Problematic Deposit from a Maya Hinterland Household: Chert, Sherds and Obsidian*

A significant amount of recent study has been directed to what have been termed "problematic deposits." Although superficially similar to middens, they tend to have a ritual component that makes them distinct from simple trash pits, and as Houk (2000) indicates, they are often located at the centerline of monumental, ceremonial architecture (Clayton et al. 2005; Houk 2000). The Tapir Group of the Medicinal Trail Community has an Early Classic "problematic deposit" that is located in the base of the steps on a modest residential structure in a hinterland household. This paper will address the meaning of this deposit in regards to interpreting what it represents in terms of ancient Maya behavior.

Hylkema, Linda [175] see Panich, Lee

Hylkema, Mark (California State Parks)

[293] *Tule Balsa Boats and the San Francisco Bay Economy.*

Early historic accounts describe the use of tule balsa boats throughout the San Francisco Bay region. The advantages attendant to this technology, ranging from increased access to estuarine food resources and the transportation of materials and people over a large geographic area is as monumental as the many mounded sites that once surrounded the Bay Shoreline. This presentation will review descriptions of these boats and propose a possible connection between maritime travel, mounded sites and the economic opportunities that must inevitably have developed among the many Bay Shore Ohlone and Miwok polities that used them.

[293] *Chair*

Iannone, Gyles [48] see Cheong, Kong

Iannone, Gyles (Trent University)

[115] *Towards a Socio-Ecological Understanding of Agrarian-Based, Low-Density Urbanism in Early Tropical State Formations*

Archaeological examination of the remains of the early tropical states in Central America and Asia have demonstrated that, although they exhibit a unique type of settlement pattern, they do represent large, sophisticated, and undoubtedly “urban” state formations. The unique urban footprint of these tropical states – in which settlement units of varying size and complexity are scattered across the landscape, and agricultural lands and green zones extend up to, and even into epicenters – has come to be referred to as “agrarian-based, low-density urbanism.” We are just now beginning to explore, in detail, the nature and significance of this variety of urbanism, with particular emphasis on understanding: 1) Why it seems to characterize many of the earliest state formations to appear in the world’s tropical zones? 2) What it tells us about the nature of socio-economic and socio-political organization in these regions? 3) What specific resiliencies and vulnerabilities are associated with this urban footprint? and, 4) Whether we can use our archaeological knowledge of low-density urbanism in the past to inform some of the contemporary urban re-visioning projects that are currently being initiated in the tropics.

Ibarra, Georgina (Instituto de Geología UNAM), Felipe Ramírez (INAH - DEA), Elizabeth Solleiro (Instituto de Geología, UNAM) and Sergey Sedov (Instituto de Geología, UNAM)

[141] *Soil, Landsurfaces, and Settlements under Lava: The Case of Cuicuilco, Mexico*

First societies based on agriculture settled the Mexico Basin around 3000 years ago (from B.C. 1500 to A.D. 100), during the Formative period, according to Mesoamerican chronology. Cuicuilco is one and probably the first of these Formative sites in the Mexico Basin and is located in the southern part of Mexico City, in an area covered by lava flows from the Xitle volcano, named El Pedregal. The age of the eruption has been established around 1,670+/- 35 years B.P. It is considered that Cuicuilco was probably abandoned as a direct consequence of this eruption. We have started a survey looking for sites where the paleosurface, inhabited by Cuicuilcs, is still preserved. This landsurface has been found in several places, just below a thin dark grey ash and the thick Xitle lava flow. The buried paleosol has abundant artifacts. We study this paleosol in order to reconstruct environmental conditions in the area during the settlement, as well as the impact of human activities in the area. The paleosol has a very hard and dark organic horizon and does not rest directly under the lava. However the lava has caused an extraordinary effect of compaction that it is necessary to discriminate.

Ibarra-Morales, Emilio [141] see Martinez-Yrizar, Diana

Iceland, Harry [357] see Widmayer, Elise

Iizuka, Fumie (University of Arizona), Masami Izuho (Tokyo Metropolitan University) and Pamela Vandiver (University of Arizona)

[115] *Adoption of Ceramic Technology: Case Study from Incipient Jomon of Southern Kyushu (ca. 13,500/14,000 – 12,000 cal yr BP)*

Hunter-gatherers of late Pleistocene Japan were among the first in the world to adopt ceramic technology. Archaeologists have suggested that in southern Kyushu, these people of the Incipient Jomon period (13500/14000-12000 cal yr BP) also used large grinding stones, stored food, occupied pit houses, and made boats for navigation; they had signatures of reduced residential mobility. Nevertheless, there have not been systematic tests to assess the hypothesized decreased residential mobility. Identification of pottery production zones and circulation helps us to infer degrees of sedentism. Detailed analyses of production processes allow us to assess prioritized performance characteristics and functions intended by producers. Inferred functions would help contextualize pottery production, consumption, and transportation patterns. The objective of our study is to better understand economy and degrees of sedentism, and intended pottery function, when ceramic technology emerged in southern Kyushu. We examined pottery from three Incipient

Jomon sites in Kagoshima Prefecture; two from the northeastern Satsuma Peninsula surrounding Kagoshima Bay, and one from Tanegashima Island. Ceramics were analyzed visually, mineralogically, with xeroradiography, and with porosity tests. We present our results on ceramic sourcing and technology to provide inferences on production zones, circulation, and the producers' intended functions.

[115] *Chair*

Ilani, Shimon [64] see Ekshtain, Ravid

Iles, Louise (University of York)

[23] *Iron Producers, Iron Users*

Participation in technological activity in sub-Saharan Africa is often discussed in terms of identity, whether that is framed by gender, kinship, status or ethnicity. In particular, social distinctions between iron producers and iron users are well known from the ethnohistorical and ethnographic records of numerous African regions, providing important information as to the social organization and values of a particular society. However, recognizing these identities in the archaeological remains of metal objects, metal working and/or metal production presents a significant challenge, not least because of the fluid nature of identity itself and the changing parameters of inclusivity or exclusivity in economic activities.

Drawing together evidence from Ethiopia, Uganda, Kenya and Tanzania, this paper will discuss different ways in which the identities of past iron producers can be explored through archaeological data, before considering the impact of interactions between different groups – whether iron producers or iron users – on iron production technologies and artifact style. Through a careful combination of archaeological, analytical and ethnoarchaeological research, it is possible to identify groups and interactions in past metal-working technologies, with a view to gaining a broader appreciation of past social relationships.

Iliev, Ilia [40] see Connor, Simon

Iliff, Jeremy [358] see Hronec, Laura

Iliopoulos, Ioannis (Department of Geology, University of Patras) and Albert J. Ammerman (Department of Classics, Colgate University, U.S.A.)

[25] *A Characterization Study of Some of the Earliest Ceramic Building Materials from Sites in Rome and Its Surrounding Area*

Roman roof tiles and architectural terracottas constitute an important resource for the study of the architectural development of early Rome, through the detection of different sources and perhaps workshops in the region of the Roman capital. Unfortunately, the location of possible clay sources available to the Roman tile-makers has been obscured due to the city's extensive urbanization. However, a drilling project in the area of the Roman Forum and other sites offers important evidence of clayey levels in an ancient valley close to the River Tiber and access to these has permitted their integrated study by means of petrography and chemistry. So far 132 tiles and architectural terracottas dated between 7th - 6th centuries B.C. have been studied by means of petrographic and chemical analysis (INAA). More than half of them come from 11 sites in Rome and the rest are from the broader region. The integration of the petrographic and chemical approach has allowed the identification of four main ceramic fabric groups and some smaller subfabrics. Their comparison with the raw materials, as well as to tile wasters recovered from the area of Tarquinia, shed light on ancient tile production and distribution.

Illingworth, J. S. [114] see Adovasio, J. M.

Imfeld, Sarah [194] see Hirth, Kenneth

Ingalls, Teresa [209] see Mitchell, Douglas

Ingalls, Victoria (The University of Texas at San Antonio)

[338] *The Power and Narrative of Liminality: The Quadripartite Badge in Maya Iconography*

Ancient Maya iconography primarily depicted elite individuals in idealized states of being and rationalized their power and authority through ideological concepts. This study reexamines previous assumptions made concerning the Quadripartite Badge. This motif is examined based on iconographic associations and contexts, as well as temporal and spatial distributions. The spread of this motif is demonstrated through time and its spatial distribution is noted for its political consequences. It is established that elite women from Tikal and Calakmul disseminated this iconography. This was done most frequently by marriage alliances, as seen in the number of newly 'arrived' women carrying the Badge. Other iconographic associations of the Badge revealed a strong association with the Maize God and the cyclical nature of agriculture. For the continuation of the maize cycle and renewal of universal forces, sacrifice was required; the completion of ritual sacrifice was demonstrated through the depiction of the Quadripartite Badge. Indicating the liminal status of its user, it is frequently placed in scenes of transformation and rites of passage. This one expression of power simultaneously validated earthly and otherworldly power, ensuring the continuation of the cosmos, the perpetuation of the sun and maize cycles, and favorable dispensation from the gods.

Ingram, Scott [304] see Hunt, Robert

Ingram, Scott (University of Texas at Arlington)

[333] *How Archaeologists Can Identify Human Resilience and Vulnerability to Climatic Conditions*

If interdisciplinary concepts such as resilience and vulnerability are to be useful to archaeologists, then understandable methods of identifying these complex social phenomena are needed. Archaeological approaches that use familiar methods and material indicators can be used to explore these topics. This presentation will demonstrate how both human resilience and vulnerability to climatic conditions can be identified using changes in residential abandonment rates and food storage behavior. When regional-scale and long-term data on these behaviors are compared to paleoclimatic records of changes in climatic conditions, resilience and vulnerability to these conditions can be identified, compared, and quantified. Examples and results of the application of the method in the North American Southwest will be presented.

[333] *Chair*

Inomata, Takeshi (University of Arizona)

[196] *A Revised Kaminaljuyu Chronology and Its Implications for Social Processes*

An evaluation of new and existing data indicates that the Middle and Late Preclassic portions of the Kaminaljuyu chronology need to be shifted 300 or 400 years later. This paper primarily examines relevant radiocarbon dates and then discusses the implications of this revision for our understanding of how centralized polities with rulership developed in the southern Maya area and in the Maya lowlands.

[285] *Discussant*

Inoue, Hiroko (University of California-Riverside), Christopher Chase-Dunn (University of California-Riverside), Eugene Anderson (University of California-Riverside), Alexis Álvarez (University of California-Riverside) and Christian Jaworski (University of California-Riverside)

[291] *Comparing World-Systems: Empire Upsweeps and Non-core Marcher States Since the Bronze Age*

This is an examination of one of the implications of the hypothesis of semiperipheral development: that major increases in the sizes of polities have been attained by the conquests of semiperipheral marcher states. We use the comparative evolutionary world-systems perspective to frame our study of upsweeps of the largest polities in four regional world-systems and in the Central system since the

Bronze Age. Each of the twenty-two identified upsweeps is examined whether it is an instance of a semiperipheral marcher state formation. The hypothesis of semiperipheral development holds that polities in between the core and periphery have been fertile locations for the implementation of organizational and technological innovations that transform the scale and the developmental logic of world-systems. This is because semiperipheral polities have less investment in older institutional structures than do core polities and greater incentives to take risks on innovations. In the marcher state formation, a recently founded sedentary polity on the edge of an older core region conquers the core and builds a core-wide empire that is significantly larger than earlier polities have been. We find that over half of the twenty-two empire upsweeps were likely to have been produced by the semiperiphery or periphery marcher states.

Intoh, Michiko (Michiko INTOH (Professor))

[77] *Clay and Technology: Micronesian Ceramic Tradition*

Pottery tradition in Micronesia was diverse in terms of technology, due to various factors, such as historical and/or cultural reasons and the natural environmental conditions. Above all, the nature of clay resource available to the potters has significant effect upon forming techniques and products. Thanks to William Dickinson's wide-ranging geological knowledge and active involvement in mineralogical studies of excavated pottery from Oceania, our understanding on prehistoric pottery technology has significantly been developed. This paper examines the technological variation of prehistoric pottery makings described in Micronesia, focusing on the tempering technique in particular. All the early pottery traditions identified in high islands of Micronesia have fine beach sand (most are calcareous) mixed in the clay as a temper. This tradition was comparable to the early Lapita pottery traditions in Melanesia and western Polynesia. The subsequent changes observed in Micronesian pottery were diverse. It is most probable that the technological alterations to avoid using calcareous sand temper had caused the variations in technology and in the products.

Iriarte, José [157] see Cárdenas, Macarena L.

Iriarte, Jose

[226] *A Multi-Proxy Approach to Investigate Human-Plant Interactions in Amazonia: A Case Study from the Llanos de Moxos*

This paper summarizes the results of a multiproxy study on the past human impact of Late Holocene peoples across different regions of the Llanos de Moxos. In the Monumental Mound Region, paleoecological data show that the savanna soils were sufficiently fertile to support crops; maize being a predominant one. Macrobotanical remains from mound habitation sites in this region documented the presence of maize (*Zea mays*), squash (*Cucurbita* sp.), peanut (*Arachis hypogaea*), cotton (*Gossypium* sp.), and palm fruits (*Arecaceae*). Microbotanical results confirm the widespread use of maize, along with manioc (*Manihot esculenta*), squash, and yam (*Dioscorea* sp.). These results represent the first comprehensive archaeobotanical evidence of the diversity of plants cultivated, processed, and consumed by the prehispanic inhabitants of the Amazonian lowlands of Bolivia. Investigations in the geometric earthworks that occur in the Bella Vista region show that in what is today land covered by terra firme forest, the inhabitants exploited a naturally open savanna landscape that they maintained around their settlement despite the climatically driven rainforest expansion that began ~2,000 yr ago across the region. The benefits of these multiproxy approaches are discussed.

[186] *Chair*

Irish, Mark (University of California, San Diego)

[375] *Unit-Stamped Red Jars in the Southern Lowlands: New Insights into Ceramic Production and Exchange*

Monochrome red jars and bowls featuring unique unit-stamped designs have been excavated from

Late Classic contexts throughout the southern Petén and the areas surrounding the Maya Mountains. Adorning apparently utilitarian vessels, these unit-stamps show both a consistency in size and application across their spatial range, as well as a great diversity in the preferred motifs depicted. Combining a new ceramic chronology developed at Lubaantun and data from across southern Belize and the southern Petén, this paper seeks to understand how the unit-stamp designs and the vessels they adorned varied spatially and temporally. An attempt is also made to establish if one area in particular was the progenitor of the monochrome red unit-stamped system, or if it developed in situ across multiple sites in the Southern Lowlands. Additionally, the new data are compared to the dominant polychrome types from the same area to determine the variation between elite and non-elite exchange networks. From both the new and reinterpreted data, new explanations of the relationships between elite and non-elite pottery production and exchange from the Late Classic Maya Lowlands are explored.

Isensee, Theron, Christopher Webster and Roger Werner

[90] *The Benefits of Virtual Offices for a 21st Century Cultural Resource Management Consulting Firm*

In today's day and age, we have created technology to help benefit our interaction, our communication, streamline our workload and increase our work output. The need to be in person or in house all the time as a business has changed. A company is able to save resources by allowing employees to work on their own schedule, but yet still accomplish all of the tasks and workload, and exceed deadlines, by being virtual. This form of business leads to a more relaxed and happier lifestyle for those employees involved. Having a virtual business and/or virtual office gives you the ability to be flexible, on the go, more energized, and more relaxed. This way of business allows you to accomplish more without having the huge overhead of those "in house" companies. It allows a company to invest in more travel, marketing, promotions, and equipment which allows the business to succeed even better. There are multiple companies and business owners that live by the virtual office and their companies are thriving like crazy!!

Isla, Johny (ANDES - Centro de Investigación para la Arqueología y el Desarrollo) and Markus Reindel

[31] *Un nuevo patrón arquitectónico de la cultura Paracas en la sierra sur del Perú*

En nuestras recientes investigaciones de la cultura Paracas en la vertiente occidental de los Andes del sur del Perú hemos encontrado un nuevo patrón arquitectónico, cuyo elemento básico lo constituye una estructura en forma de D, que se encuentra combinada en número de dos, tres y más elementos. En el caso ideal se forma un círculo perfecto, generalmente sobre una colina artificialmente modificada, y alrededor de un patio hundido. En el sitio de Cutamalla se han identificado doce complejos circulares, de unos 40 m de diámetro cada uno. Durante las prospecciones en la sierra de Lucanas se han identificado por lo menos ocho sitios más con complejos similares, formándose así un patrón arquitectónico recurrente y bien establecido. Por el tamaño de sus componentes y su ordenamiento formal y repetitivo, este nuevo patrón arquitectónico de la cultura Paracas se podría denominar como monumental. Todavía se desconoce la función de las estructuras circulares. Por el momento parecen ser exclusivas de la región de Lucanas. Existe un vínculo con tradiciones arquitectónicas de la sierra sur del Perú y del norte de Bolivia, de las cuales, sin embargo, nos faltan todavía datos concretos para establecer comparaciones de mayor envergadura.

Islas Orozco, Mirsa Alejandra [298] see Mancilla Medina, Margarita

Ivanova, Maria (University of Heidelberg) and Elena Marinova (Royal Belgian Institute for Natural Sciences)

[154] *Heading North: Landscape Use and Food Technology at the Initial Stage of Farming Expansion in the Balkans*

During the spread of farming from the Near East to Europe, farmers and their domestic plants and animals gradually penetrated into new environments. Reaching the northern periphery of the Balkans (present day Serbia, northern Bulgaria, Romania and Hungary), early farmers encountered for the

first time an ecological zone that significantly differed from the natural habitats of their domesticates. The continental environmental conditions, i.e., frosty winters with snow cover, stronger expressed seasonality, diverging precipitation regimes, for example, must have put considerable pressure on their traditional farming system, calling for biological adaptations in the plant and animal populations. Instead of biological adjustments, however, a rapid cultural adaptation ensued. In comparison to the areas of origin in Anatolia and the southern Balkans, diversity of crops was radically reduced, the composition of herds changed, and the use of wild resources became increasingly important in the northern Balkan peninsula. The modifications in the food economy were accompanied by a transformation in the traditional ways of storing, processing, and consuming food. In this paper, we explore the emergence of distinct strategies of landscape management, food acquisition, and food processing with the initial adaptation of farming to European continental conditions.

Ives, John (University of Alberta) and Gabriel Yanicki (University of Alberta)

[182] *Mobility, Exchange, and the Fluency of Games: Promontory in a Broader Sociodemographic Setting*

We are currently undertaking new investigations of the Promontory Cave 1 and 2 (Great Salt Lake, Utah) collections Julian Steward excavated in the 1930s along with renewed excavations in both caves to explore Steward's suspicion that these A.D. 13th century assemblages were created by migrating ancestral Apacheans. Artifacts for gaming are richly represented, including a ball, hoops, feathered darts, cane, wooden, and beaver tooth dice, and markers or counting sticks; a guessing game using buried moccasins may also have been played. Rather than simple recreation, such games often figure in ceremonial contexts, while the geographic scope for commonalities in the gaming pieces is vast, suggesting another aspect of their play. In Native North America, the gambling that frequently accompanied these games often took place between members of different communities with ambiguous relationship prospects, becoming more acceptable with increased social and kinship distance. The ubiquity of the Promontory gaming materials may reflect an "enemy-friend" relationship with neighboring groups such as those found at the nearby terminal Fremont site of Chournos Springs. Gambling can only provide such a medium when the games played are mutually intelligible. Thus, gaming materials can serve as an archaeological proxy for sociodemographic interaction, particularly in migratory contexts.

Ivic de Monterroso, Matilde [242] see Popenoe Hatch, Marion

Izeta, Andres Dario [35] see Cattaneo, Roxana

Izquierdo Egea, Pascual [86] see Anaya Hernandez, Armando

Izuho, Masami [53] see Terry, Karisa

Izuho, Masami (Tokyo Metropolitan University), Ian Buvit (Central Washington University), Takeyuki Ueki (Chiba Institute of Science), Gunchinsuren Byambaa (Institute of Archaeology, Mongolian Academy of Science) and Tsogtbaatar Batmunkh (Institute of Archaeology, Mongolian Academy of Science)

[53] *In Search of Upper Paleolithic Sites in Alluvial Contexts in the Tsukh (Chikoi) Valley, Northern Mongolia*

Mongolia, located at a key crossroads for human migration between central, eastern, and northern Asia, is important for understanding a number of current hotly debated archaeological topics, including the possible human exodus out of northern Eurasia at the Last Glacial Maximum (24,000-18,000 cal yr BP), the emergence of microblade technology as an adaptation to extremely cold and harsh environmental conditions, and the route and process of an initial modern human migration into high latitudes (and ultimately into the Americas). Notwithstanding the significance of Upper Paleolithic research in Mongolia, the ages of many sites are not supported by reliable geochronological evidence due to their poor preservation in colluvial contexts. In 2013 a team of Mongolian, Japanese and American researchers began survey and initial testing of sites along the

Tsukh, or Chikoi in Russian, River where a number of high, stable alluvial terraces have been identified. Here we present the initial results of subsurface testing at the Bayantsagaan'uul-1 site (49°45'29"N, 107°31'51"E) and pedestrian survey along the river.

Jabbour, Rebecca [132] see Cirillo, Laura

Jackson, Lauren [123] see Trelogan, Jessica

Jackson, Sarah (University of Cincinnati)

[142] *Human-Object Relationships in Classic Maya Contexts: Object Technologies, Political Participants, and Cultural Infrastructures*

This paper examines the foundational cultural infrastructure provided by seemingly quotidian objects in Classic Maya (ca. A.D. 250-900) contexts. These materials (things like ceramic vessels, stone benches, and mirrors) carry out prosaic tasks (e.g., containing, supporting, reflecting), but also higher-order relational work, taking on roles as non-human "persons," and as partners in social relationships. In this paper, I focus on these human-object relationships in order to recast our view of objects and their technological significance, and to frame Maya political systems as structured around both human and non-human participants. To do this, I look at representations of human-object relationships on Classic-era painted ceramic vessels and carved stone monuments. In particular, I examine moments of interaction and intersection, including bodily engagement and communication between people and objects, in order to address several related questions: What kinds of work are these objects carrying out? How are humans and objects involved in mutually constitutive ways? What do we learn about the technology of objects and their role in providing underlying cultural infrastructure in ancient polities through examining the dynamics of their efficacy on short and long time scales (including the contexts necessary for their successful functioning, and moments of apparent material failure)?

Jackson, Brittany (Department of Anthropology, UCLA), Jacob Bongers (Cotsen Institute of Archaeology, UCLA), Susanna Seidensticker (Department of Anthropology, UCLA), Terrah Jones (Cotsen Institute of Archaeology, UCLA) and Gail Kennedy (Department of Anthropology, UCLA)

[169] *Bioarchaeology of the Chincha Kingdom: Life History Patterns in a Chullpa Population from the Late Intermediate Period and Late Horizon mid-Chincha Valley, Peru*

This paper considers evidence for population health and lifestyle in the Chincha polity during the Late Intermediate Period (LIP) (ca. 1000-1400 A.D.) and Late Horizon (LH) (ca. 1400-1532 A.D.). Beginning with the Chroniclers, scholars have described the Chincha as a large complex society with population organized into distinct economic sectors (e.g., coastal fishermen, merchant core, and inland agriculturalists). Previous archaeological studies have demonstrated evidence for fishermen and artisans in the lower valley, but no evidence for life outside of the lower valley has been considered. Following an upper valley archaeological survey and previous demographic study on human remains, a bioarchaeological survey of a looted communal tomb in the mid-Chincha Valley provides a first glimpse into health status among populations outside previously studied areas. We identified over 115 individuals of all age and sex groups and collected data on health status and trauma in that population. Here, we compare our evidence to regional trends and consider evidence for workload within the context of horizontal social organization among the Chincha. Future work will further explore lifestyle dynamics in the mid- and upper-valley and seek to interpret the role of these populations in the larger social and economic structure of the Chincha Kingdom.

Jackson, Marie (University of California, Berkeley) and Gabriele Vola (Cimprogetti S.p.A., Via Pasubio 5, 24044, Dalmine)

[399] *Lime Preparation in Ancient Roman Architectural and Marine Mortars*

Romans prepared lime for the volcanic ash mortars of conglomeratic concretes using methods (Vitruvius, de Architectura 5.1.2-3) that are reflected in modern Italian lime industry terminology. In mortars of architectural concretes in Rome (1st century B.C.E.–3rd century CE) builders mixed

quicklime with freshwater to form stiff putty (grasello di calce) and then incorporated moistened scoriaceous ash, shown by an experimental reproduction. Pure calcite in unburnt particles (incotti) suggests pre-orogenic Jurassic-Cretaceous limestone of the Monti Sabini 30km northeast of Rome, rather than syn- and post-orogenic Cenozoic carbonate deposits with detrital silicate minerals. High calcium lime (94 wt% CaO) was likely calcined at the quarry; no marine limestone aggregate occurs in the concretes. In mortars of maritime harbor concretes (1st century B.C.E.–2nd century CE) drilled by ROMACONS, builders used fine sand- to gravel-sized lime (zolle or greggio di calce) mainly calcined from local limestone, with high calcium compositions (Portus, Pozzuoli Bay), mixed calcic and dolomitic compositions (Cosa, Anzio, Egnazia, Caesarea, Alexandria) and, rarely, argillaceous compositions (Chersonessos). The lime was likely aged in freshwater (calce spenta e maturata), mixed in a trough with pumiceous ash, and submerged in submarine forms. Carbonate rock is the predominant aggregate of eastern Mediterranean harbor concretes.

Jacob, Robert [8] see Urban, Thomas

Jacobs, David (Arizona State Historic Preservation Office), Arleyn Simon (Arizona State University), Owen Lindauer (Federal Highway Administration) and Glen Rice (Arizona State University [Retired])

[278] *A Local Expression of "Salado" in Tonto Basin*

"Salado" refers to a series of local expressions developed when populations were faced with the challenges of increased population sizes, migrants, and complexity. Local populations incorporated ceramic styles, iconography, architecture, and community organization from new arrivals and surrounding populations in ways that were adaptive and fostered integration. This brought migrants into the fold, albeit keeping them at a safe distance with limited participation and membership. To have excluded migrants would have led to attacks and raiding. Ceramic data, architecture, community rooms used for ritual observances, and burial data are used to examine one such local development in the Tonto Basin, Arizona.

Jacobs, Zenobia [294] see Cawthra, Hayley

Jacobs, Zenobia

[356] *Pinnacle Point 5-6 and Diepkloof Rockshelter (South Africa): Testing the OSL Ages and Constructing a Standardized MSA Chronology*

Single grain optically stimulated luminescence (SG-OSL) dating has made a major contribution to our understanding of the chronology of the Middle Stone Age of Africa. The accuracy of many of the SG-OSL chronologies has been verified by other independent dating techniques. Diepkloof Rockshelter (DRS), however, has produced disparate chronologies that have resulted in a dating controversy. Criticisms raised have been used to cast doubt on and, in some cases, dismiss the chronology for the Howiesons Poort (HP) and Still Bay (SB) presented in Jacobs et al. (Science 322, 733–735, 2008). As a result, an alternative age model and interpretation of the ages, durations and relationship between the HP and SB techno-complexes has been proposed. In the process of doing so, the published ages for Pinnacle Point Site 5-6 (PP5-6) have also been questioned. In this presentation, I will demonstrate why the SG-OSL chronology of DRS is robust by directly addressing the concerns raised and by presenting new data. I will also present a complete chronology for the PP5-6 sedimentary deposits. These two new data sets will then be used to assess the merits of the two divergent age models for the HP and SB in southern Africa.

Jacobsen, Geraldine [77] see Allen, Melinda

Jacobson, Nicole [207] see Knaub, Colene

Jacobson-Tepfer, Esther (University of Oregon, Mongolian Altai Inventory Project)

[353] *Documentation of Rock Art Complexes in the Mongolian Altai: From the Unknown to World*

Heritage Status

This paper describes the complex process of documenting two huge rock art complexes and a third very old complex, in the Altai Mountains of Mongolia. Previous to our work in this region at the Mongolian border with Russia and China, all three complexes were virtually unknown except to local herding populations. Our project began with a survey of a broad region in Bayan Ölgii aimag and the identification of the complexes on which we wished to concentrate our efforts. This initial phase was followed by the multi-year process of their documentation. Our project began before there were any detailed maps available for this border region. Our gradual development of appropriate mapping, using a variety of sources, coincided with building an analytical system that allowed us to divide each complex into manageable sectors and to link specific images and panels to GIS data points. Our system also allowed us to map specific motifs (e.g., vehicles, riders, wild bulls) and probable cultural periods across the complexes. This paper will conclude by briefly describing the analytical process we used to support the nomination (successful) of these sites for World Heritage status.

Jacoby, Lindsay [27] see Villarreal, Margarita

Jadot, Elsa [253] see Cohen, Anna

Jaffe, Yitzchak (Harvard University)

[67] *Colonial Developments in a Global Context- Complex Connectivity in the Western Zhou World*

The period of Western Zhou (1046-771 B.C.E.) is often identified with the genesis of Chinese civilization. As the Zhou expanded their borders and influence they developed a Chinese political tradition that would eventually formalize and consolidate the elite culture and practices of this emerging world. While postcolonialism theory has been successful in highlighting the multi-directionality of regional interactions in the ancient world, globalization offers a wider approach, geographically and temporally, that is most beneficial for cases of colonial contact among larger scale processes of supra-regional developments. The state of Yan 燕 - an important polity established by the Zhou - provides a case study for this new perspective on Western Zhou expansion: the bronzes found in the realm of the Yan polity are shown to have been locally used in a variety of ways that reflect a continued incorporation of Zhou material culture into indigenous communities, rather than the expansion of the Zhou power and the subsequent assimilation of local peoples. More than just a unique period of colonization, this paper finds the Western Zhou influence to represent an increased stage of interaction and connectivity within the larger process of globalization that preceded it.

Jaffee, Yitzchak [37] see Flad, Rowan

Jaimes, Gustavo [129] see Sugiura, Yoko

Jakobsen, Nicholas [80] see Martindale, Andrew

James, Emma (The University of Queensland), Erik Otárola-Castillo (Harvard University), Jessica Thompson (Emory University) and Shannon McPherron (Max Planck Institute for Evolutionary Anthropology)

[139] *Human Volunteers and Mechanical Arms: Quantitative and Comparative Analysis of Bone Surface Modifications Created by Humans and Machines*

Zooarchaeologists use traces on bones to understand something about the ecology and subsistence behavior of our ancestors. Although we may not be equipped with the proper interpretive analogues to understand the possible range of roles hominins had in past ecosystems, numerous taphonomic studies have investigated the quantitative and qualitative characteristics of natural and cultural bone surface modifications (BSM). Most experimental taphonomic research relies on 'naturalistic' simulated situations in which bones have been trampled, gnawed, fed to various carnivores,

butchered, and shot at with projectiles. However, the physics behind the creation of a mark are poorly understood and difficult to control under these circumstances. This study holds constant the physical variables that affect actualistic assemblages, such as force of the strike, angle of the strike, or velocity of the strike, and measures how they translate to characteristics of BSM, such as their shapes and sizes. This is done for human experiments with volunteer butchers given specific instructions and in experiments using a mechanical arm where each individual variable can be held constant. Comparison of the two experimental datasets shows that mark attributes are governed by basic physics and that these laws can be applied to interpreting ambiguous marks in zooarchaeological assemblages.

James, Steven [282] see Bostwick, Todd

James, Steven (California State University at Fullerton)

[282] *New Deal Archaeology at Buena Vista Lake in the San Joaquin Valley and the Sierra Madre Mountains: The 1933-34 CWA-Smithsonian Institution Project in Southern California*

Perhaps the earliest Federal Civil Works Administration (CWA) archaeological project in California was conducted during the winter of 1933-34 at five sites along Buena Vista Lake in Kern County by the Bureau of American Ethnology (BAE), Smithsonian Institution. The project location was chosen for several reasons: mild winter climate, high number of unemployed men from nearby oil towns, and large, deep prehistoric sites. At the height of the excavations, the labor force amounted to 187 men. BAE archaeologists William D. Strong and William M. Walker directed the work, with field supervision by Edwin F. Walker (Southwest Museum), and UC Berkeley graduate student Waldo R. Wedel, who later wrote the final report. As an outgrowth of the project and in order to determine the boundary between the Yokuts and eastern Chumash, Strong conducted a two-week archaeological reconnaissance in nearby Cuyama Valley and the Sierra Madre Mountains with local cattle rancher James G. James, who had explored archaeological sites in the region containing well-preserved perishable artifacts and was a distant relative of the author (my grandfather's first cousin). The significant results of the CWA-Smithsonian Buena Vista Lake project and subsequent survey by Strong and James are discussed in this presentation.

James, Vivian (University at Albany)

[397] *"Of What Use Is a Bear?": Examining Black Bears (Ursus americanus) as a Capitalized Resource in Northeastern North America during the Woodland and Colonial Periods (A.D. 1300-1800)*

One of the largest terrestrial mammals in Northeastern North America, black bears (*Ursus americanus*) were an important dietary component throughout the Woodland and Colonial Periods (A.D. 1300-1800). Previous research has demonstrated an increase in the frequency of black bear remains recovered from archaeological sites in New York State that have been dated to this five hundred year period. Primarily interpreted as a subsistence resource, the use of black bear secondary products has been acknowledged, but not fully discussed in the literature. Black bears and ursine secondary products were valued as a commodified resource in both Iroquoian and European capitalized economies. Trade networks are not limited solely to economic capital, but also rely on social, cultural, and other forms of capital to develop and maintain economic structures. This study, which focuses on black bears as both an Iroquoian and European resource in what is now New York State, reviews literature related to archaeological black bear remains and secondary black bear products as well as relevant historical documents within a framework of anthropological economic theory to demonstrate that black bears were increasingly capitalized in Northeastern North America during the Woodland and Colonial Periods within both social and trade networks.

James Tait, Elder [358] see Sparks, Shane

Jameson, John H (ICOMOS ICIP)

[405] *The New Public Archaeology: Evolving Concepts in International Public Archaeology and Interpretation*

In this presentation I discuss evolving concepts in public archaeology and interpretation. I give two examples, one from South Carolina, USA, and the other, as of early 2014, in Crimea, Ukraine, on how these concepts have been proposed and applied at sites and parks. In many parts of the West, the overarching trend is an increasing involvement of non-professionals in planning and carrying out archaeological and cultural heritage studies and public interpretation. We look at three evolving concepts in public archaeology: Activist Archaeology; Inclusive Public Interpretation and Presentation; and Sustainable Cultural/Archaeological/Heritage Tourism. Outside the West, when these principles are introduced, for cultural and political reasons, many sites and parks are challenged to adapt and may even reject them. In these arenas, our continuing exchanges of experience and concepts, our collegial collaborations, can build trust as lessons are learned on both sides about the international applicability and feasibility of these principles.

Janaway, Rob [19] see Groen, Mike

Janetski, Joel [85] see Coltrain, Joan

Janetski, Joel (Brigham Young University)

[127] *Antelope Cave and Far Western Anasazi Lifeways of the Virgin River Region*

The dry deposits of Antelope Cave on the Uinkaret Plateau in northwestern Arizona have yielded a rich artifact assemblage and abundant faunal and botanical remains dating to the late Archaic, Basketmaker II, and especially late Pueblo I/early Pueblo II times. The collections recovered through archaeological work provide especially useful insights into Ancestral Puebloan life in this region. These activities include rabbit drives for food and the production of rabbit skin textiles, sandal repair and perhaps construction, and evidence of wide ranging forays for food and raw material for various material goods. The subsistence-related data sets demonstrate the importance of hunted prey, farming, and gathered foods. These data provide critical and rare perspectives on resource use that contrasts starkly with many Virgin Anasazi sites to the north. These contrasts are particularly visible in the archaeofauna recovered from the cave when compared to assemblages along the Virgin River. Taken together the recovered record provides substantive evidence that Puebloan people practiced seasonal movements and the use of both wild and cultivated resources. This flexible subsistence strategy crosscut a diverse landscape and illustrates how Ancestral Puebloan people exercised their intimate knowledge of the land.

Jankauskas, Rimantas [207] see Page, Katherine

Janssen, Marco [221] see Barton, C. Michael

Janusek, John (Vanderbilt University)

[305] *The Earthly Production of Fleshy Subjects in the South-Central Andes*

A specific range of human subjects, or fully socialized, moral persons- rigorously categorized according to age, sex, kinship, and so forth -are, of course, the most critical 'things' that any society seeks to produce. I investigate the production of prehispanic human subjects in the Lake Titicaca Basin of the South American Andes. To understand the emergence of the Middle Horizon center of Tiwanaku at around A.D. 500, I investigate the deployment of innovative spatial, material, and iconographic technologies that sought to create entirely new sorts of moral persons at the beginning of the Andean Middle Horizon. Indeed, those subjects produced the Middle Horizon that we archaeologically apprehend. I argue that Tiwanaku's emergence correlated with the production of emergent moral subjects who subscribed to a novel, redemptive set of relational but also consumptive and even predatory practices. Becoming and remaining a fully moral Tiwanaku person was supremely contextual and fraught: it required continual return to a monumental landscape that emphasized both 1) the consumptive practices required to be a fully Tiwanaku subject and 2) the ritual violence required for that existential transformation.

[184] *Discussant*

Janzen, Anneke (UC Santa Cruz) and Marie Balasse (Archéozoologie, Archéobotanique: Sociétés, Pratique)

[406] *Migrations and Exchange: Early Pastoral Mobility in Kenya Assessed Through Stable Isotope Analysis*

Specialized pastoralism emerged in Kenya around 3000 years ago and has adapted with changes in the social and ecological landscape to this day. Ethnographic research has documented significant changes in herding strategies among pastoral groups throughout colonial and post-colonial periods. Stable isotope analysis sheds light on how crucial mobility was in maintaining herds before the appearance of iron-using and –producing peoples in the region. Intra-tooth sequential sampling of livestock tooth enamel presents an isotopic record of diet during tooth formation, and can thus track movements across the landscape. These analyses were conducted on enamel of livestock teeth from several Savanna Pastoral Neolithic sites in the Central Rift Valley and neighboring plains of Kenya. Some sites are clearly the result of specialized pastoralist pursuits, and other sites indicate a mixed economy of pastoralism and foraging. While carbon stable isotope ratios do not indicate seasonal altitudinal mobility up to higher elevations, this does not preclude herding of livestock long distances at low elevations. $^{87}\text{Sr}/^{86}\text{Sr}$ ratios can reflect movement across geologically distinct soil complexes. Recent analysis of the strontium isotope composition of livestock tooth enamel provides another line of evidence for pastoral mobility.

Janzen, Anneke [414] see Hildebrand, Elisabeth

Jarman, Catrine (University of Bristol)

[18] *Female Mobility in the Viking Worlds*

Recent reassessments of the gender balance among Viking Age Scandinavian populations in the British Isles have suggested a greater presence of immigrant women than previously thought. At the same time, increasing support for a view of the Viking world as a diaspora, with a sustained network between the original and the acquired homelands, has necessitated a better understanding of the mechanics of the migration process. This paper evaluates interdisciplinary evidence for the level of mobility among women in the Viking world, through an evaluation of archaeological, historical, and scientific data from Northern Europe. ^{87}Sr and ^{18}O isotope data from burials from central Norway suggest that the level of mobility among women may have been higher than suggested historically. ^{13}C and ^{15}N dietary analysis demonstrates diverse, non-gender specific diets from the same region. This questions the traditional interpretation of strict gender roles during the Viking Age, in which women were largely excluded from the outward expansion from Scandinavia. The paper argues that women were active participants in the migration process, both through the creation of alliances forged to strengthen ties between homelands old and new, and as communicators of culture and social identities within the Viking diaspora.

[18] *Chair*

Jarman, Jarman [191] see Popp, Brian

Jarry, Marc (INRAP University of Toulouse France), François Bon (University of Toulouse France TRACES UMR5608), Laurent Bruxelles (INRAP University of Toulouse France), Céline Pallier (INRAP University of Toulouse France) and Lars Anderson (University of Toulouse France TRACES UMR5608)

[35] *Aurignacian(s) in the Mas d'Azil Cave (Ariège, Pyrénées, France)*

Mas d'Azil cave is one of the most important karstic landmarks in southwestern France. This prehistoric research hotspot is mainly famous for evidence of Magdalenian and Epipaleolithic cultures, but recent researches were confirmed the existence of traces of the oldest occupations of the Upper Paleolithic, poorly documented so far. In this case, the discovery of an in situ cultural sequence containing older and recent Aurignacian opens up largely new possibilities. First, because the cave contains a chronological sequence never recognized in earlier work; this sequence revealed by recent surveys confirms the presence of an older Aurignacian (cf. Péquart's excavations

in the "Silex Gallery"), while providing the first evidence of recent occupation phases, which has no known regional equivalent. Second, these observations cast new light on a context that, for the Aurignacian, is greatly lacking in the French central Pyrénées; that of a vast cavity at the bottom of a deep valley that possibly corresponds to another settlement type in the territory; significantly different from (and complementary to) the "small" caves often "perched" in the landscape, which is by far most of the information we currently have to describe this culture in this region.

Jarvi, Forrest [276] see Roth, Barbara

Jaworski, Christian [291] see Inoue, Hiroko

Jazwa, Christopher (Pennsylvania State University), Lorne Leonard (Pennsylvania State University), Chris Duffy (Pennsylvania State University) and Douglas Kennett (Pennsylvania State University)

[32] *Freshwater Availability and Prehistoric Settlement Patterns on California's Northern Channel Islands*

An important variable that influenced prehistoric human settlement patterns on California's northern Channel Islands was the availability of freshwater. Existing models of settlement use watershed size as a proxy for water availability. However, in semi-arid regions, this approach has limitations because ephemeral streams common in these environments may lose much or all of their flow to groundwater. We have developed a hydrological model that incorporates measured and modeled geospatial/temporal data for climate (precipitation, solar radiation, wind speed, relative humidity, temperature), soils, vegetation, and topography to simulate the complex land-surface-groundwater behavior of island hydrology. We also discuss the role of fog and fog-drip as a freshwater input into this system. We discuss the implications of this model for the location of permanent settlements on the northern Channel Islands during the past 5,000 years. Climate projections are constructed as input to the model for hypothetical 100-year intervals that represent wet, dry, and average conditions.

Jeanty, Naphtalie (University of California, Berkeley)

[15] *Tracing Relationships among Buffalo Soldiers in 19th Century Fort Davis, Texas*

The historic archaeology of US cavalry forts in the 19th century allows for exploration of a wide range of social issues and historical questions. Using examples from Fort Davis, Texas, this study analyzes Buffalo Soldier troops stationed there from 1867-1891. It presents results of an investigation of male identified homosociality within black communities by tracing male relationships within 19th century gendered labor spaces. A queer perspective allows this research to focus on the bonds and relationships amongst African American soldiers that did not subscribe to traditional heteronormative practice. Because so often these relationships are obscured within documentary and material record, this paper engages with queer politics that aim to address queer identities within African American communities- both historic and modern.

Jelinek, Lauren (Bureau of Reclamation), Jon Czaplicki (Bureau of Reclamation) and M. Scott Thompson (Arizona State University)

[123] *The Digital Legacy of Public Archaeology in the Phoenix Basin, Arizona*

Federal undertakings, particularly flood control and water transmission projects, have served as the impetus for some of the largest public archaeology projects in Arizona since the 1950s. The Central Arizona Project, a 336 mile diversion canal that distributes water from the Colorado River into central and southern Arizona, was the largest and most costly transmission system constructed in the United States. It took nearly 25 years to identify and mitigate the cultural resources within the project area, which in turn generated an enormous amount of archaeological and ethnographic data, only a fraction of which was readily accessible to scholars in regional libraries. Since 2009, the Bureau of Reclamation has been working with the Digital Archaeological Record (tDAR) to create an online digital library of Central Arizona Project (CAP) archaeological reports. Currently, Reclamation has made 130 records available through tDAR. The CAP records have received 27,000 views and 1,200 downloads, numbers which attest to the continued importance of this project within the

archaeological community. By partnering with tDAR, Reclamation continues to ensure this project's legacy and facilitate use of project data for current and future research projects.

[161] *Discussant*

Jenkins, Emma (Bournemouth University), Carol Palmer (Council for British Research in the Levant), John Grattan (University of Aberystwyth), Samantha Allcock (Bournemouth University) and Sarah Elliott (Bournemouth University)

[210] *An Integrated Phytolith and Geochemical Approach to Understanding Activity Areas and the Choice of Building Materials in Neolithic Sites Using Ethnographic Analysis*

The Neolithic in southwest Asia is an important period in human history which saw the advent of sedentism, agriculture, and ultimately the rise of complex societies. It is also, however, one of the most poorly understood. This is partly due to problems associated with site recognition and partly because of the lack of preservation of many forms of evidence, particularly biological. As a result, many Neolithic sites are comprised of a series of structures, the construction and function of which is difficult, if not impossible, to unravel. With this in mind we have been developing an integrated method to increase our understanding of such sites based on more durable forms of evidence, i.e. phytoliths and geochemical elements. Using an ethnographic approach we sampled a number of buildings from a recently abandoned mud and stone constructed village in Jordan, to help us understand building construction and to establish if different activity areas have specific phytolith and geochemical signals. We then used the results of this analysis to help us interpret the Neolithic sites of WF16, Beidha and Ain Ghazal.

Jenks, Kelly (Fort Lewis College)

[99] *Simulating Engagement: Teaching Students about Stakeholders*

In my introduction to archaeology class, one of the most difficult topics to make my students understand and care about is the role of stakeholders in shaping archaeological research. This subject is simply not engaging in a lecture format. So, instead of lecturing about diverse perspectives, I ask students to participate in a simulated stakeholder meeting. The recent controversy over the development of fracking at Chaco Canyon provided the inspiration for my hypothetical scenario, in which multiple stakeholders are asked to weigh in on a proposal to allow hydraulic fracturing in an area rich with cultural resources. Students are assigned the role of a stakeholder, provided with basic background information, and given one week to research their role before the simulation. Afterwards, they are asked to reflect on their experiences in a response paper. In this poster, I describe the activity in greater detail, offer my own reflections on its successes and failures, and make suggestions about how it might be adapted to suit other audiences.

Jennings, Richard [33] see Shipton, Ceri

Jennings, Thomas (University of West Georgia)

[148] *Exploring the Relationship between Folsom and Midland Points in the Southern Plains*

The relationship between Folsom points and Midland points in the Southern Plains remains an unresolved topic of debate. At the scale of individuals, it has been suggested that the fluted Folsom point was a symbolic object made by a person(s) of power to alleviate risk in hunts. Along similar lines, differences between Folsom and Midland points have been attributed to the relative skill differences between knappers. At a broader scale, some have questioned the association of Folsom and Midland, suggesting that the two might represent separate population groups or that Midland was a later development. Finally, some suggest that Folsom and Midland points were made by populations who switched from Folsom to Midland point production during periods of raw material scarcity. This paper uses current evidence to explore these hypotheses, focusing primarily on the latter two which are, in my view, the most likely explanations.

Jensen, Jacob [4] see Becker, Rory

Jensen, Anne (Bryn Mawr College)**[302]** *Nuvuk, Birnirk, Utqiagvik, Walakpa and Beyond: All Those Sites Will Soon Be Gone*

These are all classic sites, but many of them were last excavated a half century or more ago. New questions and new methods require types of data that was not collected back then; additional excavation with finer provenience control is also needed. Such work has been undertaken at sites like Cape Espenberg, but only at the Nuvuk cemetery in North Alaska. The apparent assumption by those not working in the area has been that the sites were stable, and that there was no hurry. That is no longer the case. Erosion rates have increased tremendously, due to warming permafrost, sea ice retreat and longer ice-free seasons. Nuvuk is averaging a loss of 10 m a year. Coastal erosion exposed a house at Walakpa in 2013. Small scale salvage was done, and additional funding was sought to excavate the structure and associated area, but a single fall storm in 2014 destroyed the structure before funds were secured. This paper highlights a problem with current funding mechanisms. The review process is such that funds cannot be available to deal with an important endangered site during the next field season, even if a competitive proposal is prepared on very short notice.

Jeremiah, Kristen (Public Archaeology Laboratory, Inc. (PAL))**[281]** *Lithic Variation and Tool Technology at the East Pasture Site, Martha's Vineyard, Massachusetts*

In 2003 the Public Archaeology Laboratory, Inc. (PAL) completed survey and data recovery excavations at the East Pasture Site, located immediately east of Menemsha Pond on Martha's Vineyard, Massachusetts. The investigations revealed a multi-component site dating from the Early Archaic to Late Woodland/Contact Period, and recovered a total of 19,679 artifacts and 24 cultural features. The artifact assemblage was dominated (99%) by lithics, including debitage, projectile points, groundstone tools, raw materials, utilized flakes, cores, performs, unifaces, scrapers, choppers, blades, drills, and others. Of the total diagnostic projectile points, 71% were which William Ritchie defined as Late Archaic Squibnocket Stemmed in 1969. The contexts in which the points were recovered at East Pasture suggest a temporal association to the Late Archaic through Woodland Periods, which challenges the traditional association between Small-Squibnocket Stemmed projectiles and the Woodland Period on the Vineyard. This paper details the results of the investigations with emphasis on the recovered lithics and Archaic Period occupation.

Jerrems, William**[150]** *The Rise and Fall of Lake Lahontan and the Climactic Implications for Paleoindian Inhabitants of the Great Basin*

The Lahontan Basin, a huge Pleistocene lake, located in the western Great Basin, northwestern Nevada, has had a long history of rising and falling water levels dependent on heavy precipitation and decreased evapotranspiration of the Pleistocene Ice Age climatic regime. Three subbasins occupy the western side of the Lahontan Basin and include Pyramid Lake, Winnemucca Lake and the Black Rock Desert-Smoke Creek subbasins; the focus of this presentation. The climatic implications of a filling and waning lake of such magnitude would have had a substantial impact on early inhabitants of the northern Great Basin. Recent evidence, a petroglyph panel on a tufa dome at the west shoreline of Winnemucca Lake, possibly the oldest artwork known in the Americas, has revealed a date of between 14,800-10,300 cal. yr. BP. This implies that the ancient lake had maintained a substantial high water level, filling all three subbasins for a much longer period of time than had been previously thought. These results have questioned the effect and duration of the Younger Dryas Chronozone particularly on Paleoindian habitation of the Lake Lahontan lakeshore and thus seriously questioned the archaeological interpretation of several early lakeshore sites.

Jeske, Robert [139] see Sterner-Miller, Katherine

Jessmore, Laura [54] see Motta, Laura

Jew, Nicholas [32] see Erlandson, Jon

Jewett, Maximilian (Burns & McDonnell)

[106] *Using Unmanned Aerial Vehicles for Aerial Photogrammetry on the San Diego Coastline*
Developments in Unmanned Aerial Vehicles (UAVs) over the past five years have allowed for their use among non-experts and the rapid development, at relatively low cost, of Unmanned Aerial Systems (UASs) or drones. UASs use the UAV platform to carry a variety of sensors. One of the most important developments coming from this technology is the ability to collect aerial photos for photogrammetry at relatively low cost. In an effort to better understand the uses, practical issues of operation, and future potential of UASs in archaeology this study will examine the process of acquiring and operating a large octocopter, data acquisition and data processing. The survey area is on the San Diego coast and is part of a larger effort by the Society of California Archaeologists (SCA) in conjunction with the San Diego Archaeology Society (SDAS) to map cultural resources at risk of damage by climate change.

Jiang, Leping [179] see Xie, Liye

Jigetts-O'Neill, Alexandra [21] see Turkon, Paula

Jimenez, Lissette (University of California, Berkeley)

[240] *Variations on an Osirian Theme: Gendered Expressions of Identity in Osiris Funerary Shrouds from Roman Egypt*

Throughout the Roman Period in Egypt, decorated shrouds with images of the god Osiris were used in mortuary rituals and wrapped around the mummified body of the deceased. Full-length painted images of the dead in the guise of Osiris, flanked by Egyptian funerary scenes, were effective modes of representation that reveal how gender was used to facilitate the transfiguration of the deceased and aid his or her journey in the afterlife. This paper examines gendered expressions of self-presentation and specifically investigates the iconography and composition of the Osiris funerary shrouds. An analysis of the inscriptions and representations of both males and females on the shrouds adds a new comparative dimension arguing that gender relations were fluid and dynamic—being made and negotiated through new and innovative magical and material resources. I explore the problematic relationships between death, Osiris, and the potency of masculine regeneration over feminine reproductive powers, and how these concerns were iconographically and textually addressed to preserve and commemorate the age and gender of the deceased. I conclude by revealing how the individualizing portraiture and the adaptable iconographic repertoire of the shrouds indicate a growing interest in the posthumous expression of gender and identity in Roman Egypt.

[240] *Chair*

Jimenez, Diego (INAH: National Institute of Anthropology and History Mexico) and Salvador Ruíz-Correa (Centro de Investigaciones en Matemáticas)

[346] *A New Classification of Masks from Guerrero Discovered in the Great Temple of Tenochtitlan*

This paper focuses on a new kind of typological analysis based on a quantitative procedure called Spectral Clustering. This technique uses Graph Theory to analyze the eigenstructure of an affinity matrix in order to partition data points into disjoint clusters. The original algorithms were developed a decade ago by mathematicians and machine learning professionals. To the best of our knowledge, this technique has not been applied before in archaeology despite its proven performance in partitioning a collection of artifacts into meaningful groups. As a study case we choose a collection of stone masks from Guerrero but found in the remains of the Sacred Precinct of Tenochtitlan, the main ceremonial Aztec center. The schematic features of these objects set them apart from other artifacts with more naturalistic style. This has attracted the attention of many specialists and during the last three decades the style of these items has been the subject of intense debate. Through the

application of Spectral Clustering we were able to segment this collection into well-defined groups. In the future, this could lead to a better typology of this collection.

Jiménez, Socorro [86] see Bishop, Ronald

Jimenez Alvarez, Socorro [24] see Fernandez Souza, Lilia

Jiménez Fenández-Palacios, Belen [100] see Remondino, Fabio

Jimenez Roman, Karina (Centro I.N.A.H. Oaxaca) and Jorge Luis Ríos Allier (Centro I.N.A.H. Oaxaca)

[111] *Un acercamiento al estudio de las pinturas rupestres en el Cerro Danush, Oaxaca.*

La presente investigación tiene como objetivo mostrar el trabajo realizado en el cerro Danush localizado en la comunidad de San Mateo Macuilxóchitl de Artigas Carranza, Oaxaca; el cual tuvo como eje principal conocer las características que comparten los paneles de pintura rupestre de acuerdo a su ubicación en el cerro Danush, tomando en consideración las singularidades del paisaje.

La importancia del estudio de las pinturas rupestres radica en que estas son una de las primeras manifestaciones que el ser humano dejó para la posteridad, que se plasmaron en abrigos rocosos y cuevas en los que se observan diferentes motivos pictográficos. También se describen los elementos paisajísticos ya que se consideran sus características importantes para los asentamientos prehispánicos, siendo el mismo hombre el que ha proporcionado una carga simbólica al espacio.

Jiménez-Cano, Nayeli (Universidad Autónoma de Madrid)

[130] *A Zooarchaeological Record of Ancient Fishes from the Maya: Evidence from Fish Bones in the Study of Ancient Fisheries*

Large bodies of water surround the Maya Area, and its ancient inhabitants had close subsistence relations with the aquatic world by exploiting the resources that this scenario provided them. In this sense, fishes were one of the animals widely exploited by the ancient Maya and whose zooarchaeological study helps to uncover questions and pose new queries about their social and environmental uses. This paper gathers information about the archaeological presence of such resources from various settlements in the Maya Area. The occurrence of such animals is documented in at least 56 Mayan settlements from the Preclassic Period to Colonial times. Fish remains belonged to at least 78 species that were used for ritual, food and ornamental purposes. Also it evidenced the presence of a trade network between remote inland sites and coastal settlements. This corpus of information offers to explore a holistic zooarchaeological perspective of the ancient use of fishes and to lay the foundations of ichthyoarchaeological studies in the Maya Area.

Jin, Guiyun and Fuqiang Wang

[283] *Early Neolithic Plant Exploitation in East China*

Early Neolithic plant exploitation is a key subject for understanding the subsistence strategies of late hunter-gatherers and early farmers. As archaeobotany has developed in China, plant remains, together with other ecofacts, have been recovered from several early Neolithic sites around Shandong Highlands, East China. Preliminary results show changes in the role of plant resources. At about 10000 year BP, the inhabitants of Bianbiandong Cave relied mainly on animal food with very small amount of plants. At about 9000 year BP, the Zhangmatun people exploited at least 38 species of plant resources on the floodplain near the mountains in the south. There have been very few animal remains recovered from this open-air site. At about 8000 year BP, the diversity of plant remains from Xihe and Yuezhuang site decreased to 19 wild species of plants but with 3 species of cultivated or domesticated cereals (rice, foxtail and broomcorn millet) and more than 20 species of animals which were dominated by fresh water creatures.

Jin, Hetian, Xu Liu (Culture Heritage and Archaeology Institute of Yunn), Rui Min (Culture Heritage and Archaeology Institute of Yunn), Xiaorui Li (Culture Heritage and Archaeology Institute of Yunn) and Xiaohong Wu (School of Archaeology and Museology, Peking University)

[286] *Early Subsistence Practices at Prehistoric Dadunzi in Yuanmou, Yunnan: New Evidence for the Origins of Early Agriculture in Southwest China*

In 2010, flotation work was carried out at the site of Dadunzi in the Chuxiong Yi Autonomous Zone. A number of crops were recovered from this work including: foxtail millet, broomcorn millet and rice, as well as weeds originating from both fields and the natural environment. The results of the flotation show that at 4000 BP, that the Yuanmou site had already entered a phase of agricultural production and the majority of the diet of the inhabitants of this site came from these three crops. Agriculture at Dadunzi appears to have been of a mixed strategy of both upland dry field and wetland agriculture. Upland agriculture originated from Northwest China, while rice agriculture on the other hand is hypothesized to have entered this region from areas to the east and slightly north.

Jobbova, Eva (UCL)

[130] *New Research into the Dynamics of Human-Environment Relationships in the Maya Region*

Despite recent debates and new analytical opportunities in Maya archaeology provided by developments such as increased amounts of paleoclimatic data, the growing field of settlement archaeology and advances in Maya epigraphy, we still know very little about either short or long-term dynamics of human-environment relationships in the Maya region: for example, the choices humans make in response to extreme variability in rainfall patterns or changes in soil conditions. Does society become increasingly complex? Is collapse inevitable? Do people simply move, and if so, do their ideological and religious beliefs change, or do they remain the same? This paper responds to some of above-mentioned debates and attempts to address a continuing void in our knowledge of how the Maya responded to environmental variability. I examine changing Maya settlement through time, cultural and political trajectories through epigraphy, short-term ethnographic evidence for Maya community responses to recent environmental stress and long-term climate proxies. My presentation focuses on relationship between Maya society and the local environment over the long-term, from the Classic (c. 250 to 900 A.D.) to the Early Colonial (1500/1600 A.D.) period, while also taking into account socio-cultural agencies via information from the written record.

Jochim, Michael (Univ of Cal - Santa Barbara)

[40] *A Lacustrine Revolution: Adaptive Shifts in the Late- and Postglacial of South Central Europe*

The environmental changes in Europe at the end of the last ice age had profound effects on human populations. One of these changes, the development of numerous lakes in the region north of the Alps, created new habitats and niches that were rapidly exploited, with significant effects on many aspects of behavior. The record of environmental and archaeological changes in Switzerland and southern Germany are examined with an emphasis on subsistence, technology, and land use.

Johannesson, Erik (Pacific Lutheran University)

[20] *What You See Is What You Believe: Mortuary Ideology and Transmutations in Funerary Practice at the Advent of the Xiongnu Empire in Mongolia*

This paper examines the intersection of mortuary ritual and beliefs, at the edge between funerary ideology and religion. The formation of the Xiongnu polity in the 3rd century B.C.E. in what today is Mongolia included the introduction of new funerary regimes that conspicuously upended previous mortuary traditions. Xiongnu mortuary practice breaks a millennium-long convention of east-west orientation of funerary monuments and accompanying inhumations, the creation of visibly prominent and highly variable stone monuments, and a general low investment in grave-goods in the funerary assemblage. Instead, Xiongnu mortuary monuments are oriented north-south, are placed in areas with low visibility, shift the locus of material and labor investment, both quantitatively and qualitatively, to the funerary assemblage, and introduce marked standardization throughout the

funerary repertoire, from monument form to the inclusion and placement of grave-goods. Here I question if Xiongnu mortuary practices represent the introduction of new religious ideas, and argue that they imply the strategic implementation of new ideational constellations that subvert the instantiation of commemorative narratives celebrating local lineages of leadership. While Xiongnu funerary repertoires may have referenced new cosmological beliefs, they above all stressed the adoption of, and inclusion in, a distinctively “Xiongnu” political economy.

[20] *Chair*

Johansen, Peter (University of British Columbia) and Andrew Bauer (University of Illinois)

[142] *The Techno-politics of Water and Iron: Resource Materialities in South Indian (Pre)History*
Water management and iron production were two socio-material practices deeply entangled with the politics of emerging social distinctions during the South Indian Iron Age. Beginning with small well-distributed modified rock pools and systematically dispersed iron-smithing facilities, Iron Age social actors laid specific claims to the materials, places and technologies of water management and iron production. This created and maintained a constellation of social differences and affiliations. Stepping back from a political economy of resource production, however, our interest here is with the dynamics of relational resource assemblages (e.g., materials, practices, infrastructures, knowledge) and their historical and ecological constitution. Here we investigate how the ‘distributedness’ of these assemblages both enables and constrains social and ecological conditions. In doing so we interrogate the interwoven relationship between the politics of resource production and the materiality of process, exposing a techno-politics that is uniquely disposed to this region’s ecology and history. We begin with the earliest archaeological evidence of water management and iron production during the South Indian Iron Age and end in the ethnographic present exploring how shifting orientations of assemblage components affect the value, meaning and experience of water and iron production, technology and consumption.

Johansson, Lindsay (University of Colorado, Boulder), Sara Cullen (University of Colorado, Boulder), Kaitlyn Davis (University of Colorado, Boulder), Rachel Egan (University of Colorado, Boulder) and Scott Ortman (University of Colorado, Boulder)

[95] *Engaged Anthropology at Cuyamungue, New Mexico*

In 2014 the Pueblo of Pojoaque and University of Colorado-Boulder began a collaborative project at Cuyamungue (K’uuyemugeh ‘stones falling down place’), an ancestral Tewa village. The goals of the project are to increase awareness of local ancestral sites in contemporary Pueblo communities; to strengthen local community identities; and to integrate archaeological, historical and traditional knowledge in telling the story of Cuyamungue. The first season of work involved surface survey, low-altitude aerial survey, assessment of museum collections and site visits with Tewa scholars and leaders. Initial results suggest the pueblo was founded in the late 13th century and was home to more than 1,000 people by 1400 CE. Cuyamungue continued as a smaller community through the first century of Spanish colonization, and its inhabitants participated in the Pueblo Revolt. In 1696, the remaining inhabitants moved to Tesuque and Pojoaque pueblos but returned periodically over the years to maintain their connection to their ancestral home. Cuyamungue also remains an important place in the consciousness of present-day Tewa people. Another important finding is that, under certain conditions, it is possible to trace adobe wall-lines from vegetation patterns in low-altitude aerial photos.

Johansson, Lindsay [182] see Cameron, Catherine

Johnen, Connor [362] see Stirn, Matthew

Johnson, Jennifer [28] see Kukekova, Anna

Johnson, Lisa (University of California, Berkeley), Arlen Chase (University of Central Florida) and Diane Chase (University of Central Florida)

[108] *'Limestone Bars' as Power Objects among the Ancient Maya: a Consideration of Objects as Active Participants in Ritual Practice*

This paper considers how people and things come together in a ritual setting and attempts to break down the division between the human participants and the materials engaged. Using contemporary perspectives surrounding post-Marxian materialism, it is argued that archaeology has the means to explore the ways in which materials exhibit their active nature in particular contexts. With this in mind, this study will reassess small bar-shaped limestone artifacts that have been recovered from numerous archaeological contexts throughout the Lowland Maya area of Belize, Guatemala, and Mexico. A consideration of general size, shape and treatment suggests that these objects may have been tools and that their role in ritual practice transformed them into an active participant. Understanding that things can be active when articulated in an assemblage of social relations, enables scholars to disentangle subjective assumptions of value and meaning. In this case, it enables one to argue that a seemingly "ordinary" bar of limestone, an abundant resource in the Maya area, was seen as an object of power through its participation in ritual.

Johnson, Keith

[127] *The Setting: Location, Environment and Excavation History*

Antelope Cave is a large limestone cavern sunk beneath the rolling hills of the Uinkaret Plateau in northwestern Arizona. Native Americans lived in the cave intermittently for 4000 years during the Archaic and Puebloan periods. Environmental conditions over those thousands of years appear to have changed little. This paper addresses the variety and abundance of local resources available to the cave's inhabitants who lived in this semi-arid region north of the Grand Canyon. Flora in the vicinity of the site is scanty and characterized by xerophytic plants, grasses, and very few trees. Available fauna includes antelope, deer, rabbits, small rodents, snakes and birds. Just like in the area today, sufficient water for drinking, cooking and farming was a constant challenge for the cave's inhabitants and may have been a major factor contributing to the seasonal occupation of the cave. Archaeologists from three institutions excavated Antelope Cave in the 1950s and 1980s.

[127] *Chair*

Johnson, John (Santa Barbara Museum of Natural History)

[175] *The Formation of Mission Indian Communities in South Central California: An Ethnohistorical Case Study*

The Mission Period in Spanish-Mexican California resulted in the breakdown of original independent native polities. Depopulation from introduced European diseases coupled with intermarriage between people from different tribal groups at the missions led to the disappearance of linguistic differences and the formation of new community identities named after the different missions. Alongside these processes of coalescence and ethnogenesis, political and traditional ceremonial activities continued that allowed social memory to be preserved of ancestral ethnic identities. Ethnohistorical study of records kept by Franciscan missionaries, as well as the rich ethnographic and oral historical information collected by anthropologist J. P. Harrington, permit a detailed examination of the incorporation of Chumashan peoples into the mission communities, processes of social change, and persistence of cultural identities in South Central California.

[143] *Chair*

Johnson, Adam

[159] *Discussant*

Johnson, Natasha (Phoebe Hearst Museum of Anthropology, UC Berkeley)

[160] *Discussant*

Johnson, Lauren

[162] *A Seedy Affair: An Archaeobotanical Study of the Johnston Site (36In2)*

Archaeobotanical research can provide archaeologists with insights into what plant resources past peoples were consuming and utilizing as well as the spatial organization of resource use and other activities within a site. Investigations at the Johnston Site, a large ring village located in Western Pennsylvania date back to the 1950s, yet until recently, relatively little research has been completed with archaeobotanical samples. This Late Prehistoric site is categorized in literature as representing the Johnston Phase of the Monongahela culture, but many questions still remain about village structure and its residents. Analysis of the carbonized wood and seeds retrieved through flotation not only provides a more detailed picture of the resources used by the Monongahela people but information on how those resources were distributed across features may clarify the use of space in this village. Applying archaeobotanical research to this site contributes to the understanding of Monongahela culture and provides a framework for future study.

Johnston, Janene (University of West Florida), Lara Homsey-Messer (Indiana University of Pennsylvania) and Karla Johnston (Hancock Biological Station, Murray State University)

[162] *Characterization of Plant Ash Morphology Using Scanning Electron Microscopy*

Calcitic plant ashes are a ubiquitous indicator of anthropogenic activity at archaeological sites. In conducive preservation environments, ashes may form undisturbed deposits in which individual ash crystals remain intact and identifiable. Under these conditions, ashes afford a unique opportunity to better understand both the human selection of fuel as well as to investigate changes in vegetation communities in response to climate change. This study seeks to characterize ash crystal morphologies for various hardwood and softwood species in the American Midsouth using Scanning Electron Microscopy (SEM). Preliminary data support previous research, which identified a morphological difference between deciduous and coniferous species. However, our results demonstrate that this pattern is less discrete than previously recorded, and indicate that the size and volume of crystals must be quantified in addition to simply qualitatively characterizing crystal shape. Moreover, ashes combusted from different anatomical parts of the same species (e.g., pine wood versus pine needle), show considerable differences in both size and shape and therefore require more robust indicators to differentiate. The ultimate goal of this research is to develop a comparative collection of ash crystal morphologies using experimentally combusted materials for comparison to archaeological samples from across the Midsouth.

Johnston, Karla [162] see Johnston, Janene

Johnston, Susan (George Washington University)

[289] *Space as Place: Understanding Emptiness in Archaeological Landscapes*

One of the basic tenets of the landscape approach in archaeology is that we need to think beyond the idea of discrete sites and consider instead the use of an entire landscape (or landscapes). From this perspective, places in a landscape that do not contain "sites" as understood in the conventional sense were nevertheless woven into the lives of ancient people. This means that, in order to understand the past, we need to understand both the places where people left things behind and the places where they left no obvious trace, as well as the relationships between them. This not only affects the interpretation of the past but also how archaeological data is collected. These ideas are explored in this paper with examples from public archaeology in Rhode Island and from research in Iron Age Ireland, to begin to develop ways to think about the "empty spaces" of the past.

Johnston, Christine (Cotsen Institute of Archaeology, UCLA)

[368] *Market Exchange Seen Through the Mist: Network Visualization for Variable Data*

In analyzing micro and mesoscale distribution systems, it is necessary to identify the economic structures and elucidate the socio-economic conditions governing the interaction of agents. Of particular interest in assessing economies of the Late Bronze Age Mediterranean is the potential incorporation of extra-palatial actors in privatized production and non-centralized exchange. Central to this issue is the question of whether marketing activity was extant outside royal jurisdiction, providing independent access to imports and luxury goods. In recent scholarship, materially based frameworks including the Distributional Approach have supplemented traditional studies on the

location, and spatial configuration of the physical marketplace by examining the distribution of objects throughout consumption units. This paper will explore these methods while assessing the utility of certain approaches when applied to variable datasets. Using the Late Bronze Age Mediterranean port kingdom of Ugarit as a test case, the economic structure of the site will be profiled through an examination of small finds. With a lengthy excavation history, Ugarit offers an apposite example of the opportunities and limitations provided by large and variable datasets. The illustrative capabilities of Network Visualization will then be explored for contexts in which quantitative analysis is constrained by issues of data robustness.

Johnston, Kevin (FARES), Richard Hansen, Beatriz Balcarcel (Foundation for Anthropological Research and Ecology) and Carlos Morales-Aguilar (Paris Sorbonne University)

[408] *Non-mounded Architecture, Invisible Housemounds, and the Problem of Settlement Identification and Demographics in the Mirador Basin*

In a landscape distinguished archaeologically by elite-dominated, often massive architecture, the small and unobtrusive is easily overlooked. Since its inception as a discipline, Maya archaeology's principal focus has been cities and the buildings that comprise them. These buildings, often of extraordinary scale, are typically represented in the archaeological record by mounds. This phenomenon of architectural "moundedness" has conditioned Mayanists' perception of settlement as a whole. Indeed, their search for settlement and demographic estimates has consisted almost entirely of the identification of mounded structures. Yet discoveries at numerous sites indicate that many Maya buildings and cultural activities are not represented by mounded remains. As illustrated by research undertaken in the Mirador Basin, a more productive approach re-conceptualizes the problem of Maya settlement and demographic identification in terms of prepared "surfaces," or sub-surface architecture whose discovery requires new and varied sampling techniques. The evidence of ancient behaviors, activities, and forms of organization that archaeologists seek are present primarily on these surfaces. Some such surfaces are mounded, but many of them are not. To obtain representative samples of Maya settlement, surveys must include intensive subsurface sampling—a practice too infrequently undertaken in the Maya Lowlands.

Johnstone, Dave

[323] *Round Structures: Their function(s)*

Round foundation braces for perishable walls are seldom the focus of excavation owing to their relatively unimpressive physical characteristics. However, these structures become common throughout the Northern Lowlands at the end of the Terminal Classic period, appearing in 50 percent of the surveyed sites. This paper will examine their possible function, and explain why they became so widespread.

[323] *Chair*

Jolie, Edward (Mercyhurst University)

[143] *Preliminary Insights from the Cache Cave Textile Assemblage*

Much of what is known about the pre-contact textile industries of interior Chumash peoples derives from early archaeological investigations and nonprofessional collections acquired from caves and rockshelters during the late nineteenth and early twentieth centuries. The vast majority of this material is undated, poorly provenienced, and underreported, which makes interpreting such artifacts' technological stylistic variability and significance difficult. Recent recovery of more than 500 fragments of cordage, baskets, basket impressions in asphaltum, mats, and nets from secure archaeological contexts at the Cache Cave site thus stands to enhance considerably our understanding of interior Chumash woven technologies. This paper presents the results of preliminary technological stylistic analyses of the assemblage, considers insights from this material into the use of the site, and places the Cache Cave textile assemblage within the context of previous research on Chumash woven articles.

Jolivette, Stephanie (Statistical Research, Inc.), Amanda Taylor (SWCA Environmental Consultants) and Sarah Van Galder (Statistical Research, Inc.)

[152] *Accessing and Assessing Coastal Shell Middens on Private Property in the Pacific Northwest*

The majority of coastal property in the Pacific Northwest is in private hands. Although laws in Washington State protect archaeological sites on private property, such sites are traditionally only assessed on a case by case basis when the landowner seeks a permit. Landscape scale assessments of coastal resources in the Puget Sound region are rare. Here we compare the results of two such projects along Puget Sound; an academic project in the San Juan Islands conducted by researchers at the University of Washington and a cultural resource management project conducted by archaeologists from Statistical Research, Inc. for Pierce County Planning and Land Services. Cooperation from landowners varied between projects, but in both cases concerns about changing property values and land use restrictions were paramount. Both projects utilized public outreach to increase the participation pool with some success, suggesting that utilizing social networks to reach private property owners may be a viable solution for access issues. Evidence of extensive coastal shell midden disturbance due to both natural and anthropogenic causes suggests an urgent need to engage landowners as stewardship partners.

Jolly, Sarah [203] see Kellett, Lucas

Jolly, Sarah (University of Pittsburgh) and Danielle Kurin (University of California, Santa Barbara)

[299] *Surviving Trepanation: Approaching the Relationship of Violence and the Care of "War Wounds" through a Case Study from Prehistoric Peru*

The political instability that characterizes the early Late Intermediate Period (ca. A.D. 1000-1250) in Andean prehistory had widespread impacts on how people lived, ranging from changes in settlement patterns to an increase in skeletal trauma and infectious disease. This paper explores the social experiences of violence and its implications for healthcare, primarily through the analysis of a notable case study: a young male from Andahuaylas, Peru, whose skeleton evinces multiple lesions and fractures, post-traumatic impaired mobility, and healed trepanations. Trepanation, in particular, is a clear indicator of medical intervention, but is still just one step in the larger process of care and recovery. Using modern clinical literature, it is possible to approximate the physical impacts of trauma, surgery, and rehabilitation, and address the logic of treatment during this time. More generally, we address the accommodations afflicted individuals would need to convalesce and survive in a high-altitude fortified settlement. Results demonstrate the underlying role violence played in generating novel healthcare practices and reifying new social categories in the ancient Andes. Ultimately, such data can inform on the nuances of social organization required for such intensive care and the respective social experiences of disease and violent injury in the past.

Jones, Terry (Cal Poly San Luis Obispo)

[406] *Fish, Fishing, and Fish Bones on the Central California Coast*

In much of Native western North America fish and the aquatic technologies used to exploit them were associated with intensive hunter-gatherer economies and heightened levels of socio-political complexity. Central California, however, is more commonly associated with exploitation of acorns, a resource that also encouraged dense, sedentary, storage-dependent populations. The relative significance of fish to these less populous foraging groups has only recently become a focus of systematic study. Here we review salient diachronic patterns from over 200,000 fish bones from 99 sites investigated over the last 40 years with an eye toward variation related to technological change and/or economic intensification.

[1] *Discussant*

[1] *Chair*

Jones, Hillary, Judson Finley (Utah State University), Tammy Rittenour (Utah State University) and Kenneth Cannon (Utah State University)

[6] *Depositional Circumstances of Three Paleoindian Sites along Lima Reservoir, Montana*

Wave action along the Lima Reservoir in Centennial Valley, Montana has exposed three adjacent

Paleoindian sites along the north shore cutbank. While these sites date to the same period and are near each other (within 1.5 miles), they possess markedly different geologic contexts. The westernmost site, 24BE43, is a surface scatter resting on an old soil with a very well-developed Btk horizon. The eastern site, 24BE52, is also a surface manifestation but it sits on a very thin soil capping what appear to be eroded lacustrine sediments. The center site, 24BE46, contains a likely Paleoindian subsurface component and younger surface cultural material. Using optically stimulated luminescence (OSL) dating, stratigraphic mapping, and sediment analysis, we determine the likely geomorphic sequence of events for these three sites and attempt to explain why they differ. Identifying which landforms and sediment types contain intact buried cultural material among these sites may help determine what other areas in Centennial Valley have good potential to contain subsurface archaeological deposits.

Jones, Mica [7] see Klehm, Carla

Jones, James (MN Indian Affairs Council)

[30] *Indigenous Cultural Resource Ceremonies*

Indigenous Cultural Resource Ceremonies looks at the relationship that Indigenous people have with archaeological sites and with sacred places. Spiritual connections that Indigenous people have with the land, waters and even with the stars and with the cycles of the moon. How is this relationship defined within modern archaeology and cultural resource management today? The relationship and the connections to places that we originate from. The villages, communities, towns, and the cities. Places are a way in which we identify ourselves, in Ojibwe culture that is the traditional way to introduce oneself. Your dodem and where you're from. Just like these artifacts that lay beneath the ground. What is it that lays there? What is the type of artifact or place? What is the age of the artifact or site? Where you're from, your community? This is one of the many ways that indigenous cultural resource ceremony is defined within everyday lives of Indigenous people. People have been interpreting our past and our cultures without having a clear understanding of who we really are as a people and have little or no understanding of our cultures and our spiritual beliefs.

Jones, Sharyn (Northern Kentucky University), Justin Cramb (University of Georgia) and Alison Weisskopf (University College London)

[77] *Mid-sequence Colonization and Occupation at Nukubalavu, Vanua Levu, Fiji*

Inspired by Bill Dickinson's broad and multifaceted perspective on the archaeological record of human colonization in the Pacific Islands, we present both new data from Vanua Levu, Fiji—informed in part by Bill's ceramic petrography from the site of Nukubalavu and reflections on the thalassic pattern of colonization in the central Pacific Islands. While a sea focus in the Pacific Islands is unremarkable, some Lapita, Late Lapita, and Mid-sequence occupations of Fiji reveal an intriguing pattern of colonization focused on somewhat marginal areas including small islands, tombolo, and seemingly isolated or separate sea bound land formations such as that found at Bourewa, Vorovoro, and Nukubalavu. We also describe recent archaeological work on Nukubalavu on Vanua Levu where a house foundation yielded organic material suitable for radiocarbon dating, zooarchaeological remains, Late Lapita and Mid-Sequence ceramics, coral files, charred and waterlogged archaeobotanical remains, and subsurface features.

Jones, Janet

[101] *Glass at the Crossroads: Production and Emulation at Phrygian Gordion*

Glass vessels recovered from over sixty years of archaeological investigation at Gordion (central Turkey), the capital of ancient Phrygia, range in date from the eighth century B.C.E. through the Roman period and represent nearly all techniques of glassworking. Several groups of luxury glass from Gordion illuminate key moments in the transmission of cultural influence and of glassmaking technology, production, and utilization from the Near East into the Mediterranean basin in the first millennium B.C.E. Molded glass objects from late ninth century through seventh century levels demonstrate that the Phrygians were either receiving glass objects from northern Mesopotamia, possibly in diplomatic exchange, or were themselves working glass by applying their expertise in

bronze casting to imported glass ingots. Molded vessels in the Achaemenid style from the later fourth century into the under third century B.C.E. suggest that the production of molded vessels was revived in this region under Persian influence. Categories of core-formed vessels at Gordion suggest that Phrygia may also have been a site of production during the late Classical and Hellenistic periods. This paper discusses how the important corpus of glass from Gordion informs our understanding of cultural exchange between east and west based on typological and chemical analysis.

Jones, Carleton (National University of Ireland, Galway)

[155] *Dating Ancient Field Walls in Karst Landscapes Using Differential Bedrock Erosion*

While karst environments present methodological and interpretive challenges to archaeologists, they also provide some unique opportunities. One of these opportunities is the ability to date field walls by measuring divergent rates of bedrock erosion underneath and adjacent to ancient walls. Field walls are traditionally difficult to date, either by using morphological typologies or through the association of diagnostic or chronometric materials. The method presented here, therefore, represents a valuable tool for archaeologists working in karst landscapes. The methodology is described along with a discussion of potential problems, drawing in particular upon evidence from the karstic terrain of the Burren in western Ireland. The methodology is then applied to a group of field walls on the Burren where independent archaeological and geomorphological evidence confirms the usefulness of the method.

Jones, Emily Lena (University of New Mexico), Cyler Conrad (University of New Mexico), Hannah Van Vlack and Seth Newsome (University of New Mexico)

[163] *Ritual or Dietary Use? Wild and Domestic Turkeys at Tijeras Pueblo (LA 581)*

Recent work on turkeys (*Meleagris gallopavo*) in the prehispanic Southwest (e.g., Speller et al. 2010, McCaffery et al. 2014) has highlighted both the long history of domestic turkey use in the Southwest and the concurrent exploitation of the local wild Merriam's turkeys (*Meleagris gallopavo merriami*). This new information has added to the ongoing debate over whether turkeys were domesticated for ritual or for dietary purposes. At Tijeras Pueblo (LA 581), turkeys eating a maize-heavy diet (presumably domesticates) and turkeys with an isotopic signature more similar to modern wild specimens (presumably Merriam's turkeys) have been identified in 14th century contexts. In this poster, we examine the contexts in which these turkeys were found to test the hypothesis that wild and domestic turkeys were treated differently by prehistoric Pueblos.

Jones, Terrah (UCLA Cotsen Institute of Archaeology), Jacob Bongers (Cotsen Institute of Archaeology at UCLA), Brittany Jackson (Department of Anthropology at UCLA), Susanna Seidensticker (Department of Anthropology at UCLA) and Charles Stanish (Cotsen Institute of Archaeology and the Department)

[169] *Fine China, Flatware, and Crockery: An Archaeological Reexamination of Chincha Domestic Contexts*

This paper considers how material culture reflects the manipulation and creation of identity through a reexamination of the Chincha ceramic typology using ceramic vessels recovered from two mid-Chincha Valley domestic contexts dating to the Late Intermediate Period (LIP) (1000-1400 A.D.) and the Late Horizon (LH) (1400-1532 A.D.). The Chincha Kingdom was an extensive and powerful trading polity that emerged during the LIP and continued into the LH. Previous studies identify three distinct zones within the lower-Chincha Valley (administration sector, coastal fishing district, and agricultural area), however not much is known about peoples living outside the central hubs of the Chincha Kingdom. The materials presented here derive from a series of systematic site surveys or two mid-valley domestic contexts conducted in 2014. The current analysis revealed a wide variety of vessel forms and a collection of stylistic motifs that provide insights into the construction of the social and political identities of these communities. This paper explores these different ceramic motifs and vessel forms to ascertain how the groups inhabiting these domestic sites identified themselves.

Jones, Jason (Hybrid Manufacturing Technologies) and V. Garth Norman (ARCON Inc.)

[249] *RTI (Reflectance Transformation Imaging) Examination of Weathered Sculpture for Accurate Delineation of Weathered Detail*

A test case applying advanced digital imaging to decipher weathered sculpture detail at Izapa, Mexico, was successfully initiated in 2012 by Dr. Jason Jones (University of Warwick) and completed in 2014 with support from CIR (Center for Izapan Research, ARCON Inc.) under INAH permit. A series of digital camera photos taken with lighting from different directions (highlight method) on each monument was analyzed and merged using computer software according to the Reflectance Transformation Imaging (RTI) technique as developed by Cultural Heritage Imaging and Hewlett-Packard Laboratories. This has provided an unparalleled way to review and interrogate stela details, which is far less prone to subjectivity than artistic drawings. The combined ability to view color, together with the surface shape and texture, helps resolve the difference between features carved intentionally and those arising from deterioration in the stone. Furthermore, the virtual re-lighting and magnification makes it practical to document features with a robust audit trail, which cannot easily be seen or photographed otherwise. These images confirm the superior accuracy of NWA photo drawings in Norman 1973, 1976 over artistic re-drawings from on-site/video inspection (NWA 1999, 2007 test case).

Jones, Eric (Wake Forest University), Pierce Wright (Wake Forest University) and Peter Ellis (Wake Forest University)

[275] *Examining the Non-Mississippian Southeast: A Comparison of the Intrasite Arrangement of Piedmont Village Tradition Settlements, A.D. 1200–1600*

Excavations at the Redtail site (31Yd173) have begun to reveal the internal arrangement of a Piedmont Village Tradition (PVT) settlement occupied during A.D. 1200–1600 in the upper Yadkin River Valley of the western North Carolina Piedmont. Research projects over the last 40 years have established similar information for a small number of settlements in the eastern and central Piedmont of North Carolina and Virginia. This research examines the morphology and spatial patterning of postmolds and pit features at the Redtail site and compares the results to those from sites in the Eno, Haw, and Dan River valleys. The results of this community-level analysis complement recent regional and sub-regional analyses of settlement ecology by displaying the variability across PVT settlement patterns on multiple scales. This has implications for a number of PVT cultural characteristics and phenomena, including social organization, economic exchange, and political relationships. These results further suggest a need to create a new and more complex model for studying the non-Mississippian, non-hierarchically organized societies and communities of the Late Precontact Southeast.

Jones, Brian (University of Connecticut) and Brianna Rae (Archaeological and Historical Services, Inc.)

[281] *A Snook Kill Phase Site in Marshfield, Massachusetts*

Archaeological and Historical Services Inc. recently excavated a rich Snook Kill phase site in Marshfield, Massachusetts. Dated features and diagnostic tools from the site indicate a radiocarbon age of 3500 years ago. Artifacts were recovered beneath a horizon of peat that had formed over the past 1500 years in this near-coastal setting. The strikingly pristine site documents a complete lithic artifact production, use, and discard sequence, from the reduction of rhyolite cobbles into carefully prepared cores, and large flake blanks into tools. Bifacial implements include numerous Snook Kill points, asymmetrical knives, and over a dozen awls. Refitting between debitage and tool fragments indicates two contemporaneous areas of activity. The organization of the site and spent tool kit suggest that a focused episode of construction occurred here, possibly related to bark canoe manufacture.

[281] *Chair*

Jones, Catherine (University of Wisconsin-Milwaukee)

[301] *Mixed Burials and Commingled Human Remains Recovered from the Milwaukee County Institution Grounds Poor Farm Cemetery*

From the mid-1800s to its abandonment in 1974, the MCIG Poor Farm Cemetery in Wauwatosa, Wisconsin served as a burial place for institutional residents, unidentified or unclaimed individuals

from the Coroner's Office, and the community poor and indigent. Previous excavations at the cemetery in 1991 and 1992 recovered 1649 individuals in predominantly single interments with an occasional extraneous body part representing incidental amputation or autopsy. The 2013 excavations at the site yielded 650 additional coffin burials, including a significant number of multiple interments unexpected for a historic cemetery of this time. These represent a wide range of burial contexts, including multiple complete individual skeletons as well as body parts likely reflective of autopsy and medical school cadaver use. In addition, many graves contained debris consistent with general refuse disposal and/or medical waste. The Milwaukee County Poor Farm Cemetery Project has worked to carefully excavate these commingled burials, to separate the remains, and to return individuality to those whose stories have been lost.

Jones, Warren (Qanirtuuq Incorporated)

[337] *Archaeology and Cultural Preservation: A Perspective from a Yup'ik Village*

Qanirtuuq Incorporated and the village of Quinhagak have supported archaeology in our community since 2009. Thousands of our cultural artifacts have been saved from an eroding archaeological site, and are now being studied and preserved. Working with archaeologists from the University of Aberdeen is helping our people by protecting of our cultural heritage and also in helping to reconnect young people, elders and culture-bearers. In this presentation, I will speak about my community's experience with archaeology and archaeologists, and where we will go from here.

Jones, Martin (University of Cambridge)

[345] *Discussant*

Jones, Penny (McDonald Institute for Archaeological Research, University of Cambridge), Emma Lightfoot (McDonald Institute for Archaeological Research, Un), Martin Jones (Department of Archaeology and Anthropology, University), Tamsin O'Connell (Department of Archaeology and Anthropology, Univer) and Cameron Petrie (Department of Archaeology and Anthropology, Univer)

[345] *A Climatic Imperative? Testing the Connection between Climate and Crop Adoption in the Indus and the Hexi Corridor*

Why might societies adopt new crops or change their cropping patterns? Climate change is one of several possible drivers, but its role in crop exchange has rarely been empirically tested and its importance relative to other factors, particularly cultural factors, remains controversial. As part of the Food Globalisation in Prehistory project, two isotopic studies have aimed to directly test the relationship between climate change and crop movement in particular contexts. One focuses on the Hexi Corridor, which is one of the main routes by which crops may have traveled between China and Central Asia. The other focuses on the Indus region in northern South Asia, where climate change has been invoked in both the spread of African, Eurasian and indigenous millets, and the decline of the Indus Civilization. In both cases, we have aimed to generate focused, archaeologically-relevant climatic data which have the capacity to provide a robust empirical foundation for testing the relationship between climate change and crop movement. In so doing, we hope not only to further our understanding of the possible role of climate in these two key locations, but to demonstrate new approaches and techniques with the potential for much broader application.

Jones, Ian (University of California – San Diego)

[402] *Questioning Technological and Economic "Decline" in the Medieval Rural Levant*

This paper argues against a common view of medieval Levantine villages as isolated from larger regional centers by examining a group of hand-made ceramics — commonly called Hand-Made Geometrically Painted Wares (HMGPW), and formerly "pseudo-prehistoric" wares — prevalent across the Levant from the 12th-17th centuries A.D. They are generally seen as the products of non-specialist village potters and, as the older name suggests, an example of technological decline. That view, though, is based primarily on ethnographic evidence from the late 19th and 20th century Levant, and hinges on a number of assumed, and generally unquestioned, dichotomies: urban/rural, specialist/non-specialist, wheel-made/hand-made. As HMGPW is the most visible indicator of

settlement during these periods in the southern Levant, these assumptions have influenced the ways archaeologists conceive of rural Levantine economies, leading to a view of villages as disconnected from larger centers where higher-quality, wheel-made pots were produced. This view, however, is at odds with historical evidence for substantial state investment in rural agriculture. In this paper, I present a broader approach to HMGPW — integrating archaeological and ethnoarchaeological insights from beyond the Levant — that helps us better understand what the widespread adoption and longevity of this “retrogressive” technology says about rural economies.

Jones, Kari

[416] *Before San Francisco: The Archaeology of El Polín Spring in the Presidio of San Francisco*
Archaeological research at El Polín Spring in the Presidio of San Francisco illuminates the early history of the city before San Francisco and Yerba Buena. Initial historic research and archaeological excavation at El Polín revealed what was interpreted to be the home and associated refuse midden of two intermarried colonial families. This is the first known Spanish-colonial occupation outside the walls of El Presidio de San Francisco, dating to sometime after 1812. More recent excavation at the site has uncovered additional features, including a terra cotta tile kiln, suggesting a more complex settlement. This paper explores the potential of the preserved archaeological site at El Polín to answer questions about the Spanish and Mexican period in what is now San Francisco. Current efforts to interpret this history to park visitors are also discussed.

Jorda Pardo, Jesus F. [155] see Aura Tortosa, J. Emili

Jordan, Keith (California State University, Fresno)

[39] *From Tula Chico to Chichen Itza: Implications of the Epiclassic Sculpture of Tula for the Nature and Timing of Tula-Chichen Contact*

Although most scholars now reject hypotheses of a Toltec invasion of Yucatan to explain similarities between the art of Tula and Chichen Itza in favor of models involving economic, political, and religious interaction between the two centers, questions remain concerning the nature and timing of this exchange. Some archaeologists and art historians posit a 9th-10th century florescence for “Toltec” Chichen, and argue that since this makes the “Toltec” style in Yucatan older than the Tollan Phase at Tula, most of the style features shared between the cities originated with the Maya. I examine the relevance of the Epiclassic relief sculpture of Tula Chico for this debate. The presence of reliefs of reclining figures in clear “Toltec” style at Tula Chico, in contexts predating their occurrence at Chichen Itza, suggests that claims for a predominantly Maya origin for that style stand in need of revision. Such rethinking is supported by other images from Tula Chico (eagles and Venus symbols), as well as by new studies of ceramics and chronology at Chichen.

Jordan, Amy (University of Washington)

[44] *Alone in the Deep Blue Sea: A Comparison of Indonesian Colonial Period Nutmeg Plantations and New World Plantations*

Plantations on the nutmeg-bearing Banda Islands are contemporaneous with early North American plantations and are an excellent place to investigate cross-cultural responses to colonialism. The Banda Islands were the world’s sole source of nutmeg in the 16th century and control over this spice was a major goal for European powers during the Age of Expansion. Consequently, the Banda Islands were the location of early experiments in colonialism by European powers and can provide information for cross cultural studies of the different responses to colonialism, as suggested by Deetz (1991). Using models of ethnogenesis and resistance developed from the study of New World plantations, I review how well these models fit the archaeological record from three colonial era nutmeg plantations in the Banda Islands, Maluku Province, Indonesia.

Jordan, Jillian (University of New Mexico) and Keith Prufer (University of New Mexico)

[248] *Late Classic Household Ceramic Production at Uxbenká, Belize*

Uxbenká, an Early Classic to Late Classic period Maya polity, is the most extensively excavated site in southern Belize. Recent ceramic analyses have succeeded in refining our understanding of the

extent and duration of occupation at Uxbenká as well as its position in regional interaction spheres. Like other sites in the Maya Lowlands, we know very little about household ceramic production due to the lack of workshops and tools, probable seasonal production resulting in low volumes of finished products, and firing areas located outside structures where excavations are focused, making it difficult to identify these contexts in the archaeological record. Recent analyses of previously excavated ceramic and lithic assemblages from settlement groups located in the southwest periphery of Uxbenká's hinterland revealed evidence of Late Classic (A.D. 600-800) household ceramic production. Evidence includes polishing stones, ceramic tools, and unifacially retouched chert flakes that may have been to scrape ceramic vessel walls. This poster presents the results of use wear analyses on ceramic production tools. These data, in concert with contextual and spatial data, provide information on household production and intracommunity interaction at Uxbenká.

Jordan, Alexis [301] see Freire, Shannon

Jordan, Alexis (University of Wisconsin-Milwaukee), Catherine Jones (University of Wisconsin-Milwaukee) and Shannon Freire (University of Wisconsin-Milwaukee)

[301] *The Sum of Their Parts: Reconstituting Individuality from Atypical Mixed Burials at the Milwaukee County Institution Grounds Poor Farm Cemetery*

Excavations in 2013 at the Milwaukee County Institution Grounds cemetery recovered 650 burials from one of four locations used by Milwaukee County officials for burial of more than 7000 individuals from the mid-1800s through 1925. Of those recovered during the 2013 excavations, at least 25% have been identified as multiple interments. The diverse depositional contexts of several of these burials are indicative of a variety of mortuary behaviors atypical for a historic cemetery during this period. The interment of partial human remains, medical waste, and presence of secondary burials suggest a deliberate departure from mortuary norms exhibited elsewhere at the site and have resulted in a loss of individuality for the deceased. Examination of the burial assemblages, associated historical documentation, and skeletal analyses will shed light on the society that conducted these atypical interments and allow us to retrieve a degree of individuality for those interred.

Jorge, Ana (University of Aberdeen), James Conolly (Trent University) and Rick Knecht (University of Aberdeen)

[337] *Soils, Plants, and Animals in the Making of Hunter-Gatherer Pottery in Coastal Alaska*

Explorations of human-environmental interactions in prehistoric Alaska tend to draw on biological, botanical and faunal data. Artifacts have often received much less attention beyond links to subsistence concerns and the gathering of additional paleoenvironmental information (e.g. wood and grass species). Pottery, in particular, has featured in such discussions only in regards to the processing of foodstuffs: both its suitability for particular cooking methods and the substances it may have contained. Yet, ceramic technologies can be viewed in terms of people's engagement with the environment and transmission of environmental knowledge as well as use of material resources. Ongoing study of pottery assemblages from the late prehistoric site of Nunalleq shows that ceramic vessels were often tempered with grasses, while lamps were often tempered with fur or not tempered at all. In the tundra and highly dynamic deltaic landscape of this part of Alaska, sourcing for clay required great understanding of the land and its sharp seasonal changes. This paper will argue that detailed ceramic technological studies can provide the opportunity to further explore interactions between prehistoric arctic hunter-gatherers and their environment.

Joslin, Terry

[32] *Fishing and Ecological Resilience on California's Channel Islands*

On California's Channel Islands, the Chumash and Tongva relied on a relatively consistent repertoire of small and medium-bodied fish species over a period of more than 10,000 years. Throughout all time periods, the majority of fishes in the archaeological record could have been procured from the near shore waters of rocky intertidal, sandy beach, and kelp forest habitats. There is also limited evidence for offshore fishing for large pelagic fish later in time. I argue that the significant continuity

in fish species caught through time reflects the abundance and resilience of fish in this highly productive marine ecosystem. Even during periods of lowered marine productivity small and medium-bodied fish were important contributions to islander diets, suggesting the fish resources around the islands were both abundant and stable through time. Various island assemblages show a dramatic increase in fishing alongside an increase in population density during the Late Holocene (4000 cal BP to present). This reflects the flexibility of subsistence fishing and its ability to be intensified to support larger populations. These results provide significant insights on the long-term adaptability of island fishers, and the role of rich marine fisheries in mitigating resource stress.

Joyce, Rosemary (University California Berkeley)

[16] *Interrogating "Property" at Neolithic Çatalhöyük*

Neolithic Çatalhöyük poses an interpretative challenge: while there is evident distinction among houses in elaboration, concentration of mortuary remains, and generational persistence, this did not translate into the kinds of material advantages that can be discerned as dietary privilege or preferential mortuary treatment. This has led to the characterization of the people of the site as "fiercely egalitarian". In this paper, I reconsider the established facts from the perspective of the ethnographic analysis of living societies on which the social model of the "house", used to understand Çatalhöyük, is based. Materially visible inequality is not always present in ethnographically, or else is blurred by processes such as distributed curation and use of materials by people other than their acknowledged owners. This leads to a reconsideration of what kinds of "property" can distinguish the estate of a house, with particular attention to what was labeled "immaterial property" in the initial definition of house societies. Economic stratification can be independent of hierarchies of status, prestige, or ritual power. I report on an investigation of one way that one form of immaterial property might be reflected archaeologically: through control of knowledge, or even authorization to produce, craft goods, specifically, pottery vessels.

[108] *Discussant*

Joyce, Arthur [249] see Brzezinski, Jeffrey

Joyce, Arthur (University of Colorado at Boulder), Arion Mayes (San Diego State University), Bethany Weisberg (San Diego State University) and Chris Morgan (Western Door Archaeological & Osteological Service)

[410] *The Bioarchaeology of the Cerro de la Cruz Cemetery*

This paper discusses preliminary bioarchaeological findings from the Late Formative cemetery at Cerro de la Cruz in the lower Río Verde Valley on the Pacific coast of Oaxaca. The Cerro de la Cruz cemetery has figured prominently in a long-running debate over the hypothesized conquest of the region by Monte Albán. We discuss the results of detailed bioarchaeological analyses of four individuals from the cemetery in the context of an ongoing regional study. Although taphonomic processes complicated the analysis, the individuals from the cemetery did not reveal evidence of traumatic injuries consistent with warfare. Instead, the range of pathological conditions visible on the bones is consistent with broader regional patterns. Although the age profile of the cemetery is clearly biased toward adults, this pattern appears to be the result of cultural selection and not death in battle. We also discuss the migration implications of a strontium isotope analysis from individuals in the cemetery. We consider the Cerro de la Cruz cemetery in relation to four cemeteries discovered in the region that span the Late Formative to the Early Classic periods.

Juarez, Santiago (University of Illinois at Chicago)

[237] *The Preclassic Maya Site of Noh K'uh: A Network of Communities*

In many societies around the world, the concept of community plays a central role in the formation of individual identities. Communities are subject to change and the focus on community identity provides a theoretical approach in which the individual can be situated in a broader sphere of social interaction. I research community through spatial analyses of human constructions at the Preclassic site of Noh K'uh in Chiapas, Mexico. My findings revealed that house-mounds clustered on hill-tops that were heavily modified to accommodate multiple structures. Through spatial observations and

other archaeological data, I propose that the site of Noh K'uh could be best understood as a collection of corporate households, in which individual buildings and platforms were designed to meet specialized needs. In practice, these aggregates were micro-communities where the processes of production, distribution, transmission and reproduction took place over very wide spread spaces that encompassed multiple buildings. Spatially similar to neighborhoods, these micro-communities were tightly knit with well-defined and unique identities that were constructed and maintained through ritual activities. As an early urban society, Noh K'uh offers the opportunity to study how populations organized themselves during an era of incipient urbanization.

Judd, Veronica (Arizona State University), Hannah Zannotto (Arizona State University), David Abbott (Arizona State University) and Douglas Craig (Northland Research, Inc.)

[123] *Digging without Getting Dirty: Making use of Archival Data to Explore Variations of Labor Costs in Hohokam Residential Architecture at Pueblo Grande*

Archaeological research in Arizona's Phoenix Basin has been ongoing for nearly four decades, reaching its heyday during the 1990s. This resulted from large CRM projects associated with development in Phoenix, especially A.D.OT. The potential uses of data collected as a part of these excavations has only begun to be realized, and efforts to digitally preserve and make available these data accessible for new analysis are underway. At Pueblo Grande and elsewhere in the lower Salt River Valley, there was a rapid change from Hohokam pithouses to narrow-walled adobes at ~1150 A.D. This change was probably the result of environmental degradation, which made it necessary to use less wood and more adobe in house construction. Later, a second transition to massive-walled adobes enclosed behind towering compound walls occurred across the Hohokam region around 1275 A.D. Using archival data we calculated labor costs for more than 100 rooms at Pueblo Grande and compared them within and between architectural styles. We found the labor costs for massive-walled adobes were considerably greater than for other kinds of structures. From these labor costs we aim to better understand the architectural transitions, as well as examine potential wealth differentiation at Pueblo Grande and beyond.

Juengst, Sara (UNC-Chapel Hill)

[187] *Community and Ancestors in the Titicaca Basin during the Formative Period*

The Formative Period (1500 B.C.-A.D. 200) in the Titicaca Basin was a time of important social and economic changes, such as the establishment of sedentary settlements and long distance trade routes, increasing horticultural investment, and an emerging regional ritual tradition, Yaya-Mama. However, while archaeologists have documented and described these changes, less is understood about how they impacted local communities. In particular, Yaya-Mama has been interpreted in a variety of ways: as a unifying lake basin identity, a social mediator, a cult of ancestor worship and the emergence of social stratification. To investigate this ritual tradition and its impact on the lake basin, this project uses human skeletal remains excavated from four temple and two non-temple sites. Specifically, I ask how people participating in Yaya-Mama ceremonies were related, both socially and genetically, to others in the lake basin and how they negotiated changing community boundaries and identities. In this paper, I will report dietary and disease lesion data and the results of biodistance and strontium isotope analyses in order to reconstruct who shared access to resources, who was considered acceptable reproductive partners, and if participants at temple rituals were local or foreign.

Juleff, Gillian (University of Exeter)

[89] *Does Practice Make Perfect? Is It Possible to Read Technological Development in the Actions and Outputs of Individual or Group Practitioners?*

No smelter of iron, industrial or pre-industrial, expends energy in gathering raw materials, designing, building and running a furnace without the intention of producing useable metallic iron at the end of the process. Therefore their work is ultimately driven by a success imperative. At a macro, cultural-scale technological development may be readily discernable through indicators such as material/alloy properties, artifact traits and production levels. However, change is brought about by individual or small group actions, whether incremental or fundamental, and actions are rooted in more than one origin. This paper considers the interplay between actions derived from inherited and

established practice, ease (convenience), idiosyncrasy (personality) and optimization (conscious trial and error) and explores what opportunities may exist to detect these in the archaeological record. Two examples will be examined; the macro-morphology of smelting sites and residues, and the micro-morphology of tap slags produced during experimental smelting.

Julien, Sion [242] see Barrientos, Isaac

Júlíusson, Árni Daníel [351] see Harrison, Ramona

Just, Bryan

[88] *Incoherent Internationalism: Mayoid Elements in the Art of South-Central Veracruz*

During the Epiclassic period, several discrete iconographic motifs and technical qualities were adopted by peoples of South-Central Veracruz that have close affinities to art of the greater Maya area. For example, some Rio Blanco modelled-carved bowls mimic the iconography of Tiquisate wares of Escuintla, Guatemala. Nopiloa figurines bare well-known ties to figurines from Campeche, Mexico. Apparently indicating an alternate direction of artistic influence, decorative motifs common on polychrome plates from the Las Tuxtlas region of Veracruz were incorporated into plates of Maya manufacture. It will be shown that such artistic relationships are not indices of some unified, emergent world religion (Ringle, Gallareta Negrón, and Bey 1998) nor components of a broadly-shared, political-ideological system (López Austin and López Luján 2000). Instead, they seem intensely local and particular. This paper will posit that such cases of apparently disjunctive, long-distance copying or emulation must also be taken into account when considering the nature of multi-culturalism and interaction during the Epiclassic period.

Justeson, John

[259] *Language Contact and Intergroup Interaction in Precolumbian Mesoamerica*

Research on contact linguistics has shown that, and to a great extent how, the nature of the linguistic influence of speakers of different languages on one another relates systematically to the nature of the interactions among speakers of these languages. This paper will survey some of the evidence and inferences that historical linguistics can contribute to some of the culture-historical situations addressed by other papers in this symposium, from varying time frames, and will address some of the controversies and the kinds of analysis and evidence that seem to contribute to the understanding of precolumbian intergroup interaction across a range of times and places. Facets of this framework are applicable within other kinds of expressive systems. However, understanding the internal histories of languages and language families depends upon detailed documentation of Mesoamerican languages, and a great deal of the linguistic diversity remains to be documented. Until richer documentation work is done, especially on Oto-Manguean languages, linguistic resources will not be able to elucidate some of the major transformations in Mesoamerican prehistory.

Kabata, Shigeru [317] see Murakami, Tatsuya

Kacki, Sacha (UMR 5199 - PACEA) and Dominique Castex (UMR 5199 - PACEA)

[207] *From Burial Grounds to the Interpretation of Past Epidemics: Diagnostic Approach and New Insight on Funerary Practices*

Archaeological discoveries of mass graves testify to an abnormally high death rate linked to a specific event, such as wars or epidemics. Two research lines are fundamental to ascertain the nature of such crises: biological analysis of the exhumed skeletons (age, sex, and paleopathology), and research on the DNA of the ancient pathogens which may have caused the deaths. In addition, these burial sites provide insight into the impact of such a high mortality on funeral customs. At present, enough data are available, especially on plague, to develop an interdisciplinary strategy in order to interpret accurately mortality crises of the past. Therefore, we propose a synthesis on this topic based on several European burial sites related to epidemics. Through the analysis of

archaeological data, our aim is to better understand the attitude of ancient societies toward epidemic death, and to highlight discrepancies between the archaeological evidence and both the textual and iconographic sources that describe these peculiar events.

Kahanov, Yaacov [368] see Bar-Yosef Mayer, Daniella

Kahn, Jennifer (The College of William and Mary)

[388] *Priests' Houses and Architectures of Ideology in East Polynesia*

Most studies of East Polynesia religion focus on the largest monumental sites, those related to the "marae complex". Yet ethnohistoric documents indicate that a wide range of site types had ritual importance, including specialized structures within monumental ritual centers that had diverse functions. Priest houses form one element of the architecture of ideology. Can we identify the houses of full time ritual specialists in the archaeological record of East Polynesian in order to enrich our understanding of religion and social complexity in prehistory? Utilizing ethnohistoric data and archaeological case studies drawn from the Society Islands and the Hawaiian archipelago, I argue that priests' houses conform to specialized house sites and differ in sometimes dramatic ways from mundane sleeping houses, both in their spatial context and in their suites of artifacts and sub-surface features. I conclude that identifying formalized occupational specialists in the archaeological record adds to our understanding of the integrated nature of ideology and social and economic control as important power bases for socio-ritual elites in complex societies. Such a bottom-up perspective draws on the strengths of household archaeology while allowing for a contextualized approach to identify ritual practitioners and their association with monumental architectures of ideology.

Kaijankoski, Philip (Far Western Anthropological Research Group) and Jack Meyer (Far Western Anthropological Research Group)

[293] *A Land Transformed: Holocene Sea-Level Rise, Landscape Evolution, and Human Occupation in the San Francisco Bay Area*

The effects of landscape evolution on the archaeological record of the San Francisco Bay Area have been profound, primarily due to rising sea levels. These changes are illustrated through a trans-Holocene "tour" of the bay that incorporates the landscape context of many sites featured in subsequent papers. For the region's first inhabitants, this area was a vast inland valley rather than the state's largest estuary. The Holocene transgression is illustrated utilizing a new sea-level curve developed for region, which is based on an analysis of over three hundred radiocarbon dates from marsh deposits in the bay and delta. This curve is used to reconstruct the extent of the bay at various times in the past, illustrating just how much of the landscape once available for prehistoric human populations is now submerged. The terrestrial response to rising sea levels during the latter portion of the Holocene included infilling of formerly incised stream channels, alluvial deposition on surrounding floodplains, and the formation of extensive wetlands and dune fields, as illustrated by recent geoarchaeological studies from the region. These examples show how large-scale landscape changes structured the region's archaeological record, and likely explain why the early portions of California's past are poorly represented.

Kaiser, Jozef [12] see Láznicková-Galetová, Martina

Kaiser, Jessica (University of California, Berkeley)

[240] *Where's your Mummy? The Business of Mummification in Late and Roman Period Egypt*

It is often said that the practice of mummification became a veritable business during the Late and Roman periods, when it was extended to include not only the elite, but also those on the lower end of the status scale. The increase in the number of bodies being embalmed led to the widespread adoption of more expeditious techniques, sometimes resulting in mummies that, though outwardly pleasing in appearance, concealed nothing but a jumbled mess of bones beneath their wrappings. The non-elite Late through Roman Period cemetery of the Wall of the Crow at Giza has yielded several examples of such presumed shoddy workmanship. In one example, a coffin contained one primary individual and three additional lower legs. In others, the bodies had been heavily

manipulated or were missing altogether. Scholars have often interpreted such 'fake' or 'composite' mummies as false advertising on the part of the embalmers. However, archaeological finds accompanying the Giza burials and the appearance of some of the coffins suggest that the mourners must have been at least somewhat aware of their imperfect contents, rather than unwitting victims of 'embalming fraud', perhaps influencing the way their loved ones were represented in death more than previously thought.

[240] *Chair*

Kakaliouras, Ann (Whittier College)

[146] *Quantifying Indianness: Commonsensical Practice in U.S. Bioarchaeology and Skeletal Biology*

Throughout the 19th and 20th centuries, U.S. museums and universities amassed massive stores of the skeletons of Native American people. These collections eventually became the source-base for bioarchaeology, a subfield of both physical anthropology and archaeology that emerged in the 1970's and continues producing interpretations about past Native American identities from the study of skeletal remains. Over the last few decades, the reburial movement and the passage of NAGPRA has slowed—or sometimes stopped—further collection of Native American remains, and has given indigenous people a say in the fates of their ancestors and a seat at the archaeological table. Yet, cultural interpretations in bioarchaeology and skeletal biology remain insular and informed by processual concerns with objectivity. This "objectivity," though, has commonly rested on older, biologized notions of identity, including claims that remains must "look Indian" to be related to or ancestral to contemporary Native people. Kennewick Man/The Ancient One represents the most famous recent instance of this interpretive tradition in bioarchaeology and skeletal biology. This paper, however, focuses on other more ubiquitous and less publicized cases to assert that common sense notions that equate morphology with cultural identity need further examination in the anthropological and archaeological sciences.

[146] *Chair*

Kakoulli, Ioanna [140] see Muros, Vanessa

Kalra, Kanika (University of California Los Angeles)

[180] *Innovations under Limitations: A Landscape Approach to Agricultural Practices and Water Management in a Frontier Zone of Medieval South India*

Agricultural intensification and water management are widely studied in the context of changing political complexity. My research, centered on semi-arid southern India, addresses this theme through a survey of three areas that exemplify the diversity of archaeological sites and trajectories of change in the Raichur region. Irrigation played a significant role in the expansion and intensification of agriculture in this region, achieved through the construction of reservoirs that conserved surface run-off during the monsoons. These reservoirs directly fed the agricultural fields and also replenished the underground water table, from which people drew water by constructing wells close to the embankments. Inscriptional and historical data provide the wider context within which the results of the systematic survey are analyzed. This research indicates that the spread of state society into the Raichur frontier zone did not by itself necessitate monumental investments in agricultural intensification. However, when political stress increased, local elites came to amass greater allegiance and control over resources that allowed them to construct and maintain substantial hydraulic infrastructure. The over-arching regional powers in turn depended on these local elites to control and extract resources from these frontier areas.

Kamenov, George D. [164] see Krigbaum, John

Kaminski, Amanda [164] see Hendrix, Jillian

Kamp-Whittaker, April (Arizona State University) and Bonnie J. Clark (University of Denver)

[237] *Creating a Community in Confinement: The Development of Neighborhoods in Amache, a WWII Japanese American Internment Camp*

In 1942 Japanese Americans from the west coast of the United States were forcibly relocated to incarceration camps scattered across the interior of the country. Constructed by the Army Corp of Engineers and designed to house around 10,000 individuals, these centers followed a rigid, gridded layout that allowed for the rapid construction of what were ostensibly cities. Residential sections were laid out in blocks, each containing twelve “apartment” buildings to which internees were assigned on arrival. Four seasons of intensive pedestrian survey at Amache in Colorado, accompanied by extensive oral histories, has determined that these residential blocks became neighborhoods with individual character and personalities. Particularly compelling are the internee-created landscaping features, which are sometimes coordinated at the level of the block. This paper will discuss the strategies of these frequently arbitrary arrangements of families for creating more cohesive units in a place they did not choose to live. Especially in light of the nature of institutional confinement, these results contribute to the disciplinary conversation about the social role of neighborhoods in the formation of community identity.

Kandler, Anne (City University London)

[191] *Analyzing Cultural Change*

The archaeological record provides information about frequencies of different cultural artifacts in potentially time-averaged samples. The temporal frequency changes of these artifacts reflect the dynamic of the underlying evolutionary processes but the question remains whether inferences about the nature of those processes, especially about the nature of cultural transmission processes, can be made on the base of observed frequency patterns. Here we develop a non-equilibrium framework which establishes whether observed frequency changes between samples at two different time points are consistent with different hypotheses about cultural transmission, in particular with unbiased, frequency-dependent and age-dependent transmission. We account for the fact that any evolutionary process acts on the population of artifacts and not only on the observed sample and allow for time-averaging mechanisms. The model produces theoretical samples conditioned on the considered transmission hypotheses and using Bayesian techniques we are able to infer which hypotheses could and more importantly could not have produced the observed frequency changes between the two samples. Lastly we apply the developed framework to a dataset describing the Linear Pottery Culture and show that unbiased and frequency-dependent transmissions are not adequate descriptions of the observed data. Age-dependent transmission, however, is mostly consistent with the observed frequency changes.

Kane, Susan [3] see Carrier, Sam

Kang, Bong (Gyeongju University)

[49] *A Reexamination of the Terrestrial Animals Depicted on the Rock Art of Bangudae in Southern Korea: Problems of Animal Domestication and Chronology*

Many aquatic and terrestrial animals such as whales, sea lions and turtles, tigers, wild cats, deer, boars, and weasels were identified on the rock art of Bangudae, located in the southeastern part of Korean peninsula. The scenes of human figures, whale hunting, boats, and net and fence huntings are also presented. Some Korean scholars have suggested that domesticated animals such as cow, horse, sheep, goat, pig, and dog appear in the rock art. This paper argues that domesticated animals do not exist on the rock art and its chronology is much earlier than the Bronze Age (ca. 300 B.C. – 100 A.D.).

Kansa, Sarah (AAI / Open Context)

[123] *DINAA and Bootstrapping Archaeology's Information Ecosystem*

Data management is fundamental to the practice of archaeology in the 21st century. As such, archaeological data management requires wide engagement and capacity building across our discipline. Archaeological data management increasingly involves the choreography of diverse data, software, Web-based services, and communications channels deployed and curated by a host of

actors, ranging from individual researchers, to open source projects, libraries and archives, publishers, and commercial ventures. A major challenge centers on cultivating collaborative and synergistic approaches to working with digital data given the wide array of interests, players, and institutions involved. This poster presents the Digital Index of North American Archaeology (DINAA), a project that can help catalyze Web-scale collaboration in using data to understand the prehistory of North America. The project emphasizes Linked Open Data (LOD) strategies to publish governmentally-produced site file data without revealing site coordinates and other sensitive information. DINAA is an Internet index for archaeological concepts of culture histories, site types, diagnostic materials, investigation strategies, and important attributes. The poster illustrates how DINAA is starting to be used as an investigative tool and a tool to help cross-reference relevant data curated by researchers and institutions across the Web.

[68] *Moderator*

[5] *Discussant*

Kansa, Eric (Open Context / UC Berkeley)

[200] *Academic Freedom, Data, and Job Performance in the Panopticon*

This paper explores the challenges in recognizing and rewarding greater openness and collaboration in archaeology, given neoliberal institutional realities. After years of advocacy, governments and major granting foundations have embraced many elements of the open science reform agenda. The White House recently made open access and open data in research a policy goal, and it is exploring other policies to promote “reproducibility” in federally-funded research, including archaeology. Despite open science’s success in entering the mainstream, the outlook for enacting meaningful improvements in practice remains far from certain. Archaeologists, like most scholars, face both tremendous competitive pressures and increasing time constraints on their research. It is a great irony that “data” in the form of normative publication performance metrics, dissuades many from sharing their own data. This paper explores how Taylorism, especially performance metrics, helps shape the published archaeological record. New policy requirements, including Data Management Plans, the growing prominence of new Web-based “Alt-Metrics”, and emerging Linked Open Data technologies will further expand the scope of performance monitoring. Open science and digital humanities advocates have struggled for recognition and autonomy to pursue their research goals. How will we encourage greater academic freedom and avoid further entrenching workplace surveillance?

[68] *Discussant*

Kansa, Eric [123] see Kansa, Sarah

Kantner, John (University of North Florida)

[287] *Discussant*

Kaplan, Robert [122] see Ranhorn, Kathryn

Karacic, Steven (Bryn Mawr College)

[398] *Producing Pottery in a Province of the Hittite Empire*

The Hittite Empire seized control of Cilicia, corresponding with the present-day states of Mersin and Adana in the Republic of Turkey, in the latter half of the second millennium B.C.E. While this region was under imperial rule, Hittite-style pottery became the most common ceramic type. Geochemical analysis of the pottery from Tarsus-Gözlükule, an urban center within Hittite Cilicia, indicates that the Hittite-style pottery was locally produced. At the same time, alternative ceramic types are found alongside the Hittite-style pottery. These alternative types developed from Cilician traditions pre-dating the Hittite conquest and were made using the same raw materials as the Hittite-style pottery. The aim of this paper is to explore how pottery production was organized within the community of Tarsus-Gözlükule and to examine what this organization can say about the relationship that

developed between imperial and provincial actors. Ultimately, this paper will use the production of pottery as a means of speaking to the complex, inter-societal nature of empire.

[398] *Chair*

Karberg, Rebecca (US General Services Administration)

[392] *49ers and Firm Foundations: A Short Archaeological History of San Francisco's Civic Center*

As part of the work undertaken as part of the rehabilitation of the historic Federal Office Building at 50 United Nations Plaza in San Francisco, the US General Services Administration uncovered some of the remaining foundations for San Francisco's old City Hall, which was destroyed in the earthquake of 1906. These foundations represent the easternmost extent of the city hall, which had not been previously documented. Previous work on the rehabilitation project had turned up artifacts that originated from another chapter in the site's history, when the civic center area of San Francisco served as the main burial ground for the city, Yerba Buena Cemetery. In this paper I will explore the archaeological history of this small but important part of San Francisco, the artifacts that GSA has uncovered at the site of 50 United Nations Plaza, and the role that the federal government plays in preserving and maintaining these historic resources.

Kardamaki, Elina [25] see Tenconi, Marta

Kardulias, P. Nick [51] see Torpy, James

Kardulias, Paul (College of Wooster)

[292] *Stone Tool Use in Late Prehistoric and Historic Contexts in the Eastern Mediterranean Region*

In part because of their lack of plasticity (compared to ceramics, for example), lithics exhibited relatively little change over long periods of time. This rigidity of form also conferred great benefits on lithics. With some modification, various stones could make extremely useful implements for cutting, scraping, drilling, incising, and abrading, grinding, or crushing various materials, even when compared to tools provided by new technologies. Indeed, both flaked and ground stone tools persisted even as new materials and technologies were introduced because their relatively low cost and high durability provided substantial value and utility for people. Specifically, this study examines the continuation of lithic technology from the end of the prehistoric period (Bronze Age) into subsequent historical phases (Archaic, Classical, Roman, Byzantine) in the eastern Mediterranean and Near East. In some instances, such as with threshing sledges and the use of millstones to grind grains, the technology persisted well into the 20th century and was a significant part of the domestic and political economy. The concepts that underlie this technological persistence are strategic thinking and economizing behavior on the part of people in cultures past and present.

Kardulias, P. Nick [92] see Bosch, Stephanie

Kariwiga, Jason [52] see Golitko, Mark

Karkanias, Panagiotis [190] see Marean, Curtis

Karkanias, Panagiotis (The Malcolm H. Weiner Laboratory for Archaeological Science, ASCSA)

[356] *Micromorphology Reveals Changing Levels of Site Occupation Intensity at Pinnacle Point 5-6*

Using simultaneously fine and coarse resolution sedimentary studies of the deposits of the MSA site of PP5-6 at Pinnacle Point, Mossel Bay, South Africa, it was able to reveal different patterns of anthropogenic input and behavior and how these changed through time. Through the microfacies approach using micromorphology it was documented that the PP5-6 sequence shows occupations characterized by small groups and short visits during MIS5. This part of the sediments is dominated

by numerous single and mostly intact hearth structures in a roofspall-rich matrix. The sea was very close to the site and the people were focused on exploiting the rocky shores. With the beginning of the glacial conditions of MIS4, the occupation of the site becomes much more intense. This part of the sequence is characterized by the occurrence of thick palimpsests of burnt remains, sometimes disturbed by small-scale sedimentary gravity processes. As sea level dropped and the coastline retreated, the geogenic input shifted to predominately aeolian sediments implying an exposed shelf probably associated with a rich but more distant coastal environment. Since sites dating to MIS4 are abundant in the Cape, we suggest that populations during MIS4 responded to glacial conditions with population growth and technological change.

Karsten, Jordan [166] see Heins, Sarah

Kartal, Metin [91] see Grant, Sarah

Karul, Necmi and Mert Bertan AVCI

[218] *Heritage and Sustainable Tourism In Turkey: The Case Study of Aktopraklık*

This paper will present the Aktopraklık Cultural Heritage Management Project, which was established as a result of the archaeological evidence excavated from the prehistoric site of Aktopraklık in northwest Turkey. The project encompasses all aspects of archaeological heritage as well as heritage and sustainable tourism. The paper discusses public outreach and interactive engagement through reconstruction of the prehistoric life, ethnographic exhibits, and experimental areas together with the conservation and presentation of the archaeological site. As the archaeological excavation on the site is still ongoing, the paper will also scrutinize the question of sustainability through in regard to the local and regional economy. One of the main ideas is to integrate the Aktopraklık Project into the existing natural and cultural tourism both on the local, national and global level. With the reconstruction of a traditional village near the prehistoric mound, for which the wooden architecture of the surrounding mountain villages has been chosen the local and regional population has been actively engaged in this project. The aim is therefore to redirect the focus of urban tourism towards the surrounding natural environment and rural life, while providing sustainable tourism via educational information about ecology, archaeology, history and rural traditions.

Kasper, Kimberly (Rhodes College), Karen Hess (Rhodes College), Anthony P. Graesch (Connecticut College) and David M. Schaepe (Stó:lō Research and Resource Management Center)

[162] *The Complexity of (Un)charred Seeds: Unearthing the Taphonomic and Cultural Processes at a Stó:lō-Coast Salish Settlement in the Upper Fraser Valley*

Many archaeologists overlook the presence of uncharred archaeobotanicals, specifically seeds, within excavated cultural contexts. Frequently assemblages of uncharred seeds receive little analytic attention due to the difficulty of differentiating taphonomic variables associated with their presence, including soil moisture, pH, and insect activity. Further confounding this methodological quandary, it is often difficult to distinguish between the “cultural” and the “modern” seed rain recovered within archaeological samples. As a result, most assemblages of uncharred seeds are excluded from analyses, and their interpretive significance is seldom addressed. This poster addresses the above methodological issues through the investigation of archaeobotanicals from Welqámex, an island-based Stó:lō-Coast Salish settlement in the upper Fraser Valley of British Columbia. Focusing our analysis on residential architecture, we consider the taphonomic and cultural processes accounting for the presence of uncharred archaeobotanicals recovered from house floors, pit features, and roof layers. We argue that rigorous sampling procedures - systematic collection of samples beyond features and across vertical space – afford an opportunity to analytically distinguish between cultural and natural site formation processes. In turn, we demonstrate how both charred and uncharred seeds further our understanding of variation and the choices embedded in foodways and medicinal practices among Stó:lō-Coast Salish extended-family households.

Kassa, Sonja (Central Washington University), Anne Parfitt (Central Washington University) and Patrick McCutcheon (Central Washington University)

[91] *Selective Conditions for Obsidian Stone Tool Manufacture and Use in Central Washington State*

The presence of obsidian in chipped stone tool assemblages in central Washington State is well known. Local, low quality obsidian sources have been documented occurring in conjunction with more commonly found nonlocal, high quality obsidian sources. Though the archaeological occurrence of obsidian is well documented in this area, a systematic study of the organization of technology using evolutionary archaeological approaches can help clarify how obsidian was selected and incorporated into stone tool industries. Recent x-ray fluorescence sourcing, paradigmatic lithic analysis, and statistical comparisons of obsidian frequencies from central Washington sites reveal patterns different from those noted in previous studies in the Pacific Northwest. First, source diversity varies through time, rather than decreases. Second, lithic attributes typically associated with local, low quality obsidian also occur on non-local, high quality obsidian. Third, obsidian frequencies do not follow a monotonic decay curve, where increased source to site distances should result in decreased source frequencies. These patterns demonstrate that understanding obsidian occurrence in central Washington is complex and best approached using evolutionary archaeology where scientific explanations for the observed obsidian lithic variation are possible.

Kassabaum, Megan [8] see Steponaitis, Vincas

Kassabaum, Megan (University of Pennsylvania)

[289] *The Importance of the Center: Exploring Circular Spaces in the Lower Mississippi Valley*

The mound-and-plaza complex is a hallmark of late prehistoric sites in the Lower Mississippi Valley. While these mounds and the spaces between them have been the focus of much productive research, many mound-and-plaza centers began as circular or oval-shaped middens and only later incorporated mounds. Moreover, sites organized around central "empty" spaces are common starting in the Archaic period. I argue that by examining these earlier and less frequently studied examples of "plazas," we can increase our understanding of how later mound-and-plaza centers are used and specifically, their functions as gathering places and locations of communal ritual activity.

Kataoka, Osamu [233] see Giovas, Christina

Katz, Steven (Midwest Archaeological Research Services, Inc.) and Addison Kimmel (Independent Researcher)

[90] *Addressing Anthropogenic Safety Concerns in the Archaeological Workplace: A Case Study*

The changing nature of contract and academic archaeology has led to new safety challenges that cannot be addressed simply through adherence to OSHA regulations. In this paper we move beyond the still-relevant environmental safety challenges that were the focus of earlier work on archaeology and workplace safety, and examine anthropogenic safety issues that can commonly arise during fieldwork. We address issues such as potential theft, assault, harassment, uncontrolled animals, as well as the witnessing of crimes and other human-made safety challenges, and look at how other industries have responded to similar issues. We then introduce a recent long-term, large-scale urban architectural survey as a case study in how archaeologists can proactively respond to these challenges. Lastly, we argue that these challenges need to be explicitly addressed by employers within the archaeological sector, and that field safety manuals should be updated frequently as to enhance archaeologists' ability to participate in the Section 106 process and to effectively conduct research in a safe and efficient manner.

Katz, Sandra (University of Pittsburgh) and Kathleen Allen (University of Pittsburgh)

[109] *Stone Tool-Making at Two Sixteenth Century Cayuga Sites*

Cowan's (1999, 2003) research on small Iroquoian camp sites in New York State demonstrated that analyses of stone tools and debitage assemblages enable archaeologists to investigate which type of stone tool industry was emphasized at a site (core flaking versus biface reduction) and to draw

inferences about site function. This study illustrates the broader applicability of Cowan's approach for conducting micro-scalar analyses of technological organization. We compared debitage assemblages from one house at each of two 16th-century Cayuga sites in NY State, Parker Farm and Carman. Our analyses revealed a combination of core flaking and biface reduction within both houses, thereby indicating at least seasonal occupation and longer term use. Comparison of flake attributes from different areas within the structures showed more evidence of core flaking and/or early-stage biface reduction in the vestibule areas, and more evidence of late-stage reduction within family compartments. This finding suggests that task sequencing of tool production might have taken place inside these houses. Overall, this study demonstrates that coupling flake attribute analysis with typologically-based approaches to tool production (e.g., core flaking versus biface reduction) and site function can enhance our understanding of site role and the organization of stone tool production within Iroquoian households.

Katz, Jared (University of California, Riverside)

[133] *Music in the Court: An Analysis of the Status of Musicians in the Maya Court*

Just as there was a formal class of scribes in Maya courts, there was also a class of formal musicians. This paper will focus primarily on analyzing the position and social status held by musicians in the Classic Maya area. To begin, the paper will discuss musicians as a formal class within the Maya courts. Musicians are frequently depicted in iconographic portrayals of political events, and based on the garb they are shown wearing, it appears they formed cohesive groups. By analyzing the role of musicians in the court setting, we can gain a more complete understanding of both the composition and structure of Classic Maya courts, as well as the role of formal musical groups. Next, the paper will examine how other elites engaged with music. For example, several elite women were interred with musical artifacts; however, there are no depictions of women playing music at elite settings, demonstrating the gendered aspect of music. Music was widespread throughout the Maya court, and by analyzing both formal musicians, as well as other elites who played music, we can better understand the differences between those categories in order to see the role music occupied in the lives of the elite.

[133] *Chair*

Katzeman, Chelsea [314] see Griffith-Rosenberger, Jacob

Katzenberg, M. Anne [328] see Offenbecker, Adrienne

Kaufman, Brett [51] see Barnard, Hans

Kaufman, Brett (Joukowsky Institute for Archaeology and the Ancient World, Brown University)

[89] *Behavioral Metallurgy of the Phoenicians, Carthaginians, and Neo-Punic Peoples*

Some cultures do not just adopt or develop innovative technologies, but actually define themselves based on their technological acumen. The Phoenicians were such a culture, whose economic reliance on metallurgical and maritime knowledge went further in defining their long-term communal cohesion than did other factors. Lacking historical texts written by Phoenicians, it is only through archaeology and archaeometric analyses that such a resource-based ideology can be reconstructed. Compositional and microstructural characterization using pXRF, XRD, VPSEM-EDS and metallography demonstrates that various Phoenician groups—from Tyrians to Carthaginians to Neo-Punic Roman subjects—manipulated a wide range of metallurgical techniques in order to preserve political autonomy, dominate trade in tin and precious metals, expand militarily, and subsist as colonial subjects. Metallurgical remains of ferrous and non-ferrous forging, smithing, and melting activities from three sites spanning roughly 1400 years are analyzed and interpreted through the lens of an identity based in technological achievement.

Kawano, Masanori (Meiji University)

[145] *Spread of Digging Tools and the Social Change in Kofun Period Japan*

This paper discusses an aspect of the social change that took place in Kofun Period western Japan as a result of evolution of digging tools. The iron blades of such digging tools changes from rectangular plates with bent edges to U-shaped edges in the fifth century A.D. This change was not merely morphological but technological as well. Background to this change was the introduction of highly advanced smithing technique from the Korean peninsula. This technological innovation diffused to all over western Japan in the following sixth century, which facilitated large-scale construction works, including irrigation system, and consequently resulted in the increase in productivity of wet rice agriculture. Behind this rapid spread of new technology was, I argue, the strategy of the central Yamato polity wanting to gain more direct control over local regions.

Kay, Marvin (University of Arkansas)

[74] *Breckenridge Shelter, Arkansas and the Younger Dryas*

In 2012 renewed excavations by Arkansas Archeological Survey personnel re-exposed 1960s test units of up to 3m thickness to further evaluate the unusually deep deposit and its stratigraphy; and to collect sediment, associated artifacts, and radiocarbon samples. Compared to Rodgers Shelter and Big Eddy, two well-dated alluvial archaeological sites in the western Ozark Highland of Missouri, Breckenridge Shelter is clearly of similar antiquity but represents a high hill slope setting within the White River drainage. Basal Breckenridge Shelter likely defines a Younger Dryas encampment, or encampments, by people who used two discrete technological systems--Dalton and Packard—that reflect the last of fluted and western stemmed point traditions in North America.

Keach, Levi [7] see DiBenedetto, Katelyn

Keach, Levi (University of Nevada, Las Vegas)

[7] *Geospatial Analysis of Areal (Polygonal) Units: Applications at the Site Level in Neolithic Cyprus*

For the first time in the age of GIS, there is a growing resurgence of interest in intra-site level spatial analysis. Many studies focusing on the application of GIS technology to site level phenomena focus, either explicitly or implicitly, on the analysis of fine resolution datasets. Realistically, however, few archaeological data are recorded as sub-centimeter points. The majority of archaeological data tends to be recorded at the resolution of the 1x1 or 2x2 meter excavation unit. These data are best considered as areal units; however, doing so presents a number of problems both technically and statistically. This poster will present results of the recent application of GIS-based intra-site spatial analysis using areal units to the pre-2014 chipped stone assemblage of 'Ais Giorkis, Cyprus. 'Ais Giorkis is an Early Aceramic Neolithic site (c. 9.5 kya) located in the western foothills of Cyprus' Troodos Mountains that has produced a chipped stone assemblage exceeding 250,000 pieces. This assemblage was recorded at a variable resolution, generally lower than 2x2 meters making it an excellent test case for lower resolution applications of GIS-based spatial analysis. This poster demonstrates several successfully answered questions using areal data at the site level.

Kealhofer, Lisa, Judith Field (University of New South Wales) and Adelle Coster (University of New South Wales)

[186] *Phytoliths and the Development of Agriculture*

Investigations of rainforest archaeological sites from the Koombaloomba Dam environs in the NE Queensland Wet Tropics, have established a human presence here since the early Holocene (Cosgrove et al. 2007). These open sites have yielded abundant archaeological finds including excellent preservation of plant macro-remains in the form of wood charcoal and the carbonized shells of some toxic starchy economic plant species including *Beilschmiedia bancroftii*, the Yellow Walnut. Examination of the microfossil record from soils collected during excavation at Urumbal Pocket (a Eucalyptus pocket within the rainforest) and Goddard Creek (rainforest) has revealed an in situ record of phytoliths and, through part of these sequences, starch remains. The Urumbal Pocket excavations also yielded a small grindstone fragment from which starch grains were recovered. This paper presents the compiled phytolith and starch data and discusses the possible interpretation of

site use and change through time as reflected in the plant microfossil record. Using recently developed analytical techniques for the analysis of starch we will explore the quantitative identification of starch to genera, and possibly species.

Keall, Edward [401] see Khalidi, Lamya

Keegan, William (Florida Museum of Natural History)

[105] *No Man or Woman is an Island Revisited: The Social Construction of Small Island Space*
The construction of space usually begins with the georeferencing of physical boundaries. As such, space becomes an external container that affects the structure of its contents. This paper explores the construction of space from the perspective of the individual. It begins by recognizing the minimal distance of face-to-face interactions and expands outward from there. The first step is to reject three-dimensional space and to situate the individual in an n-dimensional space. Production, consumption, procreation, mobility, exchange, and ritual are some of the common categories used to express dimensionality, but they tend to be investigated as cause-effect relationships. Yet these dimensions share more in common with clouds than they do terra firma. In practice, space is expressed in the creation of covalent and ionic bonds that define the social being, which is materialized through diverse expressions. Expressions of an infinite volume in a finite space. Archaeological examples from The Bahamas and Turks & Caicos Islands are used to examine social spaces on small islands.

Keener, Nichole

[12] *Hanna's Town Unbuttoned: An Archaeological Study of Clothing Adornment and Fasteners*
Of the three basic necessities humans need to survive – food, clothing, and shelter – clothing is often underrepresented archaeologically as fibers do not typically survive due to environmental challenges. Although often under-analyzed, these small commonly-found artifacts are valuable parts of the archaeological record. Through decorative and utilitarian buttons and fasteners, patterns can be identified to address questions regarding daily life during an occupation of a site. Patterns in the archaeological record reflect the way that people of a community portrayed themselves. One such community is Hanna's Town. Hanna's Town was an important center during the Revolutionary War, acting as both the original county seat of Westmoreland County, Pennsylvania, and one of the first North American communities to declare its independence from Britain. Although diversity of Hanna's Town's residents is not fully realized, the history and site continue to hold meaning to the local community today. Analysis of the button and buckle collection from Hanna's Town offers a unique glimpse into lives of historically silent members of this community, which helps relate its story to future generations.

Keeton, Glen [327] see Triozzi, Nicholas

Kehoe, Alice (University of Wisconsin-Milwaukee)

[340] *Introduction: Evidence-Based Practice versus Ivory Tower Careers*
As contract firms have become employers for the majority of archaeologists, evidence-based practice is demanded. Universities have responded by creating contract programs separate from traditional doctoral tracks. Some glorify theory construction, some others—where some of our presenters are affiliated—are responding to mandated public involvement by encouraging faculty and students to seek to work with local and descendant communities. Action archaeology, Kleindienst and Watson called it in 1956, when they were grad students in Sol Tax's department in Chicago. Theory, that is, hypotheses and interpretations, gets tested not in laboratory-like controlled projects but in confrontation with stakeholders, descendants, and not least, all the data a site vouchsafes. Archaeologists who have engaged with communities, particularly non-Western societies, often find inference to the best explanation greatly expanded and enriched by premises and experiences outside Western Enlightenment tradition. This broadened interpretive base reflects the postcolonial standpoint. We believe the YouTube video mocking the best-known theorists is a sign that the hollow Sound of Theory can no longer command all academic programs, much less

most practicing archaeologists. The musics of many folk sound instead.

[340] *Chair*

Keim, Sherry [336] see Corbett, Debra

Keinan-Schoonbaert, Adi [235] see Bonacchi, Chiara

Kelleher, Anna and Sudarsana Mohanty

[232] *Analysis of In-tact Mummy Bundles from the 2014 Field Season at Panquilma*

The Ychma site at Panquilma, dates from the 13th to 15th centuries, and lies in the Lurin Valley of central coastal Peru. The site provides an interesting case study for the development of ideologies, specifically mortuary rituals, due to the close proximity and the relationship the Ychma community maintained with the important Andean religious center of Pachacamac. Significantly, during excavations in the 2014 field season, two intact mummy bundles were found at the site. One was of an adult, found in the domestic sector and the other was of an infant, found in the funerary sector. It is the goal of this paper to describe and interpret the analysis of these bundles in order to contribute to the ideological dialogue of Yschma mortuary rituals.

Kellett, Lucas (University of Maine at Farmington), Sarah Jolly (University of Pittsburgh), Danielle Kurin (University of California, Santa Barbara) and Guni Monteagudo (Museo Andahuaylas)

[203] *Life at Achanchi: A High Altitude Chanka Burial Site from the Andahuaylas Region of Southern Peru*

Recent archaeological research from a high elevation (4,000 m asl) hilltop site in the Andahuaylas region of southern Peru offer new data to illuminate aspects of life and social organization within the Chanka society that lived during the tumultuous Late Intermediate Period (A.D. 1000-1400). In contrast to the machay (or cave) burials typical of this time period, an intramural burial site excavated from the ridgetop site of Achanchi may offer another perspective on this localized polity. This highly fragmented and commingled burial assemblage contains the remains of roughly 40 individuals associated with several burial goods, including a copper bracelet, nine ceramic vessels, and five human rib "trophies." Preliminary skeletal analysis suggests that raiding-style violence and infectious disease were features in this community that would have impacted quotidian lifeways. Furthermore, preliminary non-metric data suggests some individuals may be genetically related. This burial could thus represent a small social unit or extended kin grouping. Finally, the appearance of multiple types of cranial vault modification may suggest some degree of socio-ethnic integration within Achanchi during a time of heightened environmental and political stress and balkanization.

Kelley, Alice, Joseph Kelley (School of Earth and Climate Sciences & Climate Cha) and Daniel Belknap (School of Earth and Climate Sciences & Climate Cha)

[243] *A Predictive Model for Submerged Prehistoric Sites, Northern New England and Canadian Maritimes*

Predictive models to address site location and preservation of submerged cultural resources have improved with growing societal interest in the nearshore. While some commonalities exist and are broadly applicable, working at a local scale requires an understanding of regional geology, geomorphology and sea level history, and the dynamic landscape processes that acted in the region through time. Along the Atlantic coast of Northern New England and the Maritime Provinces of Canada, varying bedrock and surficial geology, combined with complex postglacial sea level changes have created areas of high preservation potential and regions where only isolated, out of context artifacts are likely to remain. Our study of the archaeological preservation potential of the Bass Harbor and Green Ledges areas of the Maine coast illustrate the factors that lead to site formation and preservation in this region: abundant surficial materials available for reworking by waves to form productive terrestrial environments attractive to human use, occasional slow rates of sea-level change, and shelter by islands and shoals from open-ocean waves. While focused on the Maine and the Canadian Maritimes, this model is useful as a starting point for other glaciated regions

that have experienced both marine transgression and regression.

Kelley, Joseph [243] see Kelley, Alice

Kelley, Krystle (Texas Tech University)

[263] *Establishing the Acropolis: Two Seasons of Excavation at Chan Chich*

Open plaza spaces are a commonality among Maya sites. Excavating through the sealed contexts of these plaza surfaces can yield reliable data on the construction history of the site and how the space may have changed over time. This paper details the results from two seasons of excavations, which took place in May-June of 2012 and 2013 at the Maya site of Chan Chich in Northwestern Belize. Our investigations focused on the Upper Plaza, located at the acropolis of the site. Our investigations uncovered buried architecture below the plaza surface, as well as a series of plaster and compact dirt surfaces, a problematic deposit, a midden, and a burial that included human and canine remains.

Kellner, Corina [31] see Whalen, Verity

Kelly, Robert (University of Wyoming)

[178] *David Hurst Thomas: A Retrospective*

This contribution opens the Fryxell session by providing an overview of the career of David Hurst Thomas. Thomas' career spans some 50 years and includes contributions to Great Basin, Southeastern and Southwestern archaeology, from the paleoindian to the historic periods. He has produced widely-used textbooks; the first textbook in statistics for anthropologists; and other popular works. Significantly, he served as a founding board member of the National Museum of the American Indian. Throughout his career, his work has been both interdisciplinary and cutting edge, and his career shows no signs of slowing down.

[135] *Discussant*

[35] *Chair*

Kelly, Kenneth G. [50] see Goldberg, Kelly

Kelly, Sophia (Arizona State University)

[304] *Evaluating Multi-Sector Supply and Demand on Canal System 2 as a Component of a Complementary Hohokam Economy*

As one of the largest canal systems in the Phoenix Basin, Canal System 2 likely served as the economic, social, and political center of life for thousands of people residing on the north side of the Salt River. Canal System 2 capitalized on a fortuitous geographic location that permitted irrigation systems and associated fields to extend miles from the river. Despite the large size of the canal infrastructure, the low population density relative to the size of the system indicates that local residents may have invested more time in building, maintaining, and using irrigation networks than their nearby counterparts. This paper explores how high labor investments in irrigation agriculture by the residents of Canal System 2 may have contributed to demand for goods produced by specialists. Specialists located in areas less optimal for irrigation agriculture may have supplied goods to the residents of Canal System 2. The analysis evaluates the emergence of a Hohokam economy that relied on complementary exchange of agricultural and craft products by producers and consumers located in different areas of the Phoenix Basin.

[390] *Discussant*

Kelly, Kenneth (University of South Carolina)

[311] *"The City's gone—Nought...Remaining to Disclose the Site of this Forgotten Babylon:" Ephemeral Architecture and Identity at Black Rock City. (Apologies to Horace Smith; "Ozymandias")*

The temporary (at least physically) community of Black Rock City, which is constituted for one week each year in the Nevada desert at the Burning Man festival, is made up of hundreds of camps. Many of these camps create architecture, or create reference to architectural style and history, that helps cement a sense of identity to that particular camp. The architectural referents are generally not obscure, as they are intended to be read by both camp members and others who are not members of the camps but pass by in the process of interacting with fellow citizens of Black Rock City. By looking at the choices that are made in creating architectural stages, such as that at the Black Rock French Quarter among others, I explore the ways in which a sense of place is created that references both real and imagined localities.

Kelsoe, Camilla (University of Pittsburgh)

[283] *A Tale of Two Towns: Demographic and Economic Change in Two Middle Yangzi Communities*

The late Neolithic marked the emergence of a new kind of settlement pattern in the middle Yangzi river valley. During this period, large, tightly nucleated communities, many of which were surrounded by moats or walls, rapidly replaced the dispersed hamlets and small villages of the middle Neolithic. This dramatic transition in settlement organization may have been associated with significant changes in social and economic relations between individuals both within and between settlements. To address these possibilities, and their potential implications for the evolution of complex societies more generally, we compare the results of a full-coverage regional survey and a geochemical study of local utilitarian pottery. Our analysis indicates that demographic and economic change within these communities occurred at very different rates.

[283] *Chair*

Kelvin, Laura [302] see Hodgetts, Lisa

Kemp, Leonard, Cynthia Munoz (Center for Archaeological Research, University of), Raymond Mauldin (Center for Archaeological Research, University of) and Robert Hard (Department of Anthropology, University of Texas at)

[229] *Archaeological Implications of Vegetation Shifts in the Northern Chihuahuan Desert*

Modern climate and ecological data from the Northern Chihuahuan Desert suggests that precipitation is temporally and spatially localized leading to pulses of plant production. Regional paleo-environmental models have been developed that focus on large temporal and spatial scales. These scales obscure short-term human adaptation within this region. We present a study of stable carbon and nitrogen isotopes of bone collagen from leporids that can provide a high-resolution proxy for aspects of the region's paleoecology. Cottontails and jackrabbits have a generalized feeding strategy, restricted home range, and short lives. As such, their diet, and their collagen, likely reflect local vegetation regimes at short (ca. 2 year) temporal scales. Focusing on carbon as an indicator of vegetation types and nitrogen as an indicator of aridity, 33 modern and 212 prehistoric (A.D. 600 to A.D. 1350) leporid specimens from 10 archaeological sites were analyzed. Our results show a dramatic shift in vegetation and an increase in climate variability over time that can be used to develop high-resolution models of prehistoric human adaptation within arid settings.

Kemp, Dylan (University of Montana), Kelly Dixon (University of Montana) and Nikki Manning (University of Montana)

[311] *Urban Landscapes: Social, Cultural, and Ecological Heritage*

Urban locations have an entire component of the landscape that is often overlooked: historic underground spaces. Not to be confused with the underground art and culture scene that occurs in a thriving, modern city, the historic underground can provide insight into a city's past social, cultural, and ecological heritage. Because this particular part of the landscape is often neglected in anthropological research, there are not a lot of resources available to understand the historic uses of these urban spaces. There is a common phrase, "build it from the ground up," yet there is a lot to be learned by modifying that to "build it from the ground, above and below." During 2012-2014, a study was conducted in Missoula, Montana, to investigate subterranean archaeological features including

steam tunnels, sidewalk voids, and city basement spaces to determine if the socio-cultural, economic, and cultural heritage of that city could be detected in the archaeological record. This project seeks to build upon that work by employing tried and true archaeological survey and historical research, but also newer, modern archaeological tools such as Geographical Information Systems and ground penetrating radar technology for a more detailed spatial analysis of historic urban design and urban ecosystem transformation.

Kendall, Heather (Simon Fraser University)

[185] *Chert Characterization and Provenance in the mid-Fraser Region of British Columbia*

Globally, chert is the most common rock material found in archaeological contexts. Its prevalence on the Earth's surface in Quaternary deposits and relative abundance in archaeological contexts indicate that it was an important resource material for ancient populations and, as such, can provide information about toolstone exploitation in prehistory. The results of this research suggest a local origin for the chert artifacts recovered from ST 109 at the Keatley Creek site (EeRI-7) in the mid-Fraser region of south-central British Columbia, but also to a remote origin for the toolstone deposits found within the study area. Elemental characterization suggests that although the chert deposits in the study area are geographically separate, they are likely derived from a larger parent chert source, redeposited in the mid-Fraser region by glacial activity prior to human occupation of the area. This thesis also demonstrates through the application of the Keatley Creek Lithic Typology that the visible properties of color and texture are not a reliable means for discerning the provenance of chert artifacts.

Kendrick, James

[29] *Recent Archaeological Studies in National Parks of the Northeast Region*

The Northeast Region of the NPS extends from Saint Croix Island on the Maine-New Brunswick border to Booker T. Washington National Monument in Virginia, and from Cape Cod National Seashore to New River Gorge in West Virginia. The national parks of this region contain the archaeological signatures of presidents, poets, war, human rights struggles, maritime history, industrial history, and thousands of years of American Indian heritage. This paper discusses recent archaeological studies in the national parks of this region. These studies range from baseline documentation efforts to inventories of areas threatened by climate change. Recent archaeological overviews are discussed, with those at Petersburg and Richmond National Battlefields highlighted. Several geophysical investigations have recently been conducted, and those at Longfellow National Historical Site and Booker T. Washington National Monument are reviewed. Recent inventories are presented, and those at Cedar Creek and Minute Man National Historical Parks are discussed. A progress report is given of the National Constitution Center project in Philadelphia, one of the largest excavations conducted within a national park. Attention is brought to sites threatened and damaged by climate change, with specific mention of sites at Cape Cod, Saint Croix Island, and Colonial National Historical Park.

Kennedy, John (SWCA Environmental Consultants)

[12] *Metal Projectile Points of the Interior West: A Synthetic Overview*

Metal projectile points of the Protohistoric and early Historic periods are a somewhat rare, yet ubiquitous artifact type that has received little attention regarding synthetic research. Their roughly 300 years of use across the interior west coincided with perhaps the most profound and rapid culture changes experienced by native groups of North America during the entirety of their prehistory and history. A survey of 14 states across the interior west is currently underway to gather data on all available metal projectile points. Current numbers from this ongoing data collection effort are presented along with preliminary results and goals for future research.

Kennedy, Ryan (Indiana University)

[45] *Plants, Animals, and Food Choice Within the Market Street Chinatown, San Jose, California*

The Market Street Chinatown was a major urban Chinese community in nineteenth century San

Jose, California. From 1866 to 1887, the community housed and served as a home base to several thousand Chinese residents and laborers. Excavated in the 1980s, the Market Street Chinatown yielded an incredibly rich collection of material culture as well as faunal and floral remains. This paper examines food consumption and food choice amongst Market Street's nineteenth century Chinese residents. The author draws upon botanical data from the site as well as recently collected faunal data. Ultimately, the data show that Market Street's residents utilized a combination of traditional and local plants and animals to construct their diet. This combination of both the familiar and the unfamiliar typifies Chinese dietary strategies in the United States. This paper ultimately explores how Chinese dietary flexibility with both plants and animals played out in the Market Street Chinatown.

[45] *Chair*

Kennedy, Gail [169] see Jackson, Brittany

Kennedy Richardson, Karimah (Autry - Southwest Museum of American Indian/UCR)

[160] *Discussant*

Kennett, Douglas [32] see Jazwa, Christopher

Kennett, Douglas (Penn State)

[334] *Past and Present Human Response to Drought in the American West*

Multi-year droughts in the American west have major impacts on water resources and agricultural systems that sustain growing populations. Environmental engineering projects (e.g., California Aqueduct or Hoover Dam) were designed within the context of instrumental climate records and historical knowledge of the last century. Archaeological and climatological records now provide a longer-term perspective on the severity and longevity of droughts and the impact of these droughts on human populations. Paleoclimatological records for the last 2,000 years indicate that the multi-year droughts of concern today are modest compared to medieval droughts between A.D. 900 and 1300. Lessons embedded in the archaeological record of this interval provide context for managing water in the American west going into the future.

[178] *Discussant*

Kerchusky, Sarah (University of California, Santa Barbara)

[31] *Investigations of Nasca-Wari Interaction and Imperial Expansion during the Middle Horizon: A View from the Las Trancas Valley, Nasca, Peru*

During the Middle Horizon (A.D. 750-1000) the Wari Empire established at least three colonies (Pacheco, Pataraya, and Inkawasi) in the Nasca Valley and its tributaries. Archaeological survey of the Southern Nasca Region conducted by Katharina Schreiber and students in previous decades observed dramatic changes to the local settlement patterns during this period (Edwards 2010, Schreiber 1999). The number and size of habitation sites in the Nasca and Taruga Valleys decreased but increased in the Las Trancas Valley, away from and perhaps in contention with the Wari. Sites in these valleys were established in more defensible locations. In addition, sites in Las Trancas formed a four-tiered site hierarchy in Las Trancas with Huaca del Loro as an administrative and ceremonial hub, a second-tier center (Zorropata), and smaller villages and hamlets (Schreiber 2005). The present research investigates the potential impact of Wari encroachment on the various economic, social, political, and quotidian practices of Nasca peoples living at the site of Zorropata in the Las Trancas Valley. This paper presents some of the preliminary findings of recently completed archaeological fieldwork and laboratory analysis at this site.

Kerdsap, Puangtip [49] see Yankowski, Andrea

Kerdsap, Puangtip**[407]** *Environmental Archaeology of Spinning, Weaving and Dyeing in Ancient Thailand*

This paper will address the question of “what impact would cultivation, and possible domestication, of native and introduced fiber plants have on the local environment and people’s lives in prehistoric Thailand?” This study begins by considering artifacts such as spindle whorls but will also discuss evidence of fiber plants. How many are native? Where do the introduced species come from and when do they first appear in Thailand? In addition to the cultivation of fiber plants, it is noted that other environmental impacts would result from subsequent processing, including dyeing and weaving. I argue that when considering the implications of agriculture, archaeologists often concentrate on the obvious crops (rice & millet for example), however, plant (and animal) products have clearly been important for reasons beyond subsistence. Thus, the larger aim of this paper is to broaden the conversation about human-environment relationships beyond subsistence practices to a wider social and cultural context. This paper will consider evidence from the site of Ban Non Wat (c. 4000-1000 BP) in Northeast Thailand initially, but also consider evidence from across Southeast Asia.

Kerry, Sagebiel [147] see Haines, Helen

Kersel, Morag (DePaul University)**[409]** *Landscapes of the Dead: Mapping, Survey, and Site Monitoring at Fīfa, Jordan*

Birds’ eye views of archaeological sites and landscapes provide excellent vantage points for our understanding of the past. Images from archives, balloons, drones, kites, poles, and satellites are changing the ways in which we carry out archaeological investigations. In cooperation with the Jordanian Department of Antiquities under the umbrella project of Follow the Pots, the Landscapes of the Dead Research Project is using Unmanned Aerial Vehicles (UAVs, ‘drones’) to monitor archaeological site looting at the Early Bronze Age site of Fīfa in Jordan. Drones, both fixed and rotary wing, are being deployed as part of a 5-year study of the scale and pace of looting at the site. By constructing high-resolution digital elevation models (DEMs) across multiple years, we are able to both map the site and identify new looting events from year to year. This change-over-time data, in conjunction with pedestrian surveys and ethnographic interviews, is particularly valuable for identifying looting events in an already heavily disturbed site. Unfortunately findings from the first two years of the project document significant, on-going damage. These early outcomes are currently being used to develop site protection strategies and local community outreach programs to protect the cultural heritage of this landscape.

[279] *Discussant***Kessler, Nicholas (University of Arizona)****[311]** *Documenting the Legendary 1844 Flood from a Kaw Village in the Kansas River Valley*

Geoarchaeological fieldwork has documented an alluvial deposit associated with a flood event which overtopped a relatively high terrace in the Kansas River Valley near present day Topeka, Kansas. The deposit, defined as an overwash phase, exhibits structures indicative of flowing water. The overwash phase’s position, overlying a historic Kaw Village, corroborates second hand historic accounts which date its origin to a flood in the year A.D. 1844. This flood event probably resulted in the rapid abandonment of the village and thus presents archaeologists with a “strong case” for reconstructing the systematic context of this village. This fact is significant because of the paucity of well-preserved stratigraphically defined contexts for early historic period sites. These findings are also notable as they provide a geologic marker recording the height of this legendary flood event.

Keyser, James (US Forest Service-Retired)**[353]** *The Hunter's Revenge: Magical Use of a Petroglyph*

A petroglyph panel at 48SW85 in southwestern Wyoming presents a convincing case for the use of rock art imagery in hunting magic rituals. Based on differential weathering and revarnishing of the

petroglyphs, different stylistic signatures of artists carving various animals and humans, and key superimpositions, the panel can be confidently identified as the product of at least half a dozen artists reusing the site for more than a century, and possibly much longer. The panel's basic structure shows a communal big game hunt whose components show a corral (that incorporates the panel's natural surface features), several animals, and several humans in different roles as participants.

Khaksar, Somayeh and Grant McCall (Tulane university)

[53] *Delazian: An Open-Air Upper Paleolithic Site in Central Iran*

Most Paleolithic research in Iran has been focused on the caves and rock shelters of Zagros Mountains. Only in recent years has this focus shifted to other parts of the country, leading to the discovery and study of additional Paleolithic sites. Delazian is one such newly-discovered site with an assemblage of lithic artifacts indicating the presence of Paleolithic societies in central Iran during more hospitable periods of climate. In 2009, a systematic survey was conducted at this arid open-air site, which recovered an assemblage of 1344 artifacts. In this poster, we present a techno-typological analysis of this assemblage showing that Delazian was probably used as a residential camp at which tool production occurred as part of daily activities. We also find a general lack of evidence for the intensive reduction cores, which we consider to be a sign of easy access to local lithic raw materials. This conclusion is also supported by the presence of many unused blanks in the assemblage. This flake-based assemblage is characterized by the presence of some tool types common to the Upper Paleolithic and Epi-Paleolithic periods but the small sample size prohibits a definitive assignment to one particular time period.

Khalidi, Lamya (CNRS - Archéorient - University of Lyon 2), Clément Ménard (TRACES - University of Toulouse), Bernard Gratuze (CNRS - IRAMAT - University of Orléans), Amélie Diaz (University Paul Valéry Montpellier III) and Edward Keall (University of Toronto - Royal Ontario Museum)

[401] *Obsidian Value and Exchange in the Southern Red Sea Region and Its Role in the Establishment of Prehistoric Complex Societies: New Data from South Arabia and the African Horn*

The Red Sea is renowned as a locus of maritime activity during the early historic periods. As a result of systematic obsidian analyses of sources and artifacts, maritime interaction in South Arabia can now be traced back to the beginning of the Neolithic period. Its increased intensity is echoed in the cultural sphere that eventually formed on opposing shores of the two continents by at least the third millennium B.C. New geochemical, archaeological, and technological data from South Arabia, Ethiopia and Djibouti illustrate the current state of research on Afro-Arabian prehistoric interactions, highlighting variabilities and relationships between two mirroring regions either bound or separated by the Red Sea. While major chronological gaps remain regarding the transition from the LSA to the Neolithic, the study of lithic and faunal material from several sites allows us to note major technological and subsistence shifts that occurred independently in each region, but also early links, such as maritime interaction, that may have affected the nature of the process of neolithization. Finally, we discuss obsidian circulation in light of elements of cultural convergence that make up the Red Sea cultural sphere and that occur sometime in the late 4th millennium B.C.

Kharlamova, Anastasiya [28] see Kukekova, Anna

Khatchadourian, Lori (Cornell University) and Ian Lindsay (Purdue University)

[285] *The Fortress Refigured: Authority and Community in the South Caucasus (ca. 1500-300 B.C.)*

In many world regions, the mountain fortress has long stood as little more than a practical instrument of institutionalized force. Such reductionism obscures more than it reveals, for fortresses are equally salient as projects of communal labor, mediators in the making of subjects and authorities, and objects of contestation, curation, and commemoration. In the South Caucasus, fortresses played a

crucial role in the reproduction of polities from the Late Bronze Age to the mid-first millennium B.C. Based on research in Armenia, this paper tracks the shifting role of the fortress in forging political associations from the earliest complex polities to the age of empires. For centuries, authorities of southern Caucasia relied upon fortresses and the range of esoteric and governmental practices they hosted to bind seasonably mobile communities in a shared sense of identity and obligation. However, with the collapse of the Urartian Empire, communities living under Persian rule brought about a transformation in the logics of political order. Opting out of a politics premised on steep social asymmetries, they recast this once pivotal apparatus of sovereignty into an object of ambivalence—at once indispensable to the reorganization of social life but also a focus of collective repudiation and redefinition.

Khreisheh, Nada (Emory University)

[33] *Learning to Think: Using Experimental Flintknapping to Interpret Prehistoric Cognition*

The analysis of stone tools has long been a technique used when addressing prehistoric cognition. While experimental studies have been used extensively as a tool that can give information on these technologies, these studies have often been short term and involved a small number of participants. This paper uses the examples of two longer term multi-disciplinary studies of experimental flintknapping, involving the teaching of early knapping technologies, to demonstrate the value of experimental archaeology in providing information that can be related to hominin cognition. In these studies volunteers without previous knapping experience were taught skills in some of the earliest known technologies with the aim that they would achieve expert levels of ability. Through careful mapping and assessment of skill level together with analysis of materials produced, a picture of learning in different technologies could be constructed. This information has been related to hominin cognition and the evolution of modern human brains and intelligence to build a picture of the different cognitive requirements of the technologies assessed. Analysis of materials allow this experimental work to be tied in with the archaeological record, indicating aspects of this that can be analyzed when seeking evidence of early hominin cognitive processes.

Kiahtipes, Chris [239] see Roos, Christopher

Kidder, Barry (University of Kentucky), Daniel Vallejo-Cáliz (University of Kentucky), Shannon Plank (University of Kentucky), Jacob Welch (Yale University) and Scott Hutson (University of Kentucky)

[24] *Great Expectations: Negotiating Community at Ucanha, Yucatán, Mexico*

Activities of all actors should be considered collectively given that communities were likely forged through a negotiation of needs and wants from the perspectives of rulers and subjects. Successful elite institutions would need to closely monitor these negotiations. If the needs of the general public were not met, elite institutions could be undermined. During the Terminal Preclassic, Ucanha, a secondary center connected to other monumental centers via an 18-km long causeway in the Northern Lowlands, experienced significant population growth and large-scale monumental construction, from mobilizing regional support. Ceramic and architectural evidence shows larger structures near the ceremonial center likely served as nodes that galvanized the community on a more intimate local scale, while monumental contexts integrated the community at large. The presence of an elite structure with pop motifs suggests the presence of formal rulership by the end of the Preclassic. By the Middle Classic, however, many houses were abandoned, and the hinterlands along the causeway experienced a florescence. Nonetheless, Late Classic monumental construction and residential reoccupation evidences that local elites were successful in coaxing people back to Ucanha. Tacking between elite and nonelite structures across time enables us to present a better picture of the social dynamics at Ucanha.

Kidder, T.R. [155] see Winter, Jacob

Kidder, Tristram (Washington University)

[288] *The Roots of the Modern Anthropocene: The Yellow River Valley, China, 5000-2000 BP*

Using geoarchaeological data I argue that human activity in the late Holocene transformed the environments of the Yellow River, China, into an anthropogenic landscape and that these changes altered China's history. Ancient China provides a critical case study for understanding how economic intensification, demographic change, technological innovation, and political centralization combine to create the roots of the modern Anthropocene. The Yellow River-- known as "China's Sorrow"—is seen as a natural scourge that afflicts the inhabitants of North China. However, when viewed over the long term, China's Sorrow is clearly the result of human manipulation of the environment. These data provide an archaeological perspective on contemporary transformations in China. Today, China is developing economically at a stunning pace; it is not clear that this rate of change is environmentally sustainable. Many of the environmental issues facing contemporary China, however, have been experienced in the past—albeit at a different scale—and it is instructive to understand how Chinese society has grappled with these issues and which approaches and strategies have been successful and which have failed.

Kieffer, C. L. (University of New Mexico, Maxwell Museum), Kyle Ports (Texas Tech University), Marisol Cortes-Rincon (Humboldt State University) and Rissa Trachman (Elon University)

[248] *Analysis of Faunal Material from Sacred Spaces at Agua Lluvia and along the Dos Hombres to Gran Cacao Archaeology Project in Northwestern Belize.*

This research focuses on the faunal material from the caves and sacred deposits at Agua Lluvia and along the Dos Hombres to Gran Cacao Archaeology Project in northwestern Belize. The analysis and interpretation of faunal material in caves can be problematic for zooarchaeologists. Unlike other archaeological features, caves have the added complexity of bioturbation, irregular stratigraphy, and inconsistent preservation. Similarly, faunal remains found within caves can easily be disregarded on the grounds that preservation conditions allow for invasive species to enter the archaeological record. This research bears these factors in mind while comparing the new data with existing cave faunal studies in Central America. Due to the quantity of jute (*pachychilus* spp.) found throughout the sites, special attention was paid to contexts in which the jute was discovered and how it was modified. This study also stresses the importance of analyzing species utilization through time, as well as spatial deposition on the sacred landscape to gain a better understanding of the exploitation of and reliance on ritual resources. Ultimately, the data reflects an assemblage that was not completely environmentally driven or accumulated by natural means. Rather, these assemblages demonstrate a purposeful deposition of faunal remains by human activity in a ritualized manner.

Kieffer, C.L. [266] see Ports, Kyle

Kielhofer, Jennifer (University of Arizona), Josh Reuther (University of Alaska, Fairbanks), Francois Lanoë (University of Arizona), Dave Plaskett (University of Alaska, Fairbanks) and Jason Rogers (Northern Land Use Research Alaska, LLC)

[360] *New Carbon-14 (14C) Dates on "Old" Cultural Components near Quartz Lake, Interior Alaska*

As part of the Quartz Lake/Shaw Creek Flats research initiative, excavations took place in 2014 at the Cook, Keystone Dune and Klein sites in the middle Tanana Valley, interior Alaska. Although these sites were previously tested, continued excavation was vital to expand the 14C chronology and enhance understanding of prehistoric subarctic foraging behavior and paleoecology. At the Klein site, our goal was to gather more geochronological information on a component previously dated ~3700-5100 cal. B.P. New excavations revealed additional datable cultural remains from this underrepresented period. Excavation at the Keystone Dune site (KDS) exposed a hearth and the first in situ artifacts and faunal remains (extinct elk [wapiti]) found at this locale, despite more than ten years of intensive inspection. The KDS remains are located on a soil dated to ~12,600 cal. B.P. Finally, Cook site excavations revealed a deeper component and older soils (thought to date to >9000 cal. B.P.). Closely associated animal bone and charcoal samples provide the initial 14C chronology for this deeper component. These findings add to a growing body of archaeological data in the region that dates back ~14,000 years, allowing for a refined chronology of human land use in this subarctic lowland setting.

Kilby, David (Eastern New Mexico University), George Crawford (ENMU Blackwater Draw Site) and Stacey Bennett (Eastern New Mexico University)

[150] *New Investigations into a Late Paleoindian Bison Kill and Terminal Pleistocene Environmental Change at Blackwater Draw Locality 1*

Intensive investigation of an area of Blackwater Draw Locality 1 known as "Isequilla's Pit" has revealed a well-preserved stratigraphic sequence and the remains of a Late Paleoindian bison kill. The work constitutes a resumption of excavation in this area of the South Bank. Alberto Isequilla abruptly abandoned his fieldwork in 1969, leaving behind an open excavation pit and few field records. Over the past 6 years, the ENMU Archaeological Field School has successfully relocated and mapped Alberto Isequilla's excavation grid and carried out excavations of Unit E (Carbonaceous silt/Late Paleoindian) and Unit D (Diatomite/Folsom) sediments. Both stratigraphic units contain faunal remains and sparse cultural material, but the concentration of bison remains in Unit E appears to represent a portion of an extensive Late Paleoindian (presumably Cody) bison kill. Paleoenvironmental investigations indicate that this kill was made near the outlet channel of a prehistoric body of water that was in transition from a Younger Dryas-age freshwater pond to an increasingly alkaline early Holocene marsh. This paper presents the results of an integrated series of archaeological, faunal, geomorphic, and paleoenvironmental investigations, and attempts to shed additional light on a relatively poorly known time period in the Southwest and Southern High Plains.

Kilikoglou, Vassilis (Institute of Materials Science, NCSR Demokritos) and Anno Hein (Institute of Materials Science, NCSR Demokritos)

[25] *Petrography and Chemistry Live Together in Perfect Harmony*

Historically, pottery provenance studies in the Aegean were conducted by the application of chemical techniques for element determination. The underlying principle was that ceramics made with the same clay paste should exhibit lower chemical variability than those with different pastes. Although this principle has not changed over the years, pottery studies have undergone serious analytical and most importantly, methodological developments. The main reason for the methodological developments was the systematic introduction of petrography, which related pottery objects to their geological environments and the technology of manufacture. This had a positive effect on the use and interpretation of elemental analysis data, especially in the way that variability was explained.

Here complex chemical data sets of Mycenaean pottery are interpreted with the integration of petrography. These represent areas with long potting traditions, as well as consumption sites. We suggest that maximum information can be extracted by the stepwise isolation of petrographic groups and consequent study of their chemical variability. This amplifies the advantage of the high sensitivity of chemistry, by considering the petrographic variation of specific ceramic fabrics. Incidental chemical similarities can be identified and accordingly treated in the statistical evaluation as well as increased chemical variability due to variations fabrics.

Kilikoglou, Vassilis [79] see Montesana, Roberta

Killgrove, Kristina (University of West Florida)

[124] *Giving 3D Scanning a Porpoise: Digitizing the Zooarchaeological Type Collection at the University of West Florida*

The faunal type collection at the University of West Florida's Department of Anthropology, used for zooarchaeological reference, is composed primarily of specimens of local fauna donated by students, staff, and faculty. These crowdsourced contributions are stored in a lab facility and therefore are not readily available to archaeologists needing to make IDs in the field or to researchers working from afar. Using the department's NextEngine Desktop 3D scanner and hand-held Sense 3D scanner, we have created digital models of common fauna found on archaeological sites in the greater Pensacola area, including dolphin/porpoise (*Delphinidae* sp.), turtles (*Cheloniidae* and *Pseudemys* sp.), great blue heron (*Ardea herodias*), alligator (*Alligator mississippiensis*), and shell (*Rangia cuneata* and *Crassostrea virginica*). This presentation will discuss how digitally preserving animal bone can solve problems such as access to collections, space management

issues, lack of funding, and biological hazards. The models will be made publicly available for download and printing.

[42] *Discussant*

Killick, David [77] see Chiu, Scarlett

Killick, David (University of Arizona) and Edwin Wilmsen (Center for African Studies, University of Edinburgh)

[79] *Ceramic Petrography, Historical Linguistics and the Bantu Expansion: Tracking the Arrival of the First Pottery-Using Peoples in Northern Botswana*

It may seem counterintuitive that colonists travelling substantial distances on foot into new territory should have carried ceramic vessels with them, but in some cases the evidence from ceramic petrography shows that they did. This case study examines the movements of the first pottery-using migrants into northern Botswana between the first and the fourth centuries CE. Southern Africa was the terminus of the long expansion of Bantu languages from their region of origin in present eastern Nigeria, and we will tentatively suggest that the petrographic and stylistic analysis of pottery may provide material evidence for the convergence in Botswana of the Western and Eastern streams of the Bantu languages. We will also present our current thoughts on the status of Bambata pottery, which some archaeologists have argued was brought into this region by a separate and slightly earlier migration of sheep and cattle pastoralists.

Kim, Lynn (University of Texas at San Antonio)

[11] *A Glance at Camata: GIS Analyses of Camata Valley, Bolivia*

Although significant research has been accomplished on the Inka Empire, there are still questions about how the Inka integrated diverse people and lands, especially those regions near their imperial frontier, such as the Camata Valley. Understanding how the valley became part of the Inka imperial frontier will shed light into studies of colonialism, borderlands, landscapes, and imperialism. The goal of this poster is to explore patterns across the landscape of the Camata Valley. More specifically, I will investigate the landscape patterns in the valley from the time of the Inka to early Spanish colonialism with Geographical Information System (GIS), through the examination of (a) the environment, (b) agricultural terraces, and (c) site location. In the future, the research will expand on these analyses and focus on agrarian practices, the road system, and site function, so I may evaluate whether the inhabitants of the valley experienced a colonial or indigenous landscape during the Inka reign.

Kim, Ha Beom (University of Oregon)

[49] *A Study on the Mid-to-Late Neolithic and the Early Bronze Age Agricultural Economies and their Development at Huizui Site, Yiluo Valley Region, China*

In order to gain procedural understanding of early agricultural economies, researches have much to gain from in-depth, diachronic study of agricultural development in a single region. This study focuses on the changes in agricultural plant-use over time in the Yiluo Valley, North-Central China by using archaeobotanical data from the Mid-to-Late Neolithic and the Early Bronze Age occupations (c 3500 – 1500 B.C.) at Huizui. The study's analysis confirms that changing plant-use patterns at Huizui were a part of larger agricultural development in the Yiluo Valley region. The Huizui inhabitants relied heavily on millets as their primary means of subsistence, while beginning to include broader range of crops such as wheat and rice toward the Late Neolithic period. The study also finds the presence of statistically significant differential crop and associated weed species inclusions between Mid-to-Late Neolithic and Early Bronze Age deposits at Huizui. These results suggest an interesting hypothesis, one where crop consumption at Huizui toward the Early Bronze Age may have involved more trade and importation of processed crop goods than earlier periods. This hypothesis highlights the dynamics of early agricultural development occurring at the Yiluo Valley during the Mid-to-Late Neolithic and Early Bronze Age.

Kim, Jangsuk (Seoul National University)

[80] *Demographic Dynamics Inferred from Radiocarbon Dates and Sampling Biases*

Using the number of uncalibrated BP dates or summed probabilistic density of calibrated dates, many studies attempt to monitor demographic dynamics of the past. However, some practical factors including differences in intensity and density of archaeological investigations and the preservation of datable materials, natural decay, and even different financial situations of investigations can cause sampling biases, eventually leading to distorted distributions of radiocarbon dates. Thus, database control to remove sampling biases is critical. The temporal distribution of South Korean radiocarbon dates from houses (approximately 10,000 in number) reveals extremely unusual fluctuations over time. Although this may suggest an abrupt population decline and re-growth or result from 'cultural sampling biases' such as change in duration of houses and destruction of earlier houses by later houses, the first thing to check is whether it is caused by practical sampling biases such as inter-investigation difference in intensity of material sampling. I propose some methods that can mitigate over- and underestimation of population, by analyzing the number of radiocarbon dates and the total area of archaeological features from which materials for dating were sampled. Then, I compare the controlled database with original database to see how much sampling biases affect the pattern.

[80] *Chair*

Kim, Jangsuk [80] see Choi, Seonho

Kimmel, Addison [90] see Katz, Steven

Kimura, Birgitta [328] see LeFebvre, Michelle

Kincaid, Meaghan (University of Alaska Anchorage), Ryan Harrod (University of Alaska, Anchorage) and Aaron Woods (University of Nevada, Las Vegas)

[273] *Cut Marks and Fragments: Piecing Together Possible Explanations for Variation of Processed Human Remains among Neighboring Villages in Pre-Contact Southwest*

The discovery of disarticulated and processed human remains at several archaeological sites has provided evidence of extreme violence in the pre-contact American Southwest. Several theories have been presented to explain the presence of these traumatic injuries, including witchcraft executions, ancestor veneration, and cannibalism. The research being presented consists of a detailed reexamination of a small sample of human remains recovered from two neighboring Fremont sites and one nearby Ancestral Pueblo. Novak and Kollman, who previously analyzed the Fremont remains, suggest that the patterning of trauma resembles episodes of extreme violence in the American Southwest. The trauma was analyzed using cutmark analysis techniques described by Ventura Pérez. The reconstructions of cutmark morphology and distribution were compared by site and also to data published on other archaeological examples of disarticulated and processed human remains. The goal of this research is to provide insight into the possible motivation behind the disarticulation and modification of human remains seen by Fremont and Ancestral Pueblo groups. Our results suggest that the patterns and variation of cut marks and fragmentation between these sites may demonstrate different behaviors between these neighboring villages.

King, Eleanor (Howard University) and Stephen Epstein

[236] *Where Are We Going? The Impact of Project Archaeology on the Profession, Past and Future*

Over its 25 years, Project Archaeology has helped revolutionize not only how we teach archaeology in pre-collegiate and other settings, but also how professional archaeologists look at public engagement. The program's original objective was to prevent looting by inculcating a sense of stewardship in children. Its initial success made it the profession's premier outreach instrument. As various states adapted Project Archaeology to different regional audiences, it became clear that the deep cultural knowledge that brings archaeology to life promotes a sense of protectiveness toward the archaeological record. Even more importantly, it can give children a thrilling connection to their own identities. Project Archaeology thus helps develop a public that values cultural heritage. As economic stresses continue to threaten disciplines with no obvious connection to jobs, archaeology

will need broad public support to remain healthy. That public includes members of groups currently underrepresented in the profession, such as African Americans and Native Americans. The multicultural Project Archaeology lessons, tailored to national and educational standards, can attract a wider range of students to study their cultural heritage and pursue archaeological careers. We need their voices if we are to enrich archaeological understanding and foster a public that cares about what we do.

[330] *Discussant*

King, John [243] see Robinson, David

King, Justin, Heather Richards-Rissetto (University of Nebraska-Lincoln) and Kristin Landau (Northwestern University)

[289] *Enter the Void: A GIS Analysis of the Visibility of Empty Spaces at Copan, Honduras*

The concept of visibility: what or who is visible and who can see what, provides archaeologists with information about power, ideology, and interaction. Geographic Information Systems (GIS) allow us to quantify the visibility of archaeological features in landscapes and 3D visualizations and gives us a way to experience these past landscapes. In Maya archaeology, most visibility studies measure the visibility of monuments as a means to understand the role of architecture within ancient Maya society. In this paper, we reverse our approach—measuring the visibility of “empty” spaces at the ancient city of Copan in Honduras—in order to interpret the role they may have played in conveying messages and shaping daily life. Using GIS we identify “empty” spaces across the city and begin to interpret their potential significance. These spaces that appear “empty” today could have been agricultural fields, household gardens, or ritual stages, which each have different implications in terms of visibility. We focus particularly at “empty” spaces in San Lucas—a neighborhood overlooking Copan’s main civic-ceremonial complex.

King, Jason (Center for American Archeology), Jason Herrmann (Eberhard Karls Universität Tübingen), Jane Buikstra (Arizona State University) and Taylor Thornton (Center for American Archeology)

[331] *Ground-penetrating Radar Survey and Excavation of the Golden Eagle (11C120) Embankment*

The Golden Eagle site (11C120), located near the confluence of the Mississippi and Illinois Rivers, in Calhoun County, Illinois, is the only known Lower Illinois Valley mound site that includes an earthen enclosure. The site is frequently discussed in regional interpretations of moundbuilding traditions, though little is directly known about the site, particularly the embankment. Archaeological investigations have been limited to topographic mapping, pedestrian surveys, and limited inspection of an erosional cross-section on the eastern side of the embankment. In 2013, the Center for American Archeology (CAA) began geophysical prospection of the site, followed by excavations conducted by the CAA and the Arizona State University Field School in 2014. In this paper, we report results from ground-penetrating radar (GPR) survey and groundtruthing in the northwestern portion of the embankment. GPR and excavation results are used to characterize the structure of the embankment, and evaluate evidence from the eastern erosional profile.

King, Adam (SC Institute of Archaeology and Anthropology)

[335] *Exploring Community Creation at the Mississippian site of Etowah (9Br1)*

Etowah was the locus of a prehistoric community for 550 years. After its founding, the site was abandoned and re-occupied twice, meaning Etowah’s communities were created three separate times. Periods of abandonment create points in the life of a community where it is possible to question and modify local tradition. Re-establishment after abandonment can lead to novel ways of casting identity, social relations, and history. Data collected at Etowah and the wider region reveal this process and allow me to explore how the built environment and material culture of Etowah were transformed with the creation of each new community.

King, Stacie (Indiana University) and Ricardo Higelin Ponce de Leon (Indiana University)

[410] Mortuary Practices in the Nejapa region of Oaxaca, Mexico

To date, we have documented or recovered the remains of over 15 individuals in the Nejapa region of Oaxaca. This paper summarizes these finds and takes a first step in comparing the mortuary practices of Nejapa to those in other regions of Oaxaca. Eight individuals were found buried nearby one another at the site of Majaltepec, an early Colonial period town in the mountains surrounding Nejapa. Morphoscopic dental analyses indicate the presence of at least 4 younger individuals between 15 and 21 years old, 3 infants, and 1 individual of undetermined age. Though poorly preserved, the burials provide us clear examples of early Colonial indigenous mortuary practices. Notably, residents of Majaltepec buried their dead below floors of buildings with grave offerings, similar to practices in Prehispanic Oaxaca. The persistence of these practices alongside Dominican presence and Catholicism suggests that there were limits to Spanish oversight. Prehispanic burials in Nejapa, by comparison, are uncommon in spite of extensive excavation. The lack of sub-floor burial in Nejapa, in particular, might signal a difference in identity between the Prehispanic residents of Nejapa and the residents of Majaltepec in the late sixteenth century.

Kingwell-Banham, Eleanor (Institute of Archaeology, UCL)**[414] From Wild Rice Harvesting to Domestic Rice Agriculture in South Asia**

It is still unclear if India saw an independent domestication of rice, and so the origins of *Oryza sativa indica*, as distinct from the Chinese rice *O. s. japonica*, are shrouded in mystery. However, there is very early evidence dating to ca. 9000 BP of wild rice exploitation, and perhaps of crop management, from Northern India. Once rice becomes widely reported within the archaeobotanic record, there is long term evidence for low impact agrarian practices across the subcontinent, including shifting cultivation, lasting up to 5000 years until domestic rice agriculture became widely adopted. This presentation will sum up archaeological and genetic evidence for rice domestication in India and outline the pathway to domestic rice agriculture that the current data supports, a pathway which is almost uniquely protracted and muddled.

Kinkopf, Katherine (University of California, Berkeley) and Jess Beck (University of Michigan)**[205] Bioarchaeology and Looting: A Case Study from Sudan**

Disturbing the dead has been considered a criminal activity in the Nile Valley since the trial of Egyptian tomb robbers in 1100 B.C.E. Looting is one of the most destructive forces at archaeological sites; grave robbing, in particular, leaves human remains and cultural heritage irreparably damaged. During 2007-2008, the Oriental Institute Nubian Expedition (OINE) worked to identify, record, and preserve important archaeological sites that have since been destroyed by the Merowe Dam. Al-Widay, a cemetery that was excavated by the OINE near the Fourth Cataract region of the Nile River in northern Sudan, is a site with important implications for understanding the taphonomy of archaeological looting. Over 60% of the tumuli excavated at Al-Widay were disturbed in antiquity, making it an ideal case study for examining the effects of looting on the recovered human skeletal remains. Our research applies bioarchaeological methods of quantifying fragmentation to an assessment of culturally significant anatomical regions in order to evaluate the nature and degree of human disturbance activity at Al-Widay. Studying the preservational patterning of looting makes it possible to access aspects of looting behavior in the past, as well as to reconstruct the original archaeological context of disturbed remains.

Kintigh, Keith (Arizona State University)**[69] Discussant**

Kintigh, Keith W. [167] see Bocinsky, R. Kyle

Kintz, Theresa (The Underground)**[400] Fields of Resistance: Reflections on Archaeology and Anarchist Praxis**

In this paper I offer personal reflections on my experiences as an anarchist archaeologist. I'll be addressing how my perspective has shaped my interpretation of material culture and landscape;

describe my experiences as a CRM field archaeologist organizing to resist exploitation, lobbying for a more egalitarian profession and recognition of our unique form of archaeological knowledge; analyze the eco-anarchist movement's appropriation of anthropological and archaeological data and theory.

Kirakosian, Katie (UMass Amherst)

[270] *Moderator*

[270] *Discussant*

Kirakosian, Katie [281] see Doucette, Dianna

Kirch, Patrick (Univ. California Berkeley)

[77] *The Mussau Islands Lapita Exchange Network: A Review of Three Decades of Analysis*

From 1985-88 the author conducted excavations at Talepakemalai (ECA) and other Lapita sites in the Mussau Islands of the Bismarck Archipelago, recovering an extensive assemblage of pottery, obsidian, lithics and manuports, and other materials. Efforts to geochemically characterize the diversity and trace the potential sources of ceramic clay and temper, as well as the obsidian and other lithic materials from Mussau have continued over three decades. Throughout this evolving research project Bill Dickinson has made significant contributions. This paper reviews the complex technical and methodological issues involved, and summarizes our current understanding of early Far Western Lapita exchange.

Kirch, Patrick [339] see Swift, Jillian

Kirkendall, Whitney [106] see Leon Guerrero, Annamarie

Kiser-Go, Deanna (University of California, Berkeley)

[240] *A Tale of Two Tombs: The Relationship between Khonsu's Funerary Monument and that of Userhat*

Egypt is well known for its long-running funerary traditions, and one of the most fruitful avenues of research on the topic is the study of decorated tombs at the ancient site of Thebes (modern Luxor). The cemetery complex that served this large settlement and religious center during the New Kingdom (ca. 1550-1070 B.C.E.) contains thousands of graves. This paper examines two nearly contemporaneous tombs that although commissioned to hold the burials of different men, have a great deal in common—professionally, iconographically and perhaps even personally. Indeed, the more complete of the pair is useful in reconstructing damaged portions of the other monument. The tombs lie a short distance from one another and their imagery follows a similar decorative program. Both of the officials memorialized and interred in Theban Tombs 31 and 51—Khonsu and Userhat, respectively—were high-ranking priests in the mortuary cults of deceased pharaohs. I will briefly discuss the tombs' location and their decoration before turning to the manner in which the occupations of their owners is likely connected to administrative protocol in a tightly controlled realm of Egyptian society: tomb preparation and site assignment.

**Kissel, Marc (University of Notre Dame) and Agustín Fuentes (University of Notre Dame)
(University of Notre Dame) and Celia Deane-Drummond (University of Notre Dame)**

[53] *The Evolution of a Distinctive Human Niche: Assessing and Describing the Development of Wisdom in the Pleistocene the Archaeological Record*

How can anthropologists assess the pattern of complex decision-making that early humans undertook when navigating social networks and what role does this ability, which we might call wisdom, play in the origin & development of the cultural human experience? While it is clear that there are behaviors unique to humans such as the creation of complex lithic artifacts, unaddressed for the most part has been how behaviors such as collaboration, land use patterns/long-distance raw material transport, symbolic thinking, aesthetic preferences, ritual behavior, and stigmergy (self-

organization) are expressions of wisdom itself. We suggest that specific changes occurred in the material record between 500-100 kya that engendered substantial changes in the human niche. Here, we report on a large-scale comparative database of archaeological and fossil sites, which includes behavioral patterns, materials used, types of representation produced, possible uses for these items, and, where available, local ecological and demographic parameters. This allows focus on the feedback loop between social and material complexity in order to examine how these experiences shaped other evolutionary processes. These data will then be used to develop a model to determine patterns that can provide insight into the creation and use of the distinctive human niche.

Kistler, Logan (The University of Warwick)

[226] *Molecular Archaeobotany from Its Early Foundations Onward: New Questions and Perspectives for the Genomic Era*

Following the inception of ancient DNA-based research in the mid 1980's, researchers began applying the new toolkit of archaeogenetics to a diverse range of questions surrounding human-plant interactions. These early studies laid the groundwork for the field of molecular archaeobotany, exploring aspects of selection and domestication, movement of crop plants alongside humans, and human impacts on ancient ecosystems. Some two decades later, ancient DNA researchers began experimenting with next-generation sequencing technologies, and recent years have seen the high-profile fluorescence of genome-scale ancient DNA research with the publication of a number of complete genomes from ancient humans and archaic hominins. These technological developments have allowed researchers to mitigate—though certainly not eliminate entirely—the perennial challenges of ancient DNA-based research, such as severe limitations of sample size, molecular marker choice, and accessible DNA fragment length. The same new methods are beginning to gain more widespread usage in anthropologically motivated plant archaeogenomics, dramatically increasing the breadth and resolution of approachable research using ancient plant DNA. Several recent studies begin to illustrate the utility of molecular archaeobotany in the age of genomics, but the full potential lies ahead.

Kitchell, Lindsey [33] see Schoenemann, P.

Kjolsing, Jason (UC San Diego) and Paul Goldstein (UC San Diego)

[377] *Seeing Prehistory in Color: Interpreting the Use of Colored Pigments at the Tiwanaku Omo Temple, Moquegua, Peru*

Although color is often at the background of our lived experience, colors also have the power to demand our attention. In this paper we explore how color was a meaningful component of the built environment in prehistoric South America and specifically the ways it demanded the attention of the Tiwanaku (A.D. 500-1100) of the south-central Andes. Extensive excavations at the Tiwanaku Omo ceremonial temple (M10A) in Moquegua, Peru have revealed the use of red and green pigments on selective walls and doorways throughout the structure. Using ethnographic, ethnohistoric, and archaeological data, we argue that the colors of Omo's built environment symbolized circulating liquids and guided temple supplicants along a ceremonial procession pathway. We suggest that attention to color is an important avenue for understanding the significance of the built environment and other materials from prehistory.

Klaric, Laurent (CNRS UMR-7055 PRETEC)

[181] *Palethnographic Interpretation of the Gravettian Site of La Picardie (Indre-et-Loire, France): A Difficult Path*

After nine years of excavations (1998-2008) the site of La Picardie has delivered a major lithic collection (more than 13 000 artifacts piece plotted) chronologically related to the "Raysse burin" Gravettian (second phase of Middle Gravettian ca. 24 ky BP uncalibrated). Through the study of lithic material several major results have been brought to light (chronological attribution, description of a new retouched bladelet type, reconstruction of the flint knapping process for blade and bladelet production). However, palethnographic study and interpretation of the site have yet to be broached.

In spite of some taphonomic problems, different studies can be combined in order to push our understanding of the site further: functional analysis of stone tools; assessment of skill level in flint-knapping; vertical and horizontal distributions of artifacts and tools; and observation of the organization of the different "structures" made of limestone blocks. Through several illustrative examples we will try to expose, step by step, the various elements that help us to rebuild the probable function of the site. Finally, making quick comparisons with other "synchronous" Gravettian sites (Solvieux, Plasenn-al-Lomm), we will see why La Picardie is quite unique for this peculiar phase of French Middle Gravettian.

Klassen, Sarah (Arizona State University), Damian Evans (University of Sydney), Terry Lustig (University of Sydney), Barry le Plastrier (Independent Scholar) and Eileen Lustig (University of Sydney)

[286] *Evaluating the Sustainability of an Angkor-Period Engineered Landscape at Koh Ker, Cambodia*

Several studies have argued that the collapse of an unsustainable hydraulic network was a major factor in the abandonment of medieval Angkor (~9th to 15th centuries A.D.) as the capital of the Khmer civilization. However, Angkor presents us with a great deal of uncertainty due to the spatial and temporal complexity of the archaeological remains. The Angkor-period city of Koh Ker, in contrast, provides the opportunity to study a medieval water management system whose structure and functioning can be discerned with relative clarity. Here we present the results of an investigation into the archaeological landscape of Koh Ker, including the use of airborne laser scanning (lidar). We argue that the system at Koh Ker was a hybrid one, combining elements of a 'highland system' of damming river valleys (as in Phnom Kulen) with elements of the classical 'lowland system' of reservoirs, canals and bunded fields (as at Angkor). We assess the strengths and weaknesses of this engineered landscape in the context of different hydrological, hydraulic, agricultural, social and demographic models; present evidence for the catastrophic failure of the system during the Angkor period; and assess the implications of these data for our understanding of the sustainability of medieval Khmer cities.

Klaus, Haagen [187] see Hurtubise, Jenna

Klehm, Carla (Washington University - St. Louis), Eileen Ernenwein (East Tennessee State University), Katie Simon (Center for Advanced Spatial Technologies, University of Tennessee), Jeremy Menzer (East Tennessee State University) and Mica Jones (Washington University in St. Louis)

[7] *Bosutswe Landscapes: Defining African Complexity through Spatial Archaeometry*

This multi-component project addresses how societies in Iron-Age Botswana (550-1650 CE) experienced the change from small, rural-centered life to centralized power based on increasing involvement in trade across the Indian Ocean. How this change occurred remains a central focus, with increasing pressures on the environment in this desert-margin landscape a likely contributing factor. It features the Bosutswe region, situated on the eastern edge of the Kalahari Desert, where the site of Bosutswe has been well studied but surrounding sites are almost entirely unknown. These smaller, even ephemeral sites were drawn to the magnet of opportunity that Bosutswe provided: temporary camps for traders and hunter-gatherers, and smaller homesteads inhabited for a few years or possibly generations. The project includes low-altitude aerial and geophysical survey of two small ground sites and a hilltop site, Mmadipudi Hill, located within 4km of Bosutswe associated with the beginning of this transition period. The data from the drone-based platform, including thermography and a photogrammetrically-produced digital elevation model was compared to on-the-ground geophysical surveys including electromagnetic induction (EMI), ground-penetrating radar (GPR) and magnetometry and targeted test excavations.

Klehm, Carla [8] see Simon, Katie

Klein, Richard (Stanford University)

[296] *Archaeological Shellfish Size and Later Human Evolution in Africa*

About 50,000 years ago, modern humans expanded from Africa to Eurasia. Significant behavioral change accompanied this expansion, and archaeologists commonly seek its roots in the African Middle Stone Age (MSA) before 50,000 years ago. Easily recognizable art objects and “jewelry” become common only in sites that postdate the MSA in Africa and Eurasia, but some MSA sites contain possible precursors. Population growth is the most popular explanation for these precursors and for the post-MSA florescence of art. Economically important gastropods from coastal sites in South Africa allow a test this idea, since the number of human collectors is probably the principal determinant of average gastropod size. In every examined gastropod species, average size is similar in MSA layers with precocious artifacts and those without, and MSA gastropods are always substantially larger on average than those in succeeding Later Stone Age (LSA) layers that formed under equivalent environmental conditions. The sum suggests that whatever the cognitive implications of precocious MSA artifacts, they were not associated with population growth. MSA populations remained consistently small by LSA standards, and a substantial increase in population size is obvious only at the MSA/LSA transition, when it is dramatically reflected in the Out-of-Africa expansion.

Klein , Lauren [273] see Fernandez, Andrew

Klokler, Daniela (Universidade Federal de Sergipe - UFS)

[152] *Fish Heads that Turn Heads: Catfish from Cabeçuda Shell Mound*

Zooarchaeological analysis of the Cabeçuda shell mound identified a number of Ariidae (Genidens barbus, G. genidens) neurocrania with exceptional preservation. This site is a large mound located in southern Brazil, and the faunal collection was sampled during archaeological interventions done in the 1950s. Generally, Ariidae specimens are a common find in Brazilian shell mounds. However, Cabeçuda is the only site that presents elements with this level of preservation. Catfish neurocrania are composed of several bones that easily disconnect from each other and their presence at the site in such condition leads to some questions. This paper explores the importance of catfish and its decline throughout the occupation. Is it due to changes in preferences or environmental shifts, site formation processes and their influence on differential preservation, or site function?

Klokler, Daniela [152] see Gaspar, Maria

Klontz, Barbara (PaleoResearch Institute) and Linda Scott Cummings (PaleoResearch Institute)

[415] *PaleoNutrition, Coprolites, and Hemachromatosis: What is the Connection?*

Evidence of cribra orbitalia in the physical anthropology record has long been interpreted to represent inadequate sources of iron in the diet. Pairing coprolites with naturally mummified bodies from Nubia allowed examination of the diet and correlation with physical evidence retained by the bones at both the population and individual levels. Although the diet included foods sufficiently rich in iron, it also contained foods heavy in phytates, which block the absorption of iron. In this population, iron deficiency anemia was more likely related to eating foods rich in phytates than to not having access to sufficient iron in the diet. Hemachromatosis, commonly referred to as iron overload, is genetically controlled. To many it is the opposite of iron deficiency anemia. How might examination of prehistoric diet shed light on the origins of hemachromatosis? Hemachromatosis is more common in people of northern European origin than in people and then from other areas of the world. Can a correlation be shown through time between dietary adaptation and genetic mutation? How does nutritional analysis of coprolite evidence of diet contribute to a better understanding of health?

Knab, Timothy (Universidad de las Américas Puebla) and John Pohl (UCLA)

[259] *Round and Round We Go: Cholula, Rotating Power Structures and Social Stability in Mesoamerica*

Rotating power structures of the mayordomías circulares in Cholula show extreme stability through time. We will analyze how these systems work and why they are so effective using notions of social capital to show how these and other organizations in Cholula build up social capital needed to keep

Cholula's baroquely complicated system of ritual festivals running. In so doing, we will show that the system can be sourced to the early post conquest period when it was maintained by the city's merchants, and further propose that it was rooted in Postclassic structures that maintained Cholula as a coherent urban entity at the apex of a vast trade network. The extreme social stability of rotating power structures make them a much better model for looking at Mesoamerica's past than the linear Aztec models so often used for the comparative analysis of ceremonial centers.

Knabb, Kyle (University of California, San Diego), Matthew Howland (University of California, San Diego), Tammy Rittenour (Utah State University), Yigal Erel (Hebrew University) and Thomas Levy (University of California, San Diego)

[321] *Rethinking The Cultural and Natural Dimensions of Landscape Pollution in the Faynan Valley, Southern Jordan*

The human impact on marginal environments is an issue that has especially affected societies in the Middle East during the past 8,000 years, a time when some of the most significant political and economic developments in the history of human societies took place. Such development often permanently altered the character of these fragile ecosystems. Landscape degradation, especially heavy metal pollution, is a poignant example of the deleterious effects that humans can have on the environment. We conducted a study of ancient pollution in the Faynan valley of southern Jordan – an area rich in copper ores – during the most intensive episodes of production: the Iron Age and Roman period. Based on the results of excavation and survey, geochemical analysis, and OSL dating, we created a GIS model of the spread of ancient metal ions through biophysical processes. This information has allowed us to simulate the ways in which potential pollutants would have moved across the landscape, and hypothesize the effects on the landscape. We argue that intensive copper production did not directly lead to environmental degradation, but instead, was probably the result of a combination of post-abandonment factors, including erosion and the collapse of supportive infrastructure.

[321] *Chair*

Knapp, Dante [230] see Green, Debra

Knaub, Colene, Nicole Jacobson (University of Central Florida) and Kate Flor-Stagnato (Rutgers University)

[207] *Exhumation vs. Excavation: The Armenian Genocide and Our Ethical Responsibilities*

Records of human rights violations precede biblical times and have shown no signs of decelerating despite the contemporary measures taken to clearly define such atrocities. In the case of the Armenian Genocide, committed by the Ottoman Empire during WWI, the Young Turk government took great care as to restrict the publication of photographs and reports that would expose the widely condoned practice and to this day claim to have no responsibility or knowledge of such occurrences. The physical evidence obtained from the remains of victims that are exhumed from mass graves is delicate and controversial. We will discuss the various ways that archaeologists and physical anthropologists attempting to recover and restore historic memories that had been selectively recalled have undertaken a twofold endeavor; the exhumation as well as the excavation of mass graves. The initial and unarguably integral mission of these specialists is to identify the remains of individuals associated with human rights violations so as to be repatriated to family members. Secondly, the obligation towards collecting scientific evidence that is unable to be dismissed so that historic acknowledgement of the enormous human and material loss occurs. We will examine the nuanced process in which these endeavors are undertaken.

Knecht, Rick

[337] *Prehistory and Climate Change in Southwest Alaska*

Significant elements of the artifact assemblage, architectural features as well as recent DNA analysis of human hair recovered from the Nunalleq site (GDN-248), all support the idea of Thule cultural expansion onto the Yukon-Kuskokwim Delta region of Alaska. Other evidence points to strong links

with the Alutiiq (a dialect of Yup'ik) speaking peoples on the Kodiak Archipelago, Alaska Peninsula and Prince William Sound. There are clear similarities between late prehistoric Yup'ik and Alutiiq religious and ceremonial artifacts, game pieces, and hunting technologies. This paper compares two large and well-preserved late prehistoric assemblages: the Nunalleq site now being excavated near Quinhagak, south of the Kuskokwim River and the Karluk One site on Kodiak Island. Both are wet sites that have yielded more than 20,000 artifacts, many of rarely preserved wood and other organic materials and both were occupied during the Little Ice Age. Comparison of these sites reveals telling similarities and differences in the way coastal Yup'ik and Alutiiq peoples may have responded to climate change.

[337] *Chair*

Knecht, Rick [337] see Britton, Kate

Kneifel, Rebekah (University of Montana), Rachel Loehman (USGS, Alaska Science Center), Connie Constan (USFS, Santa Fe National Forest) and Jim Reardon (USFS, Rocky Mountain Research Station)

[90] *Fuel Treatment Guidelines to Reduce Wildfire Damages to Ceramic Artifacts in the American Southwest*

Artifact assemblages in the American southwest are currently subjected to periodic wildfires and prescribed burns, and have been exposed to fires in the past. Ceramics are a key constituent of these assemblages, leading to questions regarding effects of post-depositional heat and flame exposure on pottery. Alterations of ceramic pattern, form, and chemistry have been observed following wildfires, and such changes are significant because intact ceramics provide temporal context and other social information. Over the past 150 years, southwestern wildfires have shifted away from the historical high-frequency, low-severity regime; thus, cultural resources can be exposed to fires that are potentially more damaging than have occurred in the past. The wide range of fire environments and the duration and intensity of heating that result in damages to ceramic artifacts has not previously been systematically assessed. We report on results from laboratory tests conducted as part of the Joint Fire Science Program-funded ArcBurn project. Our results demonstrate that the type of fire environment and sustained dose determine patterns of alteration. Results can be used to identify fire environments that cause loss of information from artifact assemblages, and to develop management treatments and procedures to guide archaeological preservation in fire-prone landscapes.

Knell, Edward (California State University, Fullerton)

[386] *Terminal-Pleistocene through Late Prehistoric Settlement Strategies around Pluvial Lake Mojave (Soda and Silver Lake Playas), California*

Multiple lines of evidence are used to establish terminal Pleistocene-early Holocene (TP-EH) through Late Prehistoric spatio-temporal patterns and settlement strategies around pluvial Lake Mojave (more recently Soda and Silver Lake playas), California. Data from pedestrian survey and in-field analysis of lithic artifacts at four survey areas along the eastern shoreline of Soda and Silver Lake are analyzed using GIS to establish whether settlement strategies changed in accordance with variations in the lake water-level. Prior analysis of the Little Cowhole survey area identified three spatially separated, dense bands of artifacts that follow the TP-EH shorelines and reflect a gradual, time transgressive shift in TP-EH habitation closer to the receding water-level (Knell et al. 2014). Other survey areas at Soda and Silver Lake have sites dating from the TP-EH to Late Prehistoric, providing the opportunity to evaluate whether post-TP-EH peoples continued shifting towards the receding water-level. The analyses indicate that the Middle and the Late Holocene sites are at sequentially lower elevations than the TP-EH sites, ultimately providing temporal and spatial context for the TP-EH sites (the focus of my research) and key insights regarding Lake Mojave's or Soda and Silver Lake playas role in the regional settlement system.

[386] *Chair*

Knight, Charles (University of Vermont)

[172] *The Middle to Late Formative Olmec Chipped-Stone Assemblage from Los Soldados, Veracruz, Mexico*

The use of chipped-stone in domestic Olmec contexts has only recently become a focus of archaeological investigation. With the publication of data on the chipped-stone assemblages from the Olmec centers of San Lorenzo and Tres Zapotes in the last few years, a picture emerges of great diversity in materials consumed and technologies used by commoners and non-commoners alike. The Middle to Late Formative household chipped-stone assemblage from the 2010 excavations at Los Soldados, in the hinterland of the Olmec center of La Venta, adds to this picture of regional diversity. Unlike other Olmec period sites where obsidian from numerous sources was the principal chipped-stone material consumed, the Los Soldados assemblage reflects the utilization of a wide variety of microcrystalline materials, the most common being chert. While obsidian also is common, it appears to have been used in ways that differ from other materials. What this variation suggests about the participation of the Los Soldados inhabitants in a region-wide obsidian exchange network is addressed through regional comparison.

Knight, Charles L. F. [259] see Smith, J. Gregory

Knight, Terry (Ute Mountain Ute Tribe)

[369] *Discussant*

Knipper, Corina [93] see Harris, Susan

Knodell, Alex [385] see Gosner, Linda

Knox, Kelsey (University of Colorado, Denver)

[396] *Biogeography of Neandertals: The Southern Italian Middle Paleolithic*

Most research on the Middle Paleolithic in southern Italy has focused on the region of Apulia. This research has been extensive and productive, and so it stands to reason that other less researched regions of southern Italy hold similar potential. This paper uses predictive niche modeling to identify Neandertal niche from site location and environmental variables in Apulia, and applies the modeled niche to under researched regions to predict locations of new Middle Paleolithic sites. The model will also be tested against locations of recent site discoveries in the regions, allowing a reflexive look at both where researchers choose to look for sites as well as the accuracy of the predictive models as derived from Apulia and applied elsewhere in southern Italy. Results will help call attention to the potential of the area while guiding future research.

Knudson, Kelly J. [338] see Novotny, Anna

Kober, Brent [304] see Craig, Douglas

Kocer, Jacqueline

[354] *An Examination of Gallina Utility Ware: Vessel Morphology and Function*

The morphology of a ceramic vessel is directly related to intended use, and potters consider function during manufacture. Functional types such as cooking vessels, ollas, water jars, seed jars, bowls, and pitchers, are common in our ceramic lexicon. However, the relationship between morphology and function is not always intuitive, especially when considering secondary function and special use. The Gallina (A.D. 1050-1300) produced a wide variety of utility wares, but archaeologists have conducted almost no research on the ceramic style, use-wear and function of these non-decorative vessels. How many different shapes of utility ware were utilized in Gallina country? How did the Gallina use these different morphological types? Do interpretations based on shape indicate something different than use-wear and residues? I examine whole vessels from the Gallina culture area and categorize them into morphological classes. I also compare sooting on these different

morphological classes to evaluate actual use. I test whether or not vessels in the identified morphological classes were positioned over the fire in the same manner as evidenced by sooting patterns. Finally, a qualitative discussion of individual vessels allows for further interpretations about vessel use.

Koenig, Charles (Texas State University - San Marcos, Texas)

[256] *Floods, Muds, and Plant Baking: ASWT Excavations at Skiles Shelter*

Skiles Shelter (41VV165) is a "wet" rockshelter situated approximately ½ kilometer upstream from the confluence of Eagle Nest Canyon and the Rio Grande in the Lower Pecos Canyonlands of Texas. Due to the threat of inundation and damage due to extreme flooding events when Rio Grande flooding backs up from Amistad Reservoir, Skiles Shelter is the most-threatened site within Eagle Nest Canyon. Initial testing of Skiles was conducted during the 2013 Texas State field school. In 2014, the Ancient Southwest Texas (ASWT) Project greatly expanded on these preliminary excavations, focusing on four main research objectives: 1) understanding the site's depositional history; 2) quantifying how much earth oven baking occurred there; 3) using ground based (e.g., hand-held digital cameras) Structure from Motion (SfM) photogrammetry to document every excavation unit, layer, profile, or exposure; and 4) relating the prehistoric record at Skiles to the other sites within Eagle Nest Canyon. Combining the SfM data with Total Data Station shots, we have created an unparalleled 3D record of the site, as well as high resolution documentation of every sample collected for radiocarbon dating, geoarchaeology, archaeobotany, and zooarchaeology. This presentation will highlight the investigative methodology and preliminary results of the ongoing analyses.

Kohl, Philip (Wellesley College)

[340] *Silence and Noise in the Archaeological Record: Are Archaeological Understandings Always Underdetermined?*

In his seminal critique on the practice of history: *Silencing the Past: Power and the Production of History*, Michel-Rolph Trouillot persuasively argues that historians often cannot understand or even recognize major historical events, such as the slave organized and directed rebellion in Haiti (1791-1804) that led to the end of slavery and the establishment of the Republic of Haiti. It was simply inconceivable that slaves could plan and lead a successful revolt against their French masters. If historians with such a rich textual record can overlook or largely ignore this past, what chance do we have as archaeologists to recognize and interpret the silences of the material cultural record that are so fundamental to the discipline? This paper addresses the acute archaeological problem of interpreting "the absence of evidence" through the development of international collaborative research programs that foster a more robust understanding of the archaeological record; more dissonance undercuts the refractory silences of the past.

Kohler, Tim (WSU/SFI/CCAC)

[348] *The Effects of Temporal Coarse-Graining on Inferred Networks of Human Movement*

Analyses using tree-ring dates provide an attractive test-bed for examining effects of temporal coarse-graining in archaeological contexts, due to the high-resolution of dendrochronology. After compiling a database of every known tree-ring date in the U.S. Southwest, we use tree-ring-date counts and locations as proxies for gridded human population estimates in the upland portions of the SW US. Grid-squares that lose dates are connected to nearby grid squares that gain dates as we move from one time slice to the next, thus forming spatial networks of (putative) population flow. We progressively coarse-grain the cutting dates (e.g., bin them first by decade, then by 20 years, etc.) and we quantitatively monitor the effects that this coarse-graining has on the statistics calculated on the networks. These spatial networks, which we call spatial genealogies, tend to show that areas developing distinctive ceramic types and wares emerge as more-or-less separate components in a network sense. Thus, the implication is that style zones emerge because of relatively dense circulation within them, compared to sparser movement between them. In this paper we ask, At what temporal coarse-graining does this effect disappear?

[84] *Discussant*

Kohler, Timothy A. [84] see Crabtree, Stefani

Kohut, Lauren (Vanderbilt University)

[11] *Fortified Lookouts and Border Patrol in the Late Intermediate Period Colca Valley, Peru*
During the Late Intermediate Period (A.D. 1000-1450), the Colca Valley in the southern Peruvian highlands was heavily fortified. Survey of hilltop fortifications (pukaras) identified a class of large non-habitational pukaras located along the rim of the valley that were perhaps designed to monitor the vast expanses of puna surrounding the valley. Additionally, a prehispanic road which leads into the valley from the south passes through a primary defensive wall at one of the sites—further suggesting access into and out of the valley was a central concern for local groups. In this paper, I use spatial modeling of ideal regional routes (least-cost paths) along with known prehispanic roads to examine the relationship between the location of this class of fortifications and access points to the valley. The results show that the number of ideal access points is limited by the geography of the valley. The proximity of these fortifications to these access points indicates they likely functioned as monitoring outposts and were strategically placed to monitor access into and out of the valley. This pattern suggests that communities in the Colca Valley were organized against external threats, rather than local raiding within the valley during the Late Intermediate Period.

Kolar, Miriam

[59] *DIY Digital Archaeoacoustics: Sensory-Spatial Mapping*

An experiential link to past life, sound is a medium for engaging questions of ancient emplacement and human activity. Spatial sonics can be linked to a dynamic sensory map of one's surroundings; beyond conveying information about structural boundaries and environmental events, architectural and landform acoustics can help or hinder communication. Although acoustics and audio digital signal processing are specialist disciplines, consumer audio technologies can enable the extraction of sonic characteristics from the objects that produce sound and the structures that shape it. Inexpensive, free, and/or open source audio computing tools can be leveraged for non-invasive research methods, important to site conservation. Integrative archaeoacoustics fieldwork at the Andean Formative ceremonial center at Chavín de Huántar, Peru has relied upon customized digital audio research tools and methods, frequently developed in the field DIY-style, in response to site features and logistical challenges. New research connects acoustic data with coincident auditory perceptual responses to generate sensory spatial maps, informed by DIY archaeoacoustics, to engage sonic questions.

[59] *Chair*

Kolb, Charles (National Endowment for the Humanities)

[35] *Tales from Three Caves and a Rockshelter in Balkh Province, Northern Afghanistan*

The geomorphology and archaeology of four Balkh River Valley sites near the bazaar town of Aq Kupruk (36°05'0"N 66°50'0"E) spanning the Upper Paleolithic through Contemporary Nomadic cultures are detailed and compared. This valley served as a significant north-south corridor through the Hindu Kush Mountains, a western extension of the Himalayas, and a caravan route from the Turkestan Plain to the Bamiyan Valley and on to the Kabul River Valley, Indus and the Subcontinent. Major excavations were conducted at Aq Kupruk I (Ghar-i-Mar/"Snake" Cave), a rockshelter with a slight overhang and highly complex stratigraphy located on the east side of the river, and Aq Kupruk II (Ghar-i-Asb/"Horse" Cave), a true cave situated on the west side. Aq Kupruk III, an open-air Upper Paleolithic campsite, was also tested and a small sondage excavated in Aq Kupruk IV, a shallow cave, which yielded ten disarticulated secondary burials and grave goods dating to the late Early to Late Iron Age. Chronologically, the longest stratified archaeological sequence anywhere in Afghanistan occurs at Aq Kupruk I: Upper Paleolithic, Epi-Paleolithic, Neolithic, Bronze Age, Iron Age, Achaemenid, Early Kushan, Great Kushan, Early Sasanian, Kushano-Sasanian, Hephthalites, "Early" and "Late" Islamic, and Contemporary Nomadic.

Kolb, Michael [368] see Balco, William

Kolber, Jane [149] see Huang, Jennifer

Kolise, Jennifer (USAG Fort Carson) and Pamela Miller (USAG Fort Carson)

[363] *"Got Data, Now What?": Fort Carson's Steps Toward Addressing Data Gaps in Archaeological Research*

For several decades, the U.S. Army Garrison (USAG) Fort Carson, Colorado, has had an active cultural resources management program, resulting in the documentation of over 8,000 archaeological resources. The known archaeological resources represent every period of human occupation from the Paleoindian period to the present. Site types include cache sites, open/sheltered camps, village sites, game drive sites, rock art panels, quarries, historical ranch complexes, historical trails, historical trash scatters, and cairns. In support of the Army's training mission, the Fort Carson Cultural Resources Management Program has focused their most recent efforts on the identification, protection and monitoring of significant resources. Through the execution of programmatic agreements (PAs) that allow for creative mitigation opportunities, the accumulated data is now being analyzed and synthesized to address gaps in the prehistory and history of southeastern Colorado. This poster will discuss current and future archaeological research and management goals and objectives.

Koller, Jared [238] see Alders, Wolfgang

Koller, Jared (Boston University) and Kaoru Ueda (Boston University)

[238] *In Search of Southeast Asia's Trade Network: Comparative Ceramic Analysis*

Southeast Asia is a region whose inhabitants have long been engaged in long-distance trade connected through ocean and river systems. This paper presents the preliminary results of a petrographic study on earthenware samples from archaeological sites in Singapore, Indonesia, and Thailand in order to scientifically investigate the putative trade networks. The preliminary results show a complex picture of local production and imported ceramics, one that changes depending on the location and the specific socio-political of each site. This paper argues that fine-paste ware analysis is crucial to understanding the region's trade networks, and is an essential step toward building a baseline database of Southeast Asian ceramics.

Kollmann, Dana

[19] *Put 'em to Work! The Transition from the Classroom to the Field*

Many students eager to begin a career in the forensic sciences have never been on a crime scene and it is even more unlikely that they have ever had the opportunity to process one. This paper details the unusual circumstances that enabled Towson University students to partner with law enforcement and work on both active and cold cases that have necessitated the search for human remains and associated evidence.

Komas, Tanya [310] see Everett, Mark

Kontonicolas, MaryAnn and C. Myles Chykerda (University of California, Los Angeles)

[368] *The Ancient Methone Intensive Survey Project: New Research at a Harbor City in the North Aegean*

Methone (located in Pieria, Greece) was a key trading hub in the prehistoric and historic North Aegean, visible in the discovery of an array of workshops, production tools, and imported artifacts, and by some of the earliest evidence for the Greek alphabet in the Mediterranean. The 2014-2016 Ancient Methone Archaeological Project aims to enrich our understanding of the settlement and situate it within the wider Mediterranean world. The principal components of the project—intensive surface survey, excavation, and geophysical and geomorphological survey—work together in interdisciplinary collaboration to enhance our current understanding of this significant site. This

presentation outlines the initial findings of the 2014 survey, focusing on critical information concerning the surrounding natural and cultural landscapes of the settlement. Over six weeks in summer 2014, a total of 80 hectares was surveyed via intensive pedestrian survey methods. Geographically-linked data was digitized and visually presented in ESRI's ArcMap 10.2. General trends show a rich material assemblage ranging from the Late Neolithic (ca. 3500 B.C.E.) onwards, with a number of individual finds attesting to the industrial manufacturing and trade that took place at this center. Other materials represent military, cultural, and economic spheres of Methone throughout its rich occupational history.

Konwest, Elizabeth [235] see Bollwerk, Elizabeth

Konwest, Elizabeth (Indiana University, Bloomington)

[335] *Where We Live: Houses, Households, Barrios, and Towns in Postclassic Oaxaca*

Greater La Amontonada, a cluster of Postclassic period sites in the Nejapa region of Oaxaca, Mexico, is an ideal location for investigating the ways in which people would have negotiated their roles as members of households, neighborhoods, and larger communities. Group members enact their relationships through everyday choices, habits, and routines that are materialized through daily action. The practices enacted in one community, the learning and doing, may be materialized differently than those learned in other communities. These practices are physically manifested in the learned methods of production that are passed down from generation to generation, and can be seen in technological choices, production methods, and raw materials. Through an analysis of the production technologies of artifacts recovered from excavated residential structures, primarily ceramics and lithics, this paper will consider how the residents of greater La Amontonada would have been linked to various spatially defined groups including, but not limited to, households and communities. Maintaining these group ties was important, as people of greater La Amontonada reacted to various foreigners traversing through Nejapa on trade and conquest campaigns between the politically powerful Oaxaca Valley and the resource rich Tehuantepec coast.

Kooiman, Susan (Michigan State University)

[280] *Pottery Function, Cooking, and Subsistence in the Upper Great Lakes: A View from the Middle Woodland Winter Site in Northern Michigan*

The relationship between subsistence and food-processing technology is a burgeoning topic in archaeology and has the potential to yield new perspectives on resource choice and cuisine in the Upper Great Lakes. This paper presents the results of exploratory functional pottery analysis from the well-dated Winter site, a Middle Woodland habitation in the western Upper Peninsula of Michigan. The analytic data discussed includes those physical properties affecting ceramic vessel performance, as well as use-alteration traces, particularly those indicative of cooking and food processing techniques. The analytic results are compared to similar data from the Naomikong Point site, another northern Michigan Middle Woodland site. Both sites are then contrasted with data from the nearby Late Woodland Sand Point site in order to explore possible temporal changes in subsistence practices, which could be linked to a broader suite of behavioral changes taking place during the late prehistoric period in this region. Together, the comparative application of functional pottery analysis to these assemblages could serve as the foundation for a more refined regional understanding of prehistoric vessel function, cooking techniques, and diet.

Koons, Michele [90] see Nash, Stephen

Koons, Michele (Denver Museum of Nature & Science)

[404] *Southern Moche Politics Reevaluated: The Reconciliation of Relative (Ceramic Chronologies) and Absolute (Radiocarbon) Dates*

Recently I performed a reevaluation of published radiocarbon dates for the Moche culture (200-900 A.D.). I only considered ^{14}C samples obtained from short-lived plant materials found in association with "datable" ceramics (Moche I-V, and Early, Middle, and Late Moche). The purpose was to test the validity of the relative ceramic chronologies in each valley against absolute dates. For this paper,

using Bayesian analysis I compare the well contextualized Moche dates from the Chicama Valley to those from the Moche and Viru Valleys to demonstrate that ceramic style does not strictly follow time and that there are marked differences in the dates when each ceramic style was in use in the different valleys. This has major implications on our understanding of Moche politics in the Southern Moche region. The reevaluation of the Moche 14C record demonstrates that ceramic phases are insufficient for understanding Moche chronology. However, by careful analysis of the absolute dates associated with ceramic styles at different sites, we can begin to reconstruct Moche political dynamics and site affiliations through time.

Koontz, Rex (University of Houston)

[39] *Patterns of Elite Self-Presentation in North-Central Veracruz, Middle to Epiclassic Periods*

Elite public imagery in north-central Veracruz during the Cacahuatal phase (c. 350-600) focused on frontal presentations of single figures and a restricted iconography. The Late Classic brought considerable changes to elite self-presentation in the region, including a more complex multi-figure narrative format and the palma, a new costume object. Both of these changes were directly related to changes in the visual patterns of public sculpture and the performance of public rites. This essay looks at the changes in patterns of elite self-presentation from the iconic, earlier Cacahuatal through the complex narrativity of the Late and Terminal Classic periods (Isla A and B) against the backdrop of the growing importance of the urban center of El Tajín.

Koontz, Cassandra [208] see Birge, Adam

Koontz, Cassandra

[208] *Landscapes of Violence: Trophy Head Production and Interpersonal Violence during the Wari era in the Middle Majes Valley, Arequipa, Peru*

The Middle Horizon (600 - 1000 A.D.) is known as a period of increased social hierarchization, changing mortuary customs, and high rates of interpersonal violence in many regions of the prehistoric Peruvian Andes. This project compares rates and types of violent practices (antemortem, perimortem, and postmortem violent dismemberment) between the northern and southern sectors at the recently excavated Middle Horizon cemetery site of Uraca in the middle Majes Valley to skeletal data from the early and late Middle Horizon excavated by Tung in the upper Majes Valley in order to determine whether violence types and rates are different near the ritual center of Toro Muerto than at other mortuary and residential sites in the upper valley. Spatial distributions of violence types and rates from the present project and published data are also explored in order to determine whether local geography predicts the type of violence practiced. Differences observed in violence rates and types can be explained by two alternate hypotheses. The northern and southern sectors at Uraca may have been used for interment during different time periods, or for interment of individuals from different social classes, ethnic identities, or occupational groups.

[208] *Chair*

Kopperl, Robert (SWCA Environmental Consultants), Amanda Taylor (SWCA Environmental Consultants), Kenneth Ames (Portland State University) and Christian Miss (SWCA Environmental Consultants)

[360] *New perspectives on Native American occupation of the Puget Lowlands of Washington during the Late Pleistocene-Holocene transition from the Bear Creek Site (45Kl839)*

The Bear Creek site (45Kl839) in Redmond, Washington has yielded important information about Native American settlement, subsistence, and technology in the Puget Lowlands during the Late Pleistocene-Holocene transition. This poster presents new data on radiocarbon and optically-stimulated luminescence dating, paleoenvironmental reconstruction, and lithic analysis conducted as part of the 2013 data recovery investigation. New dates contribute to an age model that places the initial archaeological component prior to 10,000 cal BP. Occupation of this lacustrine shoreline ended by the early Holocene as the position of the shoreline shifted and the local environment became a wetland. The lithic assemblage, comprising over 5,000 artifacts in all, is dominated by an expedient flake technology, but also contains bifaces, retouched tools, and associated debitage. Analysis

focuses on procurement strategies of local volcanic and metasedimentary cobbles and extra-local materials, production sequence of flake tools, and technological comparisons of the Bear Creek stemmed and concave-base points with Paleoarchaic technologies of Western North America including Clovis, Western-Stemmed, and Olcott traditions. Microwear and residue analysis of a portion of the assemblage suggest potential functions of the site occupants' toolkits.

Kornfeld, Marcel (PiRL - University of Wyoming) and George Frison (University of Wyoming)

[138] *Paleoindians and Rockshelters in the Middle Rocky Mountains*

Since at least the 1980s the University of Wyoming has conducted Paleoindian and rockshelter studies on BLM administered properties from northern Colorado to southern Montana. The cooperative and assistance agreements have benefited both the agency and the University. An enormous amount of research effort contributed by the faculty, and enhanced by volunteers and avocationalists, have produced results far beyond what could have been accomplished without the cooperation. The results include students training (many becoming federal archaeologists), student and faculty conference presentations, publications including MA and PhD thesis, and public education. We highlight some of our research results including excavations at Mill Iron, Upper Twin Mountain, Krmpotich, Two Moon Shelter, Last Canyon Cave, and others.

Kornfeld, Marcel [166] see Larson, Mary Lou

Korpisaari, Antti (University of Helsinki, Finland)

[184] *On the Absolute Chronology of Late Tiwanaku / Early Late Intermediate Period Ceramic Traditions: Case Studies from the Bolivian Altiplano and North Chile*

Although the timing of the Tiwanaku collapse is debated and probably varied somewhat from one region to another, this process probably took place in the 10th and 11th centuries A.D. In 1998-2006, I worked at two Tiwanaku heartland sites which produced long series of radiocarbon dates corresponding to this critical period. At the cemetery site of Tiraska, ceramic grave goods in a style closely resembling Tiwanaku V were present from the early 10th until the mid-13th century A.D. On the island of Pariti, our investigations uncovered the remains of a probable closing offering: huge quantities of "Classic" Tiwanaku pottery in two contexts securely dated to circa A.D. 1000. As for North Chile, many of the 16 radiocarbon dates I obtained in 2013-2014 for four "Middle Horizon" cemetery sites of the Azapa Valley are surprisingly late; this is especially true for the dates related to the Cabuza ceramic tradition, all of which post-date A.D. 1000. In light of the abovementioned case studies I shall discuss the use-life of the "Classic" and "Decadent" ceramic styles in the Tiwanaku heartland and the possibility that the spread of the Cabuza pottery into North Chile was largely related to the collapse of the Tiwanaku state.

[184] *Chair*

Korstanje, Maria Alejandra (Universidad Nacional de Tucumán - CONICET), Marcos Quesada (Universidad Nacional de Catamarca - CONICET) and Mariana Maloberti (Universidad Nacional de Tucumán - CONICET)

[180] *Agriculture Roles in Landscapes and Taskscapes: An Interdisciplinary Approach from Northwestern Argentina*

Traditionally, the Agriculture of the Formative Period (1000 B.C.-100 A.D.), was conceived as technologically simple and spatially reduced. However, this simplicity is reconsidered when we take into account that these technologies made possible the practice of agriculture in desert environments with eroded and underdeveloped soils, during millennia. Our research in El Bolsón valley, which is a high basin in western Catamarca, allowed us to know in detail some peasant practice as the irrigation technologies, the field preparation and other agronomic techniques as well as how the agrarian landscapes were structured in the past. In this presentation we summarize the results obtained through multiple lines of work (including landscape archaeology, archaeobotany), that allowed us to discuss the idea of agriculture perpetuated from traditional models, and also rethink it from a perspective that considers the complexity of the relationship between plants, soil, water, agricultural knowledge and ways of labor organization. Thus, we have recognized a significant

variability of peasant practices through which agriculture was configured during the Formative period. We have also recognized the persistence of certain aspects of this agriculture during Regional Development Period (1000 - 1500 A.D.), for which it has been assumed a re-articulation of production and power structures.

[347] *Discussant*

Kosakowsky, Laura (University of Arizona)

[295] *Remembrances of Things Past: Peter D. Harrison and Maya Archaeology*

After Peter Harrison's forays at Tikal, Guatemala and in Quintana Roo, Mexico, he turned his attentions to archaeological research in Belize in the late 1970s. Thus began his multi-year project at Pulltrouser Swamp, with his colleague Billie Lee Turner, which resulted in a series of foundational publications on Prehispanic Maya agriculture. In this paper we reflect on Peter's contributions to Belize archaeology and to the discipline as a whole, as we celebrate his many interests in Maya settlement patterns, agriculture, architecture and hieroglyphs.

[295] *Chair*

Kosiba, Steve (University of Alabama)

[305] *Killing Time, Becoming Inca: Subject Creation and Monument Construction in Ancient Cuzco*

The Incas built the largest indigenous empire in the Americas, and though they lacked a written history, they were keen to tell Spanish scribes how they assembled their domain. Inca nobles explained that their ancestors vanquished anyone who dared challenge Inca claims to authority. Like the boasts of other conquerors, these stories cast only particular people as the subjects of history and the cultivators of "civilization." But they also conceal another side of Inca history: For, it was precisely during these violent encounters that the places and people of the Andes became Inca—essential members of an Inca polity.

This paper challenges Inca and archaeological tales of domination by focusing on the negotiated sites and violent practices that created Inca subjects and constructed official histories in Inca and Spanish Cuzco. It presents recent archaeological and ethnohistorical data to trace the social life of the Inca deity and shrine at Huanacauri, a contested monument that first served to support Inca absolute authority and later came to embody a generalized Andean identity. Over the past six centuries, Cuzco's people have built, revered, and demolished this monument, thereby collapsing Inca myth and history while giving rise to different understandings of the concept "Inca."

[305] *Chair*

Kosintsev, Pavel A. [74] see Van Kolfschoten, Thijs

Kotegawa, Hirokazu (Universidad Veracruzana)

[172] *An Olmec Cylinder Seal from Los Soldados*

In 2010, a young man from the Ejido Diaz Ordáz found a Prehispanic clay cylinder eroding out of a road cut in the Olmec site of Los Soldados. Although the exact archaeological provenience is not secure, we consider the object belonging to the Olmec culture through other data obtained by the Proyecto Arqueológico Arroyo Pesquero-Los Soldados. The artifact is of particular importance because of the unique images presented on this artifact, which appears to constitute a domestic scene. We know of no comparable Olmec or other Mesoamerican cylinder seals. In this study we develop an iconographic comparison between similar Mesoamerican images to clarify unique and common characteristics. And we argue that the scene represented on this clay cylinder seal has much to do with the activities engaged by the residents of the site. We consider the potential that this archaeological piece has in helping to reconstruct the daily life of the Ancient Olmec.

Kott, Isabela [52] see Pratt, Jordan

Kott, Isabela, Carl P. Lipo (California State University, Long Beach), Christopher Lee (California State University, Long Beach) and Terry L. Hunt (University of Oregon)

[52] *Spatial Analysis of Prehistoric Garden Features on Rapa Nui (Easter Island, Chile)*

Manavai are circular walled stone gardens used for cultivation by the prehistoric populations of Rapa Nui (Easter Island, Chile). Though not fully mapped, over 1000 manavai are known across the island in a distribution that reflects dispersed settlement patterns. Object-based image analysis of newly available high-resolution imagery of the island offers a means of systematically identifying manavai features. Using the results of these analyses, we examine the spatial patterns of manavai and their association with topography and other environmental resources to test hypotheses about the role that these gardens played in past communities.

Kouvatsou, Patricia [81] see Avila-Ortiz, Alan

Kovacevich, Brigitte [22] see Callaghan, Michael

Kovacevich, Brigitte (Southern Methodist University)

[86] *The Materiality and Mobility of Jade in the Upper Usumacinta Basin*

Distributions of jade in the Upper Usumacinta basin suggest that the movement of jade followed political connections and were not purely instances of down-the-line trade motivated by economic gain. Jade objects were likely gifted between elites to solidify political relationships. Some sites along the Usumacinta River received a wealth of jade, while others were relatively impoverished and turned to replicas or other forms of symbolic capital. The materiality of jade during the Classic period gave it a unique role within Maya society in the constitution of social identity and social connections.

Kovach, Adreinne [81] see Howey, Meghan

Kovacik, Peter (PaleoResearch Institute)

[176] *New Perspectives on the Use of Yucca in the Arid Southwest: Archaeobotany and Experiment*

Macrofloral analysis conducted on sites concentrated in the northwestern Permian Basin (southeastern New Mexico) recovered evidence of charred yucca (*Yucca* sp.) leaf bases in numerous features. Ethnographically various yucca plant parts are mainly associated with fiber and food processing. The presence of these remains in solitary hearth features distributed on the arid landscape of southeastern New Mexico suggests use of these plants simply as tinder. Yucca plants represent a natural and easily accessible element in this environment. Experimental burning of whole yucca plants was carried out to better understand the ignition properties of dry yuccas and to identify charred plant remains that would be common in the archaeological record. In addition, scanning electron microscope imagery was used to compare the microscopic anatomy of archaeological and modern yucca reference materials. Results of this study were plotted, using GIS, on the landscape to show distribution of these remains compared to all of the feature samples examined within the project area. In addition, hundreds of AMS radiocarbon dates on charred yucca leaf bases and other remains from features that contained charred yucca also were obtained, indicating burning this common native plant by people crossing this landscape consistently for a few thousand years.

Kováčik, Peter [62] see Varney, R.

Kovacs, Shawn (McMaster University), Eduard Reinhardt (McMaster University) and Dominique Rissolo (Waitt Foundation)

[370] *Calcite Rafts as a Proxy for Reconstructing Holocene Surface Water Conditions of Hoyo Negro: A Phreatic Coastal Karst Basin in Quintana Roo, Mexico*

Located in the Sac Actun cave system on the eastern coast of the Yucatán Peninsula, Hoyo Negro pit (HN) has proven to be a very important pre-Maya archaeological site as human (Naia, dated between approx. 13 000 - 12 000 calendar years ago) and faunal remains have been discovered

(Chatters et al., 2014). Reconstructing the flooding history (accessibly when the cave system was dry) and water chemistry of HN is critical to our understanding of the movement of humans and fauna into and through the cave over time. To accomplish this, cores of calcite raft piles from the upper cave passage connecting HN to Ich Balam Cenote (IB) and the base of the HN pit were analyzed for stable isotope composition ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$ and $87\text{Sr}/86\text{Sr}$) and trace element concentration. This study identifies the long-term paleohydrochemical conditions in IB and HN while comparing/contrasting independent climate records within the circum-Caribbean region. Furthermore, this will represent an innovative proxy that will reconstruct surface groundwater salinity and its potability during the Holocene.

Koyiyumptewa, Stewart [239] see Ferguson, T. J.

Kozuch, Laura [152] see Marquardt, William

Krall, Angie [110] see Wescott, Konnie

Kramer, Karen [153] see Greaves, Russell

Krasinski, Kathryn [72] see Seager-Boss, Fran

Krasinski, Kathryn (Adelphi University)

[87] *Towards a Multivariate Model for Accurately Identifying Cutmarks*

The identification of cutmarks has been integral to expanding the understanding of hominin behavior ranging from the origins of meat eating to megafaunal extinctions and the peopling of Australia and the Americas. However, paleoanthropological and archaeological research has demonstrated that while cutmark placement may be indicative of activity, cutmark morphology is more complex and influenced by multiple variables such as raw material, tool shape, and bone density. Further, significant overlap in the classic features of cutmarks, such as the standard V-shaped cross-section, has also been recognized in numerous processes including carnivore gnawing and trampling. This presentation establishes an empirical, probabilistic, and multivariate approach through logistic regression for differentiating raw materials (lithics, steel, and teeth) as well as actors which produce modifications commonly identified as evidence for butchering in the archaeological record. The results demonstrate that no diagnostic attribute of cutmarks produced by lithics was identified. Therefore, single attributes are insufficient for accurate cutmark identification. However, an approach which includes excavation history, stratigraphic context, location, orientation, and color of mark improve the likelihood with which cutmarks are identified accurately.

[87] *Chair*

Krause, Samantha [350] see Beach, Timothy

Krause, Samantha (University of Texas at Austin), Timothy Beach (University of Texas at Austin), Sheryl Luzzadder-Beach (University of Texas at Austin) and Thomas Guderjan (University of Texas at Tyler)

[350] *Maya Wetlands: Natural and Anthropogenic*

In our continuing endeavors to better understand Maya wetland formation and agricultural systems across the Maya Lowlands, we now compare natural and anthropogenic wetland field formation. Natural wetland processes can form patterned environments that may be similar visually to intensive, culturally modified, wetland systems. This paper will consider natural factors that can produce similar topography to Maya wetland fields. We will also present aerial photography, GIS, soil stratigraphy, and wetland chemistry to clarify the differences between natural wetland features, such as hogwallow, tree islands, ant mounds, and gilgai patterns, and intentional ancient canal and field systems. By developing new techniques to better quantify wetlands that have been culturally

modified, it will be possible to improve upon previous models of identifying and mapping Maya agricultural systems and understanding other earth surface processes and forms.

Krause, Johannes (Max Planck Institute - SHH), David Reich (Department of Genetics, Harvard Medical School, Bo), Iosif Lazaridis (Department of Genetics, Harvard Medical School, Bo), Nick Patterson (Broad Institute of Harvard and MIT, Cambridge, MA,) and Alissa Mittnik (Institute for Archaeological Sciences, University)

[396] *Ancient Human Genomes Suggest Three Ancestral Populations for Present-Day Europeans*

Ancient DNA can reveal historical events that are difficult to discern through the study of present-day individuals. To investigate European population history around the agricultural transition, we sequenced complete genomes from a ~7,000 year old early farmer from the Linearbandkeramik (LBK) from Germany and an ~8,000 year old hunter-gatherer from Luxembourg. We also generated genome wide data from seven ~8,000 year old hunter-gatherers from Sweden. We compared these genomes and published ancient DNA to genome wide data from 2345 present-day individuals from 185 diverse populations to show that at least three ancestral groups contributed genetic material to present-day Europeans. The first are Ancient North Eurasians (ANE), who are more closely related to Upper Paleolithic Siberians than to any present-day population. The second are West European Hunter-Gatherers (WHG), related to the Loschbour individual, who contributed to all Europeans but not to Near Easterners. The third are Early European Farmers (EEF), who were mainly of Near Eastern origin but also harbored WHG-related ancestry. We model the deep relationships of these populations and show that about ~44% of the ancestry of EEF derived from a basal Eurasian lineage that split prior to the separation of all other non-African lineages.

Krause , Samantha [350] see Hanratty, Colleen

Kretzler, Ian (University of Washington), Joss Whittaker (University of Washington) and Ben Marwick (University of Washington)

[200] *Grand Challenges vs Actual Challenges: Text Mining Small and Big Data for Quantitative Insights*

Kintigh et al (2014) recently published a survey of archaeologists that claimed to identify 'archaeology's most important scientific challenges'. Numerous commentators have critiqued the small sample size of this survey (181 respondents) and the subjective reading of the responses. We use quantitative methods to analyze the full text of the survey responses and discover different challenges to those highlighted by Kintigh et al. We also analyze over 6000 archaeology journal articles in JSTOR to investigate the importance of the 'grand challenges' over time. We show how quantitative analysis of text reveals the diversity and dynamism of archaeological topics.

Kribaum, John [205] see Steinbruchel, Amber Joliz

Krigbaum, John (University of Florida (Anthropology)), Christina M. Giovas (Department of Anthropology, University of Pittsburgh) and George D. Kamenov (Department of Geological Sciences, University of F)

[164] *Strontium and Lead Isotope Evidence for Paleomobility of Introduced Fauna in the Southern Caribbean*

Increasingly, studies seeking to understand the interconnectivity of precolumbian Caribbean island societies have employed isotopic approaches to identify the movement of peoples and goods between islands and continents. These investigations advance reconstructions of mobility and exchange, and their social context, by providing robust data on the non-local status of archaeological remains and their ultimate origins. Here we report on the results of strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) and lead isotope ($^{206}\text{Pb}/^{204}\text{Pb}$, $^{207}\text{Pb}/^{204}\text{Pb}$, and $^{208}\text{Pb}/^{204}\text{Pb}$) analyses of introduced South American mammals, agouti (*Dasyprocta* sp.), opossum (*Didelphis marsupialis*), and dog (*Canis lupus familiaris*), in the southern Lesser Antilles during the Ceramic Age, ca. 2500-500 BP. Importantly, we report new data for bioavailable strontium and lead for four islands with variable volcanic and carbonate geologies: Grenada, Carriacou, Mustique, and Barbados. When incorporated with zooarchaeological findings, these data inform on Amerindian exchange, socio-economic networks,

faunal exploitation, and the potential captive management of introduced animals and their possible ecological impacts.

[328] *Discussant*

Krigbaum, John [205] see Groff, Amanda

Krill, William [358] see Sakai, Sachiko

Kristan-Graham, Cynthia (Auburn University)

[88] *The Form and Function of Lineage: Council Houses in Epiclassic Mesoamerica*

The council house (popol nah or nim ja in Maya languages) is found from North Mexico to southern Mesoamerica. With roots in Classic-period architecture and enduring until after the Conquest in some regions, the council house typically was located in central areas of civic-ceremonial centers and featured a rectangular colonnade and built-in benches. In situ glyphs and ethnohistory indicate that lineages used these buildings for ritual-administrative purposes, and perhaps also as dwellings. This paper analyzes the proliferation of the council house during the Epiclassic period and queries whether it can be considered diagnostic of Epiclassic architecture, and how its consistent form came to be spread over a wide geographic area.

[39] *Chair*

Kroot, Matthew (Skidmore College)

[401] *Understanding Temporal Patterns of Occupation at Small Sites: The Case of Early Neolithic al-Khayran, west-central Jordan*

Beyond their identification and recording during survey, small sites have only occasionally and sporadically been the object of significant research in archaeology. Yet, such sites can be of great significance when trying to understand a wide variety of social systems and practices. While the potential practices associated with small sites in the past are virtually limitless, some patterns are commonly found within specific forms of settlement systems. Within autonomous village-based settlement systems, such sites can often play central roles in subsistence production and the exercise of land tenure. One aspect of the occupations at small sites within such systems that is especially important is the temporal dimension. Typically, small sites within autonomous village-based settlement systems are only occupied during a portion of the annual cycle. However, understanding the temporal patterns of occupation at such sites is often quite difficult, given the frequent paucity of materials available for analysis. This paper examines evidence for temporal patterns of occupation at the Pre-Pottery Neolithic B small site of al-Khayran. Because al-Khayran is the first such site excavated from this time period, understanding the role of the site within broader settlement systems is potentially of great significance.

[401] *Chair*

Krug, Andrew (University of Missouri), Kyle Waller (University of Missouri) and Christine VanPool (University of Missouri)

[245] *There And Back Again: A Geochemical Analysis of Casas Grandes Shell Procurement and Exchange*

Previous studies of shell exchange in the Southwest have supported archaeological interpretations of competing regional networks in which the Hohokam, Sinagua, and Anasazi acquired shell from the Gulf of California, while the Casas Grandes, Mimbres, and Western Puebloan groups acquired shell from West Mexico. This study will build on previous analyses by integrating stylistic analysis with an expanded compositional database to further examine the role of shell exchange in the Animas phase region of New Mexico and Arizona. ICP-MS analyses of shell artifacts from 76 Draw will be combined with modern shell and an expanded Casas Grandes geochemical dataset to investigate potential regional sources for shell procurement. The geochemical analysis of shells from 76 Draw, as well as other Animas phase and Casas Grandes samples, will provide a clearer picture of exchange and interactions between the Casas Grandes core and sites in the borderlands.

Krummel, Jordan

[408] *A Bioarchaeological Analysis of Human Remains on the Summit of Tigre Pyramid, El Mirador, Guatemala*

On the platform between the triadic group on the Tigre pyramid at the site of El Mirador, Guatemala, the Mirador Basin Project discovered human remains scattered over the upper platform of this pyramid associated with hundreds of projectile points, in both local chert and obsidian from Central Mexico. Additional artifacts included shell, bone, and large quantities of Early Classic ceramics. This presentation will focus on the osteological remains from this deposit. Skeletal analyses of the remains will be considered with artifacts recovered in their proximity in order to reconstruct who these individuals were and the events that led to their deaths.

Kuckelman, Kristin [85] see Smith, Susan

Kuckelman, Kristin (Crow Canyon Archaeological Center)

[285] *Fortified Settlements as Forces of Social Change Among the Ancestral Pueblo Peoples of the Northern San Juan Region*

The sociopolitical landscape of the ancestral Pueblo peoples residing in the northern San Juan region of the American Southwest was influenced and shaped in significant ways by a variety of pressures associated with the construction and habitation of fortified communities during periods of heightened social tensions and increased violence. Evidence of the formation of fortified communities and the implementation of various defensive strategies dates from at least three major periods of occupation within this region: the Basketmaker III period (A.D. 500–750), the Pueblo II period (A.D. 900–1150), and the Pueblo III period (A.D. 1150–the early A.D. 1280s). This paper explores the societal effects of defensive strategies employed during these periods, which, during the earlier periods, included the construction of wooden stockades that surrounded individual farmsteads or hamlets and, during the final period, included the aggregation of populous communities and the construction of fortified villages near springs in protective alcoves and on canyon rims. Among ancestral Pueblo communities of this region, diverse environmental and societal pressures necessitated the construction and habitation of fortified settlements, an adaptation that, in turn, strained existing social systems and forced the development of more complex and integrated sociopolitical organization.

[85] *Chair*

Kuester, Falko [409] see Meyer, Dominique

Kuhn, Steven (University of Arizona) and Mary Stiner (University of Arizona)

[135] *The Antiquity of Hunter-Gatherers Revisited*

One of the challenges of Paleoanthropology is developing coherent models for ancient social and economic systems that have no close analogues in the recent archaeological and historical records. Systematic observations of variability among recent foragers produced by Binford, Kelly and others, are vital tools for understanding early humans. They provide necessary frames of reference for predicting variation, and for understanding why observations may not fit predictions. In a 2001 paper we argued that Middle Paleolithic hominins were very different kinds of hunter-gatherers than recent humans. Data accumulated over the past decade provide an opportunity to refine and reshape these arguments. Both theoretical and empirical findings highlight the importance of demographic factors in explaining the anomalous features of the Middle Paleolithic record. However, this begs the question of what might account for differences in the demographic potentials of hominin populations.

[241] *Discussant*

Kuhn, Steven [296] see Stiner, Mary

Kuijt, Ian [56] see Gunter, Madeleine

Kuijt, Ian (University of Notre Dame)

[82] *Where We Sleep: Ethnoarchaeological Perspectives on the Near Eastern Neolithic House and Households*

How many people lived in individual buildings within early food producing communities? Be it as an explicit driver or as an implicit background landscape, all modeling of small-scale household life, developing Neolithic villages, and the evolutionary trajectory towards the full-blown domestication is linked on some level to demography and the increasing scale of human communities through time. The reconstruction of the scale of Neolithic house, including our engagement with what may represent the shape and materialization of what can be called nuclear and extended households, is both complex and in need of further research. Ethnographic and archaeological studies demonstrate that the number of people living in early food producing houses, farms and villages varies depending upon household life-history, and that in many cases there is significant out migration of household members to other households or neighboring communities. Drawing upon comparative ethnoarchaeological research on 19th century houses and households from the fishing village of Inishark, Co. Galway, western Ireland, I explore how this comparative context reframes discussion of how we model social relations and connections within and between houses in specific, and Near Eastern Neolithic settlements in general.

Kukekova, Anna, Jennifer Johnson (University of Illinois at Urbana-Champaign), Anastasiya Kharlamova (Institute of Cytology and Genetics of the Russian), Rimma Gulevich (Institute of Cytology and Genetics of the Russian) and Lyudmila Trut (Institute of Cytology and Genetics of the Russian)

[28] *Genetics of Behavior in Fox Model of Animal Domestication*

Domestication as a special form of evolution offers valuable insight into how genomic variation contributes to complex differences in behavioral and morphological phenotypes. The silver fox (*Vulpes vulpes*) is taxonomically close to the dog but normally exhibit distinct patterns of aggressive and fear-aggressive behavior to humans. At the Institute of Cytology and Genetics (ICG) in Novosibirsk, Russia the process of animal domestication has been experimentally reconstructed and a strain of domesticated fox with behavioral patterns extremely similar to those of domestic dogs has been produced. The research program aimed to identify genetic regulation of these behaviors is under way. The Fox Experiment provides a strong support for genetics-centered view of animal domestication.

Kulaga, Nicole

[364] *When in the World? A Comparative Debitage Analysis of Single-component Sites through Time at Petrified Forest National Park*

Both Paleoindian and Archaic sites hold valuable information concerning some of the first people in North America, yet these sites remain to be some of the most difficult to identify. Without diagnostics like architecture and ceramics to turn to, projectile points are what are most commonly depended on when trying to date these locales. However,debitage makes up the bulk of the artifacts found on these sites and sites of later dates, and it is highly plausible thatdebitage characteristics will follow a pattern based on the technological changes that occur over time. Takingdebitage and the associated patterns into greater consideration allows for more accurate dating and data. In-fielddebitage analyses on single-component sites paired with analyses done in the past at sites spanning from the Paleoindian to Pueblo IV in the Petrified Forest is presented here. I will be looking at a variety of variables, including size, platform types and sizes, proportions of raw materials,debitage types, and other morphological characteristics. By doing so, I hope to find lithic assemblage signatures that correspond with specific time periods which would allow for Paleoindian and Archaic sites, as well as later sites, to become more distinguishable in the archaeological record.

Kulhavy, Kathryn [204] see Pack, Frankie

Kulick, Rachel (University of Toronto)

[395] *Social Geoarchaeology: A Case Study of Structural Organization at Peyre Blanque, Ariège*
Recent studies of structural remains at Magdalenian open-air sites have provided valuable insights into patterns of occupation and intra-site spatial organization. However, interpretations of activities that may have occurred within the structures have primarily been limited to understandings of the repetition and duration of such activities. Determining more detailed use-of-space within the structures has been challenging at many sites due to site disturbance, not only from natural and anthropogenic post-depositional processes, but also from difficulties in amalgamating structural data from recent studies with those of previous excavations (e.g., at Oelknitz, Andernach-Martinsberg, and Gönnersdorf). Current excavations at the site of Peyre Blanque, Fabas, Ariège, have revealed a possible Magdalenian stone structure, and spatial analyses of the archaeological finds and structural remains have been implemented. For the first time at a Magdalenian open-air site, a systematic geoarchaeological analysis of the potential structure has been conducted to better understand the use-of-space within the structure, and the post-depositional and soil formation processes that have affected the structure and overall site. This study demonstrates how soil micromorphological and geochemical analyses provide a high-resolution record of human activities and environmental processes that can enhance our understanding of Magdalenian site occupation and social organization.

Kulow, Stephanie [21] see Torvinen, Andrea

Kupriyanova, Elena [345] see Hanks, Bryan

Kurin, Danielle [11] see Diaz, Diana

Kurin, Danielle (University of California Santa Barbara)

[334] *Chair*

Kurin, Danielle [384] see Sugimoto, Kassie

Kurnick, Sarah (Lehigh University)

[335] *Discordant Relationships: Household and Community at Callar Creek, Belize*
From the Late Preclassic to the Late Classic period (400 B.C.E. to 900 CE), the Mopan Valley of Belize was a complex political landscape and an arena of intense political competition. During this time, the Valley witnessed the sequential rise of three, closely-spaced, major centers – centers likely in direct competition with one another – as well as the establishment and abandonment of minor centers and settlement clusters. The Mopan Valley Archaeology Project recently completed excavations and analyses of the minor center of Callar Creek. Located approximately halfway between the contemporaneous major centers of Buenavista and Xunantunich, Callar Creek was likely the home and administrative center for a low-level elite family. This paper will examine the relationships between members of the Callar Creek household and those living in both larger centers and small settlements. Excavations elsewhere in the Valley have suggested that individuals living at both major and minor centers actively cultivated relationships with those in adjacent hinterland settlements. Those living at Callar Creek, however, appear not to have engaged directly with those living in nearby settlements, and the Callar Creek household appears to have prospered while the surrounding households declined and were abandoned.

Kus, Susan (Rhodes College) and Victor Raharijaoana (Chercheur Associé Université de Fianarantsoa, Mada)

[20] *Some "Muse"ings on Past and Recent Encounters with Lutins, Naiads, and Non-Anthropomorphic Forces: Reconsidering Vocabulary and Questions Concerning "Religion" and "Belief" in the Face of Ethno-Archaeological Experiences in Madagascar*

This contribution involves a re-examination of assertions we have made in the past concerning “religion”, “belief” and “ideology: jettisoning some, reasserting others, and offering “refinements” where appropriate. Often limited cultural exposure to a circumscribed terrain of contemporary religions in service of the state contributes significantly to the initial framing of our questions (and attendant expectation of answers). One of our lives, embedded in context in rural and urban Madagascar, and our shared professional experiences in the field as ethno-archaeologists, have offered us some “alternative” insights because of a number of “grounded” and material encounters: with “imps”, “mermaids”, and “things; with others who have had such encounters; and with individuals capable of cajoling a range of quasi-anthropomorphic and non-anthropomorphic forces. On this edge between “religion” and “magic”, we focus attention on the audacious stance of specialists in a “lifeworld” (à la Jackson) where humans are sometimes ephemeral features among amoral autochthonous and immanent forces. We continue to argue that the inscrutability of some concrete material (syncretic) tropes of word, object, and deed in such lifeworlds might prove more challenging than the assumed insubstantiality of (orthodox) beliefs that may be deliberate artifacts of the calculated abstractions of ideologues (and later, social theoreticians).

Kus, Susan [142] see Raharijaona, Victor

Kusimba, Chapurukha [264] see Williams, Sloan

Kuzminsky, Susan [204] see New, Briana

Kuzminsky, Susan (Universidad Católica del Norte, Chile, University of California, Santa Cruz)

[357] *Cranial Morphological Variation among Paleoamerican Skeletons: A Test of the Coastal Migration Hypothesis*

Although the origin of the first Americans has been resolved through genetics, the routes that early humans traveled from Asia into North and South America are still the subject of intense scholarly debate. Recent genetic and archaeological data suggest an early migration may have occurred along the Pacific coast of the Americas. Based on these lines of evidence, it is hypothesized that Paleoamericans may show morphological affinities to prehistoric skeletons from coastal sites if an early Pacific migration occurred. To test this hypothesis, I compared Paleoamerican crania (>8,000 years BP) to samples from 30 coastal and interior sites in North and South America (7,500 - 1,000 years BP). High-resolution digital models were created with a 3D surface scanner and used to record standard craniofacial landmarks. A suite of 3D geometric morphometric analyses was conducted with the coordinate data to assess similarities among the coastal and interior groups. The results indicate close affinities between nearly all Paleoamerican and coastal samples, but do not exclude the possibility of an interior migration during the initial peopling of the Americas. This research is in accordance with recent genetic, archaeological, and skeletal analyses addressing the possible migration routes and biological affinities of the first Americans.

Kvamme, Kenneth

[284] *NCPTT and the Growth of American Archeogeophysics*

Before the turn of the millennium there were few practitioners of geophysical prospecting in American archaeology. In this relative vacuum NCPTT came into being at the right time, situated to support and promote these methods for site exploration, documentation and, in effect, preservation of site structural information because vast areas of the subsurface and its archaeological content could finally be mapped. In the late 1990s NCPTT was an early supporter of research into the integration or “fusion” of multiple geophysical data sets as means to build on relationships between complementary information and to provide a fuller picture of the subsurface. Since that time these approaches have risen to the forefront and occupy a central focus of contemporary research. By the early 2000s NCPTT also funded website development to promote knowledge of archaeological geophysics among American archaeologists and to share information about results across the country. In more recent years the NCPTT realized the importance of expanding knowledge of instrument capabilities and theoretical knowledge of the geophysical responses to archaeological

phenomena. Through these efforts NCPTT has been a constant promoter and support of geophysical prospecting in archaeology.

Kvamme, Emily (Four Corners Research)

[364] *Tree-Ring Analysis at Petrified Forest National Park, Arizona*

Samples of ponderosa pine and juniper have been collected from various historic sites at the Petrified Forest National Park. Historic sites include several structures that were built by the Civilian Conservation Corps in the 1930s, old fences and sign posts, as well as Navajo hogans. The CCC structures were constructed with ponderosa pine beams that were imported to the park from sources not too far from the Petrified Forest. From tree-ring analysis, climatic variations in the past can be inferred from these CCC structures. Old fences, sign posts and Navajo hogan roof beam samples of juniper are also being analyzed. The presence of cut old growth juniper is apparent and will provide an interesting perspective on past structures in the Petrified Forest.

Kvetina, Petr [82] see Pavlu, Ivan

Kvetina, Petr (Institute of Archaeology Prague, Czech Republic)

[82] *Chair*

Kwak, Seungki (University of Washington)

[407] *Farming as a Dominant Subsistence Strategy? Organic Geochemical Analyses on Potsherds from Prehistoric Korean Peninsula*

This study attempts to understand prehistoric human subsistence in Korean peninsula using organic geochemical analyses on potsherds. Organic geochemical analyses strive to be precise about the types of food groups that were processed within a pot by attempting to isolate and identify the specific organic compounds trapped in the fabric of its wall or adhering to its surface in residues. Traditionally, the transition from foragers to farmers in the central part of the Korean peninsula has been described as the subsistence change from hunter gathering to intensive rice farming around 3400 BP. However, due to the limited paleobotanical evidence in this region and high acidity of the sediment, detailed information about the subsistence is not yet known. Organic compounds have the advantage in that they are often preserved directly within archaeological ceramics. Studies have showed that high-temperature boiling using pottery is particularly effective in the preparation of various resources. In this regard, the methods have potential to become important tools of investigation to better understand the subsistence of ancient Korean people. This research provides a unique opportunity to reveal the characteristics of the transition from foragers to farmers in the central part of the Korean peninsula.

Kyriakou, Xenia-Paula [132] see Tica, Cristina

La Favre, Karl (UCLA)

[11] *Macro-Scale History of the Lake Titicaca Region, Peru and Bolivia: A Synthesis and Comparative Analysis of Settlement Patterns*

The Lake Titicaca region of Peru and Bolivia has been extensively surveyed by a number of archaeologists over the past 3 decades, but the accumulated data await systematic synthesis and comparative analysis. This study places the settlement pattern data from a dozen different surveys into a uniform analytic framework that focuses on demographic dynamics and their relationship to political change. Substantial regional variation is apparent in characteristics such as the variability of total population size through time, whereas trends such as changes in rank-size relationships display greater inter-regional synchrony of sometimes surprising patterns.

La Motta, Vincent M. [343] see Estes, Byron

La Salle, Marina (Vancouver Island University)**[13]** *The Institution of Archaeology*

Archaeology is perhaps now, more than ever before, a viable career choice for university students. Although academic positions seem to be dwindling, opportunities in contract, commercial, or compliance archaeology are skyrocketing as the development ethic of North American capitalism continues to expand. Armed with a field school and a handful of undergraduate courses, these new graduates represent the dominant practice of archaeology today. The question is, what are they practicing? Who has been teaching them, and what are they learning in their archaeological education? In this paper, I take a critical approach to the who, what, where, when, how, and why's of the institution of archaeology. In the gap between theory and practice -- between what is said versus what is done -- the unspoken power of archaeology as an ideological tool of the state is exposed. While this conclusion has been long-established, archaeological educators remain reticent to directly confront this "negative reality" in their classrooms, pressured by both within and without. The result is that the institution of archaeology remains complicit in what is ultimately a hegemonic project of imperialist violence.

Lack, Andrew and Todd Bostwick**[209]** *Games, Feasting, and Trade Fairs: Assessing the Relationship between Ball Courts and Exchange at the Ironwood Village Site*

A significant amount of research in Hohokam archaeology has been dedicated to understanding the structure of interaction and exchange. One particular model that has gained recent momentum is that of a marketplace economy revolving around ball court events that served as gathering points for social and economic interaction. These markets, or trade fairs, would have provided a reliable mechanism for the exchange of goods to spatially and socially disparate populations. Feasting also may have been associated with the ballgames. Villages possessing a ball court may have achieved a socially and economically prominent status within their communities, and likely had greater access to non-local and other socially-significant goods. Recent excavations at the Ironwood Village Site in the northern Tucson Basin have revealed a previously unknown early ball court. In this study, we assess the relative proportions of local and non-local artifact classes, along with socially valuable goods, from deposits that immediately preceded and followed the construction of the ball court. Spatial relationships of features adjacent to the ball court are also examined. The results are then compared to other ball court and non-ball-court villages in the vicinity to better understand the strength of association between ball courts and exchange.

Lacombe, Sebastien (Binghamton University)**[395]** *Investigating the Symbolic Aspects of Flint in the Making of Prehistoric Cultures: The Case of the Middle Magdalenian of Southwestern France*

Recent research on Magdalenian flint provisioning strategies in southwestern France, particularly from sites associated with decorated caves, have opened doors to new interpretations regarding the role that these materials played in the construction and maintenance of Magdalenian society. Beyond the traditional typological and technological factors that seem to mainly fluctuate according to circumstances, more consistent symbolic functions appear to have been imbedded in most of these materials, and in close connection to the area from which they originate. Echoing similar behaviors noted in other prehistoric contexts, these observations offer a genuinely renewed vision of Magdalenian culture.

Lacy, Sarah (University of Missouri-St. Louis)**[40]** *Using Oral Health Indicators as Evidence of Environmental Instability and Subsistence Shifts in the Late Upper Paleolithic of Western Eurasia*

Oral pathology prevalence can be used to make inferences about the behavioral and environmental factors that contribute to individual and population health. Late Upper Paleolithic Western Eurasian human groups were expanding geographically as well as increasing in density, and the major climatic oscillations that define this period stressed these pioneering humans. Evidence of this strain includes temporal differences in oral pathology prevalence, namely caries, periodontal disease, tooth

loss, and evidence of oral infection, taken from 124 Upper Paleolithic individuals. Relative to the Early Upper Paleolithic, these Late Upper Paleolithic peoples show increased caries and periodontal disease prevalence, likely reflecting a shift towards carbohydrates from fats as the major nutritional supplement to an otherwise high protein diet. This would be an adaptation to increasing food resource pressures and reflect shifting ecozones. Though the severity of periodontal disease and percentage of teeth affected by alveolar lesions actually decreases in the Late Upper Paleolithic, more individuals are affected and tooth loss prevalence increases dramatically. This may indicate increasing cultural buffering of the effects of poor oral health and ultimately subsistence and environmental change. These trajectories continue into the Mesolithic. Terminal Pleistocene oral health reflects changing environmental conditions relative to the earlier Upper Paleolithic.

LaDu, Daniel (the University of Alabama) and Ian W. Brown (the University of Alabama)

[220] *The View from Mazique (22Ad502): Reconsidering the Coles Creek / Plaquemine Cultural Transition from the Perspective of the Natchez Bluffs Region of the Lower Mississippi Valley*
Around A.D. 1000 Mississippian culture emerged in the Eastern Woodlands of North America. Originating around the confluence of the Missouri and Mississippi rivers, Mississippian culture rapidly spread south and east, radically transforming Late Woodland societies in its wake. Although Mississippian culture had come to dominate much of the interior of the Southeast by A.D. 1100, its advance into the Lower Mississippi Valley was impeded. Here, Mississippian societies encountered the Late Woodland Coles Creek culture that resisted replacement or transformation for the better part of a century, and it was not until A.D. 1200 that the Lower Mississippi Valley experienced a major reorganization of lifeways. Through the selective adoption of new forms of socio-political organization, settlement, and subsistence, Coles Creek culture gave way to Plaquemine culture. Current perceptions of this transition rely heavily on studies conducted in the Lower Yazoo and Tensas basins, and have produced conflicting interpretations regarding Plaquemine origins. Drawing on the results of excavations conducted during 2012 and 2013, this paper examines how this important transition manifested at the Mazique site and reconsiders Plaquemine culture from the perspective of the Natchez Bluffs region.

Laffey, Ann (University of Florida)

[153] *What's in your Ancient Chicha? Ethnoarchaeology and Organic Residue Analysis*
Ethnoarchaeological chicha brewing was conducted on modern ceramic sherd samples for organic residue analysis. The goal was to identify botanical biomarkers that can evidence the use of *Schinus molle* L., Erythroxylaceae coca, and *Echinopsis pachanoi* (San Pedro cactus) for ancient brewing in the Middle Horizon (MH) era (c. 600-1100 CE). There is strong evidence that during this period socio-political influence was inexorably linked to the ability to provide chicha in exchange for labor, goods, and during competitive hosting. Oversized vessels, likely used for boiling and fermentation, as well as fineware and plainware serving and drinking vessels suggest that both the MH Wari and the Tiwanaku secured their interests by serving large amounts of chicha. All three botanicals have been identified in MH paleobotanical assemblages. However, whether they were used in chicha recipes remains unknown. This research is designed to identify these ingredients in archaeological ceramic assemblages in an effort to refine our understanding of large-scale Middle Horizon chicha production. By tracing these ingredients it may be possible to identify chichas that were restricted to ritual use, seasonally limited chichas, and chichas that were used for mass consumption. Pressurized liquid extraction and gas chromatography-mass spectrometry were employed to qualify chemical biomarkers.

Lafrenz Samuels, Kathryn (University of Maryland, College Park)

[405] *Parsing 'Public' for Heritage Management in the Transnational Sphere*
Engaging local communities and the many publics has become responsible practice for archaeologists and heritage managers. However, the character of the public sphere is changing. Neoliberal reforms around the world have seen private and commercial actors increasingly fill the vacuum left in the wake of state withdrawal from social services provisioning. This withdrawal has meant the blurring of public and private interests and opening of new governance mechanisms

beyond those of the nation-state. Therefore, the landscape of archaeological heritage in the 21st century is increasingly shaped not simply by local and national frameworks for heritage management but also transnational ones driven by private, commercial, and non-governmental entities. In this talk I discuss the significance of these reformulations of 'public' activity in the transnational sphere for archaeologists seeking to collaborate with public partners. Focusing on issues of particular transnational import helps draw out in sharp relief the opportunities and challenges posed by the diverse publics of archaeology in the transnational sphere. I therefore situate my discussion within the unfolding crisis of global climate change, around which a suite of key markers of transnational heritage management may be found, including economic development, corporate social responsibility, public-private partnerships, human rights, and deliberative democracy.

Lake, Mark (University College London)

[191] *Is Wright-Fisher Reproduction an Appropriate Null Model for Cultural Transmission via Objects?*

For various reasons many archaeologists are interested in identifying what kinds of social learning operated in past societies. One approach to this problem that has proved increasingly popular since it was pioneered by Neiman in the 1990s is use of the Wright-Fisher population genetics model of reproduction as a null model for human cultural transmission. The basic idea is that a mismatch between the amount of cultural diversity predicted by the neutral allele theory and that actually observed (e.g. artifact types) provides evidence for interesting biases in social learning, such as conformism or anticonformism. Archaeological applications of this null hypothesis have to date produced a variety of results, but it has recently been demonstrated by Premo that the time-averaged nature of many archaeological assemblages may lead to false inferences about the presence of biases in social learning. In this paper we investigate a further concern, which is that disanalogies between biological and cultural reproduction may similarly result in false inferences. In particular, cultural transmission via material objects may produce levels of diversity that do not match those predicted by the Wright-Fisher model even if social learning was unbiased.

[84] *Discussant*

[221] *Chair*

Laland, Kevin [33] see Morgan, Thomas

Laluk, Nicholas (White Mountain Apache Tribe), Sarah Cowie (University of Nevada-Reno) and Ben Curry (University of Arizona)

[90] *Archaeological Collaboration in North America: Are "Benefits" to American Indian Communities Truly Being Maximized?*

With the continued evolution of collaborative archaeological projects between American Indian communities and archaeologists in North America archaeologists are constantly speculating ways in which their research will benefit American Indian communities. However, do archaeological research goals and agendas truly and positively contribute to the wants and needs of tribal communities involved? This paper examines various case studies in reference to collaborative archaeological projects in North America. The authors conducted a literature review of published deliverables from collaborative archaeological field projects to gain a better understanding of the continued disconnect between archaeological research goals and the utilization of collected data for "mutual benefit." Ranging from continued paternalistic notions to discrepancies in access to funding and social capital, various issues in the archaeological collaborative context need to be further critically examined.

[90] *Chair*

Lam, Yin [37] see Fargo, David

Lamb, Céline (University of Kentucky) and Scott R. Hutson (University of Kentucky)

[75] *Within and Between: A Comparative Discussion of Intra-site Variability and Hinterland Complexity at the Sites of Yaxché, Yucatan and Cerén, El Salvador*

Long-standing research at sites like Cerén exemplifies the increased interest in rural households and settlements and the shift away from the elite-centric nature of many earlier projects in Maya archaeology. Our expanding knowledge of ancient Maya hinterlands has allowed us to consider the heterogeneity that these smaller settlements displayed and revise our western binary perspective of “urban versus rural”. Recent investigations by members of the Ucí-Cansahcab Regional Integration Project (UCRIP) have revealed a range of variability among Yaxché households, including wealth, economic specialization, ritual activity, access to non-local goods, and occupation histories. In this paper, we discuss the intra-site variability found at Yaxché in an attempt to glean insights on social organization and socioeconomic integration of this hinterland. Comparing household behaviors and supra-household interactions at the ancient Maya sites of Yaxché and Cerén allows us to underline the diversity found within and between hinterland occupations. Ultimately, we wish to contribute to our understandings of ancient Mesoamerican communities and underscore the plurality and complexity of “rural” occupations.

Lamb, Angela [154] see Madgwick, Richard

Lambert, Shawn (University of Oklahoma) and Patrick Livingood (University of Oklahoma)

[3] *Locally-Made or Transported Heirlooms?: XRF Source Analysis of Post-Removal Choctaw Ceramics from Southeastern Oklahoma*

This paper explores the benefits of using compositional analysis in order to investigate whether post-removal Choctaw-made ceramics were locally made in southeastern Oklahoma and/or were transported from their original homeland in east-central Mississippi. A total of 20 sherds were analyzed using X-ray fluorescence spectroscopy (XRF) to determine their chemical composition. 10 sherds are from two post-removal Choctaw sites, 34MC544 and 34MC399 and were compared with 10 sherds from the Pevey site, 22LW510. Similarities and/or variations in chemical composition of Choctaw-made sherds may shed light on the symbolic importance of why and how the Choctaw chose to maintain traditional pottery manufacturing practices during the post-removal period.

[330] *Discussant*

Lambert, John (UC Davis), Thomas Loebel (Illinois State Archaeological Survey) and Matthew Hill (Iowa State University)

[150] *Paleoindians on the Postglacial Margin: Early Holocene Hunter-Gatherer Mobility in Northern Wisconsin*

The area south Lake Superior was first colonized by Late Paleoindian groups during the Early Holocene after the final retreat of the Laurentide ice sheet from the region. As a result, Paleoindian sites in the area are ideal for testing ideas about the nature of hunter-gatherer adaptive responses to early postglacial environments. This project presents data from reanalysis of the lithic assemblages from a number of sites spread across northern Wisconsin and Michigan's Upper Peninsula. The first hunter-gatherer groups to occupy the region would have encountered a rapidly changing boreal forest environment with no clear modern analog. Long-distance transport of high quality raw materials and the composition of lithic toolkits both indicate that high residential mobility, investment in key organic technology (i.e., watercraft and tailored leather clothing), and seasonal use of emerging wetland environments were important strategies used to cope with the unique ecological challenges presented by this recently deglaciated landscape.

Lambrides, Ariana [105] see Harris, Matthew

Lambrides, Ariana (University of Queensland) and Marshall Weisler (University of Queensland)

[152] *Investigating Resource Sustainability during Two Millennia of Occupation on Ebon Atoll, Marshall Islands: The Ichthyoarchaeological Evidence*

Low coral atolls, consisting predominately of unconsolidated sand and gravel, are commonly less than 2 m above sea level; consequently, atolls are amongst the most precarious landscapes for sustained human occupation in Oceania. Constraints encountered by colonizers include nutrient-

poor soils and salt laden winds which hindered plant growth, the absence of perennial surface freshwater, limited terrestrial biodiversity, and an inherent vulnerability to extreme weather events. Conversely, the marine ecosystem is exceedingly rich and diverse. Recent excavations have documented two millennia of continuous occupation on Ebon Atoll where fish remains are ubiquitous throughout the sequence. Ecological measures of diversity and trophic level analysis were applied to assess resource sustainability over time. This diverse range of analytical methods provides a more comprehensive understanding of the dialogue between humans and their environment.

Lancelotti, Carla [73] see Frances, Guillem

Lancelotti, Carla (Universitat Pompeu Fabra), Xavier Rubio-Campillo (Barcelona Supercomputing Center), Matthieu Salpeteur (Universidad de Barcelona) and Marco Madella (UPF/ICREA - CaSEs research group)

[73] *Climate, Resources and Strategies: Simulating Prehistoric Populations in Semi-Arid Environments*

The aim of this study is to model resource management and decision making among hunter-gatherer and agro-pastoral groups in semi-arid zones in order to explore evolutionary trajectories in relation to (a) the appearance of other specialized groups during the mid-Holocene and (b) environmental variability. The study of coexistence and interaction between groups with different subsistence strategies and land-use behaviors represents an interesting research challenge to understand socio-ecological dynamics. This study deeply depends on the appreciation of past settlement dynamics and resource management and the approach is through Agent-Based Simulation. Our case study focuses in Northern Gujarat (India), a marginal environment between the Thar Desert and the more fertile area of Saurashtra. This region is an ecotone characterized by the seasonal influence of the monsoon, where contrasting ecological niches are in tension and small climatic shifts can generate significant environmental changes. Archaeological evidence points to the presence and possible coexistence in the area of groups of people with different resource management strategies and mobility behaviors during the mid-Holocene: hunter-gatherers (HG) and agropastoralists (AP).

[176] *Chair*

Landau, Kristin [289] see King, Justin

Landau, Kristin (Northwestern University)

[366] *Engaged Investigation: Archaeology within Copán's Past and Contemporary Neighborhoods*

Generations of Copán archaeologists have revealed the secrets of royal tombs and hieroglyphic inscriptions, as well as explored humble households of the rural periphery. A new project brings together these two initiatives to study the diversity of settlement within one particular neighborhood of the ancient city. Growth and change in the San Lucas neighborhood are articulated with major political events at Copán's center to assess the degree of state integration, and more importantly, when, how, and why this degree fluctuated over time. Simultaneously, the project prioritized community integration with the indigenous people residing in today's San Lucas. We collaborated with a local high school to teach a year-long introductory anthropology course and directly involved students in the excavations. This talk highlights how typical academic archaeological investigation may be productively coupled with high school education through a focus on neighborhoods and a blurring of the arbitrary distinction between past and present.

Landreth, Frances [225] see Rodrigues, Teresa

Landry, Shannon (Northern Arizona University)

[212] *Zooarchaeology in the Southwest: Ritual Consumption and Faunal Resources at Ridge Ruin Pueblo*

The greater Sinagua region spans a distinct convergent geographical and cultural setting which provides a range of resources. Ridge Ruin is a prominent Sinaguan site occupied during the

transition from the Pueblo II to Pueblo III period. In 1941, John MacGregor published a bulletin summarizing the results of his Winona Village and Ridge Ruin excavations. In MacGregor's report and in the few publications on Ridge Ruin since, the majority of research has concentrated on the famous burial of the Magician. MacGregor's lengthy bulletin includes only a brief summary of the faunal analysis, which combined a small sample of faunal data from both Ridge Ruin and Winona Village excavations and provides minimal detail about faunal use in the sites. In this paper, I summarize and interpret the results of a recent analysis conducted on the long curated Ridge Ruin faunal assemblage from the Museum of Northern Arizona. Additionally, this analysis provides a preliminary discussion regarding whether the faunal remains reflect the previously established interpretation that Ridge Ruin was a ritual site, as evidenced by the focus on the Magician burial.

Lane, Kevin (University of Cambridge), David Beresford-Jones (University of Cambridge), Alexander Pullen (University of Cambridge), Charles French (University of Cambridge) and Susana Arce (Museo de Ica)

[31] *Investigations at the Mouth of the Río Ica, Peru: A Preceramic Record of Rich Seas, Fog Meadows, Incipient Agriculture and Shorelines*

The earliest evidence of human occupation on the Río Ica, south coast Peru are middens at the river's mouth, accumulated through episodic fisher-hunter-gatherer occupations during the Middle Preceramic Period. We present results of ongoing investigations and dating of these sites to between 7,000 and 6,000 cal yr BP. Apart from a variety of rich marine resources, the occupants of these middens also exploited the river estuary, riparian woodlands in the river floodplain and lomas (or 'fog meadow'). The long Middle Preceramic is a period critical in three respects: (1) the onset of modern El Niño (ENSO) conditions after millennia of apparent quiescence; (2) eustatic sea-level stabilization, and (3) the gradual transition to sedentism and agriculture here. Interplay between these factors determined the availability of resources to prehistoric populations through, for instance, drinking water, the size of the estuary, beach formation, the extent and composition of adjacent lomas vegetation and indeed, the technologies developed to exploit them. We seek to understand and date these processes of environmental and social change because they are essential to understanding early human trajectories here, not least the transition from fishing and gathering to agriculture.

Lane, Rachael (University of Sydney)

[36] *Difference Theory and the Relevance of the Archaeological Past to the Present*

The relevance of the archaeological past to the present is not usually considered an ethical or moral issue, except in the context of western heritage and conservation values. There appears to be both internal conditions to archaeology, as well as external conditions, that prevent the relevance and use of archaeological knowledge. The notion of relevance is frequently embedded in presentist discourses in the humanities and social sciences with an emphasis on sociality, and social recursive methodology. Materiality is viewed as an epiphenomenon of the social and 'the individual' is placed as a prescriber of materiality. This is also an anthropocentric view elevating 'the category of the human' to a platform from which all else is subjugated. Difference theory attempts to get away from presentism and social-centricism within archaeological theory and interpretation, and public perception. The theory proposes that social rates of change will be at odds with material rates of change, causing productive dissonance. We have an impetus to study the past from the long-term material perspective if we know it can provide useful insight into the present, particularly if what can be observed holds relevance to the sustainability of human communities in modernity.

Lane, Brent

[188] *Chair*

Lane, Brian (University of Oregon)

[233] *The View from Rapa: Behavioral Ecology and Fortifications in Polynesia*

Fortifications are found in the archaeological record around the world. Studies of fortifications on the landscape tend to focus on aspects of human territoriality, especially in relation to conflict,

economics, and resources. This paper takes a Human Behavioral Ecology approach to territoriality and applies the use of viewsheds, as derived from a GIS database, to the examination of a central resource. Rapa, Austral Islands, French Polynesia, is often cited as a classic example of an island that was divided by territorial groups, as exemplified by the prominent fortified hilltop villages (pare). Enough work has been conducted on Rapa to provide an understanding of the island's culture history, and new geographic data are available that allows for expanded investigations. The objective of this paper is to quantitatively test the relationship between pare and the visibility of the most likely resource linked to territorial behavior, irrigated agricultural terrace systems. This work utilizes methods similar to those used in previous work in Fiji in order to test the strength of relationship between views between fortification and views of resource areas (Smith & Cochrane 2011).

Lange, Christine

[55] *The Use of Shell Ornaments at Las Capas, an Early Agricultural Site in Southern Arizona*

Recent excavations at the site of Las Capas, located along the Santa Cruz River in the Tucson Basin in southern Arizona, have given us an opportunity to examine an Early Agricultural period site in this area. Along with other pieces of material culture such as flaked stone and ground stone tools, ornaments manufactured from marine shell were also part of the lifeway of the local inhabitants. Deriving from locales in California and northern Mexico, where established marine shell ornament manufacturing industries were thriving, the shell ornaments of personal adornment recovered from this Early Agricultural site suggests that the local inhabitants were active participants in maintaining social and economic networks outside of the immediate surroundings. They also reveal that Early Agricultural period populations placed a high value on their shell ornaments. The study of shell ornaments recovered from Early Agricultural sites gives us a glimpse into the past as we attempt to understand the social, economic and cultural ways of earlier populations.

Lange, Richard [343] see Adams, E

Langebaek, Carl [107] see Miller, Melanie

Langford, Richard [6] see Collins, Joe

Langlie, BrieAnna (Washington University in St. Louis)

[347] *Parsing out Differential Plant Use among Households during a Period of War in Puno, Peru*

In the Peruvian altiplano near Lake Titicaca during the Late Intermediate period (LIP; A.D. 1100 to 1450) peoples' lives were overwhelmingly structured by warfare. Martial conflict between competing ethnic groups incited people to live defensively in fortified hilltop villages during the LIP. However, little is known about the agricultural practices and the internal sociopolitical dynamics of these fighting communities. Drawing on recent excavations and macrobotanical data collected from Ayawiri, one of the largest hillforts in the northern Lake Titicaca basin, I present information about the community's agricultural food products and intracommunity relations during this violent time period. Ayawiri is organized into household compounds. By comparing paleoethnobotanical remains recovered from various compounds throughout the site I identify the distribution of resources and possibly wealth allotment across the Ayawiri community during the LIP. This research also elicits a picture of differential landscape exploitation by various households during the LIP. By comparing household plant use to the landscape ecology surrounding the site, the data will shed light on which households had access to and utilized various microenvironments. These paleoethnobotanical results offer a more nuanced picture of household community relations during the altiplano LIP.

Langlitz, Meredith [72] see Thomas, Ben

Langlitz, Meredith (Archaeological Institute of America) and Ben Thomas (Archaeological Institute of America)

[188] *Keeping Up with the Times: Evolving Programs and Publics*

As an organization for both professional archaeologists and laypersons the Archaeological Institute of America's role in archaeological outreach and education has evolved and expanded over the course of its 136 year history. The Institute has launched a number of initiatives in response to perceived needs and strategic plans to promote the understanding of archaeology. Since 2004, the AIA has expanded its efforts locally and globally through Local Societies, International Archaeology Day, and the Site Preservation Program.

Today the AIA is calling for a more concerted effort to collaborate and to establish a network of committed professionals. To stimulate this cooperative endeavor, the AIA hosted a conference entitled Building a Strong Future for Archaeological Outreach and Education in January 2015. Program topics included ethics in archaeological outreach and education, state and regional approaches to outreach and archaeology, high school archaeology courses, teaching with archaeology, metrics, and promoting archaeological outreach. The AIA sees this as the first in a series of programs that will allow archaeologists and heritage educators to define best practices and develop effective ways to increase public awareness of archaeology.

[329] Moderator

Langston, Lucinda [333] see Franklin, Jay

Lanoe, Francois [92] see Daughtrey, Cannon

Lanoë, Francois [360] see Kielhofer, Jennifer

Lanoë, François (University of Arizona), Pierre Desrosiers (Avataq Cultural Institute), Dominique Marguerie (Center National de la Recherche Scientifique) and Daniel Gendron (Avataq Cultural Institute)

[360] *A Winter at Akulivik: Faunal Analysis of a Thulean House at the Site of Kangiakallak-1 (Nunavik, Québec)*

The site of Kangiakallak-1 (JeGn-2 – AKU-10-018), located near Akulivik (Nunavik, Québec), has yielded several occupations attributed to the Dorset and Thule periods. Level A corresponds to a Thulean winter house for which collapse and preservation in permafrost provides an excellent and undisturbed record of Thulean lifeway. This paper presents the results of a faunal analysis conducted on animal remains found within the Level A house. The dominant species recovered were caribou Rangifer tarandus, ringed seal Pusa hispida, and bearded seal Erignathus barbatus. Faunal materials were extremely well preserved, enabling an accurate taphonomic reconstruction of human butchery and consumption patterns. Butchery practices particularly differ between species of terrestrial mammals (caribou), for which emphasis was put on marrow was systematically exploited, and species of marine mammals, for which soft tissues were predominantly utilized. The Level A house at Kangiakallak-1 reflects the range of economic activities conducted by Thulean people, but also how people's mobility related with the distribution of resources across the landscape.

Lapeña, Queeny (California State University, Los Angeles), Jessica Morales (California State University, Los Angeles) and René Vellanoweth (California State University, Los Angeles)

[32] *The Distribution and Chronology of Abalone Middens on the California Channel Islands*

The California Channel Islands contain one of the most productive coastlines in the world. Despite the perceived marginality of available resources on the islands, they encompass approximately 428 linear kilometers of rocky and sandy bottom habitats that have abundant shellfish beds. Thousands of shell middens dated to the past 12,000 years attest to the importance of these resources to native islanders. In this paper, we define the ecology and biogeography of intertidal shellfish communities and summarize the paleoenvironmental conditions that directly affected the productivity of past marine environments. Abalone middens provide an ideal example to examine past human/environmental dynamics through time. For this paper, we provide a summary of the distribution and chronology of abalone middens across the Channel Islands. Although typically referred to as red abalone middens, they exhibit variability in the species of abalones and other

faunal remains present, as well as in the types of artifacts and features that occur at these sites. The diversity of abalone middens suggests island-specific differences in shellfish communities, harvesting patterns, as well as the type of behavioral activities that took place at each site and on each island.

Lapeyre-Montrose, Stephanie (Simi Strathearn Historical Museum)

[27] *Forget Me Nots: Smaller Collections Need Archaeologists Too*

From Native Americans to Spanish and European settlers, Southern California has a rich history. One town in particular, Simi Valley, incorporated in 1969, was home to several Chumash villages, part of the Santiago Pico 1795 Land Grant, and attracted European settlers. CA-VEN-346, the El Rancho Simi Adobe, was occupied during all three eras. It was a Chumash village, home to Santiago Pico, and home to European settler Robert Strathearn and family. When Robert Strathearn purchased the El Rancho Simi Adobe in the 1890s, he added onto the Adobe rather than destroying it, preserving both Spanish and European history. Upon Strathearn's death, he willed the property to become a historical park and museum, thus preserving and educating others about Simi Valley history. In addition to the El Rancho Simi Adobe collection, the museum houses several other Chumash collections from multiple sites throughout Simi Valley. Unfortunately, all of these collections have remained in storage untouched. In fact, many researchers are unaware of their existence and need for attention. Recent interest in the collection has prompted the museum to look for additional ways to attract researcher's interest to study the forgotten and long overlooked shelved collections.

Lapp, Jennifer (SUNY at Buffalo)

[133] *The Lithics of Conchal, Nicaragua and the Story They Tell*

During the excavations of Conchal, Department of Rivas, Nicaragua relatively few lithic materials were encountered. While there were only 315 lithic pieces found, much can be learned from these pieces; this includes the daily activities that the prehistoric population conducted. By examining the data from the excavations, it was determined that the population began as a semi-nomadic one that eventually permanently inhabited the area. The formal and informal tools, along with the site furniture allow us a glimpse of how the original population survived and then began to thrive along the coast of Pacific Nicaragua during the Sapoa Period. Flakes were found most frequently, followed by metates and metate pieces. Other tools found include: points, scrapers, celts, hammerstones, manos, pestles and hand axes.

Larios Córdova, Diana Irasema [156] see García, Carlos

Larmore, Sean (ERO Resources Corp.)

[65] *Backed Knives and Subsistence Strategies at the Hurdy Gurdy Bridge Site*

Excavations conducted near the ancestral Tolowa village of Naa-k'vt-'at on the South Fork of the Smith River produced unexpected results in terms of the apparent absence of tools, such as harpoon tips and fishing weights, related to salmon fishing. Rather, an unusual lithic tool was identified, described as a "backed" knife produced from splitting a biface or uniface longitudinally to facilitate hand-held use. This paper will explore the possible function(s) of this tool in ancestral Tolowa assemblages and then compare the overall lithic assemblage of CA-DNO-1028 with the results from limited testing conducted at the ancestral village of Lhch'aa-ghii-li~ (CA-DNO-34) located downriver at the confluence of the middle and south forks of the Smith River. The clear identification of salmon fishing implements at CA-DNO-34 and the absence of these tools at CA-DNO-1028 suggest that the backed knives must have functioned in a capacity other than salmon processing and that upriver settlement was the focus of subsistence activities other than salmon fishing despite their availability.

Larsen, Susan (Western Washington University)

[168] *Anthropogenic Thermal Alteration of Marine Bivalves, Recrystallization, and Isotope Integrity*

Archaeologists have given little direct attention to the taphonomic effects of cooking methods for

marine invertebrates, particularly the effect on shell mineralogy. Various methods of heating and steaming shellfish directly in the shell are recorded as traditional for Northwest Coast peoples and the shell samples at the Tse-Whit-Zen Village site in Port Angeles, Washington State, contain many specimens that visually appear to be thermally altered. This type of heat exposure has been shown experimentally to cause aragonitic fish otoliths to convert to calcite and become depleted in ^{18}O and ^{13}C , and thus become unsuitable as a source of isotope ratios for paleoenvironmental reconstruction. Biogenic aragonite in marine molluscs is known to alter in the same way, but at lower than expected temperatures. I conducted controlled heating experiments of modern specimens of four taxa of molluscs common in the site assemblage (*Clinocardium*, *Saxidomus*, *Leukoma*, and *Ostrea*) to determine the conditions (temperature, time) at which isotopic integrity was lost.

Larsen, Clark (Ohio State University)

[178] *Lives in Transition: Impacts and Adaptations in the Georgia Bight*

The St. Catherines Island Archaeological Project, now more than 40 years in duration, has provided a wealth of data for addressing questions and hypotheses about native adaptations in the Georgia bight. Owing to the rich archaeological context and robust research design, the project has provided opportunities to document and interpret key developments and adaptive transitions in ways not dreamed of when fieldwork began in 1975. The bioarchaeological arm of the investigation, viewed in its rich social, cultural, and natural contexts, focusses on the pre- and post-contact populations inhabiting the island and the Georgia bight generally. This paper discusses the long-term study of two key adaptive transitions, the foraging-to-farming transition in late prehistory and the impacts of exploration and colonization by Spain. The research provides a comprehensive record of time transgressive changes in health, lifestyle, and adaptations that forever altered the landscape and the people inhabiting it. Although the results of this study focus on one region, the implications are global in scope.

Larsen, Thomas [191] see Popp, Brian

Larson, Greger (Durham University), Keith Dobney (University of Aberdeen), Anna Linderholm (University of Oxford), Allowen Evin (University of Aberdeen) and Thomas Cucchi (University of Aberdeen)

[28] *Paleo-Population Genomics as a Means to Understand the History of Dog Domestication*

Dogs were unquestionably the first domestic animal and the only animal domesticated within a hunter-gatherer context prior to the advent of agriculture. Understanding the precise temporal and geographic origins of domestic dogs has proven difficult for several reasons including: the widespread distribution of wolves and the lack of easily interpretable phylogeographic signatures among modern dog populations. More recently, studies making use of high-coverage genomes of dogs and wolves have demonstrated that the wolf population from which all dogs descend is likely extinct, only exacerbating the difficulty in identifying the wolves which gave rise to dogs. In addition, the history of both domestic plants and animals has incorporate significant degrees of admixture between domestic animals and wild populations that were never involved in the original domestication process. Here, I present an empirical demonstration of long-term admixture and how that limits our ability to understand the origins of dogs. In addition, I will present case studies of how we can overcome these limitations by generating nuclear sequences from global samples of ancient dogs and wolves, and how the results may provide answers to where, when and how many times dogs were domesticated.

Larson, Katherine (University of Michigan)

[101] *Raise a Glass: The Late Hellenistic Origins of Domestic Glass Tableware*

For over three millennia after its discovery in the early Bronze Age, glass in the Near East was used almost exclusively in palatial, religious, and funerary contexts, ascribed with high status reflecting the intrinsic or perceived value of the material. But during the last few centuries B.C.E. this pattern changed, as glass cups and bowls began to appear in domestic and other urban areas in greater quantities. This transition occurs before the discovery and diffusion of glass blowing in the first

century B.C.E., which has largely been credited for the democratization of glassware. Instead, sagging and molding technologies, already practiced by the fourth century B.C.E., became utilized on a wider scale and were effective enough so as not to be supplanted by blowing for almost two centuries after its invention. At the same time, elite, cosmopolitan customers began to demand a supply of glass skeuomorphs of metal, ceramic, and wooden drinking vessels. I argue that two major factors contributed to this new function and market for glass: a decrease in the price of the raw material which enabled it to be manufactured and sold more affordably, and an aspirational economic and social class which emulated palatial consumption practices.

Larson, Mary Lou (University of Wyoming), Marcel Kornfeld (University of Wyoming) and George Frison (University of Wyoming)

[166] *Mammoth Bone from Hell Gap*

Mammoths and thus mammoth bones are associated with Clovis occupation of North America, while subsequent cultures are associated with *Bison antiquus* (Paleoindians) or various Holocene faunal species. However, this simple scenario is complicated by occasional occurrences of extinct species in later period assemblages. The Hell Gap site joins this exclusive club with a recent discovery of a mammoth tusk in deposits at Locality I. The Hell Gap site in eastern Wyoming is a stratified Paleoindian multilocality in the midst of mammoth finds, but without a well-defined Clovis component. The purpose of this presentation is to evaluate the context of the tusk object, describe its features and consider its place in our understanding of early Paleoindian existence in North America.

[342] *Discussant*

Lash, Ryan [315] see Alonzi, Elise

Lash, Ryan (Northwestern University), Terry O'Hagan (University College Dublin), Elise Alonzi (Arizona State University), Franc Myles (Archaeology and Built Heritage) and Anne Wildenhain (University of Notre Dame)

[315] *A Pilgrimage Lost and Found: Cultivation and the Cult of Saint Leo on Inishark, Co. Galway*

Pilgrimage traditions on islands along the coast of Connemara in western Ireland provide a valuable context for exploring the relationship between ritual practice, identity, and political economic change from a long-term perspective. The island of Inishark, Co. Galway, contains a number of ritual remains dating from the 9th-13th centuries, including a church, a holy well, cross-slabs, one or more burial grounds, as well as a number of penitential stone platforms known as leachta. Islanders in the 19th and 20th century incorporated some of these monuments into processional circuits associated with the veneration of St Leo. The origin of St Leo's cult remains obscure, but new research suggests how islanders adapted a medieval liturgical landscape to confront new ecological and political economic circumstances. Using excavation data alongside LiDAR survey, antiquarian accounts, census records, ordnance survey maps, and local folklore, this poster traces the development and re-use of the pilgrimage landscape on Inishark in relation to shifting patterns of settlement, subsistence, and political economy. Changing spatial relationships between foci of communal worship and places of everyday household labor suggests how islanders adapted an inherited tradition to negotiate new relationships between themselves, their ecology, and their past.

Lash, Ryan [56] see Gunter, Madeleine

Lassen, Robert (Gault Project at Texas State University)

[148] *Making Sense of the Variation in Folsom Projectile Point Technology*

Analyses of Folsom projectile point technology generally focus on the making and use of the classic bifacially fluted form. Often some mention is made of Midland or unfluted points, but formal technological analyses of these types are rare. Utilizing a sample of 989 points and preforms from Folsom and closely related technologies, this research explores the variation that is present in Folsom point production. Points from Folsom contexts are divided into five types: Folsom, Midland, unifacially fluted, pseudo-fluted, and miniature. These types are then compared based on the following variables: width, thickness, basal width, and edge grinding to determine whether they share

similar hafting characteristics. Flaking technology is also compared to explore overlaps in production techniques between the point types. Results indicate that overlapping reduction techniques do occur between all the point types, reinforcing the idea that Folsom, Midland, and the other forms were made and used by the same groups. However, slight differences in morphology between Folsom and Midland points may indicate that they were hafted differently.

Latinis, Kyle [407] see Dega, Michael

Lau, Hannah (UCLA)

[401] *Cooperation and Feasting at Late Neolithic Domuztepe: Assessing Emergent Political Complexity through Faunal Remains*

Cooperation occurs at all scales of social life: among individuals, among households, and among groups that supersede the household level. In some cases, such cooperation precipitates the formation of complex social structures and institutions and perpetuates their endurance. The variability of forms such cooperation can take at all scales of social complexity is broad, but an increasing degree of scalar cooperation correlates with increasing social complexity. This study uses zooarchaeological data from the Late Neolithic site of Domuztepe (ca. 6000-5450 cal. B.C.E.) in Southeastern Turkey as a proxy for assessing increasing scales of cooperative behavior at the site over time. Faunal data from the site's three feasting assemblages, when compared to the quotidian subsistence system, provide a means to assessing resource and labor coordination among inhabitants by elucidating the different animal management strategies employed by Neolithic agropastoralists in these different consumption settings. Such coordination has implications for reconstructing the political economy and emerging political complexity of the wider region during the Late Neolithic. While cooperation in resource exploitation and labor in any context elucidates socioeconomic and political organization, this study focuses specifically on feasts because feasting by its nature entails explicit cooperation among participants.

[68] *Discussant*

Lau, George (Sainsbury Research Unit, UNIV OF EAST ANGLIA)

[285] *Life, Land, and Labor at Yayno (A.D. 400-800), a Recuay Fort in the North Highlands of Peru*

This presentation examines the domain of work as part of the social life of fortified settlements. In particular, it focuses on the gargantuan commitment – physical and symbolic – evidenced in defensive architecture. Using data from Yayno, a large mountaintop citadel in the north highlands of Peru (Recuay culture, A.D. 200-700), work estimates are presented to demonstrate the great labor expenditure in stonemasonry construction. Builders combined massive stone blocks (local granites, imported limestones) to construct fortifications and defensible, multistorey residential compounds. The buildings ranged from small to monumental, and from low-quality to extremely fine-quality construction. The variability is attributable to changing construction styles by phase, defensive strategy, differential labor access and social inequalities. The paper concludes that making walls was indispensable work in the high Andes, both in terms of sheer effort and in terms of embodying group cooperation at different scales. While the compounds cloistered internal groups (segregating competing factions within Yayno), there was also a larger project of protecting the overall settlement that demanded intersubjective work, but located in a greater notion of collectivity. Aptly, then, the labor of defensive walls was to build subjects and community.

Lau, Hannah [380] see Nugent, Selin

Laue, Ghilraen (Rock Art Research Institute, University of the Witwatersrand, South Africa)

[149] *Exploring Regionality: A Chaîne Opératoire Approach to "Style" in the Rock Art of the Eastern Cape Province, South Africa*

Regional differences in southern African hunter-gatherer rock art have long been noted, but methods towards a rigorous definition of these regions have not been developed. Addressing a recent call for the use of style in defining rock art regions I propose a chaîne opératoire approach. Rather than focusing only on the finished product I will consider multiple factors in the production and

consumption of rock art images. Instead of relying on vague notions of style, the component parts and different elements that comprise the art can be investigated. Case studies from two sites, in different regions of the Eastern Cape Province, South Africa, illustrate this approach and how it can be used to elucidate ideas around regionality.

Lauer, Adam [205] see Steinbruchel, Amber Joliz

Lauer, Adam (University of Hawaii at Manoa) and Alexandra McDougale (University of Hawaii at Manoa)

[238] *Infant Health and Burial Practices in Late Prehistoric and Contact Period Kiiyangan, Ifugao*
Infant death in Ifugao villages has only been viewed through a lens of modern ethnography. Recent excavations at the Old Kiiyangan Village site have revealed new information on the resource base, trade networks and impact of outside groups on the prehistoric and early historic Ifugao. This work has produced a small sample (16) of individuals who died at, or around, full term to the age of two years. The age, health, and mortuary profiles of these skeletons will be presented and placed into context. These skeletal remains appear to be the product of cemetery subdivision that places adults and juveniles in one location and fetal and infant remains in another. The age-at-death estimates for these individuals range from 26 weeks in utero to 1.5 years. Fetal and infant remains are subjected to either jar or open interment in a pattern that may reflect ritualized beliefs, health status or both. Skeletal lesions were recorded from all infant skeletons. These lesions are most likely caused by nutrition-related diseases. This study establishes new information for Cordillera prehistoric and colonial period burial practices and fits into the larger Southeast Asian sample of high mortality in the late period of gestation and early infancy.

Laurenzi, Andy (Archaeology Southwest), Matthew Peeples (Archaeology Southwest) and William Doelle (Archaeology Southwest)

[278] *The Salado Preservation Initiative: Combining Research Investigations with Regional Preservation Planning*

Regional planning is an essential element of comprehensive archaeological management programs. The Salado Preservation Initiative at Archaeology Southwest is linked to our research agenda focused on Salado and related developments across the Southwest in the late precontact period. Working exclusively within a temporally defined period of record (1250-1450) and conscribed geographically by the distribution of Roosevelt redware, Archaeology Southwest conducted a series of expert workshops and interviews using a geographic information system and archaeological site databases to collectively identify high-priority archaeological resources (sites, site complexes and in some instance landscapes). This project demonstrates the potential advantages of using research to complement assessments of individual site eligibility for purposes of listing on the National Register of Historic Places by providing an added layer of regionally contextualized information at larger geographic scales. By establishing spatially explicit priority areas, this information assists Archaeology Southwest in focusing its cultural resource protection efforts and can also enhance cultural resource considerations in local, state, and federal land use planning.

Lavallée, Danièle [309] see Chevalier, Alexandre

LaValley, Stephen (EnviroSystems Management, Inc.)

[128] *Who Are the Martinez? A Report on and Examination of High Elevation Aspen Dendroglyphs in the Sangre de Cristo Mountains, New Mexico*

This paper reports on mid-20th century aspen dendroglyphs from the Sangre de Cristo Mountains in extreme north-central New Mexico. A class III archaeological survey conducted by EnviroSystems Management, Inc. in July 2014 recorded ten previously unknown historic sites between 10,400 and 11,000 feet in elevation on the Carson National Forest. Each contains at least two and up to twenty-one carved aspens that date from the 1930s to the 1950s. Upon initial assessment, these sites appear to have been part of a summer grazing rotation by members of the same family, Martinez, and/or ranch hands of an outfit from Arroyo Secco, New Mexico. The dendroglyphs include names,

dates, hometowns, and art. These sites, along with other previously recorded and contemporary dendroglyph sites nearby are examined for spatial and temporal patterns to illicit a better understanding of how, when, and for what purpose these high elevation areas were occupied. A records search provides critical information as to the people and/or ranch that utilized these lands. Lastly, these practices and dendroglyphs are cross-examined with similar sites throughout the Sangre de Cristo Mountains to gain a greater context and draw comparisons.

Laviña, Javier [170] see Mendizabal, Tomas

LaViolette, Adria (University of Virginia, Dept. of Anthropology)

[285] *The Fortified Settlement of Pujini and Implications for a Swahili Urban Landscape*

During its lifespan from the mid-fifteenth to early sixteenth century A.D., the fortified settlement of Pujini shared Pemba Island, Tanzania with numerous, undefended, more typical Swahili settlements ranging from earth-and-thatch hamlets to stone-built urban centers. The site expresses a unique combination of qualities on the Eastern African coast: complex ramparts around nearly two hectares of space, in which stood some dozen domestic and special-purpose features. Archaeological evidence from the site shows that its builders invoked multiple architectural tropes used widely in Swahili stonehouses and stonetowns, markers of Swahili urbanism and cosmopolitanism. This paper provides an analysis of the archaeology of this settlement by identifying a series of nested socially constructed contexts, from the most intimate spaces in building interiors outward to the Swahili coast itself. I argue that the combination of qualities that makes the fortified site appear singular can also be used to illuminate meaningful networks of social, economic, and political interactions and tensions: locally; in the urban landscape of Pemba Island; and in the tumultuous Swahili world of the fifteenth-sixteenth centuries that includes early incursions of Portuguese sailors, merchants, and soldiers into the region.

Lavris Makovics, Jennifer

[267] *A Perfect Pothunting Day - An Examination of Vandalism to the Cultural Resources of Canyon de Chelly National Monument*

It has been postulated that one-third to one-half of all known archaeological sites in the US Southwest have been vandalized; however there are few accurate and complete datasets available to prove this assumption, or to determine exactly which factors encourage illicit activity. In fact, in 1987 the Government Accounting Office identified this lack of data as a major reason for not fully comprehending the archaeological vandalism problem on public lands in the United States. For over 20 years, archaeologists at Canyon de Chelly National Monument in Arizona have been collecting detailed standardized data on archaeological site condition and the natural and human-caused agents of destruction that affect the Park's cultural resources. This allowed a detailed statistical analysis of the site-specific factors which have been declared to encourage illicit activity such as illegal visitation, defacement, and "pothunting", and the development of a Site Vulnerability Assessment (SVA) which was utilized to produce an "At Risk" list of cultural resources to be targeted for protective measures. Regional and local factors thought to be influential were also considered.

Lawler, Dennis [28] see Widga, Chris

Lawrence, John [77] see Marsaglia, Kathleen

Lawrence, John (John A. Lawrence), Kathleen Marsaglia (California State University Northridge), Scott Fitzpatrick (University of Oregon) and Thomas Wake (University of California Los Angeles)

[79] *Preliminary Petrographic Analysis of Ceramics from the Bocas del Toro Archipelago, Panama*

Petrographic analysis of ceramic sherds can elucidate manufacturing techniques and exchange systems. We present the first mineralogical assessment via thin-section petrography of archaeological ceramics collected from the Bocas del Toro province on the Caribbean coast of

Panama. Examined sherds include surface finds collected from archaeological sites on Bastimentos Island and at Cerro Brujo on the mainland, and excavated samples from Sitio Drago, Isla Colon. Thin-section petrography of the surface-find sherds indicates that seven different types of temper were used. Compositions of representative sherds from each group were determined by counting and classifying 200 points per thin section, into 14 mineral and rock fragment categories (temper), grog (temper), and two matrix categories (silt and clay). One group contains mainly clay rich (purpose-made?) grog temper, whereas the others contain mainly rock temper with different proportions of quartz, feldspar, dense minerals, and various varieties of volcanic lithic fragments. The latter are consistent with derivation from local Panamanian geologic units including one, with pyroclastic temper, from a more volcanically active region (El Baru volcano?). Additional sherds are being processed from Sitio Drago in order to understand how the ceramics from the largest known site in Bocas del Toro relate to the previously examined specimens.

Lawrence, Ken (SWCA-Texas State University), Charles Frederick (Consulting Geoarchaeologist-Geologist), Jacob Sullivan (Ancient Southwest Texas Project) and Christina Nielsen (SWCA-Texas State University)

[256] *Ongoing Geoarchaeological Investigations in Eagle Nest Canyon*

This presentation summarizes the 2014 geoarchaeological investigations conducted at Kelley Cave (41VV164), Skiles Shelter (41VV165), and Eagle Cave (41VV167) and highlights elements of the ongoing analyses. Research begun in 2013 at Kelley Cave and Skiles Shelter was expanded and new work was begun in Eagle Cave. The geoarchaeological investigations have encountered new problems, opportunities, and several surprises. The data obtained from each site includes micromorphological samples, high-resolution cube samples, and bulk matrix samples. This presentation discusses the preliminary results of these investigations, their interpretations, and how they correlate to the cultural deposits from the excavations.

Laws, Kaitlyn [250] see Heikkila, Raija

Laws, Kaitlyn, Cheryl Makarewicz (Christian-Albrechts-Universität zu Kiel) and Isabella Von Holstein (Christian-Albrechts-Universität zu Kiel)

[403] *Grazing Herds on a Modern Jordanian Landscape: $\delta^{13}C$ and $\delta^{15}N$ Analysis of Plants and Caprine Hair Keratin along an Altitudinal Cline*

The topography of Jordan is uniquely characterized by dramatic shifts in altitude from -300 b.s.l. to +1300 a.s.l. over extremely short distances, which results in sharp differences in precipitation levels and the composition of vegetation communities along altitudinal gradients. Graze species favored by sheep and goats collected along an altitudinal gradient indicate predictable shifts in floral $\delta^{13}C$ values, influenced by altitudinal differences in water availability, while nitrogen isotope values are determined by a complex host of factors. In contrast, the carbon isotopic composition of sheep and goat hair keratin indicate heavy anthropogenic inputs that obscure spatially defined isotopic patterning visible in plants. These modern data provide a point of entry into understanding the range of isotopic variability visible in ancient herd animals, and the extent to which we can identify herding practices that involve vertical transhumance over large altitudinal clines through carbon and nitrogen isotope analyses.

Lawson, Charles [29] see Morgan, David

Layer, Paul W [151] see Macias, Jose Luis

Layzell, Tony [190] see Mandel, Rolfe

Lazaridis, Iosif [396] see Krause, Johannes

Láznicková-Galetová, Martina (Moravian Museum), Tomáš Zikmund (Laboratory of X-ray

Micro CT and Nano CT, CEITEC V), Marie Šejnohová (Laboratory of X-ray Micro CT and Nano CT, CEITEC V) and Jozef Kaiser (Laboratory of X-ray Micro CT and Nano CT, CEITEC V)

[12] *Analysis of the State of Preservation and Determination of Raw Material of Gravettian Mammoth Ivory Personal Ornaments (Dolní Věstonice, Czech Republic) Using Micro Computed Tomography*

This poster examines the utilization of non-destructive and non-invasive microCT analysis to identify raw materials used to fabricate Gravettian artifacts, assess their current state of conservation and work out a procedure for treatment of artifacts in a problematic state of preservation.

Raw materials and manufacturing technology of Gravettian personal ornaments from Dolní Věstonice (Czech Republic) made from hard animal tissues, such as mammoth ivory, can only be identified using the microCT analysis non-destructive analyses because these objects represent rare and unique cultural relics protected by the state. The preserved mammoth ivory objects from this period, both mammoth tusks as the primary raw material for products and the products themselves, are often found in a very problematic state of conservation. The current final form of artifacts, which differs from the original one due to modifications performed, has stereotypically been borrowed by authors of individual publications. The objects discovered thus live their second life. In order to analyze how they were manufactured, what was their purpose and how they were possibly used in past societies it is necessary to reconstruct the original form of the artifacts.

Láznicková-Galetová, Martina [28] see Germonpré, Mietje

Lazo, Juana [187] see Smith, Michele

Lazzari, Marisa and Marina Sprovieri (Universidad de La Plata)

[412] *Weaving People and Places: A Long-Term Perspective on Obsidian Circulation and Social Value in NW Argentina*

The south-central Andes have a very rich record of long-distance circulation of things, animals, and people, the origins of which can be traced to the earliest hunting-gathering societies that occupied the territory ca 9600BP. We summarize the available information on obsidian circulation resulting from nearly three decades of research in the area, with a particular focus on the Calchaquí valleys area of north western Argentina (NWA) from early sedentary settlements until the Inca occupation. Understanding “social landscapes” as deep-time regionalities—regional worlds of social experience built over the long-term—, we discuss the creative transformation of NW Argentina’s landscape in relationship to the transfer of raw materials and artifacts across the region since the beginnings of settled life. Combining geochemical, contextual and artifact analysis we propose that, while obsidian was generally used as raw material for everyday tools, it had varying performative social capacities across time and space. The physical properties and limited geographical availability of obsidian are indeed important to understand its social value, yet these are not seen as essential characteristics but rather as elements in a relational field of social, material and semiotic connections that both drew upon, as well as exceeded, subsistence practices and economic calculation.

le Plastrier, Barry [286] see Klassen, Sarah

Leach, Peter (Department of Anthropology, University of Connecticut)

[243] *The Suitability of Ground-Penetrating Radar for Mapping Sub-Marsh Paleogeography and Implications for Large-Scale Archaeological Surveys of Wetlands and Marshes*

Prehistoric sites beneath modern marshes are uncommon and valuable cultural resources with superior organic preservation potential. Such sites generally offer greater stratigraphic integrity than their terrestrial counterparts as they were not historically plowed. However, these sites are overlooked and understudied in eastern North America due to low visibility, disagreement on surveying strategies, and misperceptions regarding the high costs of investigation and low potential for site preservation. A recent large-scale coring survey (>3000 augers) in Delaware, USA, identified four prehistoric sites beneath 50cm to 2m of tidal freshwater marsh sediments. Coring revealed well-

preserved paleosols with debitage and formal tools within upper soil horizons, and demonstrated that these sites were preserved due to indirect armoring from locally-outcropping, discontinuous conglomerates or lithified sediments of the Columbia Formation. While successful and informative, the field strategy comprised a brute-force, 8m grid of cores across the expansive project area. This paper describes attempts to refine wetland survey methods on two of the previously discovered sites through ground-penetrating radar mapping of sub-marsh paleogeography. Given the completeness of the existing coring data, as well as low-salinity sediments more suitable for GPR, this project area presents an ideal case study for refining archaeological prospection methods in wetland/marsh settings.

[243] *Discussant*

[243] *Chair*

Leal Hernandez, Edgar (Universidad Autónoma de Yucatán), Luis J. Venegas de la Torre (Universidad Autónoma de Yucatán) and Mario Zimmermann (Universidad Autónoma de Yucatán)

[58] *Chemical Residue and Microbotanical Analyses in the Royal Kitchen at Kabah, Yucatan*

Since 2010 the “Proyecto de Restauración e Investigación Arqueológica en el Grupo Este de Kabah, Yucatán,” under the direction of archaeologist Lourdes Toscano, performed explorations in the area that covers structures 1C-2, 1C-3, 1C-4 y 1C-5. The goal of these interventions is to test the hypothesis that the group served as a special food-processing area. Excavations resulted in the recovery of faunal remains, ceramics, as well as several types of lithic tools like prismatic blades, bifacials, hammers, and manos and metates. In addition to chemical analyses of soils from the structure’s surroundings, now starch grain analyses have been conducted on sediments recovered from within metates to identify the kinds of plants that were ground. This paper will discuss the results of recent analyses aiming to contribute to an interdisciplinary perspective on precolumbian Mayan kitchen areas and their associated activities.

[58] *Chair*

Lechado, Leonardo [313] see Balladares, Sagrario

Lechado, Leonardo (Lechado) and Sagrario Balladares (Sagry)

[313] *Investigaciones arqueológicas en el Caribe Sur Nicaragüense*

Los primeros datos arqueológicos obtenidos para la costa Caribe de Nicaragua, surgieron en la década de los setenta del pasado siglo con los trabajos del norteamericano, Richard Magnus, (1974, 1975 y 78) y el arqueólogo nicaragüense, Jorge Espinoza, 1974, sobre todo en la Región Autónoma del Atlántico Sur (RAAS), ya que la norte RAN, los estudios son muy escasos; entre 1998 y 2006, se desarrollaron estudios conjuntos entre la Universidad Autónoma de Barcelona UAB y la Universidad Nacional Autónoma de Nicaragua, UNAN, Managua; y entre 2012 y 2014 se desarrolló el inventario arqueológico en el territorio Rama-Kriol BICU-CIDCA y la UNAN, Managua, todos reportando variedad de evidencias (concheros, estructuras rituales, petroglifos, montículos).. Aunque los datos son insuficientes, existen evidencias antiguas que permitieron conocer una secuencia ocupacional (de más de 3 mil años de antigüedad y sitios con mucha complejidad socioeconómica) anteriores a las incursiones colonizadoras europeas en la zona, lo cual conlleva a desmentir hipótesis acerca del despoblamiento de la región y del atraso de las sociedades que la han ocupado, tanto en la antigüedad como en la actualidad, en comparación con las del resto del país.

LeCount, Lisa (University of Alabama)

[244] *Between Earth and Sky: The Social and Political Construction of Ancient Lowland Maya Territories*

This paper introduces the Lowland Maya Territories: Local Dynamics in Regional Landscapes symposium that critiques the current model of territories as stable geo-political entities. We use data from the Actuncan Archaeological Project and other upper Belize River valley projects to suggest

that territories were in flux, reacting and changing to social and political relationships. Territorial dynamism is driven by at least two processes: the social construction of place and the political construction of territories. We suggest that a territory is defined by the geographic extent of political authority as established through alliances, voluntary subjugation, coercion, or other integrative practices that bound centers and hinterland communities to capitals. Rather than bounded entities, territories are conceptualized as networks of politically connected sites. Their long-term stability was dependent on the social construction of place that imbued meaning and emotional attachments to people, land, and spaces over time. However, social and political constructions were often in conflict when political competition over homelands reshaped territories. The inherent tensions between dynamism and stability are exemplified at Actuncan and other sites in the upper Belize River valley through shifting political capitals, settlement patterns, architectural and pottery styles, and veneration practices through time.

[22] *Discussant*

[244] *Chair*

Ledbetter, Jerald [333] see Smallwood, Ashley

Ledger, Paul (University of Aberdeen) and Veronique Forbes (University of Aberdeen)

[337] *What Can Archaeobotanical Remains from Exceptionally Well Preserved Contexts Tell Us about Past Arctic Life-Ways?*

Anthropological studies of western Alaska consistently remark upon the substantial knowledge of the regional flora by local Eskimo groups. Despite the attritional impact of Western lifestyles on traditional ecological knowledge, the indigenous peoples of the region maintain a rich appreciation of the plant resources available in their local environment. Yet, archaeobotanical analyses from the region remain scarce and there rests a general opinion that plants did not play an important role in past Eskimo subsistence. Faunal analyses and isotopic studies which indicate a predominately marine diet entrench this assumption, but they do not present the whole picture. Ethnography demonstrates that plants were not only integral to Eskimo diets, but they also served ceremonial and utilitarian functions. Using the exceptionally well-preserved botanical macro-remains from 14th to 17th century sod structures at Nunalleq in southwestern Alaska, this paper aims to establish the role of plants in past Arctic life-ways.

Lee, Christina (University of Nottingham)

[18] *Weaving Identities*

My paper will look at textiles as marker of identity in the Viking Diaspora in Britain and Ireland. While oval brooches and metal work have been given prominent roles in the discussion of identity, the textiles they adorned are often only mentioned in passing. However, techniques and fabrics may tell us something about connections with the homelands, as well as identities which are maintained in the areas of the Viking diaspora.

Lee, Christine

[37] *Preliminary Bioarchaeological Analysis of the Qijia Culture Mogou Site (2400-1900 B.C.E.), Gansu Province, China*

At the Mogou site 1000 graves were excavated from 2008-2011. A preliminary bioarchaeological analysis was done on 154 individuals. The male to female sex ratio is the same as other Qijia sites, with more males than females. The sample population was heterogeneous with 8% of the individuals originating from the west (Xinjiang), north (Mongolia), and east (China) of the region. This may be a result of the site being situated on trade routes from the West into China. Analysis was done on trauma patterns, infection rates, anemia, enamel defects, infectious diseases, and congenital defects. The individuals buried at Mogou are from very closely related family groups. Six individuals suffered from one to three periods of starvation starting at 2 years of age until 5 years of age. All of these individuals died young. Trauma patterns were concentrated in males as opposed to females or children. The majority of the injuries appear to be warfare related. There is a high percentage of infectious disease at Mogou, which suggests continual contact with outsiders (trade route),

domesticated animals, and a large enough population for endemic diseases.

Lee, Cheng-Yi (Department of Geosciences, National Taiwan University), Maa-Ling Chen (Department of Anthropology, National Taiwan University), Peter Ditchfield (Research Laboratory for Archaeology and the History), Mark Pollard (Research Laboratory for Archaeology and the History) and Ching-Hua Lo (Department of Geosciences, National Taiwan University)

[49] *The Diet and Subsistence System of Yuan-Shan People in Taiwan*

Carbon and nitrogen isotope compositions of human bone collagen (n=5) were analyzed to discover the paleodiet of Neolithic people of Yuan-Shan (YS) Culture, in northern Taiwan. A local isotope baseline was constructed by 71 faunal samples. Four inferences are drawn: (1) pigs share similar isotope compositions with deer, which indicates they were herbivores rather than omnivores. Pigs were likely raised by humans and we suggest that C3 plant was used as pig's feed based on their $\delta^{13}\text{C}$ values. (2) The main food resources consumed by YS people were local herbivores, which is revealed by the difference in $\delta^{15}\text{N}$ values between human and herbivores ($\Delta^{15}\text{N}$ human-herbivore). (3) Rice grain had previously been found in YS site, suggesting the rice as their main crop; however, the isotope data doesn't seem to support the suggestion ($\Delta^{15}\text{N}$ human-herbivore > 4‰). One possible explanation is that the cereal grains had intrinsic higher $\delta^{15}\text{N}$ value than that of herbivore's feeds or grasses, or the grain's $\delta^{15}\text{N}$ value was affected by manuring. (4) Aquatic resources were also consumed by YS people, though in small quantities. Middens indicated another aquatic food resource, but no isotopic compositions of shellfish soft tissue are available thus far.

Lee, Gyoung-Ah [49] see Tang, Zhuowei

Lee, Rachel (University of Michigan)

[49] *Mumun Period Households and the Rise of Inequality in Korea*

In the Jinju area of South Korea, social inequality first emerged during the Mumun Period (1060 – 340 cal. B.C.), during which permanent agricultural villages were also established. Excavations in the last two decades have uncovered close to 15 of these settlements, but the process of emergent inequality during the Mumun Period is just beginning to be understood. This poster provides results from the first systematic study of households from the Jinju area that intersects this important period. By doing so, the research moves away from top-down, elite-driven approaches to inequality, instead positioning the household as an active participant in the development of complex societies. Through spatial analysis and micromorphology, I provide evidence for significant changes in household composition, activity, and ideology that occurred due to the loss of egalitarian lifeways. I contend that this, in turn, further contributed to the development of social inequality that would be foundational for the formation of the first Korean states in the subsequent Samhan or Proto-Three Kingdoms Period.

Lee, Jaeyong (Seoul National University), Youngseon Lee (Seoul National University) and Jangsuk Kim (Seoul National University)

[80] *Bayesian Analysis of the Uncertainty in Radiocarbon Dating Measurements*

The goal of the study is to investigate the uncertainty of radiocarbon dating measurements. To study the variability of the measurements, the samples from the same specimen were sent to different radiocarbon dating labs and the estimated dates from various labs were obtained as data for analysis. Through a Bayesian analysis of the data, we could estimate the variability of the labs as well as variability between labs.

Lee, Sean (UC San Diego Department of Anthropology), Andrew D. Somerville (UC San Diego Department of Anthropology) and Margaret J. Schoeninger (UC San Diego Department of Anthropology)

[166] *Paleoenvironmental Reconstruction of the Northern Frontier of Mesoamerica: Stable Isotopic Analysis of Lagomorphs from La Ferrería, Durango, Mexico*

Central to understanding the social and economic dynamics of past societies is the reconstruction of the environment in which they developed. The marginal environmental region of Northwest Mexico,

in particular, has been a focus of debate concerning the importance of environmental change in the rise and decline of complex societies in the region. This study analyzes 49 Leporid (rabbit and hare) bones from the settlement of La Ferrería in modern Durango, Mexico for stable isotope ratios of $\delta^{13}\text{C}$ apatite, $\delta^{18}\text{O}$ apatite, $\delta^{13}\text{C}$ collagen, and $\delta^{15}\text{N}$ collagen. Ratios of these elements reflect different aspects of the diet and environment in which the animals lived. Results of this study demonstrate significant changes in isotope ratios across the occupational history of the settlement, indicating environmental changes through time. When considered in combination with the material culture from the site, it is possible to make inferences about social-environmental dynamics at La Ferrería. This study contributes towards a more comprehensive understanding of the culture history of La Ferrería and increases our understanding of the relationship between society and the environment in prehispanic Mexico.

Lee, Christopher (CSU Long Beach), Carl Lipo (CSU Long Beach) and Suzanne Wechsler (CSU Long Beach)

[409] *Small Commercial Aerial Platforms for the Generation of Systematic, High-Resolution, Multi-Spectral Imagery and Photogrammetry: Trimble UX5 and X100*

In the last 5 years, the commercial availability of embedded computer systems and low-cost hardware has led to an explosion of lightweight aerial platforms for photography. Offering multispectral imaging with outstanding spatial resolutions, these platforms offer researchers an inexpensive means of systematically documenting the archaeological record on the scale of landscapes. Through our exploration of hobby-class vehicles and the Trimble X100 and UX5 aerial platforms, we learned that the quality of the products created strongly depends on the degree to which one can ensure systematic coverage and optimized flights. Our results point to an exciting future of archaeological remote sensing.

Lee, Gyoung-Ah (University of Oregon)

[414] *Niche Construction of Agricultural Communities in the Yiluo and Guanzhong Regions of Northern China in the Mid-Holocene*

Through a lens of niche construction perspective, this paper examines evolving enterprise of plant managements in different ecological and cultural contexts in Mid-Holocene China. Along a stretch of the Yellow River, bulging communities, facing different challenges of changing climates and ecological constraints, constructed agricultural and socially intertwined niches. Multiple Yangshao communities in the Yiluo valley and those in Guanzhong Plain are such examples. Drastically different from the earlier Neolithic cultures, the Middle Neolithic people in these regions laid a foundation for socially complex entities up to a state level in the subsequent periods. This paper will offer a window onto the unique effects of human niche construction through its examination of agricultural trajectories and social interactions in these regions.

Lees, William (University of West Florida), Della Scott-Ireton (Florida Public Archaeology Network) and Sarah Miller (Florida Public Archaeology Network)

[261] *Lessons Learned Along the Way: The Florida Public Archaeology Network after 10 Years*

The Florida Public Archaeology Network delivers programming through public outreach, assistance to local governments, and assistance to the Florida Division of Historical Resources. The general goal of FPAN is to achieve preservation gains through raising the awareness of Florida archaeology to the public and governmental officials. Authorized by statute in 2004, the Florida legislature funded FPAN in 2005. The program is administered by the University of West Florida but operates in a quasi-decentralized fashion through eight Regions operated with the assistance of other partner organizations. As a new statewide organization in 2005, FPAN's structure and goals were designed by a steering committee intent on avoiding certain potential pitfalls. Ten years of experience with this structure provides the opportunity to assess FPAN's success to date and to discuss broadly useful insights into the operation of regional public archaeology programs. Likewise, reconciliation of programming goals envisioned in 2005 with experience and with a new post-recession reality provides insights of general interest.

Lee-Thorp, Julia [294] see Copeland, Sandi

Lee-Thorp, Julia (University of Oxford), Kirsty Penkman (University of York) and Curtis Marean (Arizona State University)

[294] *A Late Pleistocene Aridity and Vegetation Record from Stable Light Isotope Ratios of Ostrich Eggshell in Pinnacle Point*

Even when interior regions experienced depopulation during the last glacial, the Southern Cape apparently remained attractive to Middle Stone hunter-gatherers for millennia. The region's year-round rainfall and generally mesic conditions may have contributed to its attractiveness. Although seasonality and vegetation shifts have been observed in the nearby Crevise Cave stalagmite isotope record, indications for possible shifts in aridity are few. We apply oxygen ($\delta^{18}\text{O}$) and carbon ($\delta^{13}\text{C}$) isotope ratio analysis to a sequence of ostrich eggshell (OES) fragments from the PP5-6 site spanning a period from late OIS 5 to 3 to explore aridity changes. The OES $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ trends are broadly coherent but differ from the stalagmite. The $\delta^{18}\text{O}$ data follow similar, but more marked, trends, suggesting a positive shift to more arid conditions during the latter stages of OIS4 compared to early OIS4 (Unit SA.D.BS) and to today. The $\delta^{13}\text{C}$ record is more muted, and indicates that ostriches ingested mostly C3 vegetation although slightly higher proportions of C4 or CAM are reflected in moister Unit SA.D.BS. Since the presence of ^{13}C -enriched vegetation is indicated in the stalagmite record, the OES data suggest that ostriches found the taxa unattractive or they did not occur in the breeding season.

Lefebvre, Karine (CIGA - UNAM)

[50] *Using Archaeological Data and Historic Documents to Reconstruct a Colonial Landscape*

La conquista española conllevó importantes trastornos en el paisaje del antiguo México. En la región de Acámbaro (Guanajuato), estos cambios se reflejaron ya desde una fase muy precoz, puesto que la colonización fue temprana y los especies animales y vegetales introducidos por los europeos se adaptaron rápidamente. Por otro lado, el dominio de los conquistadores sobre el territorio se acompañó de una renovación del patrón de asentamiento, que tuvo por consecuencia liberar numerosas tierras fértiles, en beneficio de los nuevos colonos. Por consiguiente, la explotación de la zona inició rápidamente. Las intervenciones europeas permitieron establecer un sistema agropecuario intensivo destinado a proveer las minas y los centros urbanos emergentes. A través del acercamiento de datos arqueológicos recientes, de las fuentes coloniales escritas y de la documentación cartográfica del siglo XVI procesados en un sistema de Información Geográfica, presentaremos la metodología desarrollada para intentar reconstituir el terruño colonial. A partir de la modelación del nuevo patrón de asentamiento y de uso del suelo (agrícola, pecuaria, pero también drenaje, riego y deforestación) pretendemos reconstituir las dinámicas del paisaje en distintos puntos del espacio y del tiempo.

LeFebvre, Michelle (University of Florida), Birgitta Kimura (Santa Fe College) and Susan deFrance (University of Florida)

[328] *Precolumbian Human Mobility and Interaction in the Caribbean: A Zooarchaeological and Ancient DNA Study of Guinea Pigs*

Current zooarchaeological records indicate that humans introduced the domestic guinea pig from South America to the Caribbean around A.D. 600. Using zooarchaeological and ancient DNA datasets from domestic guinea pig remains from the Caribbean, we address human mobility and interaction between the islands of the Caribbean and South America during the second half of the Ceramic Age (ca. A.D. 600-1500). We present new data regarding the continental origins of precolumbian guinea pig, as well as the phylogenetic relationships among guinea pig remains from two sites located in different regions of Puerto Rico in the Greater Antilles (NCS-1 and Tibes) and from Carriacou located in the southern Lesser Antilles. The results indicate that all sampled guinea pig specimens share a common point of genetic origin based in the region that is modern Colombia, South America. The genetic data suggest that guinea pigs arrived in the Caribbean as a single introduction not multiple distinct introductions. The temporal associations of the Puerto Rican guinea pigs suggest that the animals were introduced there first and then relocated to other islands, including the Lesser Antilles.

Leflar, Philip [245] see Topi, John

Lehner, Mark

[237] *Neighborhood to National Network: Pyramid Settlements of Giza*

A twenty hectare swath of Old Kingdom 4th Dynasty settlement that began with the building of the Pyramids at the low southeastern base of the Giza Plateau shows distinct components that must have functioned as neighborhoods in the sense of geographically localized social networks within the larger conurbation. Correlation between architectural patterns and builders' graffiti with district signs suggests links to larger national networks. Flanking the major Nile port of its time, community members served in both ships crews and work gangs, linking them to broader interregional networks. Immigrants from source countries that specialized in procurement and transport of exotic products made for ethnic diversity in the distinct components of 'downtown Egypt.' It has been observed that as settlement size increases, social interactions per person increase in a predictable, 'superlinear' way, and that social clusters increase as networks with broader spatial ranges. That regardless of a city's size, we all live in villages, may have been true for downtown Egypt at the pyramids.

Lei, Yu

[349] *From Settlement to City: Two Issues Related to Phases I of the Site of Sanxingdui, Southwest China*

Since the first archaeological excavation in 1934, the site of Sanxingdui has been explored in 16 separate field projects, exploring an area of nearly 10000 m². Due to various reasons, only the data of 5 excavations (Yueliangwan in 1934 and 1963, Sanxingdui in 1980, the Sanxingdui sacrificial pits in 1986, and Rensheng cemetery in 1998) have been published, reporting only on 3000 m² of excavation surface containing mainly Bronze Age remains. Our understanding of the Neolithic period (Phase I) at Sanxingdui has therefore remained rather limited, comprising only some finds from Yueliangwan and settlement layers of the central portions of Sanxingdui. It was therefore generally assumed that the Neolithic remains were limited to a rather small area with shallow settlement layers and very few objects. Based on an evaluation of excavation records spanning the most recent excavation campaigns from 1980 to 2000, this paper argues that the distribution of the Phase I remains at Sanxingdui was actually substantial, both in surface extent and in depth of settlement layers, making Sanxingdui the most substantial settlement of the Neolithic Period not only on the Chengdu Plains but also along the whole upper Yangzi River.

Leidy, Robert [293] see Gobalet, Kenneth

Leight, Megan (CUNY Graduate Center)

[133] *The Art of Noise at Teotihuacan: The Conch Shell Motif in the Classic Period*

Teotihuacan was a major cosmopolitan city located in the Basin of Mexico during the Classic Period (100-700 CE). The artwork has long fascinated but bewildered scholars, and despite the emulation of Teotihuacan's recognizable artistic styles across Mesoamerica, we still understand relatively little about their artistic styles today. This paper aims to examine the conch shell motif from artwork at Teotihuacan, particularly visible in extant mural paintings. It will focus on investigating the appearance of conch shells, conchs used as trumpet devices, and cache burials of carved conchs. Many scholars have proposed the conch is most related to noise, the wind, and the underworld. In particular, scholars link Teotihuacan's Quetzalcoatl using a conch shell as a sounding device to best Mictlantecuhtli in the underworld and the American Southwest's Zuni culture's feathered serpent named Kolowiki, which was summoned by the conch shell trumpet. In these cases, there are strong ties to the underworld and emergence myths. In order to better understand these historically proposed relationships, this study will explore the conch shell as an isolated theme in Teotihuacan art.

Leisz, Stephen [21] see Urquhart, Kyle

Lejay, Mathieu [181] see Bon, François

Lejay, Mathieu (TRACES-Toulouse University), Farid Sellami (TRACES-INRAP), Marie Alexis (METIS-Paris 6 University), Romain Mensan (TRACES) and François Bon (TRACES-Toulouse University)

[181] *Fireplace Variability in the Aurignacian: a Multiscale Analysis at the Open-air Campsite of Régismont-le-Haut (Hérault, France)*

Through the study of several contemporary fireplaces at the Aurignacian open-air site of Régismont-le-Haut we will distinguish differences in the function and operation of a common-place form of archaeological vestige. To achieve this goal we rely on multiscale examination of hearths, which consists of classic planimetric and stratigraphic observation coupled with both micromorphological and geochemical analyses. Results are also compared with experimental hearths analyzed using the same methodology.

Experimental data shows clear microscopic and geochemical variations that correlate with types of fuel used in fireplaces. These variations are equally seen in archaeological samples (while controlling for post-depositional processes), which highlight whether wood or bone were used as fuel. Regarding the question of rhythms of use, our observations of thermo-altered sediments highlight the maximal intensity of fire, but not fire length or possible reutilizations. The lack of in situ residues, such as charcoal or ash lenses, makes the study of rubefied sediment limited in regards to the chronology of fireplace use.

Along with technological and spatial analysis of artifacts, these results allow us to identify strong differences between areas organized around fireplaces. The complementarity of these areas has a structuring effect on their variability, demonstrating the complex nature of the site.

LeJeune, Colin (University of Illinois at Chicago)

[307] *Local Earthenware Ceramic Decoration and Cultural Transformation on Kenya's Swahili Coast, A.D. 700-1700*

Description of locally produced earthenware ceramic assemblages excavated from Swahili town sites on the Kenyan coast suggest that incised and impressed decoration became less common and less formally complex, particularly on cooking vessels, after A.D. 1200 (Chittick 1984; Horton 1996; Wilding 1989). This development appears to be contemporaneous with shifts in consumption practices, domestic architecture, religion, and the importance and expression of socio-economic identity within coast town society that began prior to A.D. 1000 and rapidly progressed and matured between A.D. 1200 and 1500. These shifts were associated with the formation of the cosmopolitan, hierarchical, Islamic, urban culture which has characterized Swahili town-life since the 13th century (LaViolette 2008). This paper integrates existing knowledge concerning social and cultural development experienced on the Swahili coast between A.D. 700 and 1700 and the character of local earthenware ceramic assemblages excavated from town settlements on the Kenyan coast to interrogate the meaning and function of incised and impressed decoration on these ceramics over-time. This effort will involve discussion of the utility of this variable for study querying how socio-cultural identification and its expression on the Swahili coast evolved in relation to the developmental trajectory this region experienced.

Lekson, Stephen (University of Colorado)

[354] *Architectural Wood Use in Chaco Kivas*

The architecture of Chacoan kivas was markedly unlike far more numerous non-Chacoan kivas. While Chaco is famous for its stone masonry, we focus here on wood use, and specifically on radial beam pilasters and wainscoting. Both are enigmatic and, consequently, both have often been overlooked during excavation and sometimes even removed in modern stabilization. But when the kivas were in use these features would have been dominant, eye-level aspects of kiva interiors. Using examples from Chaco Canyon, Bluff Great House, Aztec Ruins and Chimney Rock, we explore the construction, function, and symbolism of these distinctively Chacoan features.

[1] *Discussant*

Lemke, Ashley (University of Michigan)**[135]** *Hunter-Gatherers and Prehistory*

Robert Kelly's seminal work, *The Foraging Spectrum*, cataloged diversity among ethnographic foragers to demonstrate the tremendous range of cultural, economic, demographic, and political systems within the broad category, "hunter-gatherer." While we have a clear understanding that ethnographic foragers are diverse, archaeological interpretations of prehistoric hunter-gatherers still tend to be seen through the lens of ethnographic analogy. The creative and critical use of ethnographic data is difficult, and doing archaeology as Kelly tells us is like piecing together a jigsaw puzzle without a picture on the box. The question remains, what is the proper role of ethnographic data in archaeological research, particularly of prehistoric hunter-gatherers? In addition, how can we highlight diversity in prehistoric foragers and discover novel lifeways that extend beyond the ethnographic record? These are the central questions and goals of this symposium, and individual papers and participants will each contribute pieces to a prehistoric hunter-gatherer puzzle.

[135] *Chair*

Lemke, Ashley [192] see OShea, John

**Lemonnier, Eva, Céline C. Lamb (University of Kentucky, Department of Anthropology),
Daniel Vallejo-Caliz (University of Kentucky, Department of Anthropology) and Shannon
Plank (University of Kentucky, Department of Anthropology)**

[183] *Between House and Site: Considering Intermediate Units in Classic Maya Lowlands Settlements*

Traditionally, settlement archaeology of the Classic Maya Lowlands recognizes several intermediate residential units between the house and the site. For over 50 years, the concept of neighborhood has been mentioned occasionally, but conclusive case studies are still rare. Yet the concept raises the important issue of the internal social structures of communities and their relationships. After briefly describing the methods that have helped identify intermediate units in the recently studied sites of La Joyanca (Peten, Guatemala) and Yaxché (Yucatan, Mexico), we consider the implications of such units within their larger social and political landscapes.

Lennen, Joel and Jamie Arjona (University of Illinois)**[269]** *Queering Historical Worlds: Disorienting Materialities in Archaeology*

This essay draws from contemporary strands of affect and materiality in queer theory to discuss approaches to queer materialities in archaeology. This attempts to move beyond privileging sexual acts and orientations as defining queerness (Blackmore 2011), towards vast assemblages of human and material convergences that queered social norms (Chen 2012). The provocative capacities of bodies, both human and non-human, to disorient social norms offers archaeologists alternative perspectives on queer world-making in historical communities. We will illustrate how spatial and material textures can create transgressive atmospheres that reciprocally stick to human bodies. By considering a set of historic relationships that altered bodily states physiologically and sensorially, we acclimate to a world of queer matter beyond representations of identity and being. We will offer examples of how substances, spaces, and bodies intersect in ways that transform and disrupt the movements of everyday life. These relationships, in turn, remind us of the spectrum of matter that has the potential to queer contemporary social networks and prompt new theoretical approaches to queer materialities in archaeology.

Lennon, Joel [173] see Drane, Leslie

Lenoir, Michel [389] see Dogandzic, Tamara

Lenoir, Michel [53] see Martisius, Naomi L.

Lentz, David (University of Cincinnati) and Venicia Slotten (University of Cincinnati)

[75] *Common and Lima Beans (Phaseolus spp.) from Cerén: Wild and Domesticated Germplasm*
Archaeological investigations at Cerén, a Classic period Maya site in western El Salvador, have unearthed an abundance of carbonized bean remains, both *Phaseolus vulgaris* and *P. lunatus*. Surprisingly, the Cerén *P. vulgaris* bean remains were derived from both wild and domesticated populations. This find reveals that the Late Classic inhabitants continued to draw upon wild food sources even though they had clear access, as seen in the Cerén paleoethnobotanical record, to a full array of domesticated food crops. This discovery not only offers insights into human behavior patterns of the past, but also has implications for explaining the genetic interchange between wild types and cultivars. In turn, these data help elucidate the interpretation of the multiple origins of *Phaseolus* domestication and the proliferation of its varieties.

Lentz, David [75] see Sloten, Venicia

Lentz, Kari

[416] *Tokens of Travel: Material Culture of Transoceanic Journeys in San Francisco*
During the second half of the nineteenth century thousands of travelers embarked on voyages aboard steamships headed for San Francisco that could last weeks or months. In the past decade, William Self Associates has conducted multiple excavations within the vicinity of the original coastline of Yerba Buena Cove that have yielded an abundance of artifacts. This paper focuses on dinnerware pieces employed for meals aboard vessels of the Pacific Mail Steamship Company that were recovered from domestic privies dating to the 1870s. The paper examines the function of tableware utilized during maritime expeditions as well their potential purpose once collected by disembarked crew members or passengers. This paper posits that these artifacts may have operated as keepsakes or mementos that reminded migrants of their time spent aboard a ship in a “world between worlds” (Maddocks 1982) that served as a liminal space “between origin and destination” (Wenzlhuemer and Offermann 2012).

[416] *Chair*

Leon, Xochitl [144] see Lindquist, Shayna

Leon Estrada, Xochitl (Universidad Veracruzana/Universidad Nacional Autónoma de México)

[144] *Settlement at Matacanela: Preliminary Interpretations*

In this presentation we discuss data collection strategies implemented in the Matacanela Archaeological Project and provide initial interpretations of these data. Field work, completed in the summer of 2014, consisted of systematic surface collection, geophysical survey, and mapping. This discussion focuses primarily on data acquired through surface collection. Using these data, we address the architectural organization of the site, identify possible areas of craft production, and site chronology.

[144] *Chair*

Leon Guerrero, Annamarie and Whitney Kirkendall (URS)

[106] *Cruising along the Coastline: Exploring the Possibilities of using LiDAR Data to Predict Climate Change Effects along the Southern Monterey Coast*

This paper presents the collaborative efforts of the Society for California Archaeology, the US Forest Service and the Cabrillo College Archaeological field school to document sites along the southern Monterey coastline. During the 2012 field season, a new generation of archaeologists documented sites along a 2-mile stretch of coastline in order to study how coastal erosion is affecting these sites. Part of the purpose of this presentation is to highlight the importance of these types of coastal surveys, and to illustrate how much data these efforts can collect. However, the primary focus of this presentation is to explore the possibility of using LiDAR to monitor the potential loss of this collected archaeological data. By examining previous LiDAR data, it may be possible to predict how the coastline will be affected by climate change. This information can assist with predicting at what rate this data might be lost at and can be used in making management decisions about these sites.

Leonard, Lorne [32] see Jazwa, Christopher

Leonard, Daniel (B.C.R Consulting LLC) and Jennifer Chmilar (University of Calgary Dept. of Anthropology and Ar)

[38] *Fedick-ian Approaches to Wetland Studies: Rock Alignments, Resilience, and the Pulse-Based Ecosystem*

It was nearly ten years ago when Dr. Scott Fedick unleashed his graduate students Daniel Leonard and Jennifer Chmilar into the Yalahau wetlands. Upon their return, Scott asked what questions each had about the wetlands, and two projects were born. During the ensuing field seasons, and time in between, Scott helped to solidify and expand on background knowledge, encourage interdisciplinary collaborations, and offer much needed support. In time, both Dan and Jen emerged from the wetlands able to answer the questions that drew them in. This presentation will reflect on the intellectual legacy of Scott Fedick through the lens of two dissertations in the Yalahau wetlands. The first, carried out by Chmilar, focuses on the function of rock alignments in the context of detailed topography and paleoenvironmental change. The second, by Leonard, involves a regional survey to assess the nature and extent of wetland manipulation throughout the Yalahau physiographic zone. We will discuss how Scott's mentorship influenced our approach to the unique environmental archaeology of the Yalahau wetlands, and inspired the interpretations and conclusions we reached.

Leonard, Kevin (Archaeoconsulting Inc.)

[182] *Influences of Gaming on Mi'kmaq Culture during the Late Woodland Period*

About A.D. 1320, the bones of ten people were cremated in an ossuary on Canada's east coast. Grave offerings recovered from the eroding site in 1990-91 included fragments of tiny, calcined bone rods and charred plum pits with smoothed surfaces. They are interpreted as parts of a gaming set that probably included a shallow wooden bowl and a small bag to hold the dice, still used by members of the Mi'kmaq First Nation to play waltes. Although game sets were traditionally a woman's property, 17th century observers reported wives being wagered and lost in waltes matches. Overlap of the dice and bowl game with cord-wrapped stick decorated, shell tempered pottery in part of northeastern North America suggests waltes contributed to intergroup mobility for women. Consequently, their knowledge of plant management could spread in concert with certain plant species they carried with them. Intra-band waltes gambling fostered economic leveling, maintaining the status quo in an egalitarian society. At a personal level, the waltes bowl was imbued with magical powers and was used for divination by 19th century Mi'kmaqs. At the individual, group and intergroup levels, waltes helped to shape culture during the Late Woodland period in the Northeast.

Leone, Mark (University of Maryland)

[305] *The Spirit of Wye House*

The role of the supernatural in establishing subjectivity is well understood in Marxist terms, particularly through Althusser and Zizek. There are two parallel, complementary religions at Wye House near Easton, Maryland in the eighteenth, nineteenth, and twentieth centuries. Through archaeology, African and African American religions and their role in the cosmos, people's lives, and the maintenance of heritage is becoming well understood through African and African American material remains. The archaeological remains of Puritan Christianity and Anglican Christianity are different. There is ample evidence of both, but traditions, practices, and recorded beliefs show a role for parallel expressions of the supernatural in daily life.

Lepofsky, Dana [312] see Lyons, Natasha

Lercari, Nicola (University of California Merced)

[16] *Virtually Rebuilding Çatalhöyük History Houses*

3D technologies, remote sensing, geographic information systems, and virtual reality have changed the documentation and interpretation process of Çatalhöyük (Berggren et al. forthcoming 2015).

Work at Çatalhöyük Building 89 has allowed a new methodology of data capture, processing, visualization, and analysis of stratigraphic layers based on digital technologies (Forte et al. 2012). On the other hand, virtual reconstruction of Neolithic buildings rebuilt in the same place has been little discussed. Current visualization technologies allow us to simulate the tridimensional context, shared material culture, and experiential aspects of the unique urban environment at Çatalhöyük, but require archaeologists to address methodological questions such as: what is the significance of virtually rebuilding Çatalhöyük history houses? Can a scientific simulation of Neolithic buildings tell us more about the social and religious meanings of built space at Çatalhöyük? How can uncertainty, ambiguity, and different interpretations be conveyed in a tridimensional simulation? My contribution to the digital reconstruction of history houses aims to define a new approach to digital archaeology that integrates a plurality of data in a visual-analytical environment where advanced interactive techniques simulate the cosmology, shared space, material culture, and experiential aspects of Çatalhöyük cultural landscapes.

Lercari, Nicola [401] see Forte, Maurizio

Lerner, Harry (Université Laval)

[17] *Scales of Analysis, Scales of Interpretation: Interpretive Scope and Analytical Precision in Lithic Use-wear Research, or 'Trees Are Great but Don't Forget about the Forest!'*

Ever since the inception of the New Archaeology back in the 1960s there has been an emphasis within the discipline on increasing analytical rigor through ever-more precise quantification of material culture variability. While striving to improve and expand our analytical arsenal is always a worthy pursuit, these efforts must be accompanied by critical reflection on how and why we use our increasingly refined analytical techniques to address larger behavioral and cultural questions. Precise and accurate measurement of physical artifact attributes is, of course, an essential component of any program of research, but an appropriate contextual rationale for the recording and evaluation of such data is equally fundamental. The proposed presentation will examine the use of GIS in characterizing changes in stone tool surface microtopography documented using both incident light and scanning electron microscopy and how the resulting specific quantitative data can be used to not only characterize the individual tool surfaces but also to explore broader patterns of tool using behavior and their possible cultural underpinnings.

Lerner, Shereen (Mesa College)

[197] *Applying the Principles of MATRIX in the Real World*

In 2001, the SAA received a National Science Foundation grant to revise undergraduate archaeology curriculum to reflect the needs of archaeologists in today's world. As part of this grant, seven principles were developed: (1) discuss the importance of stewardship, (2) take into account the diverse pasts of stakeholders, (3) articulate the social relevance of the past, (4) include a consideration of archaeological ethics and values, (5) teach effective written and oral communication, (6) provide fundamental archaeological skills, and (7) incorporate real-world problem solving. The question that now arises is whether these principles are being applied in the field of archaeology. Was this a purely academic exercise or do we see implementation in the real world?

LeRoux, Petrus [294] see Copeland, Sandi

Les, James [66] see Gaskell, Sandra

Lesur, Joséphine [174] see Arthur, John

Letham, Bryn [80] see Ames, Kenneth

Letham, Bryn (University of British Columbia)

[320] *A Refined Relative Sea Level Curve and Paleoshoreline Modelling for the Prince Rupert Harbour Region*

Deglaciation following the last glacial maximum caused dramatic coastline changes around the world. Locating and analyzing archaeological evidence of human settlement requires an understanding of the relative sea level (RSL) history and related changes to the landscape. On the Northwest Coast of North America RSL was affected by local glacial and tectonic conditions, and current research demonstrates that sea level histories are locally contingent and vary widely. This paper presents a refined sea level curve for the Prince Rupert Harbour (PRH) region reconstructed through diatom analysis of sediment isolation basin cores, geological survey, and geoarchaeological evidence. The sea level curve is used with high-resolution digital elevation models constructed from LiDAR data to construct an archaeological survey model that targets high-potential coastal landforms from times when the RSL differed. This study is significant given that the PRH and immediately surrounding area was one of the most densely occupied regions of the Northwest Coast and has been intensively surveyed, but lacks recorded sites dating older than 6000 cal. BP, arguably due to variable paleoshorelines. This research furthers our understanding of the paleolandscape that the first peoples would have encountered and how human settlement is affected by changing sea levels.

Leventhal, Richard [218] see Cain, Tiffany

Leventhal, Alan (College of Social Sciences, San Jose State University)

[293] *Shellmounds of the San Francisco Bay as Sacred Landscapes*

Prior to the time of European contact, ancestral Ohlone tribal groups of the San Francisco Bay region buried their dead within many "shellmound" sites located near the bayshore. Archaeological inquiry over the past century has revealed that many of these burials had rich grave associations. Even so, the prevailing assumptions held by the scientific community has been that these bayshore mounds were the result from the refuse of habitation/village activities focused around the exploitation of shellfish as an explanation of site formation process. The analysis of the mortuary complex from CA-ALA-329 has permitted the development of an alternative perspective. This alternative perspective suggests that the burial activities represented at many of these mounds were central to, rather than peripheral to, the function of these sites. Indeed, the resultant analyses support the position that many of these "shellmounds" served principally as formal ceremonial sites and mortuaries for high-ranking individuals over the centuries. It can therefore be postulated that the important socio-religious Funerary and Annual Mourning ceremonies also figured centrally in the lives of these ancestral Ohlone. Furthermore, not only were these mounds deliberately constructed over time, given this alternative perspective these sites can also be interpreted as "Sacred Landscapes."

[224] *Discussant*

Leventhal, Richard (University of Pennsylvania) and Brian Daniels (University of Pennsylvania)

[254] *Museums and the Destruction of Heritage*

What are museums to do during times of war and with the destruction of cultural heritage in conflict zones? This is a question that came into focus during World War II, and more recently in Afghanistan, Iraq, Syria and other parts of the Middle East. What are the professional and ethical responsibilities of museums in the United States, in western Europe, or in other parts of the world when destruction of cultural heritage is planned or occurring? Do museums in the West have additional responsibilities if museums in these conflict zones are being destroyed? In this paper, we argue that possible actions by museums and professional museum organizations, such as the AAM, AAMD, ICOM, include: 1) providing personnel and financial resources to provide training and help preserve the heritage in situ; 2) providing a safe haven for artifacts and movable heritage during times of conflict – with assurances that these artifacts are returned to the country of origin after the conflict; 3) making sure that artifacts and material from the conflict zone are not available for sale; and 4) working to create an international task force to implement these activities on a broad scale.

Levi, Laura [66] see Wigley, Sarah

Levine, Marc N. [25] see Fargher, Lane

Levine, Marc (University of Oklahoma)

[249] *Ceramic Molds for Mixtec Gold: New Insights into Lost Wax-Casting Traditions of Late Postclassic Oaxaca*

Lost-wax casting in prehispanic Mesoamerica reached its apogee in Late Postclassic Oaxaca, Mexico. Nowhere is this artistry more evident than in the spectacular gold and silver offerings from Tomb 7 at Monte Albán. Researchers have long understood the general process of lost-wax casting, but have incompletely examined variability in techniques utilized through space and time. This poster presents new evidence of ceramic molds from Late Postclassic Tututepec that are believed to have been used to make casting cores—an important component of the lost-wax casting process in Oaxaca. To date, archaeometallurgical studies in Mesoamerica have overlooked the use of ceramic molds for making casting cores. The relatively large sample of molds from Tututepec suggests that this Mixtec capital was an important production center for making gold and silver jewelry that was consumed by local elites and possibly exported to distant centers, such as Monte Albán.

Levstik, Linda S. [236] see Henderson, A. Gwynn

Levy, Janet (UNC at Charlotte)

[187] *Intersecting Identities in Southeastern U.S. Prehistory*

Archaeological evidence from the southeastern and mid-south regions of the U.S. suggest that dress, personal ornamentation, and body modification were key strategies for presenting the self during later prehistory. These markers were apparently deployed to designate multiple and intersecting aspects of identity, including gender, age, community affiliation, and leadership status. Evidence comes from recovered artifacts, human burials, and representational images of humans. Some archaeologists have also examined patterns of architecture, food preparation, and artifact manufacture for evidence of group and personal identity. Ethnographic evidence has also been influential in scholarly attempts to understand the variability of social and individual identity. It is a complex task to integrate both multiple sources of evidence and multiple aspects of identity and life course without either oversimplifying or throwing up one's hands in despair at the complexity. This paper reviews research in the southeast with a focus on how gender identity intersects with other aspects of self-presentation.

Levy, Thomas E. [241] see Howland, Matthew

Lewandowski, David (Northern Arizona University)

[273] *Shifting North: Social Network Analysis and the Pithouse-to-Pueblo Transition in the Mogollon Highlands*

This poster examines the changes in the social networks of the Mogollon Highlands that accompanied the transition to pueblo architecture around A.D. 1000 using Social Network Analysis (SNA). SNA offers a set of formal methods in which ties and relations between sites can be examined. Using the proportions of decorated ceramics within a site's assemblage, social networks are created for 50-year intervals, allowing for changes in the networks to be observed before and after the pithouse-to-pueblo transition. This poster focuses on the relationship of the Mogollon Highlands to the Cibola region to the north, and the Mimbres region to the south and the social factors which accompanied the changing social networks.

Lewarch, Dennis (Suquamish Tribe)

[249] *Artifact Distribution Patterns among Aztec Period Households in the Coatlan del Rio Valley, Morelos, Mexico*

Using assemblages in over 4,000 4-x-4-m surface collection units from eight Aztec period sites in the

Coatlan del Rio Valley of western Morelos, Mexico, I analyze the valley-wide distribution of plain ceramics, decorated ceramics, lithic artifacts, spindle whorls, and figurines in over 300 household middens to define functional artifact sets analogous to the "bundles of goods and services" of economic geographers. Cluster analysis, multidimensional scaling, and network analysis quantify flow of ceramic classes and lithics among households and group ceramic and lithic functional classes into activity suites. Groups of functional classes reflect universal household maintenance activities as well as manufacturing of a variety of craft goods for both household use and market exchange. Distribution of plain and decorated ceramic classes and lithic materials and tools among households provides evidence of various provisioning mechanisms, including market exchange. Results contribute to the increasing corpus of research documenting complexity of Aztec period economic organization in the tributary provinces of the Aztec empire.

[195] *Discussant*

Lewarch, Dennis [360] see Lewarch, Evan

Lewarch, Evan (Suquamish Tribe), Dennis Lewarch (Suquamish Tribe) and Stephanie Trudel (Suquamish Tribe)

[360] *Holocene Site Assemblage Structure and Economic Organization In Admiralty Inlet and Puget Sound, Washington*

We compare 80 site components in Admiralty Inlet and Puget Sound, Washington, using component age, deposit thickness and complexity, feature type and diversity, portable artifact functional classes, and assemblage diversity to study the range of functional site types and diversification of tool kits through time. We previously (2011) analyzed 75 components using Thompson's (1978) 20-functional class system to code portable artifacts. We noted that most inland riverine and prairie sites did not have shell matrices that preserved bone and antler tool classes and we could not differentiate assemblages comprised primarily of lithic artifacts because variation was masked by the definition of Functional Class 9: utilized flakes and chipped stone tools. Here we use 49 functional classes generated by subdividing Thompson's original classes. Results of the new analyses suggest marine and riverine/prairie inland site assemblage patterns may be accounted for in part by differential preservation of bone or antler tools, recovery techniques, and sample size. We compare bone/antler and lithic assemblages separately to tease out functional patterns among sites not conditioned by recovery. Finer-grained analyses such as use-wear or technological studies are necessary to track functional organization of lithic assemblages.

Lewis, Patrick [92] see Davis, David

Lewis, Jennifer (Simon Fraser University)

[336] *Applying North American Approaches to Community Archaeology in Khirbet al-Mukhayyat, Jordan*

"Community based" archaeology programs are all the rage in North America, as both academic and consulting archaeologists respond to descendant communities' rights to management over their cultural heritage in the face of large-scale development and resource management. This movement is not yet applied in other regions facing similar challenges of economic development opportunities and access to heritage. The Khirbet al-Mukhayyat Community Archaeology Program (KMCAP) is inspired by North American approaches, while recognizing the unique socio-political and economic setting of Jordan. My paper presents the methods, findings, challenges, and futures from the (inaugural) 2014 season, within the larger Town of Nebo Archaeological Project (directed by Dr. Debra Foran of Wilfred Laurier University). The KMCAP is informed by my experience as a consulting archaeologist in British Columbia, and by my academic work in the southwestern United States.

Lewis, Michael [276] see Burrillo, Ralph

Li, Shuicheng

[102] *Painted Pottery of the Siba Culture and Its Implications*

The Siba Culture (c. 3950-3550 years BP) is an early Bronze Age culture in Northwest China. Painted pottery of the Siba Culture is characterized by a red slip and is decorated with thick black paint. The painted motifs consist largely of geometric patterns, apart from a few animal and human figures. These art treasures provide an important dataset to investigate the subsistence and culture of the ancient Qiang groups. Studies of the painted pottery also address: 1) implications of a change in ceramic materials in Northwest China, and 2) early East-West interactions between ancient China and farther west.

[37] *Discussant*

Li, Xiuzhen Janice [89] see Martinon-Torres, Marcos

Li, Yu Qi (Washington University in St. Louis)**[234] *Pastoral Communities Thrived in a Rocky Valley of the Tian-Shan Mountains--New Survey Results of the Dense Pastoralist Sites in the Mohuchahan Valley of Xinjiang, China***

Newly identified pastoral sites in the Mohuchahan Valley have the potential of preserving 3000 years of pastoral settlement history in the middle section of the Tian-Shan Mountains. Located between a rich high-elevation meadow and a low-elevation oasis, this seemingly barren valley might have served as an ideal residing place for numerous generations of local nomads. The scale and density of the burials and settlements they left suggest the communities once thrived here in ancient times probably were of much larger size than the current one. Considering that many of these sites are located in an apparently harsh environment, it becomes mysterious how these communities managed to survive and thrive here. Based on my ethnographic work and survey of some of sites, I suggest the success of ancient communities in the Mohuchahan Valley may partly be attributed to their connection with the meadow area and the oasis nearby. In other words, the harsh environment of the Mohuchahan Valley probably never supported local pastoral communities alone but always together with other eco zones such as the meadow and oases.

Li, Tao (University of Pittsburgh)**[283] *Economic Differentiation in Hongshan Core Zone Communities: A Geochemical Perspective***

It is proposed that a greater degree of differentiation between households in Hongshan villages (4500-3000 B.C.) in northeast China with regard to productive activities implies a greater degree of economic interdependence between households and a more complex economy, which possibly provides leaders with enhanced opportunities to mobilize labor toward such ends. Analysis of household artifact assemblages in the Hongshan periphery has indicated some very modest levels of productive differentiation in lithic production. If the Hongshan core zone showed stronger evidence of productive differentiation and thus a more complex village economy, it might help us to understand how the greater investment in public ritual spaces came to be. A combination of geochemical and mineralogical analyses was thus proposed to investigate productive differentiation between 50 individual artifact (pottery) concentrations of household scale in the Hongshan Core. By recognizing the compositional clusters represented in each household-scale analytical unit, we were able to understand the degree of compositional variety within household units in the Hongshan core zone and the degree of productive differentiation that characterized Hongshan pottery production. This study offers important insight to the role of production and distribution of utilitarian pottery to the economic foundations of early complex societies.

Li, Dongdong (University of Pittsburgh) and Wenjing Wang**[285] *Emergence of Walled Towns in the Neolithic Jiangnan Plain: Warfare or Flooding Control?***

The late Neolithic in the Jiangnan plain is characterized by the emergence of a new kind of settlement pattern. In this period, highly nucleated large local communities were walled as regional centers. In the past decades, the emergence of walled sites has caused hot debates about social dynamics, particularly with regard to function and causal factors. Most explanations for the emergence of walled sites fall into either a warfare model or flooding control model. To evaluate

those models, we investigate both archaeological data and historical records. Our holistic analysis of archaeological data and historical records indicates that the warfare model is more reasonable for explaining the emergence of local walled sites and the trajectory of local social complexity in the Neolithic period.

Li, Yongxian

[349] *Centers of Power and Ritual: Discussing the Archaeological Remains from Two Large Zhangzhung-Period Settlements on the Tibetan Plateau*

The two large settlement sites of Ka'erdong and Zebang which were radiocarbon-dated to 3000-1500 BP probably belong to the former Zhangzhung Kingdom (1500 B.C.–A.D. 645). These two sites are unusually large, covering an area of 130,000 m² and 500,000 m² respectively. Both sites have large cemeteries, residential areas, ritually-used spaces, and defensive structures. The largest structure observed is a large stone-mound tomb with a diameter of 60 m and a height of 6 m that can be attributed to a "king" or some other high-ranking individual. At some distance, there was an altar with stone pillars associated with a bronze statue that probably depicted a god; furthermore, one of the graves located in the vicinity of the altar contained a gold mask. Based on this evidence and the particularities of the object assemblages in graves and settlement layers, this paper argues that these are the remains of a stable society with a centralized power even though part of the manufacturing economy showing many characteristics of a self-regulating tribal system. The presence of the ritual installations and depictions associated both with altars and special graves indicate that this area was a regional center of worldly and religious power.

Lieb, Brad [311] see Doherty, Raymond

Liebmman, Matt (Harvard University)

[81] *In the Shadow of the Moor: An Archaeology of Pueblo Resistance in Colonial New Mexico*

Historians and archaeologists often consider the Pueblo Revolt of 1680 to be the final chapter in the saga of early Spanish colonialism in New Mexico. Borderlands scholars endlessly debate the origins of the uprising, and in recent years their attention has turned toward proximate causes. In this paper I take a longer view, investigating how the events of early Spanish contact and colonialism created conditions ripe for Native insurrection. I pay particular attention to the differential responses of Pueblo groups to similar colonial circumstances. I also review the contributions of recent archaeological investigations into the Pueblo Revolt Era, which suggest that long-term intra- and inter-Pueblo politics had at least as great an effect on the outcomes of the Pueblo Revolt of 1680 as did Spanish colonial policies.

[239] *Chair*

Liebmman, Mathew [239] see Farella, Joshua

Liendo, Rodrigo

[86] *Territorial Attachments and Border Formation in the Upper Usumacinta River Basin: Discussing Ceramic Mobility within a Fractured Political and Geographical Landscape.*

To date, archaeologists working in the Northwestern Maya Lowlands, specifically in the Upper Usumacinta region have focused their attention to ceramic variability and regional distributions trying to "picture" the degree of variability in the role of local centers in regional ceramic exchange systems. Nevertheless, little attention has been paid to territorial variability-for example, the distinction between contiguous and non-contiguous territorial formations highlighted by recent regional archaeological studies for Piedras Negras, Yaxchilan and Palenque- and how the latter affects ceramic regional distributions. The existence of a fractured geographic and political landscape poses interesting questions for archaeological scholarship: what does the existence of political allegiance or tribute from non-contiguous populations imply for ceramic distributions? How does it differ from those among territorial contiguous populations? How are not only distributions of resources but also histories of migrations, genealogies, military conquest and alliance building implicated in these patterns?

[86] Chair

Liendo, Rodrigo [86] see Silva De La Mora, Flavio

Lieske, Rosemary (Vanderbilt University)**[151] *A History of Izapa Group B: Buildings, Burials, and Offerings***

The Group B complex in central Izapa contains the oldest known structures at the site and is vital to understanding the growth and development of Izapa as a regional center. This paper offers a reconstruction of Group B's architectural development through time as revealed through the excavations and discusses the placement of its numerous burials and offerings. Most of what is known concerning the development of Group B is restricted to Mound 30a, the Mound 30 acropolis, and its auxiliary platforms. The placement of offerings in relation to the platforms aids our understanding of its development. The number of offerings and burials placed in Group B is significantly more than any other location in central Izapa. The messages conveyed by the monuments, combined with the placement of elaborate burials and offerings, delineate Group B as a very special place.

Lieverse, Angela [131] see Schulting, Rick

Lightfoot, Kent (University of California, Berkeley)**[175] *The Forging of Communities at Colony Ross (1812-1841) in Northern California***

The purpose of this paper is to examine the multiple communities that materialized at Colony Ross, the mercantile outpost administered by the Russian-American Company in northern California from 1812-1841. Archaeological and archival research suggests that several distinctive pluralistic communities, comprised mostly of colonial men and indigenous people, were established at Colony Ross. The paper will examine the dynamic relations of these communities, including how they formed, how they changed over time, and how people with diverse backgrounds were recruited into the different residential neighborhoods of the colony.

Lightfoot, Kent [178] see Blair, Elliot

Lightfoot, Emma (McDonald Institute for Archaeological Research)**[345] *Why Move Starchy Cereals? Stable Isotope Evidence for the Spread of Crops across Eurasia in Prehistory***

The spread of agriculture in the Neolithic and Bronze Age is an important topic of archaeological research, with major implications for human societies across Eurasia. The Food Globalisation in Prehistory project (FOGLIP) has furthered our knowledge of the spread of crops across Eurasia in prehistory using a variety of archaeological methods including archaeobotany, genetics and stable isotope analysis. This presentation will focus on the contribution of stable isotope analysis to our understanding of this early episode of crop exchange, particularly the consumption of millet away from its domestication center. By combining published literature with data generated by the FOGLIP project, I will contribute to our understanding of where, when and why crops were spread across Eurasia by early farmers.

Ligman, Michael [362] see Adams, Jesse

Lilley, Ian (The University of Queensland)**[77] *Lapita - the Australian Connection***

Recent research in southern New Guinea, Torres Strait and northeastern Australia suggests that Lapita users and possibly makers may have been present in regions hitherto believed to be beyond their reach. In New Guinea, the discovery of late Lapita near Port Moresby has just been complemented by findings of late Lapita ceramics in the western Gulf of Papua. Southwest of the

Gulf, undiagnostic ceramics dating to perhaps 2500 years are now known in the Torres Strait. Bill Dickinson showed that some of this latter material is from New Guinea. In northern Australia, undiagnostic material has been found in surface contexts on Lizard Island off Cape York Peninsula. The Lizard sherds remain undated but are hypothesized to be pre-colonial. They were discovered after Dickinson suggested that late Lapita in the Solomons could originate from places such as Lizard. Ceramics have never been found before in pre-colonial contexts in either Torres Strait or mainland Australia and its offshore islands. The proximity of their find-spots to the new discoveries of Lapita in southern New Guinea, and the dating of at least some of the Torres Strait material, raise dramatic new possibilities regarding the course of prehistory in those areas.

[13] *Discussant*

Lin, Yi-Xian (College of Applied Arts and Science of Beijing Union University), Ian Freestone (Institute of Archaeology, University College London) and Hui WANG (Gansu Provincial Institute of Archaeology and Culture)

[102] *Understanding the Production of Majiayao Painted Pottery in Gansu: New Data and New Thoughts*

This paper examines the evidence for local production of painted pottery of the Majiayao Culture in Gansu province based on their distinguishing characteristics in mineralogical, compositional and technological aspects, and on correlations of these features with the geographical source. We examined a database of painted pottery sherds from one Yangshao-period site and two Majiayao-period sites with comprehensive analytical methods such as petrological, grain-size, Raman microscopic analyses combined with XRF, ICP-MS, NAA, EPMA and SEM analyses, to assess factors enable diagnosing Majiayao pottery locally made in Gansu. We also examined the effects of raw materials on changes in compositions and inclusions of ceramics by studying a number of modern pottery vessels fired with local clays separately in Lintao and Linxia counties. The present case study suggests that we should be wary of linking all types of compositional and technological diversities to different provenances. However, some certain local technological characteristics of Majiayao painted pottery in Gansu might exist.

Lin, Kuei-chen (Institute of History and Philology, Academia Sinica)

[283] *Craft Production and Domestic Economies of the Prehistoric Chengdu Plain, Southwest China*

The Chengdu Plain has been home to several large walled settlements and many small villages since the late Neolithic era. Evidence from several sites suggests that multiple types of economic and subsistence production were usually coupled within a given community. Such activities might have mutually influenced one another while sharing or competing for resources, including labor and customers. Although some artisans possibly produced luxury goods or gifts used on special occasions, most of the products were everyday goods that only circulated among a village or community. It is curious and worth noting, however, that the counterparts or imitations of these local products, which followed the same prototypes but whose details were differently implemented, can be found in diverse contexts and many other far-off settlements. By comparing the manufacturing traditions of different working groups, we can discern the extent to which environments, settlement patterns and subsistence economies played an important role in shaping respective traditions. It is also clear that, to understand how these types of production were incorporated into domestic economies and perhaps also larger exchange networks, we need to further investigate users' social interests and strategies.

Lina, Zhuang (National Museum of China) and Zhou Runken (Nanjing Museum)

[179] *Use-wear Analysis on the Stone Tools from the Dongshancun Site*

The Dongshancun Site is located in Zhangjiagang city in Jiangsu Province in the eastern area of China. The site is only 2 kilometers from the Yangtze River. During 2008-2010, the Nanjing Museum excavated about 37 tombs belonging to the Songze Culture (3900-3100B.C.). Excavations revealed that some of interred were buried with abundant pottery vessels, jade artifacts, and other well-made stone tools such as the stone yue axe, stone adze and stone chisel. In this paper, we employ a low-

power method to observe the use-wear patterns on the stone stools. Our research included the examination of 20 yue axes, 17 stone adzes, and 17 stone chisels unearthed from 10 tombs. Our paper will address whether the tools were utilitarian or produced strictly for the ritual surrounding the burial event.

Linares, Adriana [261] see Coronado, Anabella

Lincoln-Babb, Lorrie [225] see Rodrigues, Teresa

Lindauer, Owen [278] see Jacobs, David

Lindeman, Michael (Desert Archaeology)

[304] *Settlement Structure at La Villa: A Preclassic Hohokam Village*

For roughly 400 years after La Villa was founded, around A.D. 500, the village would have been one of the largest in the Phoenix Basin, rivaling, perhaps, the great centers of Snaketown and Grewe on the Middle Gila River. Recent excavations at the site by Desert Archaeology Inc. combined with a series of previous investigations provide intriguing new information about the organization of settlement at Hohokam villages. The work at La Villa has resulted in the identification of two large plazas as well as occupation extending more than 120 m beyond the plaza edges. Our investigations at La Villa have identified multiple long-lived social units close to the plazas while occupations farther from the plazas are of shorter duration. We suggest that settlement along the perimeter of the plaza would have been by the village founders and their descendants, with these spaces curated for hundreds of years. A plaza proximate location would have served to display the historical relationship of the households to the founding of the village reinforcing social, political, and economic rights that are likely to have been derived from first-come status.

[304] *Chair*

Linderholm, Anna [28] see Larson, Greger

Lindgren, Alexandra [336] see Corbett, Debra

Lindley, Tiffany (The University of Texas at San Antonio)

[376] *Searching for Continuity in the Hinterlands: Households at Rancho San Lorenzo's Floodplain North Settlement Cluster, Belize*

In this paper I will summarize the results of the 2013 and 2014 field seasons at the Floodplain North settlement cluster, located within the Rancho San Lorenzo Survey Area in the Mopan River Valley, Belize. Investigations sought to identify continuous occupation from the Late Classic to Postclassic periods. Maya occupation at Rancho San Lorenzo peaked in the Late Classic, followed by a drastic decrease in population levels. However, pedestrian survey undertaken in 2013 revealed Postclassic ceramics at the Floodplain North settlement cluster, one of five distinct clusters within Rancho San Lorenzo. The 2013 season also included test excavations at five house-mounds with the primary goal of identifying more Postclassic ceramic data. Based on the 2013 data, the primary objectives of the 2014 field season were to continue testing house-mounds throughout the Floodplain North cluster and, using ceramic data, identify a chronology of occupation. A total of six house-mounds were tested. Excavations revealed a strong Late Classic to Terminal Classic presence, with possible continuity into the Postclassic.

[376] *Chair*

Lindquist, Shayna (University of Vermont) and Xochitl Leon (Universidad Veracruzana)

[144] *The Obsidian of Matacanela*

The Matacanela Archaeological Project (MAP) seeks to add to the greater understanding of the Classic to Postclassic transition, within the Gulf lowlands of Mesoamerica. Within the surface

obsidian assemblage analyzed from the first season of this two-year project, distribution patterns and source frequencies delineate a definite Classic presence, reflecting certain hallmarks of surrounding established Classic period sites. In this paper, we present the obsidian recovered, and further consider Matacanela's identity among regional contemporaries, particularly how the data contributes to the discussion of the site as a polity challenging regional authority. We finally discuss Matacanela's Postclassic occupation and areas for potential investigation.

Lindsay, Audrey (Shumla Archaeological Research and Education Center, Northern Arizona University), Victoria L. Muñoz (Shumla Archaeological Research and Education Center), Jeremy B. Freeman (Shumla Archaeological Research and Education Center) and Carolyn E. Boyd (Shumla Archaeological Research and Education Center)

[149] *High Tide in the Lower Pecos: Digital Documentation of the Threatened Rattlesnake Canyon Mural*

Rockshelters of the Lower Pecos Canyonlands display visually striking and compositionally complex Pecos River style murals painted by hunter-gatherers during the Late Archaic. The Rattlesnake Canyon mural (41VV180) is regarded as one of the six finest surviving examples of this world-renowned pictograph style. However, the site is severely threatened by repeated flooding episodes along the Rio Grande, exacerbated in recent years by siltation of Amistad Reservoir. Three known flooding episodes have impacted the paintings since 2008. Building upon the recording project conducted by the TAS Rock Art Recording Task Force during the 1990s, Shumla is collaborating with the National Park Service and Texas Tech University to record the Rattlesnake Canyon mural using state-of-the-art, digital documentation techniques before it is damaged further and eventually lost. Fieldwork sessions in June and September 2014 collected comprehensive baseline data facilitating current and future research, conservation, and public education for this threatened cultural legacy.

Lindsay, Ian (Purdue University)

[334] *Shifting Human-Environmental Interactions in the Late Prehistoric Periods of Southern Caucasia*

The Caucasus Mountain range is an exceptionally dynamic landscape whose diverse topographic, tectonic, hydrological, climatic, and pedological dimensions provided the backdrop to equally vibrant social transitions from the Neolithic through the Iron Age. The past two decades of intensive excavations and radiocarbon dates in the South Caucasus (particularly Armenia and Georgia) have resulted in important refinements to material culture sequences from the first farmers to the earliest political hierarchies and empires. A long-standing tradition has persisted in the region to uncritically invoke "the environment" as a driver of important historical transitions—from determinative access to vital highland resources like obsidian and metals, to the adoption of pastoral transhumance—despite a lack of concrete paleo-environmental data. Indeed, until recently very few data have existed to reconstruct the daily challenges and affordances of highland climatic and hydrological regimes that effected daily life for ancient populations, and how these may have precipitated settlement and subsistence change over the *longue durée*. This paper will discuss the current state of knowledge of how ancient societies (including the region's earliest complex polities) in Southern Caucasia engaged with their natural environment from the 6th through 2nd millennium B.C.

[285] *Chair*

Lindsay, Ian [285] see Khatchadourian, Lori

Linduff, Katheryn (University of Pittsburgh)

[234] *Discussant*

Lindzy, Annmarie [315] see Chesson, Meredith

Linford, Samantha

[364] *Clay Reconnaissance and Suitability Testing within Petrified Forest National Park*

The likelihood of endemic clays both suitable and used for local ceramic production within the Petrified Forest National Park, Arizona is disputed. Researchers imply clays within the park are unsuitable for ceramic production. Ethno-archaeological studies, though, document that most traditional potting communities procure clay for ceramic production within a three to five kilometer radius of their residence (Arnold 1985). In this case, past individuals residing within the current park boundaries must have located and obtained clay from a reliable source, as large amounts of utility ware is present within the park. I will ascertain the utility of naturally forming clays within the Petrified Forest National Park through the collection and firing of naturally forming geologic and alluvial clays. This study examines clay sources within three to five kilometers of five archaeological sites: AZ K:13:114, Puerco Pueblo (AZ Q:01:022), Pottery Mound (AZ Q:01:281), Sivu'ovi (AZ Q:01:114), and Twin Buttes (AZ Q:01:2), serving as a base study for sourcing ceramics within Petrified Forest National Park and contributing to specific questions regarding ceramic production. Determining the source of ceramic production within Petrified Forest National Park can shed light on trade patterns as well as cultural preferences for material and design.

Ling, Johan

[137] *War Related Social and Ritual Traits in Rock Art*

War related social and ritual traits are common features in European Bronze Age and Native North American rock art. There are some general similarities in the material that needs to be stressed between the North American images and those from Bronze Age Europe, fighters depicted with spears and shields etc. This resemblance speaks of how distant un-connected human groups may create similar imageries, given only a set of rather superficial social similarities in general terms. Moreover, the striking resemblance between the figurative depictions of armed humans and weaponry on the stelae of Iberia, dated to Late Bronze Age, and Scandinavian rock art is also important in this context. Most scholars seems to agree about that the Bronze Age in parts of Europe was an unstable period characterized by conflicts and constraints and that small-scale raiding and warfare was a common feature. This is also the case for some of the societies that produced North American Rock art. This indicates that rock art was neither a mere depiction of an ideal cosmology nor a mere religious declaration, but also a vehicle for projections and conceptions arising from tensions in the real social world.

Link, Jasmin [73] see Balbo, Andrea

Linn, Erin (Integrated Heritage Project)

[72] *Archaeology as Heritage Resource: Foundations for Successful Archaeological Tourism, Achievements and Challenges from Petra to Angkor*

Global heritage tourism is at an all-time high with tourism numbers expected to increase in the coming years. The challenges associated with managing heritage sites are as countless as they are complex. Heritage resources are finite non-renewal assets that provide critical links to the past, a source of identity, knowledge, and cultural values that enable communities and individuals to better understand and navigate the present. The management of archaeological resources, as part of heritage tourism, offers a unique set of challenges associated with their multifaceted use and fragility. Despite the difficulties in navigating the delicate balance between archaeology as academic resource, archaeology as a commodity, and archaeology as cultural heritage, numerous projects around the world are developing innovative approaches to heritage tourism management at archaeological sites. This paper will examine heritage management programs, including past and present initiatives, at heritage sites in Jordan, Cambodia, and Turkey to identify strategic successes and ongoing challenges of managing archaeological tourism at heritage sites. In particular, this paper will highlight the critical importance of community and stakeholder engagement in the creation and implementation of heritage tourism management plans and the need for educational outreach programs to establish long-term success at these dynamic sites.

Lints, Andrew (University of Alberta)**[373]** *Reconstructing a 600 Year Old Ceremonial Event from the Northern Plains: Analysis of Phytoliths from within a Modified Bison Skull*

While numerous ethnographic accounts indicate the use of plants in the creation of ceremonial bison skull altars within many areas of the Great Plains, few examples of this practice has been identified from archaeological contexts. Analysis of phytoliths from soils (n=2) obtained from within and beneath a ceremonial bison skull (A.D. 1339 and 1397) recovered from the Crepeelee site (DiMe-29), southwestern Manitoba, led to the identification of phytolith assemblages dominated by C4 grasses. Samples obtained from stratigraphic control samples (n = 24) produced phytolith assemblages composed primarily of C3 grasses, more common to Northern Plains environments. Contradictions between phytolith types found within and beneath the bison skull feature and surrounding soil profile suggest that C4 plant materials were placed beneath the ceremonial bison skull during the creation of this altar. Results of this research indicate that bison and maize (*Zea mays* spp. *mays*) played both a dietary and spiritual role within pre-contact foraging societies inhabiting the Northern Great Plains approximately 600 years ago.

[373] *Chair***Lione, Brian Michael (Iraqi Institute for the Conservation of Antiquities and Heritage) and Jessica Johnson (Museum Conservation Institute, Smithsonian Institution)****[254]** *Coursework in Disaster Preparedness and Emergency Response in Iraq: Meeting Immediate Training Needs at the Iraqi Institute*

Decades of regime rule, war and economic sanctions resulted in reductions in professional staff, isolation from the international community, and ultimately; neglect and deterioration of Iraqi cultural heritage. During a period of relative stability, the Iraqi Institute for the Conservation of Antiquities and Heritage (established through US funding in 2008) began offering academic programs in architectural conservation, artifact / object conservation, and archaeological site preservation to Iraqi professionals in 2009. Since its first courses, the Institute has educated over 250 Iraqis, most in courses delivered by the University of Delaware.

Managed by an Iraqi board of directors and an international Advisory Council, the Institute is a model of successful international collaboration. It is also noteworthy for its balanced approach to conservation education: graduates immediately apply their updated skills –and international connections– to improving the management of Iraqi sites and collections. This successful model was modified in 2014, when the University of Delaware temporarily suspended longer academic courses in favor of tailored training events in disaster preparedness and emergency response. This paper will discuss the intent, goals and content of these courses, and how graduates of the courses are applying new skills to protect and preserve cultural heritage in uncertain times.

Liot, Catherine [189] see Ramirez-Urrea De Swartz, Susana

Lipe, William (Washington State University)**[354]** *Woodrats Rule! Climbing and Coring in Southeast Utah Cliff Dwellings*

For the past decade Tom Windes and his volunteer band of merry beamsters--the Woodrats-- have been collecting dendrochronological samples from cliff dwellings in the Natural Bridges and Cedar Mesa areas of southeastern Utah. As a result, the number of dated sites has increased dramatically, and it has become clear that in the A.D. 1200s, building in these canyons declined before the onset of the "great drought" of 1276-1299. The meticulous maps and records made by the Woodrats also enable detailed reconstructions of the individual histories of these sites.

[85] *Discussant*

Lipo, Carl [52] see Hixon, Sean

Lipo, Carl (California State University Long Beach) and Mark Madsen (University of Washington)

[191] *An Approach to Fitting Transmission Models to Seriations for Regional-Scale Analysis*

At scales where individual copying events are not measurable but the regional archaeological record is rich enough to support models more detailed than phylogenies, seriation can play a unique role as a diachronic measurement tool for linking cultural transmission models to data composed of assemblages of artifact class frequencies. As a first step towards fitting cultural transmission models to regional-scale transmission scenarios, we develop an iterative deterministic seriation algorithm. We then implement summary statistics suitable for fitting models to seriations using an Approximate Bayesian Computation (AB.C.) approach.

Lippert, Dorothy (National Museum of Natural History)

[160] *Discussant***Lippi, Ronald (University of Wisconsin), Alejandra Gudino (University of Missouri) and Estanislao Pazmino (Lethbridge University)****[367] *Fiestas and Funerals? Possible Uses of a Rectangular Platform Mound in Yumbo Territory***

In 2010 the Palmitopamba Archaeology Project in northwestern Pichincha province, Ecuador, was expanded to include excavations in a rectangular platform mound (Tola Rivadeneira, NL-30) 2 km north of the monumental Yumbo and Inca site of Palmitopamba. Earthen mounds (tolas) widely distributed throughout the region, constituted a significant element in the construction of the Yumbo landscape. While recent agricultural work removed the latest occupation of the mound, excavations reveal a history of overlapping occupations that included possible feasting and mortuary functions. The entire mound was built over a Formative Period site that predated the eruption of Pululagua Volcano. Work at the site will continue, but preliminary research so far adds much to our understanding of Yumbo culture.

Lipps, Jere H. [106] see Pedersen, Jeannine

Lira-Lopez, Yamile**[198] *Distribución temporal de la cerámica teotihuacana en el valle intermontano de Maltrata, Veracruz***

Entre Teotihuacán y la Costa del Golfo, bajando el Altiplano Central y el valle Puebla-Tlaxcala, existe un pequeño valle enclavado en la Sierra Madre Oriental, habitado desde el 800 aC hasta la actualidad. Su ubicación geográfica permitió formar parte de una ruta de tránsito, comunicación e intercambio, entrelazando la Costa del Golfo de México y el Altiplano Central, permitiendo la interacción entre grupos olmecas, zapotecos, teotihuacanos, mixteco-poblanos, aztecas y habitantes locales, quienes permanecieron a lo largo del tiempo mientras que las "grandes culturas" florecían, se dispersaban o decaían. Particularmente durante el Clásico mesoamericano el valle de Maltrata formó parte del "corredor teotihuacano", siendo utilizado desde la fase Tzacualli como ruta comercial, enclave y posiblemente como colonia, dada la gran cantidad de cerámica de estilo y comercio teotihuacano (vasijas cilíndricas, Anaranjada delgada). Hasta el momento no hay reportado otro asentamiento, en el tramo hacia la Costa del Golfo, con tal evidencia. El material que se presenta proviene de excavaciones realizadas por el Proyecto Arqueología del valle de Maltrata (Instituto de Antropología-Universidad Veracruzana-IIA-UNAM), permitiendo profundizar en el análisis de la expansión de la cultura teotihuacana en el tiempo, cuya expansión o influencia hacia la Costa del Golfo alcanzó sitios como Matacapán.

Liss, Brady [241] see Howland, Matthew

Lister, Diane (University of Cambridge), Huw Jones (National Institute of Agricultural Botany (NIAB),), Hugo Oliveira (Research Center In Biodiversity and Genetic Resour), James Cockram (National Institute of Agricultural Botany (NIAB),) and Martin Jones (McDonald Institute for Archaeological Research, Un)

[345] *West to East: The Spread of Wheat and Barley Cultivation across Eurasia*

By the end of the 2nd millennium B.C., the South-west Asian crops wheat (*Triticum* spp.) and barley (*Hordeum vulgare*) are being cultivated in much of Central, South and East Asia. How did these crops spread from west to east? Can we find evidence of the routes of spread through the archaeogenetic analysis of these South-west Asian cereals? We describe our analyses of Eurasian barley and wheat using microsatellite and Single Nucleotide Polymorphisms (SNPs); this data is enabling us to elucidate possible routes of spread across Eurasia. We are primarily studying extant cereal landraces, with the inclusion of some historic and archaeobotanical material. Analysis of SNPs involved in flowering time genes is revealing the role environmental adaptation has in the establishment of cereal cultivation in new areas. We also present our analyses of the relationship between wild and cultivated barleys, and draw conclusions about the origins of wild barleys in the Tibetan Plateau.

Litschi, Melissa [2] see Sharp, Kayeleigh

Litschi, Melissa (Southern Illinois University, Carbondale) and Kayeleigh Sharp (Southern Illinois University, Carbondale)**[11] *pXRF Meets GIS: A Preliminary Investigation of Spatial Variability in Domestic Ceramics at Songoy-Cojal, North Coast, Peru***

Archaeometric approaches to ceramic analysis allow us to critically examine differences in ceramic manufacture and use. By integrating pXRF methods with spatial analysis, it becomes possible to contextualize such differences. Do elemental and technological differences correspond to distinct ceramic styles? Are these differences spatially meaningful? Attendant to our broader objective investigating Mochica-Gallinazo identity and coexistence at the Songoy-Cojal site complex, Zaña Valley north coast, Peru, the current work explores these two questions through data obtained during our short-term lab season in 2014. We collected elemental data, using a pXRF analyzer, on a sample of Gallinazo and Mochica ceramics to test for differences in chemical composition between the two ceramic styles. We then mapped the results alongside data collected in previous seasons. Our geospatial analysis uses three lines of evidence, stylistic, technological, and elemental, to explore intra-site spatial variability. We present the results of this preliminary analysis that tested our original questions of material and technological differentiation, and highlight the best areas to target in future investigations.

Litteral, Matthew [144] see Crothers, George

Little, Aimee (University of York, UK), Shannon Croft (University of York), Charlotte Rowley (University of York), Oliver Craig (University of York) and Nicky Milner (University of York)**[17] *Taken to Task at Star Carr: Integrating Scientific Approaches to Artifacts and Their Archaeological Contexts***

New research on microwear and micro-residue traces on flint and organic artifacts from Star Carr is currently underway. Extensive 3D recording of thousands of artifacts spanning several excavation seasons using GIS has provided an excellent high-resolution spatial record. As well as low/high power approaches to microwear analysis, microresidues are being analyzed using the contextual approach. Flint tools displaying residues of particular interest are being flagged for more detailed imaging by Scanning Electron Microscopy (SEM) and BIOchemical characterization. Results from these analyses are being integrated with technology and refitting studies, experimental archaeological research, geochemical survey, and a study of the micromorphology of the sediments. Integrating these datasets is enabling discrete episodes of human activity at Star Carr to be distinguished. Concentrations of tools in association with features, including structures, are revealing microscopic evidence for subsistence and craft-related activities. Some tasks were conducted in the wet, others were conducted on dry land. This presentation will outline the methods applied, before offering an interpretation of the social significance of these findings.

Little, Maran E. [152] see Hadden, Carla

Littman, Robert [409] see Silverstein, Jay

Liu, Yu and Zhanwei Yue (Institute of Archaeology, Chinese Academy of Social Sciences)

[67] *Casting Technology and Craft Production of Bronze Wares in the Central Plains of China in Late Shang Dynasty (13th B.C.-11th B.C.)*

Casting technology played a more significant role in the formation of Chinese ancient civilization than any other early civilizations. Accompanying with the appearance of bronze vessels in Erlitou period (1800B.C.-1500B.C.), the piece-mold casting technology was first established and then became a prolonged thousand-year manufacturing tradition after the Shang Dynasty. The formation of piece-mold casting technology tradition, which is very different from forging and lost-wax method in the west Asia, is closely related to the craftsman's technological choice.

Therefore, based on the scientific analysis of bronze vessels and foundry remains from Yinxu, the sequence of bronze casting, and the origin and evolution of casting technology in late Shang dynasty was discussed. By carefully analyzing casting technology and production procedure of bronzes in late Shang Dynasty, the relationship between technological styles, the evolution of bronze production technology, and the effect of mass production can better contribute to an understanding of ancient state development in Bronze Age

Liu, Li (Stanford University)

[179] *Discussant*

Liu, Xinyi (Department of Anthropology, Washington University in St. Louis)

[234] *Why Moving Starch? Trans-Eurasian Exchange of Starchy Crops in Prehistory*

Scholarly interest has increasingly focused on an episode of Old World globalization of food resources that significantly predates the 'Silk Road'. The impetus behind this growth of interest has been the expansion of bio-archaeological research in Central and East Asia over the past decade. This paper considers the agents responsible for the food globalization process in prehistory and the forms they took. One of the key aspects of the Trans-Eurasian movements of crops in prehistory was that the movements were not to regions devoid of existing starch-based agriculture, but instead constituted an addition to that agricultural system. Other economic plants, such as grapes, dates and peas, also moved significant distances. However, the novel starchy crops held a particular significance; they went on to become significant staple foods in many of their new destinations. Drawn from recent discovery from western China, we will take into consideration differences in the projected archaeological signatures of different potential agents involved in transmission of the crops.

[345] *Chair*

Liu, Xu [286] see Jin, Hetian

Liu, Chin-hsin (Appalachian State University) and John Krigbaum (University of Florida)

[407] *Human Dietary Responses to the Ecological Instability of Prehistoric Khao Wong Prachan Valley, Thailand: Corroboration between Paleobotany and Skeletal Chemistry*

In Mainland Southeast Asia, rice agriculture and consumption has been a factor frequently tested for changes in population, biological and socio-cultural dynamics in prehistory. For Khao Wong Prachan Valley (KWPV) in central Thailand, Weber et al. (2010) indicated that rice did not enter the stratigraphy until the 1st millennium B.C., while millet seeds were encountered as early as the 3rd millennium B.C. and persisted throughout. Factors such as climate fluctuation, population expansion, and diminishing wild plants due to deforestation could stimulate the incorporation of newly available plant food resources, in this case rice. A KWPV site occupied during the late Neolithic to the early Bronze Age, human skeletal remains from Non Mak La are isotopically analyzed to examine the relationship between botanical evidence and human dietary responses. Results from enamel apatite demonstrate a clear trend chronologically from a C4-oriented diet (mainly millet) to the increasing

contribution of C3 foods (rice), echoing the botanical findings. The consumption of C4 plants, however, remained evident over time, suggesting a continuous C3-C4 mixed diet. Data from other prehistoric central Thai sites also suggest that locally-sourced wide spectrum diets were maintained over time despite ecological and cultural variability.

Livarda, Alexandra (University of Nottingham, UK)

[154] *Discussant*

[154] *Chair*

Livesay, Alison (University of Oklahoma)

[276] *Inscribed Places: Examining Rock Art Sites on the Pajarito Plateau*

At Los Alamos National Laboratory (LANL), one constantly encounters cultural remains of the past, whether they are of research buildings utilized during the Manhattan Era, or the remnants of dwellings of Precolumbian farmers on the Pajarito Plateau. Rock art sites are often encountered places where images of various meanings have been physically pecked and scratched out by people inscribing their identities and worldviews onto the surrounding landscape. Because a landscape can persist in form and memory in various states of visitation, deterioration, and commemoration, we need to view rock art in relation to surrounding habitation and activity sites, as well as natural resources at various scales. I take a landscape approach combining Puebloan ethnography and GIS applications to examine approximately 150 rock art sites in the LANL cultural resources database dating from A.D. 600 - 1600. This approach allows for recognition of robust spatial and temporal patterns, such as the range of variation in topographic settings through time. Are there differences in where certain motifs can be seen and accessed, and conversely, are there places where certain images are not depicted and cannot be viewed? Can we identify differences between interior cavate or kiva art and isolated petroglyph panels?

Livingood, Patrick [3] see Lambert, Shawn

Liwosz, Chester (University of California, Santa Cruz)

[362] *Rock Art Resonance: Preliminary Results of an Experimental Acoustic Study*

Pecked petroglyphs of a prehistoric Mojave Desert slot canyon hint at experience crafting processes in rock image production. The unique qualities here not shared by other area petroglyph sites support the need to consider archaeological and geographic context of these sites as a critical variable, rather than an assumed constant. With narrow passages, dry falls, and towering vertical walls, the slot's metamorphosed limestone substrate yields the potential for sound characteristics not found at many other petroglyph sites in the region. A summer 2014 expedition undertook experimentation with percussive sounds in the highest density concentrations of rock art within the slot. This research aims to identify novel acoustic properties brought about by both the unique landform and curious continuity of the use of a pecking strategy in image production. Weathering suggests continuity in pecked engraving technique over a substantial time depth – likely spanning through both the Numic and part of the Archaic Periods. This study adds depth to the range of variables to consider relevant in recording rock art sites. More broadly, it demonstrates the capacity of experimental archaeology to push the limits of interpretation by expanding the range of inferences which can be reasonably drawn from even faint traces.

Lo, Ching-Hua [49] see Lee, Cheng-Yi

Lockett-Harris, Joshua (Trent University), Helen Haines (Trent University) and Kerry Sagebiel (Northern Illinois University)

[147] *Place Making, Authority, and Ancestors: New Evidence of Developing Middle Formative Socio-Political Complexity from Ka'Kabish, Northern Belize*

Northern Belize during the Middle Formative Period (1000-300 B.C.E.) has increasingly become recognized as a critical locus in the development of Lowland Maya socio-political complexity. This

period witnessed the founding of numerous ceremonial centers, substantial material cultural innovation, and the advent of mortuary practices indicating developing social differentiation in Northern Belize. Recent excavations at the site of Ka'Kabish in Northern Belize have uncovered evidence significantly strengthening this view. Excavations underlying Plaza D-South at Ka'Kabish have revealed a series of bedrock-hewn offering pits housing thousands of shell beads, forty-seven greenstone objects and debitage, and extensive ceramic evidence indicating communal ritual and feasting. Significantly, this elaborate series of offering caches appears to center on the secondary, bundled bedrock-cist burial of an important personage and/or ancestor. Comparable contemporary evidence from Northern Belize has been interpreted through models foregrounding site-founding, place-making, ancestor veneration, and aggrandizer driven social differentiation. By integrating and contrasting these existing models with new evidence from Ka'Kabish, this paper argues that the mortuary, caching, and architectural practices evidenced at Middle Formative Ka'Kabish represent a glimpse of the incipience of the ideological complex, the socio-cultural processes, and the material manifestations propagating the development of subsequent Maya socio-political complexity.

Lodge, Spencer

[229] *Earth Oven Facilities of the Sheep Range in Southern Nevada*

Since 2012, nearly 200 earth oven facilities have been recorded within the Sheep Range on the Desert National Wildlife Refuge in southern Nevada. The identification of these features was aided by the use of Google Earth due to a chemical reaction that occurs in the local limestone when exposed to extended periods of heat. Also known as roasting pits, the widespread use of these features in southern Nevada has not been previously addressed, resulting in a dearth of knowledge regarding their prehistoric role in the region. Roasting pits mark the focused exploitation of previously underutilized resources, such as desert succulents like agave and yucca, which require long baking periods to be rendered edible. A substantial increase in the use of similar features has been noted elsewhere within the American Southwest from 4,000 - 2,000 B.C., and has also been attributed to increasing population densities. This presentation highlights my interpretations of the earth oven facilities of the Sheep Range.

Loebel, Thomas [150] see Lambert, John

Loehman, Rachel [90] see Kneifel, Rebekah

Loehman, Rachel (USGS, Alaska Science Center), Christopher Roos (Department of Anthropology, Southern Methodist University) and Thomas Swetnam (Laboratory of Tree-Ring Research, University of Arizona)

[239] *Modeling Ecological Resilience and Human-Environment Interactions in Engineered Landscapes of the Prehistoric American Southwest*

The prehistoric human footprint in the American southwest is extensive and includes large and small structures, agricultural features, and other signatures of long and variably intensive landscape use. The southwest Jemez Mountains, focus of the current study, have been occupied continuously for the past 2,000 years, and by circa 1300 CE were densely settled in a network of large village sites and fieldhouses. Evidence from tree-rings and fire scars suggests that prior to ca. 1900 Jemez ponderosa pine forests sustained frequent, low-severity surface fires that maintained open-canopy conditions with park-like understory plant communities, a fire regime that has been significantly altered in the past 150 years by changes in climate and human activities. Prehistoric peoples in the Jemez region likely significantly influenced forest structure, fuel properties, ignitions, and thus landscape fire dynamics, but did not appear to erode the long-term persistence of ponderosa pine forests. We use a coupled natural-human systems process model, informed by rich archaeological, ethnographic, and dendrochronology data sets, to assess the magnitude and importance of human influence on fire regimes and ecological resilience. Results highlight the complexity and extent of prehistoric engineered landscapes, and identify future human activities and climate conditions likely to trigger ecosystem instability.

Loendorf, Chris [225] see Rodrigues, Teresa

Loendorf, Chris (Gila River Indian Community), Shari Tiedens (Gila River Indian Community Cultural Resource Mana), Brett Coochyouma (Gila River Indian Community Cultural Resource Mana) and R. Scott Plumlee (Gila River Indian Community Cultural Resource Mana)

[225] *Akimel O'odham Projectile Point Design and P-MIP Archaeological Research*

This presentation summarizes a Gila River Indian Community research program that is designed to provide quantified projectile point data, which are used to address significant research questions for the Pima-Maricopa Irrigation Project data recovery investigations. In contrast to people from most other regions of the world, the Akimel O'odham continued to extensively employ flaked stone points until the late 1800s. Consequently, considerable ethnographic and ethnohistorical data are available regarding lithic design and use. This information has been used to generate hypotheses regarding point style and function that have been tested through carefully controlled experiments. Specifically, it has been theorized that serration of the point blade margins was largely done for stylistic purposes, and controlled experiments were conducted that tested the effects of this practice on performance. The projectile experiments employed a fixed stand that consistently fired projectiles. Serrated and unserrated points were alternately launched into a variety of target media, and multiple aspects of performance were measured and recorded. The incidence of serration varies dramatically among different locations in southern Arizona, and this practice even varied between some nearby contemporaneous settlements, which supports the suggestion that it was done for stylistic purposes.

Lofaro, Ellen (University of Florida), Michael Wylde (University of Florida), Susan deFrance (University of Florida) and Paul Goldstein (University of California, San Diego)

[250] *Research on a Dog Burial from Rio Muerto, Peru*

This poster presentation examines the place of the dog in the ancient Andean society of Tiwanaku. The mummified remains of a small dog were recovered from a domestic context at the Rio Muerto site, located in the Osmore River drainage of far southern Peru. Although dog burials in Peru are not unusual, they appear mostly in high-status contexts in art and in mortuary practice. Offerings of young camelids and dogs have been found buried beneath floors and entryways of houses at Rio Muerto M43 and at other Tiwanaku sites in the Moquegua colony. A 2014 SAA paper provided an initial overview of the history of canids in pre-contact Peru as it relates to this individual burial, offering preliminary information from the archaeological and ethnographic records to suggest possible avenues of study focused on the ancient dogs of Peru. The isotopic study of the individual presented here will examine strontium signatures and carbon values to glean information relating to possible place of origin and dietary practices to further the hypothesis that dogs in ancient Peru were symbols of social rank and status.

Loftis, Kathy, Alex Cherkinski (Center for Applied Isotope Studies, University of) and Robert Speakman (Center for Applied Isotope Studies, University of)

[121] *Application of Compound-Specific Radiocarbon Dating of Hydroxyproline from Bone Collagen*

The ability to generate accurate and reliable radiocarbon dates for bone is of great importance in archaeology. Routinely, the age of bones is determined by radiocarbon dating of hydrolyzed bone extract. However, this method does not isolate collagen-derived organic matter, and contaminant organic carbon may be present in the extract. Exogenous organic matter, introduced during burial or post-excavation treatment, can affect the estimated radiocarbon dates. Pre-treatment methods can minimize contamination, but isolation of endogenous carbon is not guaranteed. More recently a compound-specific radiocarbon dating method was developed. This method targets amino acids that originate in the bone sample, such as hydroxyproline. Hydroxyproline is present in limited animal proteins, but is a major amino acid of collagen. As such, this compound serves as a biomarker for bone collagen, thereby yielding more accurate radiocarbon dates. We present our findings of the application of hydroxyproline radiocarbon dating to archaeological bone.

Loftus, Emma [294] see Sealy, Judith

Logan, Amanda (Northwestern University)**[258]** *Excavating Slow Violence Across the Modern/Premodern Divide*

Archaeology as a technique allows us to make visible processes of "slow violence" (Nixon 2011) that unfold over time, providing a critical temporal dimension to understanding how and why modern inequalities come to be. In this paper I attempt to reconcile why "prehistory" matters to understanding structural violence in recent times. While archaeologists of the contemporary and recent past have long used archaeology to make visible the experiences of structural violence among subaltern groups, their gaze rarely extends into deeper pasts. Yet comparison of pasts and presents can coax alternate potentialities to the surface, such as the economic potential of various regions in very different economic settings. For example, in Banda, Ghana, archaeology reveals a greater degree of food security and economic well-being prior to European expansion, suggesting a much higher potential standard of living than observed at present. This comparative project sets the stage for an archaeology of slow violence that embraces the study of long-term processes across the modern/premodern divide.

Lohman, Nicole (Northern Arizona University)**[149]** *New Methods for Rock Art Recording at Petrified Forest National Park*

Researchers and park staff recorded rock art at Petrified Forest National Park with a number of different and disparate approaches over the past half-century. As part of a graduate research project a standardized multi-scalar approach for recording rock art at the park was developed. The development process examined the efficacy of four different approaches for creating panel sketches. A comparison of the variables of time to complete, accuracy, and perceived ease for each method revealed the strengths and weaknesses of each approach. A series of forms to record rock art used by agencies and organizations in the Southwest were also examined and used to compile a park specific recording form. The results of the study permitted the development of a multi-scalar adaptive approach, which permits the collection of data appropriate for both research and management needs.

Lohse, Jon (Coastal Environments, Inc.)**[130]** *A Record of Late Holocene Volcanic Activity from Highland Guatemala*

A record of late Holocene volcanic activity in highland Guatemala was inferred from sediment and tephra stratigraphy in two cores from Lake Amatitlan. Electron microprobe analysis of glass from the tephra samples suggests most eruption deposits are of local origin, coming from nearby Volcanoes Pacaya and Fuego. The 6th-century Ilopango ash is clearly visible, and a few tephra samples have not been correlated to particular volcanoes or eruption events. Using dates from this sequence with others from regional studies of eruptive histories from Fuego and Pacaya, we present a constrained age model spanning from about ~2.7 to .6 kbp to understand the timing and frequency of volcanic history. We find that volcanism was episodic, with periods of high-frequency eruptions followed by periods of relative quiescence. This model is relevant to our understanding of regional patterns of urbanization, population growth, and political centralization.

[75] *Discussant***Loney, Helen (University of Worcester, UK)****[50]** *Gender and Age in the 18th–19th Century Worcester Porcelain Industries: Relating the Results of Archaeological Research to Social History*

This poster will present some of the finds analysis from the Worcester Porcelain Project, which is conducting fieldwork in the suburbs and agricultural zones around the City of Worcester, in order to better understand the processes of industrial waste management prior to World War II. The study of industrial archaeology in Britain since the 1960s has emphasized monument and landscape studies, with emphasis on preservation and conservation of iconic factories and installations. In parallel to this work, a number of social historians and scholars have been recording production methods and exploring company archives, in order to critically evaluate the history of industry during the 17th, 18th

and 19th centuries, in particular. These studies have contributed to our understanding of the nature of industrialization, including the roles and contributions of women and children. These results shed light on the stages of the industrial process, leading up to the production of marketable items. Importantly, the results have revealed artifacts which when seen in conjunction with local social and industrial histories can be confidently assigned to specific age and gender groups, most importantly male and female children. This offers the archaeologist an unusual opportunity to develop the link between artifact and gender studies.

Long, Emily (Sequoia and Kings Canyon National Parks)

[310] *Elevation, What's the Point?: A Preliminary Study of Selected Obsidian Projectile Points Collected From Varying Elevations at Sequoia and Kings Canyon National Parks*

Sequoia and Kings Canyon National Parks (SEKI) has evidence of a well-established trade network for raw lithic material, specifically obsidian. Obsidian was widely traded throughout the central and southern Sierra, since local material was unsuitable for tool manufacture. High elevation archaeological sites, such as those observed at Taboose Pass (11,400 feet in elevation), consist of high density obsidian lithic scatters with tools, blanks, and diagnostic projectile points. Low density obsidian scatters are observed at lower elevations in the foothills, indicating a wide dispersal of material. Is there an evident transmission of projectile point styles with the dispersal of material? Is there a correlation between projectile point types from higher to lower elevations? As a preliminary study, I selected SEKI archaeological sites with collected diagnostic projectile points from various elevations (15-20 sites per zone) and conducted a basic comparative analysis of material and form. This poster summarizes the results of the projectile point investigation.

Longhurst, Peta (University of Sydney)

[36] *Difference in the Archaeology of Institutions*

Historical archaeology has recently been concerned with the study of a diverse range of institutions – of confinement, of education, of religion, of punishment, and of reform. Disjunctions between the social ideals on which these institutions were founded and the material realities permeate much of this literature, often interpreted through a framework of resistance to institutional power. Lu Ann De Cunzo (2006) has characterized institutions as trialectical spaces -simultaneously conceived, perceived and lived. This paper explores the ways in which these disjunctions can be understood through a framework of archaeological difference. Through a consideration of a number of institutional forms, this study reflects on the extent to which De Cunzo's trialectic can be described as a form of non-correspondence between the institutions' sociality and materiality. What impact has the resultant friction had on the way in which institutions operated and were experienced? How might 'difference' inform future archaeological inquiries into the process of institutionalization?

Longie, Erich [95] see OBoyle, Virginia M.

Longie , Erich [336] see OBoyle, Robert

Longo, Julia (MOCHE, Inc.), Cyrus Banikazemi (University of North Carolina at Greensboro), Brian Billman (University of North Carolina at Chapel Hill) and Patrick Mullins (University of Pittsburgh)

[11] *Modern Settlement Patterns and Site Preservation in the Middle Moche Valley*

During the July field season of 2014, the authors conducted a survey of sites within the proposed reserves of Ciudad de Dios and Bello Horizonte in the Middle Moche Valley of Peru. GPS data was collected for comparison with previously recorded site boundaries to offer insight into the threat of modern encroachment on archaeological sites. Using GIS and statistical analysis, the authors identified areas of site degradation and loss, categorized each site on a sliding scale of endangerment, and determined patterns of modern encroachment. Furthermore, the authors assessed how modern settlement patterns in the area compared to those of the precolumbian era. Topography and geographical location, time period, site type, and number of recorded reoccupations were all factors in determining patterns of encroachment of past and present. The insight gained

through the authors' analysis of modern and prehistoric settlement patterns shows potential for the use of such studies in effective prioritization of endangered areas and future site preservation efforts.

Look, Cory (The Graduate Center City University of New York), Erin Friedman (The Graduate Center City University of New York), Matthew Brown (Brooklyn College City University of New York) and Reg Murphy (National Parks of Antigua and Barbuda)

[56] *Indian Creek Revisited: The Use of Portable X-ray Fluorescence (pXRF) Soil Analysis to Characterize Areas without Artifacts*

This paper reports on a preliminary study assessing the applicability for pXRF analysis of soils within a Precolumbian context. The data generated for this discussion comes from the site of Indian Creek, Antigua; an Amerindian site bound by a series of middens forming a concentric ring around the perimeter of the site. This settlement is the result of over 1300 years of continuous occupation, before it was abandoned just prior to contact in the New World. Aside from the excavations conducted by Irving Rouse along the outer middens, little research studying this 'bounded' space has been conducted in part due to the lack of artifacts in these areas. During the summer of 2012-2013 archaeological soils and samples were taken from this space and were characterized using multi-element soil pattern analysis. These findings were then compared to the archaeological record generating new datasets and discussions regarding the nature of human behavior and the soils capacity to characterize them.

Looper, Matthew [191] see Scholnick, Jonathan

Looper, Matthew (California State Univ-Chico), Jonathan Scholnick (University of California, Davis), Yuriy Polyukhovych (California State University, Chico), Jessica Munson (University of California, Davis) and Martha Macri (University of California, Davis)

[248] *Patterns of Grapheme Innovation in the Classic Maya Script*

The ancient Maya script evolved over the course of about 1800 years, during which hundreds of distinctive functional graphic units (graphemes) were employed. Previous studies have shown that only a small subset of these graphemes was used at any given time, with bursts of innovation in certain epochs, particularly when the production of monuments spiked. This study revisits the question of the historical development of the Maya script, using the Maya Hieroglyphic Database, a comprehensive archive of Maya inscriptions, organized by glyph block. Selecting provenienced monuments only and controlling for time, region, and number of glyph blocks, the database allows us to chronicle innovations in the graphemes employed in the script, from the Early through Terminal Classic periods. This poster summarizes the results of this analysis, showing that not only was grapheme usage temporally patterned, but exhibited distinctive spatial texture as well.

Loos, Lukas (GIScience, University Heidelberg), Michael Auer (GIScience, University Heidelberg), Nicolas Billen (GIScience, University Heidelberg) and Alexander Zipf (GIScience, University Heidelberg)

[100] *MayaArch3D: 2D and 3D Visualization and Analysis Platform*

A central goal of the MayaArch3D project is to provide archaeologists with a research platform for the spatio-temporal visualization and analysis of 2D and 3D data over the World Wide Web. To do this we are developing a web-based Geographic Information System (GIS). The client side of our application builds on top of the open-source geomajas 2D web GIS framework and consists of three central components. First, an interface for working with 2D data from different sources and formats exists. Second, a georeferenced 3D scene to explore landscapes, settlements and buildings is a component. The georeferenced coordinate system in this scene allows the combination of additional geodata (e.g., raster overlays, user defined vector data or map services). And third, a viewer which allows for the study of single 3D objects in higher resolutions exists. For the 3D components we have built a spatially enabled 3D framework "GIScene" developed by GIScience Research Group at Heidelberg University using WebGL technology and the open-source Three.js JavaScript library. Both 3D components support the user's interaction with models and provide an analysis tool-set and access to the attribute information from the databases.

Loos, Lukas [100] see Billen, Nicolas

Lopez, Karen (University of Puerto Rico - Rio Piedras)

[290] *La arqueología latente: educación informal como inspiración para preparación profesional*
El Programa Ciudadano Científico de Para la Naturaleza es un proyecto que da al ciudadano común la oportunidad de conocer, guiados por expertos, las huellas del pasado analizadas con técnicas del presente. Esto no sólo da una idea de cómo se vivía en aquel entonces sino permite conocer y entender las costumbres y estilo de vida del humano en el pasado. Comencé a participar de este Proyecto antes de finalizar mis estudios de escuela secundaria. Cuando formas parte de este proyecto aprendes procedimientos nuevos, el uso correcto de herramientas, obtener y clasificar datos y te conviertes en parte del equipo investigativo. Los líderes guían el trabajo diario y asignan las tareas de cada individuo. Haber participado en este Proyecto despertó un profundo deseo de ser Ciudadana Científica. De participar en programas que incentiven la ciudadanía, en particular a los jóvenes, para fomentar el interés, entusiasmo y compromiso en investigaciones de campo y así entender el pasado, comprender presente y mejorar el futuro. El trabajo comunitario y de campo no sólo son horas de experiencias acumuladas. Fueron mi mayor impulso y lo más determinante para que decidiera estudiar Arqueología en la Universidad de Puerto Rico.

Lopez, Max [315] see Couey, Lauren

Lopez, Maxwell (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College) and Greg P. Lord (Hamilton College)

[360] *Three Dimensional Modeling in Archaeological Interpretation: A Case Study from the Pacific Northwest*

Virtual reconstructions are becoming increasingly commonplace in archaeological vernacular and cultural heritage initiatives. As with any emergent technology however, the advantages, limits and drawbacks of such an approach are not well defined. This study assesses and contextualizes the validity and usefulness of virtual reconstructions in archaeological interpretation and academic publication and explores how such technologies are utilized in the field as a whole. In addition to a survey of the growing body of literature on the subject, and an exploration of the intersection between archaeology and computer science, findings from our own virtual reconstruction of a pithouse from the Slocan Narrows Village in the Upper Columbia River system are extrapolated upon.

Lopez, Oscar (discertante) and Stanley Guenter

[408] *Patrons and Artists: New Information on the Producers of Codex-Style Ceramics of the Mirador Basin*

Codex-style ceramics are a distinctive product of the Late Classic Mirador Basin of north-central Peten, Guatemala. Through the archaeological work of the Mirador Basin Project and the chemical analyses of affiliated scholars we now have a considerable amount of information on the physical production of these vessels. In this presentation we present new evidence on the artists who produced these vessels, as well as the nobles for whom they were painting. These data provide much needed new information to re-evaluate the sociopolitical system that gave rise to these ceramics.

Lopez Bravo, Roberto (Universidad de Ciencias y Artes de Chiapas) and Elizabeth H. Paris

[291] *Collapse from the Outside In: A View from the Western Maya Periphery*

Despite the sociopolitical instability and depopulation observed at numerous sites in the Southern Maya Lowlands during the 9th century A.D., often referred to as the "Maya Collapse," numerous politically and geographically peripheral sites do not show evidence of these characteristics. Many of the small cities and towns of the Central Highlands of Chiapas maintained their roles as political centers throughout the Late Classic-Early Postclassic period transition, and also experienced demographic expansion. Excavations at Moxviquil and Huitepec, two small hilltop sites in the Jovel Valley, suggest their durability in the face of the instability and collapse experienced by their lowland

counterparts was in part due to highly diversified local economies and relatively flexible and shifting participation in long-distance trade networks. We specifically examine the degree to which highland sites shifted exchange networks towards the periphery, to the Ixtapa Valley and Central Depression, and the degree to which such shifts provided economic and political stability. A periphery-centered perspective highlights the complex relationships between periphery polities and core centers, and challenges the assumptions of traditional core-periphery economic models.

Lopez Corral, Aurelio (Instituto Nacional de Antropología e Historia)

[180] *Strengthening the State: Intensification and Mixed Agricultural Strategies in Late Postclassic Puebla-Tlaxcala*

The development of agricultural technologies is a key element in theory concerning the growth of Mesoamerican state societies. Cultivation of species under improved environmental conditions suggests intensification oriented strategies for the finance of political institutions, and to attend auto-consumption needs of households at the subsistence level. During the Late Postclassic, the Puebla-Tlaxcala region witnessed the rise and consolidation of various rival state-level polities known locally as altepeme. Recent archaeological research indicates that, parallel to this phenomenon, there is a widespread use of different agricultural technologies, such as terraces, drained fields and canals, to intensively exploit crucial ecological areas. This paper explores the role of large-scale staple food production in relation to the strengthening of institutional apparatus and its implications for the expansion of indigenous state societies.

López J., Julieta M. [317] see Murakami, Tatsuya

López Lillo, Jordi A. [82] see Salazar, Julian

López Luján, Leonardo (Museo del Templo Mayor, INAH) and José Luis Ruvalcaba Sil (Instituto de Física, UNAM)

[194] *Templo Mayor's Gold*

Mexico is not a country rich in native gold deposits, especially compared to Colombia, Peru, or Bolivia. This would explain why the precious metal was always used rather sparingly in Mesoamerican civilizations. A good example is Tenochtitlan (1325–1521 A.D.): after thirty-seven years of archaeological exploration in the city's sacred precinct, the Templo Mayor Project (1978–2015) has recovered only a meager set of gold artifacts, in contrast to the tens of thousands of metamorphic greenstone, copper, flint, travertine, obsidian, and ceramic objects contained in the same offerings. This paper will analyze the entire collection of gold pieces from the Templo Mayor Project in light of various historical, archaeological, and chemical data, and offer new insights about the chronology, typology, function, meaning, manufacturing tradition, and "geographical area of use" of gold in Late Postclassic Central Mexico.

[298] *Chair*

López Luján, Leonardo [298] see Sugiyama, Saburo

Lopez Varela, Sandra (UNAM)

[176] *Reading Memories of Past Practices in the Landscapes of Poverty Domination: An Ethnoarchaeological Study in Morelos, Mexico*

In eradicating poverty through infrastructure building and welfare policies in the State of Morelos, the commodification of the landscape is causing people to forget the social practices of distant pasts. Memory is intimately linked with the landscape, as it creates a sense of place that legitimizes the many identities and social worlds that have existed through time. By exploring current human practices in the landscape, this study illustrates how habit memory translates and maps fragmented pieces of collectively lived histories since the XVI century and explains how economic growth and development interfere with the possibility of identifying and connecting anthropic activity markers to understand past human behavior.

Lopez-Finn, Elliot (University of Texas at Austin)

[307] *Defining the Red Background Style: The Production of Object and Identity in an Ancient Maya Court*

While many collections today exhibit Red Background vessels for their vibrant colors, supernatural content, and elegant hieroglyphic texts, recent scholarship has embedded these works in the greater social culture of the Late Classic Period. As highly mobile art objects, the vases appeared alongside works with other distinct painting styles in feasts throughout the Guatemalan Lowlands, where the vases would display the prestigious affiliations of the owners. The diverse narrative content on these vessels reveals the importance of mytho-historic origin stories and supernatural identities to the prevailing order, while the unique hieroglyphic texts link the painted style to the royal court of Pa' Chan. What identities and connotations would the Red Background style communicate as a representative of this geographic or political region? Refocusing the question of agency through the final product reveals that these works acted as part of a larger campaign for the typical courtly trappings of master artisan production and public feasting with representatives of other polities. This paper expands upon themes of my Master's Thesis to explore how the surface decoration of the Red Background style communicated prestige and the elite identity of a specific place to the larger landscape of competitive and collaborative Maya city-states.

Lopez-Hurtado, Enrique (IEP Instituto de Estudios Peruanos)

[232] *Discussant*

[232] *Chair*

López-Jiménez, Antonio [397] see Rhodes, Sara

Lopez-Johnson, Amber (California State University, Los Angeles) and Jaime Awe (Northern Arizona University)

[193] *An Analysis of Architectural Form and Function at Cahal Pech, Belize: The Case of Structure B7*

Recent archaeological investigations at Cahal Pech, Belize have focused considerable attention on understanding the form and function of monumental architecture in the site's largest public courtyard. Designated as Plaza B, the courtyard contains an eastern triadic shrine or "E-Group", and three large range-type or palace-like buildings that are located on the north, west and south flanks of the plaza. Our investigations of these buildings, particularly on Structure 7, have revealed important architectural data that can be used to examine questions relating to architectural form and function, and that provide important clues for understanding activities conducted in buildings that border public courtyards at lowland Maya sites.

López-Martínez, Mariano [397] see Rhodes, Sara

Lopiparo, Jeanne (Rhodes College)

[412] *Crafting Houses for the Living and the Dead: Obsidian Production, Multicrafting, and Household Identities at a Classic Maya Center, Chinikihá, Mexico*

Craft production in the Classic Maya world was often carried out within multi-household groups, whose shared practices were passed on from generation to generation and whose social identities were strongly tied to the products they created. Investigations of a residential zone at Chinikihá, a Classic Maya center in the Palenque region, recovered a quantity of obsidian artifacts and evidence for production that is unusual not just at the site, but across the region. Fine-grained excavations have identified contexts of obsidian production as part of a multicrafting industry among household groups in this zone. Lithic materials from all stages of production were recovered from a wide variety of contexts. The elaboration of tool types and widespread evidence for use-wear and retouch indicate both that lithic production was a primary medium for technological mastery, and that we have only begun to understand how these tools were utilized in other activities. A sequence of

burials associated with dense lithic debitage suggests that mortuary practices incorporated the performance of producing the beautiful objects that shaped household identities and socioeconomic relations in life, thus commemorating the mutually sustaining relationship of the living and the dead.

Lord, Greg P. [360] see Lopez, Maxwell

Loren, Diana (Peabody Museum, Harvard University)

[305] *Defining and Divining the Healthy Body: Materialities of Body and Wellness in the 18th-Century Spanish New World*

This paper explores the intersections of health, religion, race, and dress; how theories of disease and illness in the eighteenth century intersected with Spanish imperial understandings regarding race and dress of colonizer and colonized and culturally-distinct medicinal practices for treating physical and spiritual sicknesses. Colonial empires reshaped and redefined colonial bodies: physical and spiritual care, social and sexual interactions, and dress and language were just a few of the concerns of imperial powers who strove to maintain hierarchies of inclusion and exclusion. For the colonial individual, practices of adorning and protecting body and soul (with medicine, amulets, and religious items) were integral to constructing identities and safeguarding spiritual well-being. Using archival and material sources, I explore how colonial peoples living in New Spanish treated, mended, and covered their bodies through dress, practices of faith, and medicine.

Lorenz, Samantha, Brandon Lewis (Santa Monica College), Toni Gonzalez (California State University, Los Angeles), Bianca Gentil (Santa Monica College) and Joseph Orozco (California State University, Los Angeles)

[355] *The Sinkhole as Ch'een: A Closer Look at Ancient Maya Sacred Geography*

During the 2014 field season, the California State University, Los Angeles Cave Research Project focused its investigation on a sinkhole at the site of La Milpa that had been given a cursory examination by the TRAP in 2012. An initial inspection suggested that the feature might well have been considered a ch'een by the ancient Maya. Ch'een is generally translated as cave but the indigenous term includes a large number of earth openings that were recognized as sacred landmarks. Excavations along the lip on three sides of the sinkhole documented the existence of a rubble cored platform that appears to have encircled the feature. The platform formalized and bounded the space leaving no doubt of the special function of the sinkhole. Excavations around and within the sinkhole recovered a large assemblage of ceramic and other artifacts that suggested a fairly heavy utilization. At the close of the season, the excavation unit in the sinkhole was yielding Early Classic ceramics that predated the major utilization of the site. Evidence suggests that the unit may be a meter or more above bedrock so that an even earlier date of the initial utilization is likely.

Lorenzo, Cristina (University of Valencia Spain) and Gaspar Muñoz (Polytechnic University of Valencia)

[242] *Material Manifestation of Ritual Survival after Abandonment*

The presence of burials placed on the floor of the palaces and private patios within elite complexes but without offerings is truthful testimony about the time of the Mayan settlements' abandonment at the end of the Classical Terminal period. Such burials have been found at the Acropolis of La Blanca (Petén, Guatemala). Years later, during the Early Postclassic period, when those buildings had already partially collapsed and debris covered Terminal Classic material vestiges, other individuals were buried in this debris. Big Postclassic pots were also found near them. Thinking about death rituals that took place in both periods is the purpose of this presentation.

Lorrey, Andrew M. [77] see Allen, Melinda

Losey, Robert J. [28] see Germonpré, Mietje

Losey, Robert (University of Alberta)

[28] *Living with People Can Be Bad for Your Health: Tooth Loss and Trauma in Northern Wolves and Dogs*

Humans and dogs have long engaged in complex relationships, ranging from loving and intimate, to extremely violent and exploitive. Archaeology has tended to focus on the former, mostly ignoring the sometimes-ample evidence for trauma and tooth loss in remains of ancient dogs. Inferring the causes of such lesions on ancient dog remains has proven difficult, in part because of the lack of comparative data for canids living outside of the human niche. This paper compares patterns of cranial trauma and tooth loss in a large sample of modern wolves and dogs from northern parts of North America and Russia. Our data demonstrate that tooth loss and fracture are far more common in the dogs than among the wolves. These patterns seem to be related to a high degree of self-provisioning among the dogs, which included scavenging on hard food items. Cranial fractures also are far more common in the dogs than the wolves. The etiologies of these lesions are numerous, but many are entirely consistent with blows to the head from humans. Dogs' abilities to self-provision and sustain injuries were likely important to both their original domestication and their long-term continued use in harsh northern environments.

Loten, H

[295] *Compiling Tikal Report 15*

Two issues arise in compiling Tikal Report 15 posthumously. Between 1960s fieldwork and current museum policy, illustration formats have changed so that drawings previously inked for photo-reduction are now useless. Secondly, Tikal Report 15 presents data collected under Peter Harrison's direction, but all figure items have been redrawn digitally with inescapable interpretation, so a question of authorship cannot be avoided.

Loubser, Johannes (Stratum Unlimited, LLC)

[34] *More than Mere Dots on a Map: Archaeological Sites among Venda-Speaking Communities of the Soutpansberg*

This presentation deals with fieldwork conducted between 1983 and 1985 to reconstruct the early history and political-economy of Venda-speaking communities in the Soutpansberg region of South Africa. In order to visit, locate, identify, map, excavate, and interpret ancestral stone-walled sites, the permission, guidance, background information, physical labor, and orally transmitted information of local Venda-speaking people were essential. In most instances, permission and guidance to sites were obtained fairly easily, whereas in a few cases it was a protracted process of negotiation and false leads. Information gathered during the difficult times turned out to be valuable, as the indigenous significance of the sites under question became apparent. The results of the ethnographically-informed archaeological work appear to have had mixed responses among various Venda, revealing information about divisions within society that would not have been obvious otherwise. Whereas members of the politically dominant Singo clan benefited from the exposure that the archaeological research generated concerning Venda-speaking people in general, numerous non-Singo clans appreciated the additional recognition that research into their ancestral settlements awakened among both Venda speakers and the wider southern African society.

Loubser, Johannes [353] see Pritchard, Erin

Loucks, Jordon (University at Albany)

[381] *Irish Built Arteries: Ethnic Identification along the Canals and Railroads of New York*

This study explores the materiality of cultural boundaries manufactured around immigrant communities in industrial localities in New York State. The immigration of thousands of Irish to the United States throughout the eighteenth and nineteenth centuries was met with an intense animosity. Religious and economic differences combined with an anti-immigrant sentiment to provide the Irish-American with a continuation of the racist attitudes similar to the ones that plagued English Improvement. Using artifact data provided by the New York State Museum and documentary evidence, this study hopes to examine the trace materiality left by the actions of racialization. The material evidence left behind by actions inspired through racism may be able to indicate, more

accurately than previous ethnicity-based studies, the defined social groups and their resistance to outside influences. The Irish immigrants who flocked to the sites of industry across New York helped build the infrastructure of the Empire State. As a result of their contribution to the success of New York, the history of Irish presence at sites along railroads and canals is incredibly important, and deserves thorough archaeological study to add to our understanding of their experiences beyond the documentary record.

Loughlin, Michael [151] see Pool, Christopher

Loughmiller-Cardinal, Jennifer [4] see Cardinal, J. Scott

Loughmiller-Cardinal, Jennifer (University at Albany, New York)

[375] *Categorical Imperatives: Re-imagining the Classificatory Schema for Mayan Ceramic Vessels*

Various systems of vessel classification have evolved through the need to address specific research questions from disparate sub-fields within Maya studies. Recent work, however, has shown that these classificatory categories may be inadvertently biasing the interpretation of Maya ceramics by presupposing aspects of use, function, and social context. Instead, these aspects should be matters of empirical study and validation derived from the vessels and their contexts rather than imposition by categorical lenses.

Lovata, Troy (University of New Mexico)

[394] *An Archaeology of Skiing*

Archaeologists have explored the prehistoric development of skiing, but its study as a modern recreational activity, lifestyle, and commercial practice has generally been left to historians. Yet snow sports entail a unique material culture, are a vibrant link between past and present, and leave a visible environmental impact. Recent consolidation of ownership and demographic shifts has spurred the closure of numerous ski areas in North America. This has led to both the abandonment of slopes and an active community who ski these areas as a link to customary and traditional snow sport and landscape use. Thus, skiing is ripe for study thru the lens of contemporary and historic archaeology. This paper outlines an archaeology of skiing. First, it examines how recreational activities have lasting impacts on the environment. Second, it outlines the large community who continue to ski closed slopes in North America and how recreational activities have long term culture impacts and function as preservation of traditional culture. Third, it discusses preliminary archaeological surveys undertaken at abandoned slopes in the Rocky Mountain states of Colorado and New Mexico. These include skiing slopes as part of phenomenological approach to understanding landscape, its use, and cultural preservation.

Love, Michael (Calif State Univ-Northridge)

[151] *El Triangulo del Sur: Izapa, Takalik Abaj, and El Ujuxte*

The Pacific Coast borderlands of Chiapas and Guatemala were home to at least three major urban centers in the Late Preclassic Period: Izapa, Takalik Abaj, and El Ujuxte. How these sites were related to one another through intellectual exchanges and commerce tells us a great deal about the nature of urbanism in Mesomamerica during the Late Preclassic Period. These three sites were part of a broader southern "City-State Culture" that included Kaminaljuyu, Chalchuapa, and other early urban centers. The City-State Culture cuts across ethnic boundaries, making a distinction between "Maya" and "Mixe-Zoquean" zones moot. Shared elite elements, such as ruler stelae, texts, calendrics, and ritual performance were present in most of the zone, indicating a strong class-based identity. However, economic patterns, including a multiplicity of long and short distance trade routes, show the complex nature of interactions. The regional political systems indicate a highly competitive and fragmented landscape.

[172] *Discussant*

Love, Sarah (Georgia State University) and Andrew Vaughan (Georgia State University)**[201]** *3D Modeling of Archaeological Collections: A Case Study in Archaeometry*

Artifact collections and skeletal remains curated in multiple facilities and stored in variable conditions across the globe contain a wealth of archaeological knowledge. Access to data about these collections, much less the collections themselves, can be restricted both by policy concerns and practical considerations. Recent technological advancements have made creating high quality digital representations of both artifact and skeletal material possible. In this paper we compare two methods of 3D reconstruction, (software based photographic/photogrammetric 3D reconstruction and laser scanning), for the purpose of research in Archaeology and Bio-Archaeology. Using these methods, digital measurements taken from the models are compared with the same measurements obtained with precision instruments. By comparing 3D representations with manually obtained measurements, a quality baseline of what is currently possible in 3D digitization of archaeological materials can be established.

Loveless, Erana**[291]** *The Invisibility of Reactive Foragers and its Implications for Traditional Ecological Knowledge*

"Reactive foragers" are people who switched to intensive foraging in reaction to crises. They are largely a people without history because their turn to foraging decreased their archaeological visibility and increased their remoteness from the centers of civilization where written history is concentrated. Ironically, while colonialism was often a driver for reactive foraging it also introduced the keys for reactive foragers to succeed in some cases. Reactive foraging can explain the loss of technologies among dispersing groups, ethnographically and perhaps archaeologically. This work explores past and present examples of reactive foraging globally, as well as conditions in which reactive foraging is most likely to have developed. Reactive foragers often succeeded when able to learn subsistence skills from marginal groups that maintained traditional ecological knowledge (TEK). Thus, while reactive foragers became more marginalized themselves, it was often pre-existing marginal groups that made this survival tactic possible. Preservation issues and archaeological biases have resulted in an invisibility of reactive foragers which diminishes our understanding of the historical utility of TEK. The ability to cycle adaptively through subsistence strategies can improve the resilience of a group facing adversity. However, for this ability to persist, both ecological resources and TEK must also survive.

Loven, Jeremy (Eastern New Mexico University)**[245]** *Ritual Use of Fauna in the Casas Grandes Region*

The use of faunal remains for ritual purposes was an important part of Casas Grandes society throughout the Medio period (1200–1450 A.D.). The past inhabitants of this region utilized the bones of numerous animals for ritual and symbolic functions, as well as for personal adornment. Past archaeological and zooarchaeological research conducted within this region has focused significantly on the site of Paquimé and the artifacts/remains recovered from that site. This paper, although considering the importance of Paquimé and the utilization of faunal remains at that site, examines the ritual use of fauna at several small sites recently excavated throughout the core Casas Grandes region and incorporates recent faunal analyses into our understanding of animal bone usage by the prehistoric inhabitants of this area.

Lowe, Lynne (Centro de Estudios Mayas, UNAM)**[242]** *La tradición de los incensarios en el centro de Chiapas*

La utilización de incensarios cerámicos con el fin de quemar ofrendas durante las ceremonias, que podrían ser resinas aromáticas, papel, semillas, flores u otros elementos, constituyó una tradición milenaria en el centro de Chiapas, como lo han demostrado las evidencias arqueológicas. Las excavaciones realizadas en Chiapa de Corzo y otros sitios de la Depresión Central, como Mirador o Vistahermosa, aportan información de gran interés sobre los orígenes, formas de uso y desarrollo estilístico de estos importantes objetos rituales, así como sus relaciones con otras zonas del sur de Mesoamérica.

Lowery, Darrin**[243]** *Geoarchaeological Proxies of Late Holocene Sea Level Rise: Marine Transgression and the Archaeological Record of the Delmarva Peninsula*

Understanding the magnitude of sea level rise over the past century is a hot topic in the Chesapeake Bay region. The research presented in this paper combines 20th-century aerial imagery, 19th-century land use data, and geoarchaeological information associated with various coastal archaeological sites to provide a high-resolution marine transgression record spanning the past two centuries. Tide gauge models have suggested that there has been ~1 foot (30cm) to ~1.5 feet (49cm) of sea level rise in the Chesapeake Bay over the past century. Some researchers have even stated that the rate of sea level rise in the Middle Atlantic region over the past century is greater than at any moment during the past 2,000 years. The geoarchaeological research in this presentation shows how tide gauge models for the Chesapeake Bay region have greatly overestimated the amount of historic relative marine transgression. This research also focuses on understanding the geological parameters of sea level rise during the Holocene and provides a geoarchaeological calibration tool to better understand recent sea level change.

Lowman, Christopher**[15]** *Marking Ainu Objects*

Close examination of Ainu objects in American museums reveals patterns of use-wear, re-use, and intentional marking. These marks draw attention to the life of the object, an avenue of research when depositional data or documents are absent. In colonial contexts, modification as a form of individual or cultural ownership can be used to oppose assumptions of assimilation by revealing ways materials were appropriated or were part of cultural hybridization. Ainu artifacts drawn from multiple collections provide evidence of how "Ainu-ness" continued to be created in the face of Meiji-era internal colonialism in Japan, and how it changed in conjunction with increased tourism and cultural recognition efforts. I use ethnographic objects to examine endurance of Ainu design in material and motif, as well as signs of use and modification. Presence and absence of foreign materials, the re-application of decorative elements, and wear-patterns together mark ways the Ainu maintained, and modified, cultural ownership.

Lowry, K. Bryce [20] see Beach, Jeremy

Lowry, Justin (George Mason University), Jason Paling (Plymouth State University) and Colin Quinn (Dartmouth College)**[246]** *Obsidian Trade from the Perspective of Chiquilistagua, Managua, Nicaragua*

The 2013 and 2014 seasons at the site of Chiquilistagua, located west of Managua, Nicaragua, included survey, excavations, and descriptions of archaeological remains. Chiquilistagua was chosen because of its proximity to potential trade networks. Lithic and ceramic materials found in the excavations point to production and trade. This paper will discuss the trade networks connecting Nicaragua with southern Honduras and contextualize them within the larger context of Central America interaction.

The goal of this research is to describe the early trade networks that existed during the transition between the Tempisque and Bagaces periods.

Lozada, Maria Cecilia [169] see Weinberg, Camille

Lozano-Garía, Socorro [129] see Caballero, Margarita

Lu, Enguo (Xinjiang Institut for Cultural Relics and Archaeology)**[102]** *Prehistoric Painted Pottery of Xinjiang*

Ever since the 1970s, painted pottery has been discovered in large quantities at cemeteries and occasionally settlements on the southern and northern foothills of the Tianshan Mountain. Organizing

them into four Early Iron Age (ca. 1300-200B.C.) regional cultures: Yanbulake in the Hami region, Subeixi in the Turfan region, Chawuhu in the Kaidu Valley, and Yili Valley in the eponymous region, this paper characterizes the stylistic distinctions of the painted pottery of them. The Yanbulake culture, for instance, features the ware types of jars and bottles with double handles as well as the motifs of rhombi and triangles, whereas the Chawuhu culture features those of spouted jars and chessboard and thunder designs. Furthermore, this paper considers the possible origins of the painted pottery: while some motifs seem to derive from local textiles, some ware types are reminiscent of leather-made vessels. The painted pottery of Xinjiang, as a whole, manifests intimate connections with the Hexi Corridor. This paper sees no impact of the Harappa culture in Indian Subcontinent and Tripoli'e in the Black Sea coast, but it acknowledges inspiration from the Namazga and Chust cultures of Central Asia.

Luan, Fengshi [179] see Cunnar, Geoffrey

Lublasser, Sarah [403] see Makarewicz, Cheryl

Luby, Edward (Museum Studies Program, San Francisco State University) and Kent G. Lightfoot (Department of Anthropology, University of California)

[293] *Diachronic Changes in the Shell Mounds of the San Francisco Bay: A Case Study of Ellis Landing (CA-CCO-295)*

The purpose of this paper is to examine diachronic changes in the long-term use of the Ellis Landing site (CA-CCO-295), a large shell mound on the San Francisco Bay whose chronology spans more than 3000 years. Originally excavated in 1906-1908 by Nels Nelson, recent investigations of museum materials housed in the Hearst Museum of Anthropology at UC Berkeley are providing new insights into the harvesting practices, mortuary patterns, and community dynamics of the people who resided at Ellis Landing in Late Holocene times. This paper will summarize the findings and discuss interpretations about the long-term use of the Ellis Landing site.

Lucarelli, Rita (UC Berkeley)

[240] *The Ancient Egyptian Book of the Dead on Coffins: Ritual Protection and Justification of the Deceased.*

The collection of texts and illustrations known as the ancient Egyptian "Book of the Dead" was especially en vogue on papyrus from the beginning of the New Kingdom through the Graeco-Roman period. However, abridged versions of Book of the Dead texts and vignettes have also been widely used to decorate a number of other funerary and magical objects. Among others, the anthropoid coffins produced during the Third Intermediate Period and the 25th Dynasty present a few intriguing features in relation to the role that the Book of the Dead plays in their decorative program. In this paper it is argued that most of the extracts from the Book of the Dead occurring on coffins of the late New Kingdom and later periods have a specific ritual character concerning the protection, purification and justification of the deceased. Compared to the papyri of the Book of the Dead, coffins show a shorter but more distinctive selection of texts and vignettes from the same collection, whose analysis may deepen our understanding of mortuary rituals in the late New Kingdom and later.

Lucas, Virginia (University of Alabama at Birmingham)

[202] *A Reexamination of Human Remains from Late Prehistory in the Alabama River Valley*

The late prehistory of central Alabama is not yet well understood, particularly when compared to contemporaneous occupations elsewhere in the Southeast. Previous excavations of Durant Bend (1Ds1), a late Mississippian/Proto-historic, single mound site in Dallas County on the Alabama River, resulted in a number of artifacts, including lithics, pottery, faunal remains, and human remains that enhance our understanding of late prehistoric and protohistoric occupations in the Alabama River Valley. One such excavation in the early 1970s, yielded five sets of subadult human remains as well as one single element from an adult individual, all of which are currently curated at the University of Alabama at Birmingham. These remains originally were examined and included in a 1976 report of the site. A recent reexamination of these remains by the author employing modern analytical

methodologies allows for increased insight into the age and health of individuals occupying the Alabama River Valley during this time period. Utilizing extant collections such as these also allows researchers to apply modern methods to older data in order to gain a better understanding of past individuals. Examining these individuals from Durant Bend allows us to gain a better understanding of this time period in central Alabama's history.

Lucas, Leilani (University College London) and Dorian Fuller (Institute of Archaeology)

[414] *De-centering the Fertile Crescent: Multiple Pathways to Food Production*

Southwest Asia is one of the earliest and most documented centers of agricultural origins. With the expansion of archaeobotanical and zooarchaeological datasets within this region it is now more possible to unravel the evidence on a broader regional scale revealing a more complex picture with multiple centers and pathways of plant and animal domestication. Through a comparison of recent evidence this paper examines the multiple pathways towards domestication and the transition to agricultural economies in the Near East, suggesting four distinct subsistence trajectories. The different regional packages of both plant and also animal data are characterized and the development and diversification of these packages over time is discussed. With the addition of recent evidence from Jarmo an eastern route is established and contrasted with an Upper Euphrates trajectory that leads to Cyprus, the evidence from sites in the southern Levant, and the possible Anatolian path that feeds into the pulse-free Iranian zone represented by the evidence from Chakmak. Further, the differing rates of change within each of the crops is presented and situated within the regionally specific social contexts.

Lucero, Lisa (University of Illinois at Urbana-Champaign)

[36] *Climate Change, Dissonance and Urban Diaspora in the Southern Maya Lowlands*

In response to growing needs for dry-season water, the southern lowland Maya constructed increasingly larger and more complex reservoirs at major centers throughout the Late Classic period (550-850 C.E.). Annual rainfall replenished reservoirs and nourished rainfall-dependent crops. In exchange for access to reservoirs during the annual dry season, farmers contributed goods, services and labor to kings and their administrators. When several multiyear droughts struck between 800 and 900 C.E., the effect on reservoirs was noticeable, impacting the basis of royal power. This set in motion a series of events that ultimately resulted in an urban diaspora where farmers abandoned kings and centers for areas with more reliable sources of water and new economic opportunities. Maya kings did not adapt, whereas farmers did. I discuss how the same material infrastructure impacted kings and farmers differently, and how this dissonance bears on present concerns relating to climate change.

Ludeke, Ingrid [181] see Riel-Salvatore, Julien

Lugo Mendez, Anastasia (Utah State University), Steven R. Simms (Utah State University), Tammy M. Rittenour (Utah State University), Molly Boeka Cannon (Utah State University) and Nancy Kay Pierson (Utah State University)

[10] *The Geoarchaeology of Late Prehistoric Irrigation in Central Utah*

In 1928, Harvard archaeologist Noel Morss observed ancient irrigation systems in central Utah during fieldwork that first defined the Fremont culture. Instances of Fremont irrigation are known, but perceptions of the Fremont as a small-scale society of indigenous mixed foragers and farmers delayed empirical evaluation of Morss's report. Fieldwork, beginning in 2010 and continuing, now identifies a complete irrigation system 4.5 miles long bringing water from 8,500' to a 90-acre field at 7,100' on the east slopes of Boulder Mountain, overlooking Capitol Reef National Park. Fieldwork includes excavations exposing subsurface canals, experimental archaeology on the costs of system construction and maintenance, magnetometer imaging, and dating of ditch sediments using optically stimulated luminescence (OSL). Exposures dated thus far identify irrigation and construction episodes from A.D. 1500 – 1700 during the Late Prehistoric period, well after the presumed demise of the Fremont. No Spanish entered Utah until A.D. 1776, and our research area did not see Euro-American settlement until A.D. 1880. The implications of our findings offer support for Fremont - Late

Prehistoric continuity, and perhaps post-Fremont integration among Fremont and Puebloan histories and peoples: the Fremont of the Southwest.

Luke, Christina [167] see Gauthier, Nicolas

Lullo, Sheri (Union College)

[234] *Beauty and Adornment in Fertile Lands and Desert: Toiletries from burials of Han China and her Western Neighbors*

This paper presents preliminary research that compares toiletry sets and other items of personal adornment from burials within the political boundaries of Han dynasty China (206 B.C.E.-220 C.E.) to those found at contemporaneous sites near the westernmost periphery of the empire. Toiletry sets of the Han elite are commonly enclosed in rounded lacquer cases and include items such as bronze mirrors, combs, boxes with cosmetic powders, hair accessories, and other personal possessions. Comparison of these sets with similar items from richly furnished and well-preserved burials found at sites such as Shanpula (Khotan) and Niya, located along the southern rim of the Tarim Basin in present day Xinjiang province, reveals notable similarities in type and style. This study explores the significance of toiletries and items of adornment to Han and non-Han burial practices, and the extent to which the Han's presence near the arid Tarim basin impacted—and, perhaps more interestingly, had little effect on—even the more mundane dimensions of everyday life, such as beautification, adornment, and bodily maintenance.

Luna, Pilar [370] see Arroyo-Cabrales, Joaquin

Luna Erreguerena3, Pilar [370] see Chi, Julio

Luna Golya, Gregory (Penn State University)

[180] *Producers on the Lake: Late Aztec Lakebed Chinampa Communities of Lake Xochimilco*
Recent historic imagery analysis combined with 1960-70s archaeological surface survey data in a geographic information system (GIS) has generated a detailed spatial model of chinampa beds, canals, and settlement mounds for a 1,010 hectare area of Lake Xochimilco distinct from remnant Xochimilco chinampas that persisted into historic and modern times. The delineated agricultural waterscape was characterized by an approximately 1:1 land to water ratio with narrow raised agricultural beds (3.75 x 49.4 meters). The estimated lakebed population for the study area was 2,525 (2.5 persons/hectare) including 2,000 full-time tenant farmers. In this paper, I continue my spatial analysis of the Xochimilco lakebed chinampa GIS focusing on lakebed settlement. Two types of settlement – chinampa households/hamlets and village wharves – have been identified. Using network and least cost path analyses I define lakebed chinampa communities associated with particular lakebed village wharves – hubs of social and economic activity for tenant chinampa farmers who existed outside the traditional calpolli system of shoreline chinampa communities with pre-Aztec origins. Additionally, transport routes from fields, to lakebed wharves, to the docks of Tenochtitlan-Tlatelolco and other shoreline centers will be modeled. This project creates the first detailed spatially referenced system of lakebed chinampas and producers.

Luna Golya, Gregory [364] see Stewart, Carlyn

Luna-Erreguerena, Pilar [370] see Chatters, James

Lundin, Deil [272] see Brodbeck, Mark

Lupo, Karen (Southern Methodist University)

[406] *On Why We Still Need Ethnoarchaeology*

Although ethnoarchaeology is viewed as an important tool of analogy for the archaeological record, it

has been criticized as being too descriptive, context bound, and limited by the generation of cautionary tales. These and other criticisms have inadvertently led to a sharp decline in ethnoarchaeological research in recent times. In this paper I argue that ethnoarchaeology is an underutilized methodology that can be expanded with new technologies to test and shed light on the nature of important factors that are often identified as prime catalysts of sociocultural change. Here I demonstrate this potential by presenting ethnoarchaeological data on the changes the nature of food sharing- an often cited "leveling mechanism" that sustains egalitarianism in small scale societies. Disruption of sharing and egalitarian ideals is often viewed as one of the pressures giving rise to social inequalities. Comparative analyses of these data show when and how food sharing dissolves in response to different external pressures, including ecological degradation.

[296] *Chair*

Lupo, Karen [296] see Schmitt, Dave

Lustig, Eileen [286] see Klassen, Sarah

Luzzadder-Beach, Sheryl [176] see Cook, Duncan

Luzzader-Beach, Sheryl [350] see Hanratty, Colleen

Lyall, Victoria

[303] *Painting Ourselves out of a Corner: Considerations on the Medium*

While the connections between ancient mural paintings and twentieth-century urban mural programs may seem tenuous, certain technical, structural and physical considerations of the medium itself link exemplars from past and present. The inextricable relationship between murals and their architectural supports, as well as its scale, can compel a type of viewing and visceral engagement different from that of other types of two-dimensional media; it forces a relatedness that must be unpacked. In this paper, I will consider the medium of painting in both ancient and contemporary contexts and frame the other papers in the session.

[303] *Chair*

Lyman, R. (University of Missouri Co)

[397] *The History of "Laundry Lists" in North American Zooarchaeology*

North American zooarchaeologists believe that prior to 1970, most zooarchaeological reports were laundry lists—lists of taxa identified, perhaps with abundance data. Laundry lists make up 68 percent of titles published between 1900 and 1959; 24 percent of titles published between 1960 and 1979 are laundry lists. Some laundry lists concern samples so small that one should not expect more than a list of identified species; other laundry lists were produced by zoologists who had no knowledge of archaeological research. Ironically, the originator of the term laundry list and its derogatory implications (Stanley J. Olsen) produced only laundry lists.

Lynch, Sally (McMaster University)

[60] *A Study of Fineline Iconographic Depictions at the Late Moche Site of Huaca Colorada, in the Jequetepeque Valley, Peru*

The Late Moche Period (A.D. 500-800) of the North Coast of Peru is marked by significant alterations to the iconography of elite fineline ceramics. In particular, the earlier imagery, depicting conventionalized narratives of ritual performances and exploits of male Moche divinites or their mortal avatars disappears in certain locales. In southern valleys, at sites such as Galindo, Late Moche elite ceramics largely depicted abstract geometrical imagery including the widespread step-and-mountain motif that overlapped chronologically with the earlier Moche IV style at Huacas de Moche. Scholars have argued this abandonment of established iconographic themes and re-invigoration of Pan-Andean abstract motifs signifies a rejection of a discredited ideology in specific

sites and zones of the North Coast. However, prominent sites in the Jequetepeque Valley, including Huaca Colorada and San Jose de Moro, witnessed a continuation of narrative depictions alongside the abstract imagery so prominent in the south and at Pampa Grande to the north. In this study, I explore the social and political significance of the coexistence of these two styles at Huaca Colorada, to question whether they index disparate ideologies to argue the southern Jequetepeque was a place of less stringent political centralization, where ideas, people, and things, were more freely exchanged.

[60] Chair

Lynch, Kerry (UMass Archaeological Services)

[192] *New England's Submerged Pre-Contact History: Identifying an Intact Archaic Site in Salem, Massachusetts*

A portion of Salem Harbor in Massachusetts was investigated during a cultural resource management project in 2009/2010. The underwater reconnaissance included a remote sensing survey using a Klein 3.5 kHz sub-bottom profiler. An acoustic basement was recognized at approximately two meters below the sea bed, and was hypothesized to be an organic layer potentially representative of a buried land surface below marine sediment. Vibratory cores were used to ground truth the potential buried land surface. Interestingly, the testing identified three different horizons representing unique micro-environments around the two meter mark. One horizon was an intact, buried land surface that had been aerially exposed prior to post-glacial sea level rise. The stratigraphic profile of the land surface showed a layer of salt marsh peat with underlying terrestrial A and B horizons. Two horizons were AMS dated, the overlying peat and a B deposit containing lithic debitage, charcoal, and botanicals. The peat was dated to 4490 +/- 40 rc B.P. and charcoal from the B horizon was dated to 5750 +/- 40 rc B.P. This presentation will include an analysis of the intact site and the surrounding micro-environments. Additional work is planned, and schedule permitting, the preliminary results will be discussed.

Lynch, Elizabeth

[261] *#arrowheads: Instagram as a Creative, Social Media-Based Approach to Public Archaeology*

Social media is a hot topic of discussion and innovation among archaeologists. Although we've improved our ability to digitally reach wider audiences, "social media" is not a single entity. Each platform is different: purposes, user bases, and means of connection vary widely. As archaeologists, we must be proactive about fully understanding these differences, in order to find the most effective ways use each platform and reach a greater public. This paper provides an example of one way to accomplish these goals. Instagram is a mobile device-based image sharing social media platform; users connect with hashtags: pound signs followed by a word or phrase of interest. I surveyed American Instagram users who self-identify as "artifact collectors" to understand their demographics, how they use Instagram, how and why they collect, and their thoughts on archaeologists, collaboration, and cultural resources. This allows me to holistically understand the community that I hope to interact and collaborate with, and how best to reach them. By conducting similar surveys of users on other social media platforms, professionals and groups working in public archaeology can expand the depth and breadth of their outreach efforts, and be more aware of the needs and interests of their audiences.

Lynch, Elizabeth (University of Wyoming)

[342] *Socialized Landscapes of the Southern Plains: Bedrock Ground Stone Surfaces on the Chaquagua Plateau, Colorado*

Prehistoric peoples of the Southern Plains created bedrock ground stone surfaces in rockshelters along upper canyon rims on exposed Dakota Sandstone. These bedrock milling features became centers for the reproduction of food and other resources but also developed into anchored places that facilitated the reproduction of socio-cultural values and norms. The socialization of the Southern Plains prehistoric landscape is most visible in the material culture remains of bedrock milling features that are ubiquitous in the canyon systems of the Purgatoire watershed in southeastern Colorado. Analysis of the milling surface morphology, differences in their organization on bedrock features, and

their distribution across the landscape suggest that site activities vary from quotidian and seasonal group milling of local food resources (pinon, oak, juniper and other berries and grasses) to specialized grinding for ceremonial or ritual events. Bedrock milling surfaces were divided into sub-features based on surface proximity and abrasion between ground stone surfaces on each boulder feature. This paper uses 3D modeling called close range photogrammetry to test whether the recognition of group milling activities, through the sub-division of bedrock milling features into sub-features, is a viable method to understand how prehistoric peoples organized and socialized their milling material culture.

[342] *Chair*

Lynnerup, Niels [299] see Nystrom, Kenneth

Lyons, James (University of California, Berkeley)

[12] *Iron Grinding Technology in the Kofun Period: New Evidence and Research Techniques*

Due to both a lack of direct evidence and lack of well-defined investigative methods, iron polishing and grinding technologies in the prehistoric Japanese archipelago remain poorly understood. Following the recent foundational research by Lyons, Kawano, and Suzuki, this project seeks to clarify the tools and gestures used to finish iron objects during the Kofun period. Photogrammetric techniques and 3D laser scanning were used to record and analyze striations left by original grinding on iron objects unearthed from Omuro Tsumi-ishi Kofun 165 and Marozuka Kofun in comparison to measurements similarly collected from bronze objects from Omuro Tsumi-ishi Kofun 200, Nukudani Minamizuka Kofun and a recently polished 6th century sword of unknown provenance. Based on these analyses, the use of metal files as well as multiple grinding stones of differing grit is postulated in the manufacture of a single object. Additionally, these analyses find elements of continuity in technique with extant traditional polishing practices in Japan.

Lyons, Michael (University of Bonn and the German Archaeological Institute) and Jennifer von Schwerin (Germany Archaeological Institute)

[100] *A Transparent 3D Model of Temple 18 at Copán for Visualization and Research*

The development of a clear approach to creating highly “transparent” (effectively displaying the argument behind a reconstruction) 3D models for visualization and research in archaeology is an ongoing process. The goal of this presentation is to address this problem with a use-case example of a 3D model of Structure 10L-18 (Temple 18, ca. A.D. 800) on the acropolis at Copán in Honduras. How can data be structured and applied to this 3D model in order to provide a user with a clear understanding of where this data is coming from, and thus provide a 3D model with greater uses and applications in academic research? In discussing this question, an overview of the process will be explored covering the topics of data collection, storage and processing, the implementation and finalization of data into a usable platform, and questions about future management of this data.

Lyons, Mike [100] see Von Schwerin, Jennifer

Lyons, Patrick (Arizona State Museum) and Deborah Huntley (Archaeology Southwest)

[278] *Temporal and Spatial Variability in Roosevelt Red Ware Painted Decoration*

Recent research in the southern US Southwest has revealed patterns useful in refining ceramic chronology and investigating communities of practice among 14th and 15th century potters producing Roosevelt Red Ware (Salado polychromes). Analyses of whole and partially reconstructible vessels recovered from stratified contexts in the San Pedro Valley of southeastern Arizona confirm the Roosevelt Red Ware stylistic seriation presented by Patricia Crown in 1994. Combining these results with recent typological revisions leads to refined dating at the regional, settlement cluster, and intrasite level. A related study of geographical variability in the bands of painted decoration on the rims of late Roosevelt Red Ware bowls (Cliff Polychrome and Nine Mile Polychrome) illuminates stylistic trends bearing on models of the spread, the persistence, and the eventual disappearance of the Roosevelt Red Ware tradition. These data, juxtaposed with

typological patterns related to geography, in turn, allow us to address the evolution, operation, and decline of social networks born of the Kayenta diaspora.

[343] *Discussant*

Lyons, Natasha (Ursus Heritage Consulting), Anna Marie Prentiss (University of Montana), Naoko Endo (Simon Fraser University), Dana Lepofsky (Simon Fraser University) and Kristen Barnett (University of Montana)

[312] *Plant Use Practices of an Ancient St'át'imc Household, Bridge River, British Columbia*

This poster focuses on the interpretation of archaeobotanical macroremains from Housepit 54 occupations at the Bridge River site, on the British Columbia Plateau, dating 1100-1500 cal. B.P. Recent excavations have revealed living floors spanning a critical period when this village reached peak size and then began to decline during a period of climate transition. Previous research at Bridge River suggests that access to salmon and deer may have declined after ca. 1200-1300 cal. B.P., triggering heightened socioeconomic competition between households. Very little is known, by corollary, regarding the role of plant foods in the site economy during this time. This poster draws on paleoethnobotanical studies which investigate what the plant remains can tell us about harvesting, subsistence, consumption and cooking practices by Housepit 54's residents. The analysis allows us to determine which plant resources were being utilized in which seasons and at what distance from the site, as well as diet breadth, technological activities, and spatial use of the pithouse. The plant data also allow us to consider the relative involvement of Housepit 54 residents in local and regional networks of trade and interaction, and patterns of continuity and change amongst ancient St'át'imc communities.

Lytle, Whitney

[24] *Same Space Different Face: Recent Investigations at Xunantunich, Group D*

Xunantunich Group D, an elite residential unit, has a fascinating history of construction and reuse between two temporally separated occupations. The group is set apart from other Xunantunich residential units by a sacbe connecting it to the site core and a large ancestor shrine acting as the architectural focal point of the group. The past three years of research at Group D has focused on the Late Classic ancestor shrine and the open courtyard directly in front of the structure with the goal of gaining insight to the earliest construction and changing use of this ritual space. Recent investigations have revealed Late/Terminal Preclassic constructions including a large courtyard platform and an early structure beneath the later ancestor shrine. This paper will discuss Group D's reoccupation, the drastic alteration of the courtyard construction which took place during Xunantunich's florescence in the Late Classic, and how this reuse and modification potentially served sociopolitical functions at Xunantunich.

Ma, Minmin (Institute for the history of natural sciences Chinese academy of sciences), Guanghui Dong (Key Laboratory of Western China's Environmental Sy), Hui Wang (Gansu Province Institute of Cultural Relics and Ar) and Fahu Chen (Key Laboratory of Western China's Environmental Sy)

[37] *Dietary Shift and Cultural Evolution Relation to Intercontinental Cultural Exchanges and Climate Change in the Hehuang and Contiguous Regions, Northwest China ~3600 Years Ago: Evidence from Carbon and Nitrogen Stable Isotopic Analysis*

This study traces the extent to which dietary change coincides with intercontinental cultural exchanges in Eurasia and to enhance understanding of the effects of long-distance exchanges on the human diets. Through stable carbon and nitrogen isotope analysis of late Neolithic and early Bronze Age human and animal bone collagen, we find that intercontinental cultural exchanges in Eurasia led to significant changes in diet in the Hehuang and contiguous regions of northwest China. The isotopic evidence indicates that human diets mainly consisted of C4 foodstuffs (most probably millet) pre-3600 Cal yr BP. With the increasing intensity of long-distance exchange, enough C3 foods (probably wheat and barley) were added to human diets post-3600 Cal yr BP, which strongly influenced isotopic value of bone collagen. The dietary shift speaks to a transition to more complete cultures in the Bronze Age, around 3600 Cal yr BP in Gansu and Qinghai provinces. This occurred

through the differentiation of subsistence strategies, reorganization of social relationship in response to climate change and culture exchange in different parts of the area. In the transition it is likely that dietary changes were related to dryer and cooler climate and/or population growth.

Maas, Lauren

[44] *A Comparative Analysis of Decorative Ceramics and Choice at the Gregory Lincoln/Hspva Site and the Levi Jordan Plantation Site*

The purpose of this research was to investigate questions of aesthetic preference or choice and other driving factors that influenced the ceramic selection by people who resided at two sites: the Gregory Lincoln/HSPVA Site in Houston, TX and the Levi Jordan Plantation Site in Brazoria County, TX as well as to compare the assemblages from these two African American sites from differing environments. These ceramics assemblages, with the exception of one context, had been previously analyzed, but a re-classification of some of the assemblages was conducted. Through a set of hypotheses, the capacity of the archaeological record to reflect the driving forces behind the consumption patterns of segments of the population at these two sites was tested. Personal preference is rarely examined in archaeological literature where the assemblages from "lower status" groups, including African Americans, are often reduced to explanations of emulation or restricted access to resources. Aesthetic preference was reflected as a consumption factor in one of the four contexts examined, and was not ruled out in the other cases. One of the significant contributions of this thesis is its suggestion that aesthetic preference and choice are indeed viable avenues of inquiry for historic archaeological sites of all populations.

Mabulla, Audax [53] see Fitzgerald, Curran

Macario, Raquel (Universidad de San Carlos de Guatemala)

[183] *Elite Residences of the K'iche at Q'umarkaj, El Quiche', Guatemala*

When one visits the archaeological site of Q'umarkaj, they enter through a large open space covered by numerous platforms of different shapes from 1 to 2 m high. Closer to the Main Plaza are larger mounds, some over 40 m in length. At the edges of the plateau, beyond the cliffs that surround and limit access to the site, one is able to see three settlements, also on promontories, a few hundred meters from Q'umarkaj: to the north the site Mukwits Pa 'llokab-Chisalin, to the south Pa'Ismach, and El Resguardo Chajnel to the east. They form the area of greater Q'umarkaj.

Thus far, a total of 120 structures have been identified in Q'umarkaj, with functions ranging from, religious, socio-political and residential. Less than 15% of the structures at the site have been excavated. This paper mainly presents the results of excavations and comparative studies of residential structures conducted at the site between 2003 and 2007. This research has contributed to better understand not only the architectural morphology of the site, but has aided in a better understanding of the chronology of occupation and forms a comparative basis for other sites excavated in the K'iche' area.

Macdonald, Danielle (University of Bradford)

[17] *Exploring Domestic Tasks at Kharaneh IV using Lithic Microwear Analysis*

The use and division of space in the Early Epipaleolithic gives insights into the nature of social interaction in the Southern Levant prior to the advent of permanent architecture. This presentation presents preliminary results from the microwear analysis of the Jordanian Epipaleolithic site Kharaneh IV to explore the nature of domestic tasks within a hut structure. Kharaneh IV is located in the Azraq basin, Eastern Jordan, dating to the Early and Middle Epipaleolithic periods. The site's large size and dense artifact deposits indicate that it may have been a hunter-gatherer aggregation locale during occupation and a focal point for interaction. Recent excavations at the site uncovered several hut deposits containing lithic and faunal material. Microwear analysis was conducted on a sample of lithic artifacts recovered from the occupation surfaces of one of these structures. The distribution of these artifacts, linked with their function, provides a mechanism for understanding the organization of domestic space during the Early Epipaleolithic. How the inhabitants of Kharaneh IV structured their activities in association with the built environment will help illuminate how people

organized space in an aggregated community prior to the advent of permanent architecture.

[17] *Chair*

MacDonald, Kevin [44] see Rooney, Clete

MacDonald, Sarah (Northern Arizona University)

[212] *Problems at the Peaks: A Zooarchaeological Analysis of Subsistence Stress at Elden Pueblo*

When past populations experienced extended periods of resource shortages, acquisition and processing strategies changed to secure enough food. Understanding how faunal materials reflect those prehistoric reactions to subsistence stress remains a relatively unexplored topic in Southwest archaeology. Elden Pueblo, located in Northern Arizona, provides insight into this topic. As one of the final Sinagua occupation sites in the San Francisco Peaks region, the site's abandonment during a cool and dry period suggests that the occupants may have left the area because of resource shortages. In this paper, I analyze a sample of the faunal materials from pit houses, kivas, and a satellite pueblo associated with the site to identify if the population struggled to cope with dramatic climate changes. Residents used the selected structures during separate, consecutive periods of the Elden Pueblo's occupation, which may reveal increasing subsistence stress over time. Evidence of subsistence stress over time in the site's faunal assemblage includes a decrease in larger taxa, an increase in limb elements, and an increase in fragmentary elements. This paper presents the preliminary results of this research.

MacDonald, Douglas (The University of Montana)

[300] *Geographic and Chronological Differences in Lithic Raw Material Use by Hunter-Gatherers in the Greater Yellowstone Ecosystem*

Over the last eight years, the University of Montana has conducted archaeological research at various sites in Yellowstone National Park and vicinity. One aspect of our research is to study variation in hunter-gatherer lithic raw material procurement and use. From north to south and east to west within the region, there are extreme variations in hunter-gatherer use of a number of distinct volcanic and non-volcanic lithic raw materials. This variation can be used to evaluate geographic differences in land-use across the region. The lithic raw material data are useful in the evaluation of whether one group (single-user model) or many groups (multi-user model) of hunter-gatherers used the region in prehistory. We can also evaluate how land and material use may have changed (or not changed) over the last 11,000 years. Ultimately, answers to these questions allow for a better understanding of how hunter-gatherers incorporated Yellowstone into their land-use systems in the past.

[300] *Chair*

MacEachern, Scott (Bowdoin College)

[23] *Boko Haram, Coupeurs de Route and Slave-Raiding: Identities and Violence in a Central African Borderland*

To this point, most analyses of Boko Haram have stressed its origins in Salafi/Wahhabi radicalism in Maiduguri, the capital of Borno State in northeastern Nigeria. Equally important to the development of this organization, however, has been its utilization of frontier zones in the Lake Chad Basin, as refuges and areas for the development of political and military power. In this paper, I will argue that aspects of Boko Haram activities can be profitably understood through the deep-time examination of frontier phenomena in this region, phenomena that stretch back into the period of predatory state formation in the early-/mid-second millennium A.D. These include particularly the slave raiding that played so central a role in the formation of regional cultural landscapes, but also the banditry – a closely related phenomenon, but involving non-state-sanctioned violence – that is equally attested in early historical sources. Igor Kopytoff's 'internal frontier' model saw such interstices between states as laboratories for the creation of new social and political forms. The horrific violence being played out in northeastern Nigeria today vividly illustrates the kinds of social disruptions that accompanied those processes in the last prehistoric period.

MacFadden, Bruce [220] see Purdy, Barbara

MacFarland, Kathryn (School of Anthropology, University of Arizona)

[20] *Religious and Ritualized Landscapes of Iron Age Central Eurasia*

Culturally diverse peoples variously glossed as Scythian, Saka, and Xiongnu lived in northern central Eurasia throughout the Iron Age (ca. 1,000-100 B.C.E.). Archaeological sites of this time period range from kurgans (burial tumuli), mortuary complexes called khirigsuur, standing stelae termed "deer stones," settlements, and metallurgical centers. There is a long-term life history within the places in which these structures and monuments were built, general patterns in their spatial distribution. Placement of these monuments and structures were intentionally and meaningfully utilized, people journeyed between locations, and interacted with their built and natural environment. These places are further linked together by the presence of a distinctive iconographic style, termed Animal Style Art. Patterned usage of this iconography is representative of widespread religious ideas and beliefs; physical representations of conceptual metaphors and symbolic systems. A complementary relationship between places that are meaningful and the symbols depicted within, and those depicted on artifacts and as tattoos on individuals buried within highly ritualized locations, such as the Altai Mountains, are further expressions of religious conceptual metaphors. These concepts are demonstrated by conducting spatial analysis on distributions of symbols depicted on Scythian, Saka, and Xiongnu material culture, monuments and structures throughout central Eurasia.

[20] *Chair*

Machado, Juliana (Universidade de São Paulo)

[157] *Plants, Paths and Place-Making: Examples from the Ribeirinhos and the Xokleng/Laklãnõ in Brazil*

The environmental management practiced by traditional societies has already been presented as a model of sustainability and an example of economic flexibility. However, little is said of its meaning for that population, to whom it certainly exceeds its economic importance. Land is constantly transformed by human action through selective cuttings, extraction of weeds, fertilization and planting. In this paper I will present two different examples from Brazil, one focusing on a ribeirinho community of the delta of the Amazon river and the other, the Xokleng/Laklãnõ indigenous land on the southern part of Brazil. In the first case, I attempt to emphasize the environmental transformation that begins with few visible gestures practiced daily by women in their houses, while bringing seeds and cuttings from the forest and from houses of kin's and friends and planting them in their canteiros (suspended gardens). Planting here is understood as an act of care, which is made individually and its result is afterward socialized through a plant exchange network. In the second case, I will focus on how a hunter-gatherer society known for its high mobility pattern, the Xokleng/Laklãnõ, conceive and engage with their territory.

Machicek, Michelle [403] see Huffer, Damien

Macias, Juan Ignacio (Instituto de Investigaciones Antropologicas UNAM/UNICACH)

[21] *Dinámicas poblacionales durante el Epiclásico (600 a 900 d.C.) entre la vertiente norte del río Verde-San Pedro y el Occidente de México*

Se discuten los avances de las investigaciones realizadas en la vertiente norte del río Verde-San Pedro para destacar sus vínculos con las sociedades del Occidente de México en la época prehispánica. Para ello se mostraran las características que esta región comparte con el occidente y sus implicaciones para entender las dinámicas de interacción y movimientos poblacionales en el Epiclásico, destacándose las propuestas vigentes sobre la cronología. De igual forma se discutirá el posible impacto de los desarrollos en occidente durante el Clásico para la conformación de las sociedades que se asentarían en los Altos de Jalisco y la vertiente norte del río Verde-San Pedro. Se espera avanzar en el reconocimiento del papel que jugaron factores como los movimientos migratorios, la interacción entre sociedades aldeanas con centros mayores y la expansión de redes de intercambio para el entendimiento de las fluctuaciones de la frontera septentrional

mesoamericana.

Macias, Jose Luis (Instituto de Geofisica, UNAM), José Luis Arce (Instituto de Geología de la UNAM, México D.F.), Paul W Layer (University of Alaska at Fairbanks, USA) and Ricardo Saucedo (Instituto de Geología, Universidad Autónoma de San)

[151] *Volcanic Hazards Posed by Tacaná to the Soconusco Region*

The Tacaná Volcanic Complex consists of four volcanic edifices: Chichuj, Tacaná, and San Antonio volcanoes, and Las Ardillas dome. It began its formation ~225 ka yr ago at Chichuj, followed by Tacaná ~50 ka, and San Antonio volcano and Las Ardillas Dome during late Pleistocene. Its volcanic history recorded during the past 50 ka yr indicates that the complex has experienced major flank failures at Tacaná (~15 ka) and San Antonio (~2 ka). The latter destroyed the southern flank of San Antonio producing a pyroclastic density current and subsequent lahars that caused the abandonment of Izapa. Recent studies indicate that the complex has experienced at least four Plinian-Subplinian eruptions, two of which rank ~5 on the Volcanic Explosivity Index, dispersing ash towards Guatemala. The complex has also had at least nine other smaller explosive eruptions during the Holocene. The largest of them took place ~10 ka affecting locations up to 6 km from the main summit. The youngest of these eruptions surprisingly occurred ~150 years BP disrupting the Tacaná's summit area. Therefore, the 1949 and 1986 phreatic explosions of Tacaná are only a small reminder of its potential threat to the surrounding populations.

Macías-Quintero, Juan Ignacio [317] see Ardelean, Ciprian

MacInnes, Heather [373] see Cole, Kasey

Mack, Stephanie (University of New Mexico), R. Sinensky (University of California Los Angeles) and William T. Reitze (Petrified Forest National Park)

[364] *Space and Settlement across the Painted Desert: Comparing the Land Use Patterns of Preceramic Groups at Petrified Forest National Park*

Although preceramic archaeological sites containing evidence of maize farming were first identified at Petrified Forest National Park (PEFO) in the 1980s, archaeologists have conducted little research on preceramic Basketmaker sites at PEFO. Several radiocarbon dates on maize falling in the first millennium B.C. from preceramic habitation sites have shifted researchers' perspectives on the preceramic occupation Petrified Forest. Recent archaeological survey on Petrified Forest National Park expansion lands identified several preceramic Basketmaker II habitation sites (1000-200 B.C.). The expansion lands survey also identified several single component Archaic sites. Archaic hunter-gatherers were nomadic people who made seasonal rounds between highly productive territorial ranges therefore; their camps were moved to areas with accessible resources, such as game, plants, and water. Contrastingly, a pre-ceramic village site suggests that the people would exploit nearby resources from a more centralized area. This poster places the preceramic farming villages and Archaic sites identified at PEFO in a regional context and compares them using geographic information systems (GIS) to look at differences in settlement patterns, available resources, and site usage.

Mack, Joanne (University of Notre Dame)

[383] *The Potential Influence of Fish and Obsidian Resources on Shasta Cultural Complexity*

The geology of Shasta Valley, California provides an extremely rich food resource for fish and shellfish, which produces abundant fish resources in the Shasta River and its tributaries, well documented by fishery biologists and historical records. The geographical location of the valley and the Upper Klamath River allows relatively easy access to high quality obsidian sources to the east, providing a valuable item for trade to the west. Consideration of the geology and geography allows for a better understanding of pre-contact Shasta villages within the valley along the Shasta River and its tributaries and along the Upper Klamath River, including their size and evidence of cultural complexity, revealed by archaeological investigations completed within the past 55 years.

[383] *Chair*

Mackay, Alex [121] see McNeil, Jessica-Louise

Mackenzie, Simon

[279] *Antiquities, Drugs, Guns, Diamonds, Wildlife: Toward a theory Of Transnational Criminal Markets in Illicit Goods*

The illicit trade in looted cultural property has been observed to be an example of a 'transnational criminal market'. Other examples of transnational criminal markets are given in the non-exhaustive list in the title. These markets function in respect of a variety of goods – some are 'collectibles' markets (e.g., antiquities; wildlife), some trade 'consumables' (e.g., drugs; diamonds; counterfeit/pirated goods), while others move non-consumer goods that are not collectibles (e.g., guns; radiological material; human traffic). Trafficking therefore supplies various types of demand. Each transnational criminal market is governed by a different regulatory strategy, and we can compare and contrast the philosophies and practices involved in the types of control used to try to reduce the various cross-border flows of criminal goods. With a view to developing more effective regulation to prevent trafficking in cultural objects looted from archaeological sites, this paper will build on these preliminary observations about different types of transnational criminal markets and regulatory strategies. The aim is to engage in an analysis of the similarities and differences in criminal practices and official control programs in order to be clear about the range of policy futures applicable to the illicit trade in cultural objects.

MacKenzie, Mark [284] see Rowe, Marvin

Mackie, Quentin (University of Victoria), Alison Proctor (Mechanical Engineering, University of Victoria), Fedje Daryl (Department of Anthropology, University of Victoria) and Bradley Colin (Mechanical Engineering, University of Victoria)

[192] *Survey for Stone Wall Fish Weirs on the Continental Shelf near Haida Gwaii, British Columbia Using an Autonomous Underwater Vehicle (AUV).*

The search for early human occupation on drowned continental shelves is hampered by the low archaeological visibility of typical hunter-gatherer sites. Predictive modelling for site locations can produce polygons of potential, but these need to be tested both to evaluate the model and to recover material remains. Sampling of underwater predictive model potential polygons is difficult, expensive and usually low-return. However, some sites, such as stone-wall fish weirs, may be directly visible to imaging technologies such as sidescan sonar and also tend to be in relatively predictable locations. Guided by high-resolution swath bathymetry showing terrestrial landforms on the seafloor, we conducted a short survey program for fish weirs using a Bluefin-12 Autonomous Underwater Vehicle equipped with sidescan sonar. The study area includes paleo-river channels on the continental shelf adjacent to Haida Gwaii at depths up to 140 meters. In the immediate area, the Gaadu Din caves contain artifacts dated to 12,500 cal BP and salmon remains to 14,000 cal BP, putting both people and salmon on this drowned landscape. This paper reviews the rationale and methodology of this 2014 program.

Mackie, Quentin [192] see Fedje, Daryl

MacKinnon, Amy, Eric J. Bartelink (California State University, Chico) and Nicholas V. Passalacqua (Joint POW-MIA Accounting Command, Central Identifi)

[332] *Asturias across Time and Space: An Exploration of Medieval and Early Modern Spain Using Stable Isotopes*

Stable carbon and nitrogen isotope data from 104 individuals from eight sites were used to reconstruct the diets of Medieval and Early Modern (A.D. 600-1750) individuals from Asturias, Spain. Asturias is a coastal region located in northern Spain that remained one of the last Catholic kingdoms when the Moors ruled Iberia. Asturian society was structured hierarchically and divided into clergy, nobility, and peasant classes. Each socioeconomic group buried their own according to

status and wealth. The most privileged burial locations were within the church near the altar (ad sanctos burials) and reserved for high-ranking clergy and wealthy patrons. Peasants in good standing with the church were buried in the surrounding cemetery. Dietary resources consumed by the clergy and nobility differ from those available to peasants and are revealed through the stable isotope analysis. Individuals interred in high status ad sanctos burial locations have lower $\delta^{13}\text{C}$ and elevated $\delta^{15}\text{N}$ values. Possible explanations for this pattern may be the consumption of fish or weanling animals (e.g. suckling pig). In contrast, individuals buried in the cemetery have lower $\delta^{15}\text{N}$ values. Over time, all individuals exhibit elevated $\delta^{13}\text{C}$ indicating a greater dependence on C4 plants (sugarcane, maize) after European colonization of the Americas.

MacLean, Jessica (Boston University)

[34] *Community Entanglements: Archaeology, Heritage, and Community Partnership at the Little Bay Plantation, Montserrat, West Indies*

Tourism has replaced sugar as the Caribbean's economic engine. The ruins of sugar mills incorporated into resorts create cultural experiences rooted in romanticized notions of colonialism. Paradoxically the labor structure of this externally driven model replicates the racial, economic, and social divisions of the plantation structure. Promoted as "sustainable," the recent shift to heritage tourism, while advantageous to archaeology, is rife with the colonizing potential of Eurocentric tourism and interpretive strategies that trap the present in the historical narrative of sugar and enslavement. This paper discusses the challenges and successes associated with the implementation of an AIA Site Preservation Grant to further develop, in association with the Montserrat National Trust and the new national museum, a community based archaeological, interpretative, and educational program at Little Bay Plantation, a small-scale 18th-century Montserratian sugar plantation situated within a large-scale capital redevelopment project. Ultimately good and necessary, this paper explores the welter and complexity of community entanglements associated with the efforts of the Little Bay project to create a sustainable community partnership rooted in collaborative research and interpretation.

MacLellan, Jessica (University of Arizona)

[22] *Preclassic Maya Households and Ritual at the Karinel Group, Ceibal, Guatemala*

Founded around 1000 B.C., the Maya site of Ceibal has yielded important insights into the development of public rituals and spaces in Preclassic Mesoamerica. Recent excavations at the Karinel Group, located just outside the ceremonial core of Ceibal, have complemented this knowledge with data from domestic contexts. By making detailed comparisons of public and household ritual practices, we seek to understand the social processes through which the community of Ceibal changed over time. Some foci of the investigations include: 1) at what point Ceibal's residents first began living in permanent, formalized groups of residential platforms; 2) whether ancestor veneration played a major role in the development of social complexity at Ceibal; and 3) how an open, circular platform functioned within the Middle Preclassic Karinel Group. Work at the Karinel Group should enhance our understanding of the dynamic, reflexive relationships between public and domestic practices and spaces in Preclassic Mesoamerica.

[22] *Chair*

Macrae, Scott (University of Florida) and Gyles Iannone (Trent University)

[154] *Applying Adaptive Cycles to the Life History of Ancient Maya Agricultural Systems*

Archaeologists often struggled with understanding the life-cycles of relic agricultural field systems. By incorporating the multi-variable approach of the adaptive cycle, complex relationship dynamics can be identified and applied to understanding the historical sequences of specific cases studies. Demonstrating this is the intensive terrace systems and settlement within the Contreras Valley and the associated ancient Maya center of Minanha, Belize. The variables identified include the relationships between intensive agricultural terracing, climatic change, social pressures, and populations. Results present a multi-faceted understanding of the development, maintenance, and eventually collapse of the field systems and community. This study follows the trajectory of the Contreras Valley starting with kin-based social groups practicing small-scale, decentralized,

agricultural production. The succeeding rise of the Minanha royal court with new social and population pressures which in addition to climatic stresses drove the inhabitants to develop a hierarchically organized social structure with large-scale intensive terrace systems. The consequent collapse of many field systems and the royal court relieved population and social pressure while returning social organization to an emphasis on kinship. Results describe the advantages of using the adaptive cycle for understanding how the dynamic variables interacted to create unique circumstances that initiated changes in the Contreras Valley.

Macri, Martha [191] see Scholnick, Jonathan

MacWilliams, A.C. [262] see Roney, John

Madella, Marco (CaSEs - Universitat Pompeu Fabra)

[176] *Past Human Activities: Ethnographic and Geostatistical Models from North Gujarat (India)*

The main aim of archaeological research is the reconstruction of past human activities. So far this has been achieved mostly through the study of material culture. However, activities related to food production and consumption represent an important part of human life and leave microscopic and chemical traces. The use of ethnography and geostatistical approaches can help in unlock the patterns and identify activity areas in a controlled environment. We present here results from a multidisciplinary study in carried out in north-west India where domestic structures and activities can represent good proxies for prehistoric life-ways. Our experiment is not intended to create direct parallelisms between present and past-times, but to test the reliability of our methodology against known activities. We combined multi-element geochemistry, spot tests and phytolith analyses with a geostatistical approach to identify activities areas in a domestic compound (house and courtyard). Results show the validity of the methodology proposed and the potential of a multi-proxy approach to the study of human activities.

[73] *Chair*

Madella, Marco [73] see Lancelotti, Carla

Madgwick, Richard (Cardiff University), Angela Lamb (NERC Isotope Geosciences Laboratory) and Jane Evans (NERC Isotope Geosciences Laboratory)

[154] *Pigs and Power Centers in Late Neolithic Britain*

This paper explores the interplay between food provision, landscape, and power centers in late Neolithic Britain. This period is characterized by iconic megalithic ceremonial complexes, the most famous of which is Stonehenge. These centers represent a new scale of labor mobilization, not previously seen in Britain. Evidence for feasting, invariably focusing on pork, is rife in the environs of these monuments, yet settlement evidence is generally sparse. It is likely that these feasting events sustained inter- and intra-community relations, but the character and scale of connectivity remains unclear. This paper presents results from a multi-isotope ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$, $\delta^{34}\text{S}$, $^{87}\text{Sr}/^{86}\text{Sr}$) research project that investigates how these feasts were provisioned, from which areas of the landscape animals derived, and the social networks that were sustained through these feasts. Four sites are investigated to assess whether they may have represented competing power bases, sustaining different networks or whether their function was more ceremonial, supporting the same networks but perhaps at different times in the calendrical cycle. Isotope analysis also addresses issues of how the landscape was exploited in raising large numbers of pigs for these vast feasting events.

Madime, Omar [53] see Goncalves, Celia

Madrid, Patricia [251] see Belardi, Juan

Madsen, Mark [191] see Lipo, Carl

Madsen, Mark (University of Washington) and Carl Lipo (California State University at Long Beach)

[221] *Tools for Transparency and Replicability of Simulation in Archaeology*

Simulation is an increasingly central tool across many theoretical frameworks but especially in evolutionary archaeology. Simulation and numerical analysis is routinely employed in hypothesis tests and model development. Simulations, however, have a well-deserved reputation as difficult to replicate and test, and it is rare that researchers beyond the authors can build upon a previously published simulation study. To improve replicability, and to make our work accessible, we employ standard tools and scripted analyses, and engage a standard software development toolchain. We describe our workflow as a contribution to best practices for simulation in archaeology.

Madsen, Christian (The National Museum of Denmark)

[351] *Hierarchy and Human Securities in Norse Vatnahverfi, South Greenland - A Case Study*

Greenland was settled by Norse hunter-farmers at approximately A.D. 1000. Two fjord systems were populated: South Greenland formed the largest settlement area that lasted until c. A.D. 1450, the smaller Norse settlement area in present day Nuuk fjord being abandoned c. 100 years earlier. New detailed archaeological settlement evidence from the Vatnahverfi-a core settlement area in the Norse Eastern Settlement-is explored in terms of its environment, food securities relating to community level social hierarchy, labor access, and farming practices. The Vatnahverfi evidence suggests that increasing social stratification may initially have fortified food- and environmental securities in the upper societal stratum, and thereby boosted short-term resilience. Long-term, however, negative effects of tapping into and reducing the resilience and adaptive capacity of lower societal strata may ultimately have cascaded up through the system to undermine or affect the adaptive choices available to all social strata and the settlements as a whole. This could have exacerbated the negative effects of a climatic and environmental deterioration preluding the 'Little Ice Age' that may otherwise have been endured.

Maestri, Nicoletta

[86] *Any Port in a Storm: Identifying Port Infrastructure and Architecture in the Upper Usumacinta*

For the Classic period, recent regional studies in the Usumacinta basin have proposed a mixed system of communication involving both waterborne and inland routes. Circulation of people and things along these routes depended on physiographic features as well as political boundaries. Several settlements located on strategic points along these itineraries could have controlled and/or facilitated the transit. Some of these sites, due to their proximity to the river course, might have been ports and functioned as head of navigation or simple transit points. In this presentation we will analyze the formal architectonic features that could support these functions. Specifically, we will focus on urban layouts, the position of possible landing areas with respect to the settlement, along with the circulation paths (formal and informal) that connected them, and, finally, on the presence and typology of architectural compounds and infrastructures associated with these areas in order to support the existence of a port zone. We will explore these lines of evidence in the site of Boca Chinikihá, Tabasco, comparing it with other sites of the Upper Usumacinta, as well as with examples from the Petexbatún and Pasión regions.

[86] *Chair*

Magaloni, Diana [379] see Burtenshaw, Julia

Magargal, Kate

[119] *Fetching Firewood: Access to Fuels as a Constraint for Prehistoric Settlement*

In arid, topographically variable desert environments, resources important to humans are typically distributed heterogeneously. This variability required prehistoric humans to evaluate trade-offs over accessing spatially distinct patches. A potentially important and largely unexplored resource in these

trade-offs is firewood. This work examines the distribution of archaeological sites along the watershed of the Dolores River of southwestern Colorado and southeastern Utah. With new archaeological survey data, I offer an analysis examining the distribution of sites against different types of vegetation communities to explore the importance of access to firewood, paying particular attention to the potential multiple uses of plants and other factors that may strongly influence prehistoric site choice.

Magargal, Kate [362] see Vernon, Kenneth

Magdalena, Matczak (University of Poznan)

[332] *Osteobiographies of Two Peculiar Women from Early Medieval Poland*

The aim of this paper is to analyze the biographies of two peculiar women from early medieval Poland, one from Ostrow Lednicki and the other from Kaldus, both of which were the capitals of the Polish state. This paper presents the most representative and interesting biographies of the ill and the disabled from these sites. The very best example for such a study is the giant woman whose skeleton was discovered in the cemetery of Ostrow Lednicki. Her height was 215.5 cm. Osteoma of skull and femur, extensive degenerative joint disease, scoliosis, fracture of tibia and Harris lines were identified on her skeleton. Her body was not buried carefully, which might indicate her different treatment in the society. The other example is a female skeleton with paleopathological lesions that indicate leprosy which was discovered in Kaldus. The location of the grave and the grave goods indicate that the individual buried there could not have belonged to the lowest social layer, although her advanced stage of leprosy with facies leonia could indicate otherwise. Their osteobiographies are a bio-cultural history of their lives that answers whether illnesses or disabilities could have affected the way people were treated in their societies.

Magnani, Matthew (Harvard University), Matthew Douglas (University of Nebraska-Lincoln) and Samantha Porter (University of Minnesota)

[94] *Low-Cost Collection Digitization: Streamlining Photogrammetric Methodologies*

In recent years, it has become possible to rapidly digitize artifacts into three-dimensional (3D) form. The creation of sharable 3D datasets has the potential to increase collaborative efforts and collection access on a large scale. Despite this, archaeologists have struggled to employ an accurate, quick, and transportable solution to collecting data for model generation in field contexts. Photogrammetric modeling is an ideal low-cost solution to be explored, requiring minimal equipment, and inexpensive processing software. This project first establishes the accuracy of photogrammetric modeling, including both in terms of inter-observer variability, and between data collection protocols. We propose a standardized procedure to maximize accuracy, and minimize the time required for data collection. Machine-made objects of known dimensions are modeled and used to verify techniques, and establish error and variability associated with various procedures. Variations between measurements of photogrammetric models, caliper based measurements, and laser-scanned models are established.

Mahaney, Robert (Indiana University)

[33] *Finding the Cognitive Neurocognitive Core of Paleolithic Stoneknapping: an ALE Meta-Analysis*

Pioneering neuroimaging studies have allowed the analysis of the cognitive basis of stoneknapping and lithic technology to develop rapidly over the past 40 years. While these studies have helped identify the neuroanatomy of stoneknapping, interpretation of the cognitive significance of these results is still in its early days. To provide a comparative baseline between brain activity in stoneknapping and the rest of cognitive neuroscience, I performed an Activation Likelihood Estimate (ALE) Meta-analysis of Stout's (2000, 2007, 2008, 2011) PET and fMRI studies of knappers replicating Early Stone Age (ESA) technologies with 322 neuroimaging studies. I also compared the identified networks with 9721 studies in the Neurosynth database. The ALE meta-analysis identified

two networks involved in the replication of ESA technology. The first, including regions of the left and right frontal, parietal, and occipital lobes is involved in reaching, grasping, and low level action planning. Evolutionarily, this region plays an important role in extractive foraging abilities amongst primates. The second network, involving areas of the frontal and temporal lobes, is involved in social cognition. The interaction between these two regions may have altered the computational capacities of the core reaching/grasping system, enhancing social learning abilities necessary for Late Acheulean technology.

Mahar, Ginessa (University of Florida)

[163] *Evaluating Mass Capture Fishing Techniques*

The term “mass capture” is widely used in archaeological and zooarchaeological discourse to connote any form of fish capture besides active, individual procurement of a single fish such as hook and line or spear fishing. Unfortunately, this blanket term obscures the diversity and range of mass capture techniques and other critical factors that have implications for archaeological and anthropological interpretation such as materials, technology, ecology, and labor, among other variables. To begin to address this issue a series of experiments were undertaken involving one particular type of mass capture—fish weirs. Long shore and tidal weirs were modeled based on archaeological data from fish weirs in the Eastern United States. This poster details the preliminary results of this study via the quantification of fish species captured per weir configuration, juxtaposed against baseline fisheries monitoring data from the Florida Fish and Wildlife Conservation Commission. Variation between the weirs exists primarily in terms of labor invested in weir construction and behavioral patterns of fish species caught. These results show the need for considering particular types of mass capture fishing when addressing ichthyological remains at archaeological sites. All research presented herein was conducted at the Seahorse Key Marine Laboratory, Gulf Coast, Florida.

Maher, Lisa [17] see Macdonald, Danielle

Maher, Lisa (University of California Berkeley), Tobias Richter (University of Copenhagen) and Danielle Macdonald (University of Bradford)

[210] *(Re)Constructing and Using Space in the Epipaleolithic: Exploring Technologies, Domestic Activities and Communal Living in Eastern Jordan*

In the 10,000 or so years that make up the Epipaleolithic period, we witness several dramatic social, economic and technological changes documented in the archaeological record, including the appearance of aggregation sites and sedentary villages, intensified use of particular plants and animals, and the movements of people and objects over long distances. While it is easy to track these changes over this large time span, we rarely catch a glimpse of the daily activities and day-to-day interactions in which Epipaleolithic people participated. Here, with evidence from two Epipaleolithic sites in eastern Jordan, we attempt to get at these elusive past behaviors as evidenced by reconstructing the macro- and micro-scale activities within and between Epipaleolithic structures. At the Early and Middle Epipaleolithic site of Kharaneh IV and Late Epipaleolithic site of Shubayqa I aggregations of people congregated repeatedly and lived together for prolonged periods of time. Both sites prompt many questions about how people may have interacted at the site, what activities they performed, and how they lived. Geoarchaeological analyses of the spaces within and between structures is employed alongside other lines of evidence to reconstruct how space was used and activities negotiated at these substantial, archaeologically-dense sites.

Maher, Ruth (William Paterson University), Julie Bond (Bradford University), Stephen Dockrill (Bradford University), Julie Gibson (County Archaeologist of the Orkney Islands and UHI) and Jane Downes (UHI Archaeology Department)

[351] *The Orkney Islands: Long-Term Human Ecodynamics and Enduring Culture*

The Orkney Isles of Scotland, though greatly impacted by environmental shifts, are remarkably resilient and have a long-term occupation sequence of more than 5,000 years. There has been a concerted effort by many researchers to study Orkney's past in order to help Orkney move forward in

the face of current sea-level rise and changing social identities. Current archaeological research sheds light on land and seascapes of power, monuments of control, social identity through burials & settlement landscapes. The Gateway to the Atlantic Project is taking steps to expand research, train university students of all levels, and to bring the past to the local community in the form of community archaeology programs, public outreach, and integrated educational programs. Our research illustrates not only a successful and resilient society in the past, but we hope that our community efforts will create a society of endurance as we move towards the future.

Mahoney, Nancy (Montana State University) and Crystal Alegria (Project Archaeology)

[98] *Montana Project Archaeology: Best Practices from a Teacher--Student Field School Collaboration in Virginia City, Montana*

Located in the Department of Sociology and Anthropology at Montana State University (MSU), Bozeman, the Montana Project Archaeology (MPA) program has hosted a variety of professional development courses, institutes and workshops for teachers in Montana, Wyoming, South Dakota and Idaho since 2003. In 2013, MPA collaborated with MSU's Department of Anthropology, the private archaeological firm InteResources, Inc., the Montana Heritage Commission and private landowners to conduct an archaeological field school in Virginia City, Montana. The field school conducted test excavation within an historic city block dating from 1863. The project provided field experience for all participants, academic credit for MSU students, professional development credit for teachers, and archaeological information vital for a proposed land swap. This collaborative enterprise, with a strong component of public outreach during the field season (blogs, newspaper interviews, daily public tours, etc.), amplified the overall impact of the learning environment and benefited both the MSU students and the elementary school teachers. By contextualizing the field experience within a framework that involved local residents, elementary school students, teachers and the general public, all of the field school participants reported a more meaningful experience that left them with a better understanding of archaeology and its relevance.

Mahoney, Maureen (Seminole Tribe of Florida THPO)

[195] *Discussant*

Majewski, Teresita (Statistical Research, Inc.)

[223] *Discussant*

Makarewicz, Cheryl (Christian Albrechts University, Kiel)

[403] *Scales of Mobility: Oxygen ($\delta^{18}O$) and Carbon ($\delta^{13}C$) Isotopic Insights into Xiongnu Herding Practice*

Herding strategies involving the regular movement of domesticates to new pastures is a critical feature of pastoralist subsistence strategies. However, the utility of strontium isotope analysis as a proxy for mobility becomes complicated in regions where geological substrates are either homogenous over a wide area or are heterogeneous over small distances. Taking advantage of the geographic sensitivity of carbon and oxygen isotopes to precipitation levels, altitude, and latitude, we explore the utility of $\delta^{13}C$ and $\delta^{18}O$ in tooth enamel to record animal mobility in the Gobi steppe-desert. Here, we establish the seasonal range of isotopic variation in wild caprines and domestic sheep that grazed solely in one location - Baga Gazaryn Chuluu, Mongolia- through carbon ($\delta^{13}C$) and oxygen ($\delta^{18}O$) isotopic analyses of incrementally sampled mandibular molars. Building on these data, we then explore Xiongnu herding strategies involving small-scale mobility in Baga Gazaryn Chuluu.

[403] *Chair*

Makarewicz, Cheryl [403] see Laws, Kaitlyn

Makovics, Alexander (New York University), Mark Gonzales (New York University) and Dr. Matthew Adams (New York University)

[103] *Mapping Abydos: Bridging the Gap Between Legacy Data and Modern GPS Survey Methods in Egypt*

The Greater-Abydos Mapping Project began with the goal of creating a highly accurate, integrated GIS system for the entire 35km² site. This included incorporating all topographic and modern features, the translation and importation of previously utilized site coordinate systems, and all known archaeological data, including legacy data from historic excavations which started in the 1920s. Constraints in past cartographic and surveying methods, compounded by the scale of the Abydos site, over time caused a fracturing of spatial geodetic control. Different projects, working in separate locations, created independent reference grids that could not accurately be related to each other, and were often based upon easily damaged or destroyed survey monuments. GPS reference stations in Egypt are non-existent, inaccessible, or lack the required accuracy for establishing geodetic control monuments for baselines using post-processed GPS data. Utilizing very precise (RTK) GPS data collection was impossible without creating a local reference station. In conjunction with static GPS data collection, the project established an accurate base station monument, allowing for previous project grid coordinate systems to be readily translated into the new site-wide spatial control system, and all legacy data to be imported into GIS, allowing for continuity of ongoing excavations and mapping.

Makowiecki, Daniel [288] see Pluskowski, Aleksander

Makowski, Krzysztof

[227] *Discussant*

Malainey, Mary (Brandon University), Timothy Figol (Brandon University) and James Skibo (Illinois State University)

[4] *Addressing the Challenges of Developing a Standardized System for the Morphological and Functional Analysis of Archaeological Pottery*

Our study of precontact Aboriginal pottery from Western Canada involves morphological, use-alteration and stylistic analyses of individual vessels and the creation of precise three-dimensional vessel models using computer-assisted design (C.A.D.) software that is free-of-charge to students and educators. "Whole vessel" morphological analysis is then performed on the models using the C.A.D. program. Manuals on how to generate and analyze accurate C.A.D. models of whole or partially reconstructed vessels using the software are finished. Manuals outlining how to collect baseline morphological data from vessels or fragments thereof, take the necessary high-resolution digital images and perform detailed descriptive and use-alteration analyses have been developed. Students from Illinois State University will test these procedures on pottery collections from the American Midwest. By producing a standardized system of pottery analysis that is applicable to sites across North America, the data collected will be ready for incorporation into a web-based, interactive searchable database. The proposed database will not only allow us to share our results, but permit others to contribute new vessels, analyze the pottery themselves and conduct intra- and inter-site comparisons. As the database expands, the need to access institutional pottery collections, which can be difficult, expensive and time-consuming, will be reduced.

Maldonado, Ronald (Navajo Nation Historic Preservation Dept)

[195] *Discussant*

Maldonado, Blanca (El Colegio de Michoacan, A.C.) and Niklas Schulze

[259] *Metal Trade and Interregional Dynamics of the Mesoamerican Late Postclassic Period*

The way people were placed in relation to each other was fundamental to the distinctive character of Mesoamerica, as a historically linked series of socially stratified, economically differentiated, complex societies. Long-distance exchange, one of the practices through which intensive interaction between different peoples was fostered, was centrally concerned with obtaining materials used for marking distinctions between commoners and nobles. Costume was a major means of marking distinctions between different kinds of people in Mesoamerica, and for signaling their position in society.

Feathers, polished mirrors, and carved greenstone ornaments were all important components of costumes, indicating special status and rank. The Mesoamerican world as a social system was thus formed by its elite prestige system. Sometime during the Epiclassic/Postclassic Period, a new kind of prestige good emerged and was introduced into the trade system: metal. Copper, silver and gold came to be extensively used in the manufacture of a considerable array of adornments and artifacts for elite use and exchange. This paper explores the role of the production and distribution of metal goods in the sociopolitical structure of Mesoamerican societies during the Late Postclassic Period.

Maldonado, Jesus [339] see Hofman, Courtney

Maley, Blaine [112] see Hutchinson, Vance

Malinsky-Buller, Ariel (Institute of Archaeology The Hebrew University of Jerusalem)

[389] *The Lower-Middle Paleolithic Transition(s) – Between Southern and Northern France a Look from the Bifacial Technologies Perspective*

The division of the Paleolithic era into the Lower, Middle, and Upper Paleolithic is an arbitrary research construct that confounds chronological, behavioral, and evolutionary aspects. The Lower/Middle Paleolithic transition has received less attention. This transition is depicted as a worldwide change from biface production to flake production through Levallois flaking systems, similar to the way it has been perceived in the initial stages of research. Yet, in some European Middle Paleolithic assemblages biface production prevailed. Some key questions that remain unsolved are: What is the geographical variation of this global change(s)? Did changes occur as a result of autochthonous developments or by a diffusion wave (s)? What changed technologically and typologically beyond those guide fossils? In this paper, I explore the variations in biface production, maintenance, and transport across the landscape in Western Europe. Those technological variants will be presented in relation to their geographical patterning (Northern and southern France) as well as their chronological changes during MIS 9-7. Those modes of bifacial production will be integrated together with the general techno-typological makeup. The observed patterns do not exhibit a linear progression, but rather reflect segmented local histories. These bear important implications for the way this global transition(s) should be perceived.

Malischke, LisaMarie (University of Alabama, Tuscaloosa) and Ian W. Brown (University of Alabama, Tuscaloosa)

[381] *Architectural Features versus Historic Maps of Fort St. Pierre, 1719-1729, Vicksburg, Mississippi.*

Fort St. Pierre (1719-1729), located near present-day Vicksburg, Mississippi, was a short-lived French fort on the periphery of colonial Louisiane. Data from the 1974 through 1976 excavations have recently been collated with unreported excavation data acquired in 1977; and now provides a more complete picture of the perimeter of the fort (the palisade and dry moat) and the structural remains within this perimeter. Historical maps of this fort depict an orderly layout of fort structures; but the archaeological features reveal a crowded and confusing arrangement, use and abandonment of buildings within the fort. This presentation will briefly discuss the fort, its history, and will discuss in depth how aspects of daily life and the environment influenced and affected the reality of the fort's architecture.

Mallol, Carolina (Universidad de La Laguna), François Bachelier (2UMR 5199 PACEA, Université de Bordeaux, Bâtiment), Eugene Morin (Trent University, Dept. of Anthropology, DNA Block), Brad Gravina (UMR 5199 PACEA, Université de Bordeaux, Bâtiment B) and Isabelle Crèvecoeur (UMR 5199 PACEA, Université de Bordeaux, Bâtiment B)

[190] *Insights into Site Formation Processes at La-Roche-à-Pierrot, Saint Césaire (Charente-Maritime, France): A Microstratigraphic Perspective*

The extinction of the Neanderthals remains an open question and the current chronological, archaeological and paleoclimatic evidence reflects complex scenarios. In this context, southwestern Europe is an interesting region because as it represents not only a "dead end" for the east-to-west migration of anatomically modern humans but may have acted as a potential 'refugium' for local

Neanderthal populations. Several sites in the region play a key role in ongoing debates concerning the Middle-to-Upper Paleolithic transition. Some of these have been studied from a geoarchaeological perspective but others not. Therefore, there are still uncertainties in certain archaeo-stratigraphic sequences and gaps in our knowledge of regional paleoenvironments. Here we present the first results of a microstratigraphic study of La Roche à Pierrot, Saint-Césaire. Discovered in 1976 and excavated for 10 years (1977-1987) by François Lévêque. This small rockshelter yielded a stratified deposit containing the complete Middle-to-Paleolithic transition, as well as a relatively complete Neanderthal skeleton purportedly associated with an Upper Paleolithic lithic assemblage. Micromorphological analysis of 12 sediment blocks collected from different profiles exposed during renewed excavations at the site provide important new information for discussing the changing configuration of the site and associated site formation processes.

Malloy, Maureen [236] see Heath, Margaret

Maloberti, Mariana [180] see Korstanje, Maria Alejandra

Malpica Cuello, Antonio (Professor of Medieval Archaeology)

[47] *Paisajes agrarios en la montaña costera del reino de Granada*

En la misma costa del reino de Granada, situada al sur de la Península Ibérica, existen unos asentamientos conformados en época andalusí en los que la agricultura tiene unas características específicas. Ha de tenerse en cuenta que las condiciones geomorfológicas y climáticas no favorecen especialmente la creación de paisajes agrarios. Sin embargo, la disponibilidad de agua, que no siempre se concentra en un único punto, sino que se distribuye por todo el conjunto territorial, permite que haya asentamientos dedicados a la vida agraria con una especial relación con el medio. Todos ellos parten de la utilización del agua para regar los campos. Este modelo agrícola es propio de otras partes del Mediterráneo y puede ser contrastado con ellas.

Mañana-Borrazás, Patricia [409] see Parcero-Oubiña, César

Manchester, Keith [299] see Wilson, Andrew

Mancilla Medina, Margarita (Proyecto Templo Mayor), Laura Angélica Ortiz Tenorio (Proyecto Templo Mayor) and Mirsa Alejandra Islas Orozco (Proyecto Templo Mayor)

[298] *Wooden Scepters in the Offerings of Tenochtitlan's Great Temple: A Symbolic Interpretation*

The excavation of the Great Temple, one of the most important precincts in Mexica society, began more than thirty years ago. Since then, the examination of thousands of artifacts and organic materials has greatly increased our knowledge about Mexica cosmovision. During its seventh field season, the Templo Mayor Project has excavated thirty-six offerings. The flooded context of these oblatory deposits enabled the conservation of various organic materials that commonly degrade with the passage of time, especially wood. In the last seven years, more than a thousand wooden artifacts have been discovered: among them, we can mention numerous scepters. Most of these artifacts were found intact with remnants of their original polychromy, thus allowing an interpretation of their symbolism and the identification of nine different types of scepters: deer head, Techalotl's, Mictlaltecuhli's or closed fist, chichahuatzli (sun ray), ehēcahuictli (curved), serpentiform, xiuhcoatl (fire serpent), double volute, and tahuitimetl.

Manclossi, Francesca [292] see Rosen, Steven

Mandel, Rolfe (Kansas Geological Survey)

[190] *Unraveling the Site Formation Process at Finch (47JE0902): A Multicomponent Habitation in Southeastern Wisconsin*

The Finch site is a multicomponent open-air habitation located in southeastern Wisconsin. Archaeological excavations conducted at the site yielded numerous artifacts and cultural features

indicating recurrent and/or continuous occupation (or use) spanning twelve thousand years, from the Early Paleoindian through Late Woodland periods. The site is situated on the rim and side slopes of a kettle basin formed in matrix-supported glacial till overlying outwash and glaciolacustrine deposits. The till was deposited about 16,000 years ago, yet the cultural deposits, including burned-rock features, typically occur 15-45 cm below the surface, and some are as deep as 70 cm below surface. Intra-site spatial analysis of temporally diagnostic artifacts has demonstrated significant horizontal patterning across the site as well as some stratification in certain areas of the site. The results of the geoarchaeological investigation, which included detailed sedimentological and micromorphological analyses, indicate that burial of artifacts and features on the rim of the kettle basin occurred through pedoturbation and bioturbation (soil up-building), respectively. These site formation processes also account for the burial of cultural deposits on the side slopes of the basin, but it is likely that colluvial processes contributed to the temporally stratified trends in the archaeological record on the slopes.

[190] *Chair*

Mandel, Rolfe [190] see Simmons, Alan

Mandujano, Carlos (Instituto Nacional de Antropología e Historia) and Sarah María Mattiussi (Caltrans District 8)

[156] *La Pintura Rupestre en los Sitios Arqueológicos de la Sierra de la Giganta, Baja California Sur*

Uno de los objetivos del proyecto Arqueológico Sierra de la Giganta, es localizar y registrar la gran variedad de sitios arqueológicos en la sierra que lleva el mismo nombre. Dentro de la clasificación de los sitios arqueológicos, encontramos campamentos tanto al aire libre como en cuevas, concheros y sitios con arte rupestre, dentro de los que se incluyen los petroglifos y los sitios con pintura rupestre. En estos últimos sitios, pondremos particular interés en esta presentación, en donde haremos un recorrido por cada uno de ellos en donde se presentarán las características particulares de cada uno de ellos así como sus componentes y asociaciones con el paisaje. Otro punto importante que se considerará, son los factores de riesgo latente en cuanto a conservación y protección de los sitios se refiere y se hará mención de un programa piloto de monitoreo en dos de estos sitios en donde se ha involucrado a la comunidad del entorno cercano a estos sitios.

Maniery, Andrea (University of Nevada, Reno)

[6] *The Alluvial Geochronology of Pharo Village and Implications for Cycles of Site Occupation and Abandonment*

The results of geoarchaeological investigations at Pharo Village, a Fremont hamlet situated on an alluvial fan in central Utah, are reported in order to reveal how changes in alluvial dynamics contributed to the rise of Fremont farming there as well as the site's eventual abandonment. Cutbanks along Pharo Creek, the meandering stream adjacent to Pharo Village, were mapped and sampled during fieldwork. Field and subsequent laboratory analysis allowed reconstruction of the alluvial geochronology at the site. Carbon samples from mapped sections and buried paleosols were radiocarbon dated and correlated to additional dates generated from the site's archaeological collection housed at the Natural History Museum of Utah, both from hearths and artifact typologies. Buried soils examined in mapped sections indicate a period of stability on the landform where Pharo Village is located, and this could explain when and why the Fremont utilized this and similar locations. The relationship of a high energy flood deposit above the buried soil sections contributes to the discussion concerning site abandonment. From these data, interpretations are made regarding the contributions of local alluvial shifts to the overall termination of Pharo Village occupations, and related hypotheses are posited concerning the end of the Fremont Complex around 600 BP.

Maniery, Mary (Par Environmental Svc Inc)

[45] *Scraping Our Way To The Past: A Methodological Approach for Chinese Rural Work Camps*

Recovering meaningful information from ephemeral, short-term work camps in the west is

challenging, given the brief occupation time, absence of shelters other than tents or portable structures, and informal layout and design. One methodological approach that has proved effective for research at camps with shallow or no subsurface deposits focuses on exposing and investigating the horizontal deposits across the sites. Archaeological studies of Chinese occupied camps related to mining, railroad construction, fishing, and other activities have identified discrete functional areas within a site, subtle features and spatial layout by using broad surface exposures and detailed mapping. This presentation summarizes past archaeological work at these types of sites and outlines an effective methodological approach for Chinese work camps.

Manion, Jessica (University of Calgary), Geoffrey McCafferty (University of Calgary) and Carrie Dennett (University of Calgary)

[170] *As Good as it Sounds: Archaeology of Las Delicias, Managua, Nicaragua*

In 2008, housing development on the shore of Lake Xolotlan in a suburb of Managua discovered an extensive cemetery dating to the Late Tempisque period, ca. 1300 CE. Dozens of individuals were recovered, along with a rich array of grave goods. A new phase of development in 2014 has been closely monitored by the Nicaraguan Institute of Culture. In July heavy machinery exposed a number of additional skeletons and a team from the University of Calgary volunteered to assist in the excavation and analysis of the remains. This paper presents results of archaeological and osteological analyses of the recent finds, integrating them with those of the previous field season. Of interest to participants in this symposium is the abundance of Usulután-like negative resist pottery, diagnostic of El Salvador and Honduras but including locally manufactured varieties. The wide distribution of this ceramic style implies extensive geographic interaction, while the general wealth of the burials indicates complex social hierarchy. Ongoing stable isotope and ancient DNA analyses of the remains promise important insights into the biological profile of the ancient inhabitants of Las Delicias.

Manning, Sturt [21] see Turkon, Paula

Manning, Katie (UCL, Institute of Archaeology), Sue Colledge (UCL, Institute of Archaeology), Enrico Crema (UCL, Institute of Archaeology), Adrian Timpson (UCL, Institute of Archaeology) and Stephen Shennan (UCL, Institute of Archaeology)

[288] *Long-term Trends and the Sustainability of Early Agriculture in Neolithic Europe*

The domestication of plants and animals facilitated major changes in human ecology, demography, and social organization. Despite the seeming advantages of domestication, however, new analysis reveals major episodes of collapse in the early agricultural systems in Neolithic Europe. In this paper we present evidence for a progressive deterioration in arable farming conditions, alongside a reversion to wild resource exploitation across different regions in Europe. These apparent failures in the agricultural system correspond with other socio-economic phenomena, such as increasing population pressures and social conflict. These results shed new light on the origins of sustainable subsistence, and provide an historic context to the debate concerning Malthusian limits of the planet.

Manolakis, Laurence [211] see Weller, Olivier

Manson, Joni (Heritage Education & Research Services)

[95] *Zoning Regulations and Comprehensive Plans: Bringing Historic Preservation Home*

Archaeologists often wring their hands and bemoan the lack of regulations or guidelines designed to protect archaeological sites from destruction during development. Section 106 of the NHPA applies only to projects receiving federal funding, licenses, or permits. ARPA applies only to federal and Indian lands. Several states have State Historic Preservation Acts that apply Section 106-like regulations to state projects. Some cities have adopted legislation to protect cultural resources. However, much development today occurs in unincorporated townships where legislation is not an option and there is no federal/state/municipal connection. What can be done to introduce a measure of protection for historic properties during development in these areas? Zoning Regulations and

Comprehensive (Master) Plans are two local land use tools where such measures can be both effective and appropriate. Zoning Codes and Plans from Ohio townships were sampled to see if they included consideration of cultural resources. Results indicate that while relatively few townships now include preservation in their codes and plans, a number indicated that they would consider adding such protections if they had more information about the issue. Archaeologists must become involved with their local land use groups to be an effective voice for preservation.

Manuel, Emery F. [225] see Hoffman, John

Manzanilla, Linda (U Nacional Autonoma de Mexico)

[75] *Discussant*

Manzanilla, Linda [317] see Froese, Tom

Mao, Ruilin [37] see Wang, Hua

Maran, Joseph [25] see Tenconi, Marta

Marchand, Grégor [35] see Naudinot, Nicolas

Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)

[348] *Early farmers' house and household. Interpreting a Bayesian chronology for the Anatolian and Central European Neolithic*

The Anatolian and Central European Neolithic reveal some striking parallels in social developments. Different communal arrangements appear to be predominant in the Early Neolithic and autonomous households occupying discrete residences and performing most domestic activities in the house became clearly bonded entity only towards the end of this period and beyond. Recently conducted Bayesian analysis of a large number of AMS radiocarbon dates from both areas allow the pace of changes of the domestic domain to be established in detail and prove to be fundamental to recognizing the very nature of the transformation from the communal to more individualized social arrangements. By directly referring to these results, the paper aims to present the minutiae of the social process in both regions. It also intends to discuss a number of significant implications of the Bayesian chronological modeling for understanding of different facets of the Neolithic including village microhistory and geography. This will be exemplified by the results of Bayesian modeling of the upper Late Neolithic strata at Çatalhöyük East and early Neolithic sites from the Polish part of the North European Plain.

Marcom, Geron [352] see Garfinkel Gold, Alan

Marcone, Giancarlo, Nina Castillo (Proyecto Qhapaq Ñan - Peru), Rodrigo Areche (Proyecto Qhapaq Ñan - Peru) and Geraldine Huertas (Proyecto QHapaq Ñan - Peru)

[134] *Qhapaq Ñan Project's Research at the Guarco Site, Cañete Peru*

The accounts of Inca domination of the Cañete valley have been proposed as an example of Inca military strategies. The El Guarco site was proposed by these accounts as the head of a kingdom that established a fierce resistance to the Incas that was later overwhelmed by an unmerciful repression. Although it is present in the ethnohistoric accounts, we know little about the political and social organization of this kingdom and the functions that El Guarco had inside this society. In the year 2014 the Qhapaq Ñan Project started a research project at this site. In this first season we have a goal to establish the chronological and spatial organization of the site. In light of early results, we want to discuss what is known of the Guarco Kingdom's social and political organization, and the possible roles that the El Guarco site had. In addition, we seek to understand what changed at the site when the Inca conquered the valley. The goal is to inform us about the political strategies that

local groups deployed when dealing with the expansion of regional political formation.

Marcum, Jill (Hunter College)

[377] *A Peircean Analysis of Bucrania at Catalhoyuk*

This paper attempts an analysis of the bucrania at Catalhoyuk from the perspective of Peirce's semiotic. The spatial situation of bucrania is one of entanglement. Peirce's triadic relation emphasizes the being-in-the-world-ness of the sign, and his synechism, the continuum of signs. Using this multidirectionality, the indexical nature of the skulls is explored, including the immediate contiguity of man and beast, the various interpretants and intersubjective effects of structural space, and the distribution of agency. Spatial perception, phenomenology of place, and capacity for Firstness, are taken as valid referents of inference and abductive suggestion.

Marcum-Heiman, Alesha (University of Oklahoma), Leland C. Bement (University of Oklahoma, Oklahoma Archaeological Su) and Kristen Carlson (University of Oklahoma)

[300] *Exploring Prehistoric Resource Distribution in the Black Mesa Region: A Plains- Montane Ecotone in Cimarron County, Oklahoma*

The Black Mesa region of Oklahoma is located in northwestern Cimarron County, and constitutes the edge of the Chaquagua Plateau. It is the easternmost finger of Colorado's Mesa de Maya. Situated along Oklahoma's western border, Black Mesa is the highest and largest in a system of mesas and valleys that extend westward to merge with the foothills of the Rocky Mountains. The relief of this landscape is exaggerated by its juxtaposition with the high plains to the north, south, and east – it is thus referred to as the gateway to the Rockies. This ecotone contains a unique array of resources that have been exploited from the Paleoindian through historic periods. This paper focuses on the prehistoric utilization of these resources and the current state of archaeological knowledge of this transitional landscape. We synthesize the prehistoric record as documented principally in Oklahoma Archaeological Survey project reports. We highlight in particular the high quality quartzite that outcrop in the area and have been reported at sites both in and far from the Black Mesa region.

Marean, Curtis (Arizona State University) and Panagiotis Karkanas (The Malcolm H. Wiener Laboratory for Archaeologica)

[190] *Cave Life Histories of Non-Anthropogenic Sediments Helps Us "Raise the Bar" in Our Understandings of Anthropogenic Sediments*

A series of sea caves and rock shelters with strong anthropogenic contributions are found at Pinnacle Point (PP) near Mossel Bay in the Western Cape Province, South Africa. Two of these (PP13B and PP5-6) have been the target of extensive archaeological excavation and both document anthropogenic and geogenic contributions waxing and waning over time. A variety of caves at PP do not bear anthropogenic remains, such as Staircase Cave and Crevice Cave. A third, PP29, is filled with sediment but there are no archaeological remains visible on the surface and it has not been excavated. However, all three (as do most caves at PP) have extensive remnant and extensive sediments that provide clues to the "life history" of caves in the region. These caves offer the opportunity to understand the purely geogenic signature of the locality under the same geologic and sedimentary conditions as those caves with anthropogenic contributions, and thus offer a geogenic baseline for the PP locality. Archaeologists normally focus only on sites with strong anthropogenic signals, but by building cave life histories we enrich our knowledge of the baseline geogenic signal and "raise the bar" on our contextual knowledge.

[294] *Discussant*

[356] *Chair*

Marean, Curtis [294] see De Vynck, Jan

Marek-Martinez, Ora (Navajo Nation)

[34] *Archaeology?! Yadiilah! Collaborative Archaeology and Lessons from the Navajo Nation*

For many Native American tribes, archaeology has been a tool used to dismantle and displace tribal

narratives of the past. However, with the development of such approaches as Indigenous archaeology and community based participatory approaches, innovative collaborative projects have emerged, which have changed the way tribes view archaeology and how they engage with archaeological practice. My experiences working with Navajo communities have changed my approach and assumptions when engaging with tribal communities in archaeological projects. The successful partnerships and projects that I have undertaken while working for the Navajo Nation Archaeology Department have outweighed perceived failures. In the years that I have worked on the Navajo Nation, I have learned several tips that I would like to address in this paper that may assist other archaeologists in engaging with tribal communities.

[195] *Discussant*

Margaris, Amy (Oberlin College)

[311] *The Archaeology of a Russian Period Alutiiq Work Camp on Kodiak Island, Alaska*

The site of Mikt'sqaq Angayuk (KOD-014) on eastern Kodiak Island provides an intimate view of Native Alutiiq responses to the colonial labor regime imposed by 19th century Russians in Alaska. Recent excavation of KOD-014 through the Alutiiq Museum's Community Archaeology Program revealed a well-preserved Alutiiq style sod house and associated faunal midden dating to the 1830s. The midden was rich in cod remains, and the artifacts comprised mostly colonially-introduced products including metal hunting and trapping gear and European ceramics. These finds dovetail with Russian historical evidence to suggest the site's use as an *odinochka*: a small seasonal encampment where Alutiiq workers were conscripted to fish, hunt, and trap on behalf of the Russian-American Company. Yet the workers' economic strategies likewise involved a measure of individual autonomy as revealed in the distinctly Alutiiq ways some imported products were used, and evidence that residents also pursued subsistence aims of their own.

[68] *Discussant*

Marginson, Alex [121] see McNeil, Jessica-Louise

Marguerie, Dominique [360] see Lanoë, François

Maric, Tamara (Laboratoire de recherches Ethnologie Préhistorique ArScAn (UMR7041))

[388] *Marae of Tahiti, Society Islands*

Since the pioneering studies of Kenneth Pike Emory in the beginning of the 20th century, the ancient temples, marae, have been considered as good markers of social status, revealing the research focus on the complexification processes of Polynesian societies. Despite the lack of substantial chronological data on marae of the island of Tahiti, crossing architectural components of marae with their spatial context and ethnohistoric sources, provided an evolutive spatial model that might be originated from the Leeward islands. This presentation will explore the relations and alliances between some Society islands chiefdoms that can be inferred from both ceremonial architecture and oral traditions.

Marinkovich, Erik [103] see Mitchell, Spencer

Marinkovich, Erik (Humboldt State University), Ty Swavely (Salem State University), Spencer Mitchell and Sarah Nicole Boudreaux (University of Texas at San Antonio)

[316] *Investigating Landscapes in the Maya Lowlands: Integrating Geospatial and Environmental Sciences to Identify Archaeological Features in Northwestern Belize*

Satellite imagery and Geographic Information Systems (GIS) are invaluable noninvasive archaeological tools. The combination of remotely sensed datasets with GIS, geomorphological and ecological factors, and environmental variables associated with known archaeological features can produce a multivariate statistical predictive model. The authors will test the utility of integrating high resolution multispectral satellite imagery, lower resolution multitemporal satellite imagery,

georeferenced archaeological survey maps, and ecological land cover classifications within a GIS, to identify linear and agricultural features under continuous canopy in northwestern Belize. Various enhancement and processing techniques, such as image band transformations and vegetation indices, will be utilized to classify geomorphological and ecological factors. The results of these analyses will be compared to environmental variables associated with known archaeological features situated under similar canopy conditions. This will enhance statistical validity and serve as a baseline to determine probable areas of interest which will be ground truthed in the upcoming field season.

Marinova, Elena [154] see Ivanova, Maria

Mark, Robert (Ruperstrian CyberServices) and Evelyn Billo (Ruperstrian CyberServices)

[409] *Low Altitude Unmanned Aerial Photography To Assist in Rock Art Studies*

A radio-controlled DJI Phantom quadcopter with GoPro or built-in camera can help document archaeological features best seen from the air, such as geoglyphs, rock alignments, and some rock art panels. The camera can be set for interval photography, or monitored and triggered in real-time. The fisheye image distortion can be reasonably corrected with software such as Photoshop or DxO. This portable and relatively inexpensive method of flying a pattern and hovering directly above a site (now limited by the FAA to less than 122 m above ground level) has potential for detailed mapping and understanding features difficult to photograph or map from the ground. The archaeological community is awaiting forthcoming regulations.

Marken, Damien (Bloomsburg University)

[344] *Revisiting the Archaeology of Palenque: 25 Years after "The Children of the First Mother"*

As the site of many of the epigraphic breakthroughs that fully brought the Classic Maya into realm of history, Palenque, Chiapas, Mexico holds an important place in Maya studies. In the Forest of Kings, Linda Schele and David Freidel brought together one of the first truly comprehensive descriptions of the history of a Classic period royal family. Perhaps more significantly, they put forth a narrative of dynastic legitimization through writing and monumental construction that has endured and been applied across the Maya lowlands. This paper will briefly review the impact of subsequent investigations and discoveries at the site on how archaeologists today interpret this narrative. While little was known about the archaeology of Palenque beyond the monumental core in 1990, research by several Mexican and foreign projects over the past 20 years has greatly expanded the scope of our understanding of the ancient city's development and organization.

Markens, Robert [39] see Winter, Marcus

Markens, Robert, Cira Martínez López (Instituto Nacional de Antropología e Historia (Mex) and Marcus Winter (Instituto Nacional de Antropología e Historia (Mex))

[216] *Ceramic Production and Distribution in Classic Period Monte Albán, El Trapiche and Lambityeco*

This paper explores the organization of ceramic production and distribution in the Valley of Oaxaca during the Late Classic period (650-850 CE) by considering the evidence for pottery manufacture as well as the results of neutron activation analysis of pottery samples at three valley sites: Monte Albán in the central part of the valley, El Trapiche in the Etla arm and Lambityeco in the Tlacolula arm. More specifically, we examine evidence bearing on the intensity and scale of pottery production at each site and the results of neutron activation analyses that relate pottery samples to the clay sources in the valley from which they derive. This study helps decide between competing models that purport to explain the organization of the ceramic craft industry in the valley during the Late Classic period.

Markham, Adam (Union of Concerned Scientists)

[159] *Moderator*

Markova, Anastasia K. [74] see Van Kolfschoten, Thijs

Marks, Theodore (The University of Iowa)

[35] *Two Rockshelters in the Namib: Land Use, Site Use, and Risk over the Middle to Later Stone Age Transition in Southwestern Africa.*

The shifts in land and site use strategies that occurred over the Middle to Later Stone Age (MSA to LSA) transition remain poorly understood across the full diversity of environments in Southern Africa. In the Central Namib Desert of Namibia, two rockshelters, Erb Tanks and Mirabib, provide insights into these dynamics within the context of a persistent arid to hyper-arid climate. Employing data from an ongoing lithic sourcing survey, we argue that groups equipped with MSA-type lithic technologies procured stone and occupied broadly similar ecological zones in the Namib Desert to their LSA counterparts thousands of years later. However, data from our test excavations and technological analyses suggest that MSA patterns of occupation of discrete, attractive points on the Namib landscape, such as prominent rockshelters, shifted markedly in the context of the LSA. We argue that shifts over time in rockshelter occupational intensity and foraging technological strategies differed as a result of environmentally-driven shifts in subsistence risks as well as possible changes in the Namib's population density.

Markussen, Christine [47] see Davis, Stephen

Marquardt, William (Florida Museum of Natural History) and Laura Kozuch (Illinois State Archaeological Survey)

[152] *The Practical and Spiritual Significance of the Lightning Whelk*

We describe the biology of the left-handed lightning whelk (*Busycon sinistrum*) and some of the practical uses to which its shells were applied among coastal societies along the Gulf of Mexico. Then we explore the symbolic significance of sinistral snails, focusing on the lightning whelk as a metaphor of spiral/circle, fire/sun, and purification/continuity among Native Americans of the eastern North America. This particular whelk has had special spiritual value—and hence economic importance—for several millennia, particularly in the eastern United States, but its ritual importance as cultural metaphor resonates with cultures around the globe.

[152] *Chair*

Marquardt, William [166] see Walker, Karen

Marquez-Grant, Nicholas [19] see Groen, Mike

Marquez-Morfin, Lourdes (Escuela Nacional de Antropología e Historia INAH) and Ernesto Gonzalez-Licon (INAH-ENAH)

[410] *Children as Social Actors within the Domestic Group at Monte Albán, Oaxaca. Mexico*

This paper starts from a micro and qualitative approach to describe and analyze the social position of individuals: children, women and men within various domestic units in Monte Alban, Oaxaca, through archaeological indicators of prestige, power and wealth. The methodology uses funerary practices and its meaning in social terms within the domestic group, to identify the social role, especially of children, a sector of the population rarely studied. The location of burials in the domestic unit -- rooms, the patio, in a tomb or outside the house—as well as the offerings are used as social status indicators. The skeletons of children under 15 years were classified by age groups (of three years). Adult men and women were separated into three groups: young adult 15-15, average 25 40, advanced 40+, and registered according to their spatial localization. In addition stress indicators were evaluated to estimate general health conditions.

Marsaglia, Kathleen (Dept. of Geological Sciences, California State University Northridge), Scott Fitzpatrick (Dept. of Anthropology, University of Oregon), John Lawrence (Dept. of

Geological Sciences, California State University) and Jenni Pavia (Dept. of Geological Sciences, California State University)

[77] *From Sea to Shining Sea: The Influence of Bill Dickinson's Pacific Island Ceramic Petrography on Caribbean Research*

Bill Dickinson's research in the Pacific is widely known and considered to be one of the most exemplary cases of transdisciplinary research between archaeologists and the geosciences. The collaborative effort cultivated between Dickinson and the archaeological community over the last 50 years has led to new ways of understanding how and when peoples colonized islands, and the exchange systems that developed through time, among other important issues. One of the most significant outcomes of these partnerships has been the crossing over of Dickinson's petrographic techniques to other scholars and regions. In this paper, we highlight how Dickinson's analytical protocols and research questions have been applied to the Caribbean, which are pivotal to understanding how lithic and clay resources were used by Amerindian groups prehistorically. Ironically, while pottery often comprises more than 90% of the artifact assemblages found in Precolumbian Caribbean sites during the Ceramic Age (ca. 2500-500 BP), petrography is widely underused and underappreciated. Our research, some of the first of its kind in this region, focuses on the analysis of pottery assemblages from several islands in the southern Caribbean that provides a critical baseline for examining how peoples in the past acquired and used resources to manufacture pottery.

Marsaglia, Kathleen [79] see Lawrence, John

Marsh, Laura (Stanford University)

[379] *Examining Variability and Provenance through Ceramic Petrography at Chavín de Huántar*

The site of Chavín de Huántar, in the Peruvian Andes, exhibits an extraordinary amount of variability and complexity. In order to better understand this diversity ceramic fragments from different contexts within the site were sampled specifically for paste analysis. An initial macroscopic analysis suggested higher variability in pastes within the ceremonial center than within the residential area across the river. It also showed that the fragments from different contexts within the ceremonial center belonged largely to different paste groups. Of the fragments analyzed macroscopically 75 were chosen for thin sectioning and petrographic analysis in order to confirm the results of the macroscopic analysis and for sourcing the samples by comparison with geological samples from the area as well as with petrographic analyses from contemporaneous sites and previous studies of Chavín ceramics. This allowed for the distinction of local versus non-local raw materials among the various fragments and subsequent triangulation of this data with characteristics of the particular sherds, such as depositional context, vessel type, decoration, and other features. The results of this research provide insights into both the variability within the site of Chavín and the site's relationship with other areas and sites within the region.

Marshall, Weisler [105] see Harris, Matthew

Marshall, Lydia Wilson (DePauw University)

[335] *Household to Community, Community to Region: A Multiscalar Approach to Identity and Interaction at Two Fugitive Slave Villages In 19th-Century Kenya*

In 19th-century coastal Kenya, runaway slaves were known as watoro. This paper uses an expanding analytical framework to investigate watoro identity and interaction at three scales. First, I use artifact concentrations and domestic spatial dynamics to illustrate the daily lifeways and material preferences of individual households in two watoro villages, Koromio and Makoroboi. I then compare multiple households within each watoro community in order to investigate how these households interacted and how their consumption and production practices differed. At the broadest scale, I seek to place Koromio and Makoroboi within their respective regions. I consider how these fugitive slave villages engaged with the regional sociopolitical and economic landscape as well as how their economic and social practices compared to neighboring groups. My analysis questions the often-assumed link between cultural homogeneity and group identity. This paper also highlights the

potential for spatial approaches, particularly those enabled by GIS, to bridge multiple levels of analysis—situating households in their communities, and communities in their regions.

Marshall, Maureen (University of Chicago)

[403] *(Re)Articulating Ancient Lives: Diet and Movement in Late Bronze Age Societies in the South Caucasus*

The sudden appearance of hilltop citadels and vast cemeteries on the Late Bronze Age landscape of the South Caucasus suggests that it was a period of dynamic socio-political transformation as society shifted from highly mobile agropastoralism to a more settled lifestyle revolving around fortresses. Yet, within the Tsaghkahovit Plain, Armenia, there is little archaeological evidence of domestic architecture and activities, throwing into question people's residential and subsistence practices. This presentation discusses the results of biogeochemical analysis of human remains from Late Bronze Age and Iron I Period tombs excavated from the Tsaghkahovit Plain and comparative regions in Armenia. The results of carbon and oxygen ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$), carbon and nitrogen ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$), and radiogenic strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) analyses are used to reconstruct diet and assess movement. I suggest that generally Late Bronze Age peoples shared a common diet and 'lived' locally, possibly drawing on resources from multiple areas of the Tsaghkahovit Plain. Yet, at the individual level, the results indicate differences in dietary choices and practices of movement. The biogeochemical analysis thus holds significance for understanding the socio-economic connections within the plain and adds to a richer understanding of how people were living and moving within an early complex polity.

Marshall, Fiona (Washington University) and Jose Capriles (Instituto de Alta Investigación, Universidad de Ta)

[414] *Transport Animals and Distinctive Pathways to Domestication*

Animal behavior, diverse strategies of human management and environmental selection all contribute to domestication processes. Recent research suggests human control of breeding may have been less important than assumed and that breeding of captive animals with wild relatives significantly influenced domestication processes. Less social transport animals from extreme environments experience high levels of environmental selection and are especially likely to encounter wild relatives. Slow growth rates also lead to low culling levels. However, little research has focused on diverse practices of animal management and their role in reducing or increasing gene flow and influencing domestication pathways. This analysis suggests that diverse management practices relating to penning, foddering, political relations, hard winters, or poverty may all have affected the likelihood of gene flow and rates of domestication. More research is needed that identifies such processes in individual settlements and specific regions.

Marston, John (Boston University)

[226] *Reconstructing Agricultural Decision Making from Paleoethnobotanical Remains*

Paleoethnobotany has long been associated with the identification of crop plants and has led to important insights into domestication and the adoption of farming systems. New methods for the quantitative analysis of botanical remains, together with multiple allied datasets on human diet and environmental change, now allow paleoethnobotanists to generate empirical data on agricultural decision making in the archaeological record. The breadth of data now available to paleoethnobotanists includes macro- and micro-botanical remains from societies worldwide, isotopic proxies for human diet and fertilization of agricultural fields, genetic and phylogeographic histories of crops, and detailed local paleoenvironmental and paleoclimatic histories. Together with powerful new theoretical perspectives on human-environmental interaction, including behavioral ecology, niche construction theory, and resilience theory, it is now possible to test directly why farmers chose specific agricultural practices instead of others and to determine the environmental impacts of these agricultural strategies. I highlight several case studies from my own work and that of other panelists to elucidate the value of a theoretically rich, quantitatively driven, multiproxy analysis of ancient agricultural systems that asks how and why specific agricultural strategies were adopted and what the long-term implications of those decisions were for societies and environments.

Marston, Mac [268] see Forste, Kathleen

Martin, Lois [66] see Gaskell, Sandra

Martin, Stephanie (University of Arizona)

[120] *The Late Bronze Age Thera Eruption: A Spatial Analysis Study of Permanent Abandonment Processes*

Societies have been responding to natural disasters through evacuation and abandonment for all of human history. The same forces of nature continue to threaten human societies today and trigger many of the same responses. By engaging in cross-cultural comparisons, a pattern of responses may be articulated, directed towards answering such questions as: how far do people flee? For temporary evacuation, do they stay in existing settlements or build impermanent refugee camps? If evacuation is permanent, do they establish new settlements or integrate into existing ones? What are the archaeological markers of refugee integration in existing communities?

This study focuses on what is likely one of the largest volcanic eruptions in the last few millennia – the 17th century B.C. eruption of Thera. The inhabitants of the island were warned of the impending disaster and staged a full evacuation. Using GIS and spatial analysis to model abandonment and resettlement across cultural and temporal boundaries, I investigate the immediate and long term processes of the abandonment of Thera, what neighboring settlements might have taken in refugees, and how refugees were integrated into these communities.

Martin, Juan (Universidad del Norte - Colombia), Rainer Schreg (Römisch-Germanisches Zentralmuseum Forschungsinsti), Tomás Mendizábal (Patronato Panamá Viejo), Dolores Piperno (Smithsonian National Museum of Natural History) and Richard Cooke (Smithsonian Tropical Research Institute)

[170] *Chinina, Panama. First Evidence of Prehispanic Raised Fields in Central America*

Aerial photography has been known as an extremely useful tool of archaeological prospection for nearly one century. In recent years however it gained increasing importance by two reasons: First the availability of high quality aerial photographs via internet made it quite easy to start archaeological surveys even in remote areas. Second archaeological perspectives on past human societies changed in recent decades. Modern ecological problems caused an increasing interest in landscape archaeology. In Panama paleoecological studies were carried out by Dolores Piperno and her team, already since the 1980's. The results of this research contributed to understand American agricultural development especially related to the manipulation and domestication of plants. However, despite this important role of Panamanian data for the overall discussion of the development of agriculture in tropical environment, there has been not data on agricultural practice and land use pattern.

For the first time fossil fields structures have been identified in online aerial photographs in late 2010. This was a result of a systematic searching inspired by a previous project dealing with colonial period rising questions concerning the change in landscape dynamics.

Martin, Lana (University of California, Los Angeles)

[170] *Farming and Foraging in Late Ceramic Period Society at Sitio Drago, Western Caribbean Panama*

This paper examines patterns in plant and animal remains excavated from midden contexts at Sitio Drago, a 1400-year-old village site located on a Caribbean island in Panama. To date, most studies of farming and foraging in ancient Panama have focused on villages located in the central highlands and Pacific foothills – regions with a cooler, drier tropical climate that better facilitates agricultural productivity. Although highly informative, these studies alone do not provide us with a complete picture of food production in Lower Central American chiefdoms. Villages located in the warmer, wetter climate of the western Caribbean lowlands contribute an additional narrative of marginal landscape improvement, giving us more insight into sustainable adaptations possible in societies past and present. This paper presents the first integrative analysis of plant and animal remains from

Western Panama. Preliminary findings indicate people at Sitio Drago intensively processed staple plant food crops of either maize or manioc while relying heavily on tree fruits and palm nuts, suggesting a long-term investment in producing fertile agricultural fields and managing locally-available forest resources. Results of this project highlight the diverse array of subsistence economies and productive landscape modifications capable of supporting large-scale populations, particularly in marginal regions.

Martin, Lois

[187] *Cross-dressing to Complement the King: Eco-iconography of the Aztec Cihuacoatl's Costume*

Co-regents led the Aztec state: the principal Tlatoani, "supreme speaker," and his second, the Cihuacoatl, "Woman Snake," also the name of a fearsome goddess. The complementary rulers reflected Aztec notions of cosmic balance between opposites: while the male king directed external military campaigns during the dry season ("the day sun"), the Cihuacoatl managed internal affairs, especially agriculture, during the rainy season, or "night sun." A ruthless and visionary individual named Tlacaelel served as Cihuacoatl to a succession of Aztec kings, and cross-dressed in the goddess's clothes during state ceremonies. Many accounts suggest that Tlacaelel himself designed the splendid regalia, monumental settings, and extravagant spectacles that promoted the legitimacy of the royal couple. My research deconstructs the Cihuacoatl's outfit, and shows that its carefully crafted details serve to identify the Cihuacoatl as a perfect foil to the Aztec king—not simply his gendered opposite, but also his divine complement in ecological and technological arenas, including the maize cycle—a charter for rule in Mesoamerica since the time of the Olmecs. While the king's turquoise crown referenced a maize sprout, the Cihuacoatl's costume—in pattern, color, and style—referred to ripe corn seed, and the opposite end of the cycle.

Martin, Debra (University of Nevada/Las Vegas), John Crandall (University of Nevada, Las Vegas) and Ryan Harrod (University of Alaska, Anchorage)

[202] *No Better Angels Here: Bioarchaeology of Non-Lethal Head Wounds in the Greater Southwest (A.D. 900-1350)*

A survey of healed cranial depression fractures from Southwest collections revealed new information on the patterning of head wounds by age and sex. Head wounds demonstrate nuance and a non-linear trend over time. Thus suggests a much more complex picture than has been offered by recent scholarship that examined fracture rates based on published literature for select sites. This analysis is based on new data collected directly from Southwestern skeletal collections representing Ancestral Pueblo and Mogollon populations. Male and female rates of head wounds are tethered and co-occur in different frequencies across time and space, suggesting variable roles and implications for both males and females. Furthermore, based on the placement, size, shape and severity of the head wounds, this analysis was able to rule out accidental or occupational fractures using forensic and clinical standards. Wounds across time and between different groups suggest that nonlethal violence increased over time, and had different implications for the victims (and the perpetrators). It is possible that lethal violence due to warfare and raiding was only the tip of the iceberg, with many other forms of social control and coercion in place as well.

Martin, Richard (Knik Tribal Council), Kathryn E. Krasinski (Fordham University), Brian T. Wygal (Adelphi University) and Fran Seager-Boss (Matanuska-Susitna Borough)

[302] *Application of LIDAR in New Site Discoveries, Susitna Valley, Alaska*

Geographic Information Systems (GIS) have long been a standard tool for mapping or depicting archaeological features and sites in the circumpolar north. Recently, remote sensing techniques including Light Detection and Ranging (LIDAR) have provided extremely high resolution datasets for landscape level survey and site detection from the GIS platform. Initial applications have proven useful for identifying temple complexes and other large scale archaeological sites in the Central American rainforest where dense vegetation hinders traditional survey techniques. This paper highlights similar approaches in the subarctic boreal forest environment of Southcentral Alaska where the technique has successfully identified more subtle archaeological signatures. In collaboration with the Knik Tribal Council and Matanuska-Susitna Borough, LIDAR data were

analyzed and compared to field survey data for the identification of semi-subterranean storage and dwelling features. It has been a reliable methodology with few false positives at Montana Creek and Cottonwood Creek sites in Southcentral Alaska where short summers and dense boreal forest vegetation make ground survey challenging.

Martin, Shannon (Saginaw Chippewa Indian Tribe of Michigan)

[308] *Discussant*

Martin, Houston (University of California, Davis)

[361] *Modeling Middle Holocene Site Frequencies in Southeastern Wyoming: Exploring the Early Archaic through Probabilistic Models*

The lack of Middle Holocene sites on the Northwestern Plains provided grounds for further research on its source. A range of explanations have been proposed for the low frequency of archaeological sites dating between 8000 and 5000 BP in southeastern Wyoming, including geological, cultural, and researcher bias. Some suggest that human populations occupying the plains during this time were reduced. However, others point out that conditions during and following this time period may have destroyed sites or deeply buried them. Using quantitative and probabilistic models, this poster explores the likelihood of finding an Early Archaic period site given information concerning the history of research in the area, the chance of revealing buried cultural remains, and potential sources of geological bias. Further, it provides predictions of locations in Platte and Goshen Counties, Wyoming, that would benefit from further investigation; these areas will be subject to research attention in the future.

Martin, Erik (University of Utah), Joan Brenner Coltrain (University of Utah Department of Anthropology) and Brian F. Coddling (University of Utah Department of Anthropology)

[362] *Stratigraphic Integrity and Large Game Hunting at Hogup Cave, Utah*

Utah's Hogup Cave is an iconic example of the exceptional preservation and cultural depth present at Great Basin dry cave sites and has recently featured prominently in the debate related to the ascendancy of large game hunting in the late Holocene. However, concerns related to the stratigraphic integrity of the site have largely inhibited analysis of the cave's assemblage since the site's excavation and initial analysis in the late 1960's. We utilize 15 new radiocarbon dates in conjunction with excavation notes to examine the stratigraphic coherency and temporal range of the site. This is presented alongside new oxygen isotope data and a reanalysis of the site's artiodactyl faunal material to reconstruct trends in large-game hunting behavior stretching back to the early Holocene.

Martindale, Andrew [80] see Ames, Kenneth

Martindale, Andrew (University of British Columbia)

[80] *The Revival of the Canadian Archaeological Radiocarbon Database (CARD)*

CARD was developed at the Canadian Museum of Civilization (now the Canadian Museum of History) by Richard Morlan as a text-based online tool to compile ^{14}C dates from archaeological and palaeontological contexts. Over the years it has compiled about 40,000 dates from across Canada and into the northern United States. The database has grown to the extent that it can now be used to answer critical continental-scale questions of demography and human-ecosystem interactions. In July 2014, the CMH and the Laboratory of Archaeology (LOA) at the University of British Columbia initiated a partnership to revise CARD. In this paper we review and showcase the new features of this foundational database (including spatialization, data field flexibility, batch up/downloading, dynamic searching). We also outline our plans for expanding the database's reach in area and subject as well as adding to its functionality. We also discuss CARD as an example of a new management system for 'big data' which decentralizes authority and develops comprehensiveness through crowdsourcing.

[80] *Chair*

Martindale Johnson, Lucas (University of Florida)

[412] *Preliminary Interpretations of the Reduction Technology and Distribution of Obsidian Cores at Caracol, Belize: Learning to Reconsider Maya "Eccentrics" and Social Relations of Ritual Objects*

To the uninitiated, Maya "eccentrics" are vague archaeological labels applied to flaked obsidian objects placed in ritual caches during the Classic Period (A.D. 250-800). Although an unclear label of humanoid, deity, animal-like, or other shaped objects, lithics analysts have tried to define eccentrics based on technological attributes enabling comparisons between contexts, sites, and regions. Those studies that reconstruct a complex chaîne opératoire demonstrate many eccentrics had a dynamic socio-technological biography prior to their deposition in ritualized contexts. After 30 years of systematic investigation, the Caracol Archaeological Project has recovered many ritual cache deposits of Maya "eccentrics". Caracol eccentrics are typically terminated or disabled exhausted polyhedral blade cores, but can also be broadened to include (modified) macro-core shaping flakes/blades, platform preparation, and core rejuvenation debitage based on their context. Refits are present in many of these contexts demonstrating that exhausted cores were notched disabling further blade removal or rejuvenation. These objects may have then been used as tools in ritual just prior to their deposition. This paper defines these ritualized objects technologically and presents their distributions at households to understand the nuances of their performative production by obsidian crafters, their circulation to non-crafters, and their use during important household ritual events.

Martinez, Romina (Bureau of Land Management) and Tamara Whitley (Bureau of Land Management)

[103] *Predicting the Past: GIS Weighted Modeling on the Carrizo Plain National Monument*

The Carrizo Plain National Monument contains some of the most significant heritage resources in North America. Appropriate management is critical to the preservation of these sensitive resources. The results of GIS modeling can be directly applied toward a wide variety of historic preservation approaches. This presentation will describe the development of a site location predictive model for the CPNM and its direct application to resource management. The model identifies areas where culturally sensitive resources are likely to be based on determined criteria. Weighted overlay analysis was used to condense the output into five categories: most suitable, moderately suitable, suitable, somewhat suitable, and least suitable. The inputs to the model were numerous datasets, including: elevation, slope, aspect, distance to surface water, vegetation, and soil data based on drainage and texture. Development of the Carrizo Plain National Monument predictive model was a two-step process. The first step was to create the necessary layers for the area using a GIS. The second step was to create a predictive model of site location based on data contained in the layers. Protecting and locating these historical remains is highly important and of concern to archaeologists.

[103] *Chair*

Martinez, Julian

[137] *Pintura Rupestre Postpaleolítica de las Sociedades Complejas en el sur de la Península Ibérica*

El arte rupestre de la Prehistoria Reciente de la Península Ibérica ofrece un conjunto de datos de importante relevancia para estudiar el aparato simbólico de las sociedades complejas y sus implicaciones territoriales. Su amplia distribución también ofrece la oportunidad de discutir sobre la ocupación del territorio desde la perspectiva de la Arqueología del Paisaje. El espacio se convierte en un eje estructural en el que también es posible plantear las alternativas socio-económicas de las sociedades complejas.

Martinez, Desiree [197] see Ontiveros, Joseph

Martinez, Desiree (Cogstone Resource Management) and Cindi Alvitre (University of California, Los Angeles)

[197] *Caring for the Honuukvetam Pimuu've: Lessons from the Metropole Project, Avalon, Catalina Island, California*

While conducting necessary structural upgrades to the electrical system in the City of Avalon on Catalina Island, Southern California Edison (SCE) came upon Gabrielino (Tongva) ancestral remains. The ancestral remains were considered a possibility since the work was within the boundaries of a known village site (CA-SCAI-29) and the location had produced ancestral remains in the past. Prior to the start of the project, SCE consulted and worked with the Most Likely Descendant (MLD), as identified by the California Native American Heritage Commission, to create a treatment plan for the removal and care of ancestral remains and other items uncovered. Balancing Native American spirituality, respect for the ancestral remains, as well continuing to make forward movement on upgrades under a short time was not easy. From the view of the Gabrielino (Tongva) participants, this paper will discuss that even with a treatment plan in place, each day brought new challenges which required new assessments and directions to be made to ensure that the ancestral remains were honored and their story told.

Martinez, Gustavo (INCUAPA-CONICET/ FACSO-UNICEN) and Gustavo Flensburg (INCUAPA-CONICET/FACSO-UNICEN)

[203] *New Evidences of Human Corpse Manipulation among Hunter-Gatherers Societies in North-Eastern Patagonia (Argentina)*

A salient feature of Northeastern Patagonia during the late Holocene is the abundant record of burials with evidences of a strong handling of human bodies. In the lower basin of the Colorado River, burials are usually found in contexts such as formal disposal areas and domestic sites. In this work the bioarchaeological characteristics and the chronology of the Zoko Andi 1 site are presented. The earliest evidence of human corpse manipulation (ca. 1400 years BP) for Northeastern Patagonia was registered at this site. In addition, for the first time at least two distinct forms of mortuary treatment are simultaneously represented in the same context: simple secondary burials and the so-called "disposiciones." A deliberate intention to select certain portions of the body in order to locate them in a patterned arrangement into the funerary bundles was recorded. Also, a notable feature is the contemporaneity between funerary and domestic activities in a base camp repeatedly occupied during the late Holocene. Mortuary patterns recorded on the site will be finally compared in a regional scale.

Martínez, Diana [129] see Sugiura, Yoko

Martínez, Estela

[217] *Burial Treatment in the Area of La Noria, Tamtoc, SLP, Mexico*

Archaeological information confirms that between the second and fifteenth centuries A.D. Tamtoc evolved into a complex urban society that left evidence of their cultural identity through the vestiges of their ancient city. Testimony to this is the architectural complex designed for the preparation of complex funeral rituals, currently known as La Noria. In this area we have 67 burial mounds dug Postclassic (900-1500 A.D.), recovering 92 graves with the remains of 147 individuals of different ages and sexes. This paper will discuss the bioarchaeological research we have done on this bygone burial treatment population gave some individuals who might be considered special and through rituals help them reach their final destination.

[217] *Chair*

Martínez Lara, Mario (UNAM)

[39] *The Presence of Teotihuacan's Iconography at Cacaxtla, Tlaxcala: A Reflection on Its Interpretations*

The archaeological site of Cacaxtla, is located in the southwest of the modern state of Tlaxcala, Mexico. It has been explored uninterruptedly since 1975, and researchers agree that the site had a long occupation, reaching its height by A.D. 600-900, and was contemporary to other sites like Teotihuacan. Cacaxtla stands out for its mural paintings and, in particular, for its iconography that combines many pictorial traditions from different Mesoamerican sites. In particular, Cacaxtla's art

draws upon the styles of Teotihuacan and the Classic Maya. Studies that focus on the interpretation of Cacaxtla's iconography have revealed Teotihuacan's influence. Although studies have tended to focus on Maya influence in the art of Cacaxtla, relatively few have investigated the importance of themes from Teotihuacan that appear at the site. In this paper, my objective is to show what I think are the principal problems involved in finding those themes and to propose a new way to approach them.

Martínez López, Cira [39] see Winter, Marcus

Martinez Mora, Estela [231] see Castillejos González, Giovanni

Martinez Taguena, Natalia (The University of Arizona) and Luz Alicia Torres Cubillas (Comcáac Community)

[189] *Trading, Borrowing, Stealing, Fighting, Collaborating and Sharing: Comcáac Social Interactions with Their Neighbors*

The Comcáac (Seri) indigenous community provides a unique opportunity for community-based research in archaeological endeavors. Through a joint effort with several members from different families and of different age, the project constructed methodologies that integrate archaeological data with oral tradition and ethnographic information. In specific, we propose a distinct survey method with the recording of oral histories from landscape segments. This paper presents relevant results from this archaeological research and its associated historical and contemporary notions of past objects and places. With an emphasis on their relationship among agriculturalist neighbors (present day North Mexico and the US Southwest) as evidenced materially mainly by the presence of Trincheras pottery, Olivella shell beads, Glycimeris shell bracelets manufacture and landscape features; as well as by oral tradition evidence about territorial boundaries and relationships with Yaquis, Papagos and Apaches. Among important issues for collaboration endeavors, it also contributes to the general understanding of the region's history, the historic social interactions between coastal hunter-gatherers and agriculturalists, and the socioeconomics of raw material acquisition, manufacturing, and exchange.

Martínez Tuñón, Antonio (Zona Arqueológica de Monte Albán-INAH), Veronica Perez Rodriguez (University at Albany, SUNY) and Laura Stiver-Walsh (Metro Nashville Public Schools)

[26] *Cerro Jazmin and Its Changing Regional Context: Building upon Regional Survey Data*

Current work at the Mixtec urban site of Cerro Jazmín stems from a regional survey of the Central Mixteca Alta led by Stephen Kowalewski. As we refine Cerro Jazmin's chronology and know more about its history of occupation, we are building upon and sometimes correcting initial understandings of the site gained from that regional survey. We are able to contextualize the new information in relation to the entire Nochixtlan Valley and nearby areas thanks to the work and perspective offered by Steve's work in the Mixteca Alta and in the Valley of Oaxaca. In this paper we discuss the new chronological data that points to Cerro Jazmin as an important Early and Late Ramos urban center and we refine previous statements of its prominence in the Classic and Postclassic periods. We relate this information to the region's settlement patterns and to larger macro-regional socio-political and economic trends.

Martinez-Cruzado, Juan, Edna Tascon-Penaranda (University of Puerto Rico at Mayaguez), Francez Curbelo-Canabal (University of Puerto Rico at Mayaguez), Taras Oleksyk (University of Puerto Rico at Mayaguez) and Esteban Burchard (University of California at San Francisco)

[313] *Admixture in the Precolumbian Caribbean*

The biological origin of the Tainos is one of the most controversial issues regarding the population history of the Caribbean. The archaeological evidence suggests an early arrival from Mesoamerica and later arrivals of Arawak speaking groups from the Amazon to the Greater Antilles. We sequenced the control region of 171 Hondurans mtDNAs, 140 of which were of Native American origin, including 119 belonging to haplogroup A2, 20 to B2 and one to C1. We then chose Puerto

Rico and Dominican Republic sample pairs belonging to different mtDNA lineages, sequenced their complete mtDNA, and performed phylogenetic reconstruction using 105 continental sequences as reference. Ten out of 19 Caribbean complete mtDNA sequences showed deep roots and no strong association to any continental region. In addition, we found three Dominican and one Puerto Rican A2 lineages with strong association to Central America. We further identified two Dominican A2 and one Puerto Rican C1 lineage associated to South America. Evidence for strong population expansions in different continental regions were suggested but all Caribbean lineages with two exceptions had deeper roots. All data together suggest that Taino mtDNAs have both Central and South American origins.

Martínez-Flores, Isay Alan [141] see Martinez-Yrizar, Diana

Martínez-Muñiz, Isabelle

[379] *The Application of X-Ray Diffraction to the Characterization of Clay Samples from the Tuxtla Mountains, México*

In this project I applied X-ray diffraction (XRD) techniques to characterize the mineralogical composition of 11 clay samples collected from the Tuxtla Mountains, in the vicinity of Matacapán, Veracruz, México. These samples had already been analyzed through X-ray fluorescence (Pool 1990), and the data generated by XRD was compared to the already existing elemental analyses of these clays and of ceramics from the region. In this way, I attempt to distinguish minerals added to these clays in the form of temper during cultural processes of ceramic production, from naturally occurring inclusions. Also, through the mineralogical characterization of clay samples, I seek to more clearly define areas of resource procurement for ancient potters. Based on the XRD results, it was possible to identify a general mineralogical profile of the clay samples from the area surrounding Matacapán, as well as to highlight some intra and inter-group patterns and relationships in the mineralogical composition of these clays. Also, the XRD results support the findings obtained from XRF analyses of the clay samples. Future work will focus on comparing the data presented here to petrographic thin sections of these clay samples and on a comparison with XRD analyses of pottery produced at Matacapán.

Martinez-Yrizar, Diana (IIA-UNAM), Carmen Cristina Adriano Morán (IIA-UNAM), Emilio Ibarra-Morales (IIA-UNAM) and Isay Alan Martínez-Flores (ENAH)

[141] *Restos botánicos del sitio Precerámico de San Gregorio Atlapulco*

El sitio de San Gregorio Atlapulco (conocido como El Japón) se localiza al sureste de la Cuenca de México en la delegación Xochimilco. Su estudio se inició en la década de los 90s reportándose montículos ocupacionales y chinampas asociadas al Postclásico Tardío (1450-1521). En años recientes se retoma la investigación en el lugar en el marco del proyecto Poblamiento, Agricultura inicial y Sociedades Aldeanas en la Cuenca de México (PAPIIT IG400513-3). Uno de sus objetivos es aportar nuevos datos al estudio de las sociedades Precerámicas en la Cuenca, para lo cual se realizaron excavaciones extensivas en el sitio. Una de ellas la denominada Unidad A, se localizó en el límite sur de la plataforma habitacional y que por los materiales en superficie indicaban una ocupación más temprana (Precerámico Tardío ca. 4000-4200 a.n.e). En dicha unidad se tomaron muestras para análisis de materiales botánicos (macro y microrrestos). En este trabajo se presentan los resultados preliminares de los estratos IIIA y IIIB. Entre los taxa determinados hasta este momento se encuentran plantas de las familias: Cyperaceae, Chenopodiaceae, Poaceae, Pinaceae y Betulaceae, que son propias de cuerpos de agua y bosques templados.

Martini, Sarah [239] see Stack, Adam

Martinon-Torres, Marcos (UCL Institute of Archaeology)

[89] *Chemical Analyses and Copy-Errors: Technological Control and Artistic Behavior in the Making of China's Terracotta Army*

Built in the 3rd century B.C., the Terracotta Army constitutes an unprecedented investment of technological resources as well as a huge work of art. An icon of a much larger mausoleum, the

army of thousands of heavily armed warriors materialized in just a few decades under the command of the man who would become China's first emperor. This paper presents some aspects of an ongoing project that investigates this logistical feat, paying particular attention to craft organization, quality control and artisanal practice. Using metric, microscopic and chemical analyses of the weapons, together with geometric morphometric comparisons of digital 3D models of the warriors, we identify different patterns of artifact variability at micro and macro scales of analyses. These patterns are explained as resulting from various factors at play, including the organization of the labor force, structures for knowledge transmission and quality control, the use of standards and moulds, copy-errors and the intrinsic limitations of workers and materials. Using similar methods we attempt to explain both the materials engineering and the aesthetic or artistic constraints at play. We outline the problems and potentials of applying our methods elsewhere for comparative studies.

[89] *Chair*

Martirosyan - Olshansky, Kristine

[91] *Provenance Study of Obsidian Artifacts from the Neolithic Settlement Masis Blur (Armenia) Using Portable X-ray Fluorescence Spectrometry*

Over the past two decades, provenance research on obsidian from Armenia has been on the rise, primarily for provenience purposes, however, with only few studies on obsidian archaeological artifacts. In these studies, the geochemical characterization of obsidian artifacts and geological sources was carried out using different laboratory-based techniques such as INAA, ICP-MS and XRF. The current project presents preliminary results obtained with a portable XRF (pXRF) on the chemical characterization and provenience of a selected obsidian assemblage from the aceramic Neolithic settlement of Masis Blur. This assemblage was used to assess the prevailing belief that the raw material for the majority of the artifacts was primarily coming from one of the two Arteni sources in Northwestern Armenia, this one being nearest to the settlement. The assemblage was analyzed to determine the number of geochemical groups present. Data are compared to geological samples from all known Armenian and one eastern Turkey source in an attempt to assign individual groups to specific obsidian sources. Thirteen distinct obsidian groups were identified and many of these were attributed to various sources in Armenia or eastern Turkey. The findings attest to a much wider obsidian source utilization network than previously thought for the Neolithic settlement.

Martisius, Naomi L. (University of California, Davis), Tamara Dogandžic (Max Plank Institute for Evolutionary Anthropology), Michel Lenoir (Université Bordeaux 1), Shannon P. McPherron (Max Plank Institute for Evolutionary Anthropology) and Teresa E. Steele (University of California, Davis; Max Plank Institute)

[53] *Neandertal Subsistence at the Late Mousterian site of Abri Peyrony, France*

Beginning in 2009, the late Middle Paleolithic site of Abri Peyrony (also Haut de Combe-Capelle, as part of the Combe-Capelle sites, Dordogne, France) was reopened. Three seasons of fieldwork yielded rich lithic and faunal assemblages, as well as pieces of manganese dioxide, bone tools, and much needed information about the site's formation and antiquity. The site yielded only Mousterian levels. Level L-3A is attributed to the Mousterian of Acheulian Tradition (MTA). The remaining levels, including the underlying level L-3B, demonstrate similarities in blank production but are not MTA. Thus, the Abri Peyrony faunal assemblage provides an opportunity to study the relationship between changes in lithic technology and subsistence through a detailed zooarchaeological analysis of a highly-resolved faunal assemblage (well-preserved, finds >2.5 cm were individually provenienced and analyzed, all materials from 5 mm screens were analyzed, coding all identifiable material and recording burning on all pieces). Species diversity is high in L-3A (n=381), despite its smaller sample size. The fauna from L-3B is dominated by reindeer (n=1355), suggesting that changes in technology coincided with changes in local environments. The impact on prey selection and carcass processing is also investigated.

Marwick, Ben [200] see Kretzler, Ian

Marwick, Ben (University of Washington)

[221] *Reproducible Research in Archaeology: Basic Principles and Common Tools*

Scientific progress depends on the evaluation of findings through replication. While exact replication of results is often infeasible because of limitations of time and resources, a minimal standard of reproducibility is emerging as a norm of practice in contemporary computational and biological sciences. This standard refers to authors making available the data and code used to generate the key figures and tables of their publications. In this paper I review some approaches to reproducible research that have been emerging in other sciences. I describe how to use common open source software tools and services to improve the reproducibility of archaeological research. I also discuss barriers to their adoption, and suggest how we might foster reproducibility in archaeology

[407] *Discussant***[221]** *Chair*

Marymor, Amy [352] see Marymor, Leigh

Marymor, Leigh (Bay Area Rock Art Research Association) and Amy Marymor (Bay Area Rock Art Research Association)

[352] *Western Message Petroglyphs: Esoterica in the Wild West*

A particularly enigmatic form of rock art referred to as "Western Message Petroglyphs" has been identified at thirty locations in the American West scattered between no fewer than eight western states. Relying on standard rock art research approaches, this body of work is assigned to the historic mining boom years of the mid to late nineteenth century based on geographic distribution, symbol typology, and style analysis. A significant number of the sites are associated with the Mormon Trail and early Mormon settlements in the Utah Territory. An incorporation of icons from Obibway/Sioux Indian pictographic writing and other esoteric symbol systems allows us to formulate a hypothesis about the themes and authorship of these rock art panels.

Marzec, Edyta, Peter Day (Department of Archaeology, University of Sheffield) and Katherine Grillo (Department of Sociology and Archaeology, University of Sheffield)

[79] *Petrography of "Nderit" pottery from Pastoral Neolithic Sites Surrounding Lake Turkana in Kenya*

"Nderit" pottery is associated with the earliest pastoralists in eastern Africa, c. 4000-4500 bp. and is found at both settlement sites and ritual "pillar sites" surrounding Lake Turkana in northwestern Kenya. Several of the known megalithic "pillar sites" are large communal cemeteries and contain very large numbers of Nderit sherds, yet little research has been carried out on these ceramics in terms of their technology or provenance. Primary research questions concerning the early pastoralists of the Turkana Basin relate to issues regarding mobility and craft production; for example, did mobile herders produce this pottery on a household level as they moved throughout the Turkana Basin, or was craft production for ritual purposes more centralized and/or specialized? In the first phase of this project's petrographic investigations, sherds from three sites – two pillar sites, Jarigole and Lothagam North, and one habitation site, Dongodien – were examined. Analysis demonstrates shared fabrics between domestic and mortuary sites, as well as fabric links between sites on both sides of Lake Turkana, providing important new information on pottery production and circulation, as well as the mobility of these early pastoralists.

Mashburn, L [353] see Pritchard, Erin

Mason, Robert (Royal Ontario Museum/University of Toronto)

[79] *The Microscopy and Macroscopy of Islamic Luster Wares*

Petrographic and SEM studies of the luster-painted glazed pottery of the Islamic world between c. 700 and 1400 have defined an elite, high-technology ware made in few centers, at times only one center for the entire Middle East; with a distribution network that spanned the Old World. Production centers such as Basra in Iraq, and al-Fustat in Egypt created some of the most advanced and influential ceramic types of the period, utilizing technologies developed locally. But scientific

laboratory work is almost meaningless unless it can be extended into the trench and field to fit those finds into a statistically significant understanding of how material culture can be used to understand the human behavior of the past. This paper will focus on the wares of 8th-10th century Basra and 10th-12th century al-Fustat, and explore how attributes derived from technological developments and provenance can be used to provide an origin and a date for pottery found around the old world.

Mason, Philip

[177] *Places of Power and Passage: Hillforts and Monumental Landscapes in the Early Iron Age of Central and South-Eastern Slovenia.*

The early Iron Age (EIA) landscape in central and south-eastern Slovenia is dominated by hillforts and barrow groups. These monumental structures express and symbolize elite power in the landscape. Despite traditional emphasis on outside agency in the formation of these landscapes, it will be shown that the EIA landscape incorporated and transformed many places of the preceding Late Bronze Age (LBA) landscape, often through monumentalization. The expansion of hillfort settlements coincides with the increasing emphasis on visible differentiation in burial rites and the increasing role of iron technology, providing evidence for major social reconfigurations during the LBA/EIA transition and the development of visible elites. This is also reflected in the expansion of extra regional exchange. The aim of this paper is to examine these social changes and the role of elite ideology in the creation of place in and passage through these cumulative monumental landscapes. They were the result of intense, formalized elite competition throughout the EIA, which is reflected in the processions and festivals of Situla art and ultimately in the structure of the hillforts and barrow cemeteries themselves.

Mason, Andrew [192] see Virga, Nicolena (Niki)

Mason, Owen (INSTAAR University of Colorado), Claire Alix (Universite de Paris Sorbonne) and Nancy Bigelow (University of Alaska Fairbanks)

[302] *Birnirk Expansion across Alaska during the Medieval Climate Anomaly: Causal or Coincidence?*

Around A.D. 1000, from near Barrow, the Birnirk culture expanded southward across northwest Alaska, with settlements arising at Point Hope, Cape Krusenstern and Cape Espenberg. The motivation and successful adaptations of Birnirk were furthered by the stormy weather associated with upwelling and glacial expansion, correlative with tree ring, beach ridge and varve sequences across northern Alaska. New interdisciplinary data sets, archaeological and paleoecological, from Cape Espenberg elucidate the colonization process and contextualize the climate forcing. The data sets include diatoms, plant macrofossils, as well as a 14C dated, floating tree ring chronology (A.D. 700-1000) from a multi-room house with harpoon heads and bronze that exhibit long distance affinities to western Chukotka and northern Alaska. The cultural landscape was relatively empty: the Old Bering Sea/Ipiutak oikumene was in eclipse, allowing Birnirk peoples to act on the offensive. Skeletal biology indicates a diverse population employing distinctive mortuary practices within houses. Long-distance maritime capabilities are in evidence from a dated umiaq; the vehicle for colonization and the larger crews that focused on walrus and on bowhead whales, with increasing success. Colonization and immigration theory provide useful indices to interpret the improving radiocarbon chronology of Birnirk.

Masségli, Jane [205] see Williams, Lana

Masson, Marilyn [194] see Hare, Timothy

Masson, Marilyn (University at Albany SUNY)

[344] *Closing the Portal at Itzmal Ch'en: Termination Rituals at Mayapan*

The ceremonious destruction and abandonment of the Itzmal Ch'en group at Mayapán is symptomatic of ritual violence that marked this city's near collapse at least 50 years before its final abandonment around 1448 A.D. This new evidence revises Contact Period accounts about the

demise of this city, the last regional capital of the Maya realm prior to European arrival, and it also reveals the city's resilient (if brief) recovery. In the tradition of the interdisciplinary approach of the Forest of Kings to Maya political dynamics, we review the termination rites at Itzmal Ch'en in their larger cultural context. This group has represented sacred ground from pre-Mayapan periods until modern times, housing the second largest temple of the Postclassic Maya era, a major cenote, halls, shrines, and an oratory. It is located two kilometers distant from the site's epicenter and marks an eastern gate of Mayapan's city wall. Termination rites involved careful destruction and mixture of unique effigy censers and sculptures, now restored. These materials reflect pluralistic and idiosyncratic aspects of ritual and symbolism at an outlying political and religious facility.

[244] *Discussant*

Massone, Mauricio [251] see Morello Repetto, Flavia

Masucci, Maria (Drew University) and Hector Neff (California State University Long Beach)

[79] *Arybolas, Amphoras and Manteño Ordinario: The Production and Significance of Ecuadorian Transport Vessels*

The late prehispanic coastal Ecuadorian societies subsumed as Manteño -Guancavilca, are imagined as seafarers of the Andean region. On balsa rafts they plied a coast dotted with ports; participants in a trading empire. This traditional model of political-economic integration is being challenged with emphasis on regional autonomy and ethnic diversity. It is proposed that the analysis of the "ordinary" Manteño -Guancavilca vessels can contribute to this debate. Large, coarse paste, roughened exterior jars are ubiquitous at Manteño-Guancavilca sites and are believed to have been used on trading rafts. A narrow range of forms and surface treatment is matched by evidence from thin section petrography and elemental analysis of a standardized, unique fabric utilizing igneous materials. These materials have a limited range and are not used in other pottery production. Are these vessels, like European amphoras, a ubiquitous form of transport vessel so common they weren't even worth reusing for a return trip or like Inca arybolas, a ware which signaled control and integration? Do the vessels demonstrate that regions of the coast of Ecuador were integrated into a wider "empire" or did local elites benefit from participation in long distance trading organized through distant coastal centers?

[411] *Chair*

Matadamas Gómora, Diego (Proyecto Templo Mayor), Martha Soto (Proyecto Templo Mayor), Ángel González López (Proyecto Templo Mayor) and Michelle De Anda Rogel (Proyecto Templo Mayor)

[298] *The Polychromy of the Great Temple of Tenochtitlan "Standard Bearers"*

During the 1979 Templo Mayor Project excavations in the ruins of Tenochtitlan's main pyramid, eleven basalt sculptures, ritually buried in a hitherto unseen manner, were exhumed from the fill covering Construction Stage III (1427–1440 CE). Their complex forms and iconographic elements have made ascertaining their function within the sacred precinct of the Mexica capital difficult. After their discovery, it was surmised that they represented Huitzilopochtli's siblings, the centzonhuitznahuah, and that they functioned as standard bearers. Recent digital microscopy analysis, however, has yielded the recovery of polychromy that exhibits a combination of traits associated with centzonhuitznahuah, pulque, and rain deities, and thus strengthens the hypothesis concerning the relationships between these three groups of gods. The reconstruction of their complex iconography will reveal the identity and function of these personages.

Matarazzo, Tiziana (University of Connecticut)

[176] *Micromorphological Study of Concotto Surfaces Protected by the Avellino Eruption in 3,780 BP at the Afragola Village in Southern Italy*

The term concotto refers to fragments or patches of hard heated clay that derive from living surfaces, walls and ovens. Concotto fragments are found throughout the Italian peninsula and date from the Neolithic to the Iron Age. Current studies express contradictory opinions about whether or not the concottos found on living surfaces represent intentionally constructed surfaces or the secondary

products of the contact between hot embers and sediments. This study uses micromorphological analysis to investigate the function and composition of concotto surfaces from several domestic structures at the Early Bronze Age village of Afragola in southern Italy. Afragola is an exceptionally preserved agricultural village that was covered by almost 1 meter of ash during the Vesuvius eruption in 3,780 BP. The concottos at Afragola are hard, red surfaces that are typically associated with burned materials. Micromorphological analysis reveals that the concottos were intentionally made by laying down patches of clay and then heating them to create a hard, flat surface. This study explores the potential uses of the concotto as cooking surfaces during the Early Bronze Age of southern Italy.

Matchett, Ash (InterAmerican University of Puerto Rico)

[313] *Ancient DNA Prospecting in the Caribbean: Preliminary Findings and Future Perspectives*

Recent advancements in DNA sequencing have initiated a revolution in the field of Archaeogenetics. The results of these new studies have fundamentally affected our understanding of early human migration and peoples. Limitations, however, still exist, notably in tropical environments. These environments are believed to affect the preservation of DNA in human fossils, to the extent where DNA extraction and analysis is at the limit of even the newest technologies. A specialized facility has been setup in the Caribbean to maximize the extraction and sequencing chemistry, specifically, in order to redress this limitation. Ancient DNA recovery is optimized through a number of techniques, including samples selection, extraction, differential and selective DNA enrichment protocols, stringent biochemistry and improved chemistry. A brief outline of the initial results and successes will be investigated. Furthermore, preliminary results, both in decomposition studies and in Whole Genome Analysis (WGA) of Caribbean samples will be discussed. Finally, consideration will be given to the impact of these studies on our understanding, present and future, of the precolumbian peopling of the Caribbean.

Mathena, Sarah (University of Massachusetts-Amherst), Molly K. Zuckerman (Mississippi State University), Nicholas P. Herrmann (Mississippi State University) and Toni J. Copeland (Mississippi State University)

[220] *A Multistage Model for Treponemal Disease Susceptibility*

There are numerous historical, bioarchaeological, and paleopathological studies of treponemal disease, but most have focused on the origin and antiquity of syphilis. Therefore, little is known about the evolution and ecology of the other treponematoses, such as yaws. In modern populations, research options are limited by difficulty in culturing the causal bacteria, lack of animal models, and ethical issues with human testing. Treatment with antibiotics has also limited clinical research into treponemal disease morbidity and manifestations, though the treponematoses remain major sources of morbidity in the developing world. Bioarchaeological materials can address this deficit by enabling assessment of the effects of ecological factors on treponemal disease expression. This study addresses relationships between the morbidity and ecology of yaws via a three stage ecological model of ultimate to proximate factors, including climate, subsistence, and overall health, in six southeastern United States skeletal samples. Population frequencies of treponemal lesions are statistically compared to risk factors including average yearly temperature and rainfall, subsistence strategies, and oral health indicators, a proxy for overall health, from each sample. Results indicate climate and subsistence have little impact on overall yaws morbidity; however, poor early life health experiences contribute to later life disease expressions.

Mathews, Jennifer (Trinity University) and Kathy Sorensen (Ashford University)

[38] *Has Anyone Heard from Scott Fedick?*

Scott Fedick co-founded the Yalahau Regional Human Ecology Project in 1993, and his cross disciplinary approach continues to influence both his colleagues and students. This paper provides an overview of how Fedick's mentorship and scholarship shaped and guided the research of two former students at various sites in the Yalahau region, and how this research has led to a deeper understanding of the settlement patterns during the Preclassic/Classic transition and into the recent historic period.

Mathews, Jennifer [295] see Shaw, Justine

Mathews, Darcy (University of Victoria)

[320] *Depositional Practice and Ancestral Presence at Edye Point*

On the southernmost tip of Vancouver Island, between 400–1500 cal A.D., the Straits Salish peoples built distinctive funerary petroforms for their ancestral dead. These above ground features, constructed in a patterned array of sizes and shapes, were the material and spatial outcome of ritualized depositional practices. The Edye Point Cemetery, the largest funerary petroform cemetery in the region, has more than 300 of these features concentrated in a three hectare area. There is a recursive and mutually constituting relationship between who and where one is at Edye Point. Point pattern analysis reveals a process in which specific places were selected for certain kinds of funerary petroforms, and a spatial disposition is evident in which smaller types of mostly circular and oval features cluster together at multiple scales, while the largest, mostly straight-sided burials spatially repel one another, and occur outside of these clusters. Triangulating these results with an ethnographic thematic analysis suggests that communities of ritual practice at Edye Point performed simultaneously inclusive and exclusive burial, promoting a sense of *communitas* while also distinguishing their most powerful dead as liminal actants existing at the threshold of both the communities of the living and the dead.

[320] *Chair*

Mathiowetz, Michael (CSU Dominguez Hills)

[189] *Copper Back Mirrors (Tezcacuitlapilli) as Objects of Political and Religious Authority in the Casas Grandes World (A.D. 1200-1450)*

The rise of the Casas Grandes culture (A.D. 1200-1450) in Chihuahua, Mexico and the adoption of a new religion centered upon the Mesoamerican solar deity Xochipilli prefigured many of the social transformations that occurred among Pueblo cultures across the American Southwest by the fourteenth century. The appearance of new architecture of clear Mesoamerican derivation (e.g., I-shaped ball courts) and imported finished objects of shell and copper in the Casas Grandes world indicates heightened connections to West Mexico during this era. Among those imported items at Casas Grandes sites are complete and fragmentary tezcacuitlapilli—portable cold-hammered copper ornaments closely linked to the sun that were worn at the small of the back. Politics and religion intersect in these objects and their use in Mesoamerica provides a context for scholars to understand why these items appear in the archaeological record of far northern Mexico. This paper considers the role of the Postclassic West Mexican Aztatlán culture (A.D. 900-1350) in the rise of Paquimé and examines the use of West Mexican-derived objects of political and religious authority for Casas Grandes office-holders within the context of a Mesoamerican-inspired hierarchical social-religious organization.

[189] *Chair*

Mathwich, Nicole (University of Arizona)

[61] *Beyond the Mission Walls: Faunal Analysis of an Alta California Mission Ranchería Feature*

Mission Santa Clara de Asís, located in south San Francisco Bay, was one in a chain of Spanish Franciscan missions stretching from the south to the north of Alta California. Founded in 1777, Mission Santa Clara has been the subject of archaeological investigation for decades, but only in the past few years has the lens of research focused on native people's experiences and navigation of the mission system. This paper presents the results of a zooarchaeological analysis of a sampled pit feature (Feature 5) associated with one of Santa Clara's rancherías--adobe barracks constructed to house native peoples living at the mission. The results of the analysis provide additional evidence that native religious practices continued in parts of the "converted" population who lived and worked at the mission. The material remains from traditional religious practices were found discarded with other refuse. Alongside domesticated cattle, caprines, and chicken, native peoples ate seasonally available ducks, geese, and marine animals, suggesting continued movement and connection to the

traditional landscape. The faunal data offer deeper insights into how native peoples creatively negotiated the new resources and the new social limitations that characterized mission life.

Matisoo-Smith, Lisa (University of Otago)

[339] *The Complexities and Implications of Animal Translocations in Pacific Prehistory*

The Pacific region has some of the earliest evidence of animal translocation in the world. The use of transported landscapes – including the introduction of a range of plants and animals - was a major strategy for Pacific Island colonists, particularly in the settlement of Remote Oceania. We have been studying genetic variation in Pacific commensals for nearly 20 years and through these studies have had to constantly rethink our concepts of human and animal interactions generally and in regards to our understanding of Pacific settlement history. This paper will review this history and discuss some of the new questions that have been stimulated by our commensal animal studies thus far.

Matos, Carlos [130] see Zimmermann, Mario

Matos Llanes, Carlos (Universidad Autónoma de Yucatán), Héctor Hernández Álvarez (Universidad Autónoma de Yucatán), Mario Zimmermann (Washington State University), Lilia Fernández Souza (Universidad Autónoma de Yucatán) and Anaís Dervanian (Ecole de Chimie Clermont Ferrand)

[24] *Lo ritual y lo doméstico: estudios químicos de suelos y paleoetnobotánicos en distintas esferas de actividad en la hacienda San Pedro Cholul, Yucatán*

Si bien existen registros escritos sobre aspectos económicos y productivos en contextos históricos mexicanos, haciendas específicamente, es importante subrayar que dichos registros hacen mención breve o nula acerca de la vida cotidiana y situación económica en la que los peones acasillados vivían. Ante la presente problemática, nos planteamos evaluar y discutir las actividades cotidianas realizadas en una vivienda de construcción humilde (Solar 30), por un lado, y en la capilla de la hacienda San Pedro Cholul, por otro lado. Propusimos un acercamiento interdisciplinario haciendo uso de análisis químicos de suelos y estudios paleoetnobotánicos - gránulos de almidón en este caso- con el fin de proporcionar una comprensión más detallada de las labores y acciones de los peones acasillados principalmente. Los resultados nos indicaron un patrón consistente en la disposición y delimitación de labores dentro de la casa del Solar 30 y los solares 1 y 15 estudiados en el 2009. La capilla exhibió un uso intensivo y variación en los tipos de ofrendas depuestas en su altar.

Matos Llanes, Carlos [24] see Fernandez Souza, Lilia

Matos Moctezuma, Eduardo (MUSEO DEL TEMPLO MAYOR)

[346] *Templo y Palacio, lo Humano y lo Divino en la Producción de Tenochtitlan*

Las últimas investigaciones acerca de diversos materiales en la esfera de producción de Tenochtitlan, apuntan hacia la presencia y vínculos existentes entre la elaboración de objetos y el principal templo mexica. No solo se trata de materiales como concha, cobre, turquesa y otros más, sino que también se ha podido ver en las ofrendas del Templo Mayor y adoratorios aledaños la presencia de una fauna abundante que, al parecer, procedía del zoológico del palacio real. Todo lo anterior revela la estrecha relación entre el palacio del gobernante y el templo de los dioses.

[346] *Discussant*

Matson, RG [354] see Lipe, William

Matson, R. (Univ of British Columbia)

[415] *The Nutritional Context of the Pueblo III Depopulation of the Northern San Juan: Too Much Maize?*

The abandonment of the Four Corners area is a longstanding problem in archaeology. Recent work has shown that the terminal occupation was concentrated into a limited number of large defensive

sites. This resulted in an extreme emphasis on maize, which was nutritionally untenable because of maize's low amounts of Lysine and Tryptophan. I describe the processes that led to this settlement pattern and the evidence for this diet. I then explain how the combination of the settlement pattern and the extreme reliance on maize resulted in a nutritionally fragile situation that collapsed. I end with a few thoughts on the collapse.

Matsumoto, Yuichi [292] see Nesbitt, Jason

Matthews, Alan [294] see Braun, Kerstin

Mattiussi, Sarah María [156] see Mandujano, Carlos

Mattson, Hannah (University of New Mexico)

[354] *The Social Value of Ornaments from Pueblo Bonito and Aztec Ruin*

Ornaments are generally considered to be items of wealth, luxury, and value, and are often used as one of several indicators of social inequality. However, the value and meaning of ornaments is often assumed rather than demonstrated. Aside from power and wealth, jewelry may also relate to various aspects of social identity. It has been proposed that ornaments, turquoise, and shell may have been important symbols of status and ritual (or socially valuable goods) in Chacoan society, as they form the majority of items associated with kiva offerings in niches and under benches, floors, and pilasters. In addition, ornaments appear in burials and in rooms with other distinctive and apparently valuable items. This paper explores the relationship between identity and demographic reorganization through an examination of the extent to which elements of Chacoan identity and practice, as demonstrated by the social values attributed to ornaments at Pueblo Bonito during the Chaco florescence, were maintained or transformed by the post-Chaco period inhabitants of Aztec Ruin. Specifically, this research identifies the physical characteristics that differentiated ornaments of varying social uses at Pueblo Bonito from A.D. 900 to 1130 and compares them to those from Aztec Ruin during the A.D. 1200s.

Mauk, Brandon [300] see Smith, Lisa

Mauldin, Raymond [167] see Hard, Robert

Mauricio, Uribe Rodriguez [318] see Vidal Montero, Estefania

Mauricio, Douglas

[408] *Las cabezas de estuco, recuperadas en el Grupo Casa del Coral, El Mirador, Peten*

Reconocimientos e investigaciones recientes llevadas a cabo en las últimas dos temporadas de campo en la periferia este del gran centro de El Mirador han dado a conocer lo majestuoso en cuanto al arte de esculpir y tallar el estuco por pobladores clásicos de este sitio. Dando como resultado el descubrimiento de más de 20 piezas de estuco de incalculable valor cultural por ser piezas únicas en el área maya, todas estas piezas consideramos que representaron escenas de la vida diaria de los pobladores y la forma en que estos concebían el cosmos. Las mismas fueron recuperadas frente al muro exterior de la fachada sur del edificio Casa del Coral.

May Ciau, Rossana [399] see Seligson, Kenneth

May Ciau, Rossana [263] see Gallareta Cervera, Tomás

Maybach-Blicharski, Nikkita (SUNY University at Buffalo), Caroline Funk (SUNY University at Buffalo), Debbie Corbett (Nanutset Heritage) and Brian Hoffman (Hamline University)

[166] *Fish Through Time at KIS-050, Kiska Island, Western Aleutians*

Test excavations at KIS-050 during the Rat Islands Research Project Summer 2014 season resulted in abundant faunal assemblages, including a well-preserved fish assemblage. The goals for this research project include the development of a history of human and environment interactions between humans and the land- and seascapes, and the contribution of regional data to broader scale environmental impact studies. Sites occupied over the long term, such as KIS-050, are invaluable to better understand trends over time and fish are particularly well suited to examining temporal trends in impact from climate and predation. An analysis of the fish assemblage from KIS-050 will help research about if, and how small societies can leave a lasting impact on the surrounding landscapes and environment. This poster will present the analysis of the KIS-050 fish remains and compare trends from this site to patterns in other sites in the island group.

Mayer, Aaron (University of South Dakota) and Matthew Sayre (University of South Dakota)**[347] *Exploring Macrobotanicals of Tenenhaha from the Cotahuasi Valley, Peru***

In this paper we present macrobotanical data from the Peruvian archaeological site of Tenenhaha in the Cotahuasi Valley. Soil samples from archaeological excavation areas were recovered by Justin Jennings and his field crew from the Tenenhaha site. These soil samples were floated in order to sieve out the botanical remains of the ancient past lives of Peruvians at a ritual and ceremonial burial site of Tenenhaha. Our analysis revealed new insights into site use and the distribution of botanical staples of the Andean past. The local plant staples of quinoa (*Chenopodium quinoa*) and corn (*Zea mays*) were found in high densities in concentrated areas of the site. Local plants such as *Echinocactus* (*Echinocactus* sp.), tubers, and the Peruvian Pepper Tree (*Schinus molle*) were also recovered in abundance. These remains provide insights into changing cultural practices, as they present in different densities throughout time. The occurrence of sprouted *Zea mays* and *Schinus molle* in certain areas of the site seems to indicate ritual and or ceremonial usage of chicha during the Middle Horizon (550-1000 CE). The analysis of these macrobotanical remains gives us a glimpse into the past economic and culinary practices of people in the Ancient Andes.

Mayes, Arion [410] see Joyce, Arthur

Mayes, Arion (San Diego State University), Sarah Barber (University of Central Florida), Arthur Joyce (University of Colorado, Boulder) and Christopher Morgan (Western Door Archaeological & Osteological Service)**[410] *Intra-and-inter Regional Variation of Dental Modification and Social Complexity: a Test Case from the Lower Río Verde Valley, Oaxaca***

Dental modifications are symbolic representations permanently etched into human dentition that can have different cultural interpretations. Often done for aesthetic purposes, these modifications may reflect status, represent social inclusion or exclusion, or display regional variation. Bioarchaeological analysis of skeletons from three sites (Yugüe, Loma Don Genaro, and Río Viejo) from the Lower Río Verde Region of Oaxaca, Mexico (100 CE-800 CE) shows an increase in the frequency of dental modifications as well as in the number of individuals whose burial practices suggest differing social position both in life and death. This study discusses dental modification among adult males and females from all three sites. Additionally, a range of variation in the types of modification may suggest both intra- and inter-regional influences. Previous studies have indicated that dental modification appears in early archaeological populations within Mexico, with some of the oldest examples found in Oaxaca at Monte Alban and Monte Negro. It should not be surprising then, that dental modification makes a somewhat early appearance in the lower Río Verde Valley on the Pacific Coast of Oaxaca, Mexico. However, the dental and archaeological evidence reveal changing patterns of social complexity across time.

Mayfield, Tracie (University of Arizona)**[76] *Mahogany and Sugar for Tobacco, Booze, and Salt-Pork: Consumerism and Consumption at 19th-Century Lamanai, Belize***

During the nineteenth-century, the Caribbean region was a hotbed of trade and commerce driven principally by extractive industries such as agriculture (principally sugar) and hardwood collection. Such ventures required large injections of capital into the creation and maintenance of discrete, productive landscapes as well as for hiring, housing, and feeding the workers who provided physical labor and management. The following presentation will explore a long-term residential area of one such space: Lamanai, Belize, excavated during the 2014 summer field season. Lamanai is located in what is now the Orange Walk District of northwestern Belize. During the nineteenth-century British colonists established a short-lived sugar plantation at the site, which had long been — and continued to be long after the demise of the sugar venture — an area exploited for logwood and mahogany. Along with wild fauna, chicken, beef, and bottled, canned, or barreled products such as soda water, salted pork, and potted meat, the residents of nineteenth-century Lamanai were also active consumers of tobacco and bottled alcoholic beverages. In addition, the monies paid to the individuals and groups were used to purchase bottled medicines, health and hygiene products (e.g. chamber pots), and wearable objects such as buttons and boot heels.

Mayfield, Tracie [147] see Wolff, Sarah

Mayle, Francis [157] see Watling, Jennifer

McAlister, Andrew [412] see Mulrooney, Mara

McAllister, Martin (A.D.IA)

[197] *Getting Right with the Damage: Archaeological Value and Cost of Restoration and Repair Determinations Archaeological Damage Cases*

Criminal and civil prosecutions under ARPA require archaeological value and cost of restoration and repair determinations for unauthorized damage to archaeological resources on federal and Indian lands. These determinations also are necessary for archaeological damage cases prosecuted under other applicable federal and state statutes in order to provide monetary measures of the severity of harm. They must be done correctly to meet both the statutory requirements and the legal standards for expert witness testimony. This has resulted in the development of professional standards for the value and cost determination process. Examples of archaeological value and cost of restoration and repair determinations for recent important archaeological damage cases will be presented to illustrate the correct approach that will meet legal, professional, and ethical standards and that will also insure the damage is dealt with properly.

McAllister, Hannah (University of Wisconsin-La Crosse and PIARA), Rebecca Bria (Vanderbilt University and PIARA) and Elizabeth Katherine Cruzado Carranza (University of Memphis and PIARA)

[252] *Reconstructing a Recuay Feasting Event at Hualcayán, Peru through Ceramic Analysis*

Although research of the Recuay Culture has heavily focused on the practices and materials of Recuay feasts, these studies are limited to a few archaeological sites. Consequently, the variation of Recuay feasting practices between communities in highland Ancash is still unclear. This poster presents a typological and spatial analysis of Recuay ceramics excavated from the archaeological site of Hualcayán to reveal the local ritual practices of food preparation and consumption during the Early Intermediate Period (1-600 A.D.) in this ancient community. This ceramic assemblage was recovered from a large D-shaped patio group enclosure in which ceramics were burned, smashed in place, and associated with a variety of carbonized plants, suggesting they are the remains of feasting. The typology of the ceramic forms will be used to illustrate the range of food practices during a distinct feasting event in this D-shaped structure and the spatial arrangement of separate food preparation and consumption areas will be used to recreate the specific activities of feasting. Finally, these results will be compared with ceramic assemblages from other Recuay community sites in order to examine variation in Recuay feasting.

McAnany, Patricia (University of North Carolina, Chapel Hill)

[295] "He Entered the Water" ... Maya Wetlands and Their Caretakers

An epitaph for the death of Classic Maya rulers, "he entered the water" is an apt descriptor for a Maya archaeologist whose career spanned the royal and the watery. Peter D. Harrison—whose email address contained the word *ahau* (ruler, using a Colonial orthography)—was a master of scalar contrast. He attended to the small-scale details of a dynastic headquarters within the Tikal Central Acropolis and also theorized grandly about the role of wetlands in Classic Maya society. He became an advocate for the aesthetic beauty and utility of these watery portals that are ubiquitous in the southern lowlands. As a member of the 1981 Pulltrouser Swamp Project, I look back on Harrison's approach to wetlands, his impact on later scholarship and on the turbulent years that followed during which a science of Maya wetland utilization fitfully emerged.

[86] Discussant

McAnany, Patricia [188] see Dedrick, Maia

McArthur, Dan (University of Central Lancashire) and David Robinson (University of Central Lancashire)**[143] *Cave Sticks? An Investigation into the Use and Purpose of Bifurcated Sticks Found in Cache Caves***

This study aims to explore the purpose and use of bifurcated sticks found in cache caves of Southern California. Known as 'witchsticks' or 'spirtsticks', little formal research has been undertaken on these enigmatic cave sticks. As suggested by their naming, interpretations presume a ritual connotation despite little evidence; alternately, a purely practical application has equally been poorly considered. With the discovery of new Cache cave comes the ability to observe well preserved cave sticks found in situ. By analyzing these new cave sticks concentrating on the differing metrics and observing the differing physical attributes, questions concerning their use and purpose may be posed. This study compares these metrics and physical attributes to, a) a sample of non-modified sticks from nearby vegetation; and b) accounts of stick usage in the ethnographic record. This investigation highlights the amount that can be learned by conducting in depth studies of individual aspects of material culture.

McCafferty, Geoffrey [170] see Manion, Jessica

McCafferty, Geoffrey (University of Calgary)**[246] *'Out of Mexico' 25 Years Later: A Reconsideration of Migration into Greater Nicoya***

In 1989, John Hoopes and I presented a paper at the SAA conference in which we attempted an archaeological evaluation of ethnohistorical models for Mexican migrations into the Greater Nicoya region of Central America. Although the paper was never published, it became the foundation for my current research in Pacific Nicaragua. Colonial chronicles describe 'Mexican' cultural practices of the Nahuatl-speaking Nicaraos and, to a lesser extent, the Oto-Manguean-speaking Chorotega. Linguists and art historians of the twentieth century have supported claims of Mesoamericans in the region beginning about 800 CE. After 15 years of excavating several major sites along the shore of Lake Cocibolca, specifically looking for the Mexican connection, we have amassed an excellent database for ancient Nicaraguan lifeways, but rather ambiguous evidence for Mexican colonies. This paper will outline the evidence for migration 'out of Mexico' and then critically evaluate the archaeological evidence as it relates to foreign influence as opposed to in situ development.

McCall, Grant [53] see Khaksar, Somayeh

McCall, Grant (Tulane University)**[292] *Chert at Chalcatzingo: Implications of Knapping Strategies and Technological Organization for Formative Economics***

The site of Chalcatzingo, at the eastern edge of the state of Morelos, Mexico, has been an important source of information about shifting economic and social dynamics during the Formative period.

Lithic analyses focusing on the site's specialized obsidian knapping have played a significant role in showing Chalcatzingo's place as a trade hub situated at the boundary between the central highlands and Gulf Coast regions. This paper reports on the site's chert lithic assemblage and presents the results of a technological attribute analysis of a sample of 9,942 of the artifacts recovered during the 1996-1998 field seasons. Our analysis demonstrates that chert knapping at Chalcatzingo was expedient but also surprisingly intensive. We found that (1) retouched tools are quite rare; (2) core reduction strategies are universally informal; (3) cores are generally exhausted; (4) the sizes of both cores and flakes are very small; (5) the ratio of flakes to cores is high; (6) the assemblage shows a great deal of striking platform crushing, a high frequency of failed flake removals on cores, and general battering of all stone pieces. We conclude by discussing the implications of these findings for our understanding of Chalcatzingo's patterns of economic organization.

[292] *Chair*

McCarthy, Elizabeth (University of Missouri)

[245] *Bunny Or Bison: A Comparative Study of Faunal Material in the Casas Grandes World*

Faunal material has been recovered throughout the Casas Grandes world, from the cultural center of Paquime to the borderlands sites of Joyce Wells and 76 Draw. This study aims to compare the faunal assemblages of several Casas Grandes related sites to examine patterns of faunal utilization through time and space. Our results demonstrate that sites closer to Paquime (including Paquime itself) tend to have a more diverse faunal assemblage as well as having a higher percentage of high-ranked mammals than sites located in the periphery. Birds are also more common in the Casas Grandes core zone, which may indicate a higher focus on aviculture, a key characteristic of Paquime. Outlying Animas phase sites, such as 76 Draw, show a faunal assemblage more characteristic of local resource acquisition. We discuss the implications of our results for Casas Grandes ecology, subsistence, and human-environmental interactions.

McCleary, Alexandra (University of California, Berkeley)

[15] *New Insights at the Intersection of Historical Archaeology and the Archaeology of Religion*

An increasing number of archaeologists are arguing against the separation of ritual and religion as separate fields of study, favoring pragmatic combinations of theoretical criteria to advance more holistic understandings of the theory and practice of religion. Advancements in the archaeological study of religion have been spearheaded by archaeologists of ancient and pre-historic societies. In this paper, I will outline the potential contributions of historical archaeology to anthropological understandings of religion. This includes the robust use of multiples lines of evidence, community oriented archaeological practice, and post-colonially informed analyses of agentive practices and the formation of shared identities. In addition to examining recent interactions between historical archaeology and the study of religion, this talk will suggest a groundwork for developing a historical archaeology of religion, and in turn, what the study of religion can contribute to historical archaeology from the perspective of identity practice and social theory.

McClellan, Whitney [416] see Walker, Mark

McCloskey, Galen [128] see Renteria, Rebecca

McClung de Tapia, Emily [141] see Acosta Ochoa, Guillermo

McClung De Tapia, Emily (IIA-UNAM MEXICO)

[141] *Geoarchaeological and Environmental Studies in the Basin of Mexico*

Environmental studies associated with prehispanic settlements in the Basin of Mexico were originally focused on studies of agricultural potential and productivity, based on ethnographic assessments of essentially modern conditions. However, archaeologists were limited in their access to techniques developed in earth and biological sciences. Niederberger's research at Zohapilco in the southern Basin represents one of the earliest "geoarchaeological" approaches in which a concerted effort was

made to combine diverse paleoenvironmental studies with traditional archaeological excavation. However, similar investigations are infrequent in the region. The urban sprawl of Mexico City and adjacent political entities threatens archaeological evidence, particularly related to preceramic and Formative period occupations. This presentation summarizes some of the early studies that provide the background to new approaches to the recovery of evidence for prehispanic environmental conditions in the Basin to set the stage for more recent work that builds on new methodological approaches and techniques.

[141] *Chair*

McClure, Sarah B. [91] see George, Richard

McCool, Weston (University of California at Santa Barbara) and Joan Brenner Coltrain (University of Utah)

[162] *Oxygen and Carbon Isotope Chemistry and Maize Beer Consumption in the Prehistoric Andes: An Experimental Pilot Study*

The consumption of alcohol in prehistory is a much-studied subject, largely because alcoholic beverages were often central to social engagement, and the organization of many political, economic and religious institutions. While the role of alcohol is known to have been an important component of many societies, the ability to recognize alcohol in prehistoric contexts has proven difficult. As a result of this, many authors investigating alcohol in prehistory have used indirect indicators such as ethnohistoric, ceramic, and dietary analyses to reconstruct consumption patterns. In an attempt to produce a more direct method, the authors conducted a series of stable isotope analyses with the goal of establishing whether certain isotope values indicate the existence of maize based alcohol. This poster describes the results of this pilot study, and reveals a potential oxygen isotope chemical signature for maize beer. Our data indicate that the light ^{16}O isotope is preferentially represented in the CO_2 formed during fermentation. Thus, the resulting beverage is more ^{18}O enriched than the local water source. While this method is geared towards recognizing maize beer, it may be that similar analyses can yield insights into the recognition of non-maize based alcoholic beverages from an array of global contexts.

McCormick, Sarah (New Mexico State University)

[139] *Manufacturing Basketmaker III Bone Objects*

Bone tools are an important component in the study of the archaeological record worldwide. They have become especially useful in the study of perishable objects. This is because they are one of the few preserved items left behind that were required for processes such as weaving, and leatherworking. This research seeks to identify and replicate the manufacturing techniques required to produce a selection of bone objects that were found at the Dillard and Switchback sites, which are from the Basketmaker III time period in the Mesa Verde region of the United States. The excavations at the Dillard and Switchback sites yielded a variety of sizes and styles of bone awls, scrapers, and tubes. I have chosen a selection of the most complete and identifiable specimens to replicate in this study. Duplication of these tools will be as close as possible to the archaeological sample. This will include decisions of size, shape, taxa, manufacturing technique and anatomical element. The goal of this replication experiment is to shed light on the manufacturing process that was used by the Basketmaker III people in this area.

McCorvie, Mary [353] see Wagner, Mark

McCoy, R.M [90] see Vasquez, J. Javi

McCoy, Mark (Southern Methodist University)

[287] *Spatial Technology and the Search for Archaic State Society in the Hawaiian Islands*

Architecture holds a special place in archaeological reconstructions of past societies. I discuss how advances in the application of spatial technology in the study of architecture in the Hawaiian Islands

has put us in a better position to describe how the creation of an archaic state society shaped this all-important material indicator of social change. I draw upon forms that are commonplace – house complexes, fields, and small temples and shrines – as well as less common classes of architecture more likely to be found at royal centers, such as monumental scaled religious architecture, massive walls used to define specialized precincts, and public venues built for sports and ceremonies. Recording architectural remains continues to begin with traditional field survey, which has been joined by high precision GPS, laser scanning, and the use of spatial data from previous surveys and historic era maps, as well as increasing use of data derived from remote sensing and predictive modelling. The cumulative effects of the application of spatial technology are already being felt in how we look at emic classifications of architecture in archaeology, investigate cultural traditions first recorded at the time of European contact, and identify the pervasiveness of state power.

[287] *Chair*

McCutcheon, Patrick [92] see Davis, David

McCutcheon, Patrick [91] see Kassa, Sonja

McDaid, Chris (US Army, Fort Eustis, VA)

[325] *Pre-Conflict Planning for Cultural Property Protection in the Event of Armed Conflict*

One way to limit the amount of damage done to cultural property during armed conflict is to work within the international framework developed by the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict. This international treaty requires its signatories to develop processes to protect cultural properties including significant archaeological sites and monuments. One way to lessen the likelihood of damage to cultural properties is to have the discussions about what is significant, what data would military planners need to add cultural property to a "No Strike list," and how would one get that data to the appropriate place in the military structure. In the recent past lists of cultural property were developed in an ad hoc manner. In my presentation, I will lay out the international framework created by the 1954 Hague Convention and discuss recent efforts of academics, heritage managers, and military members to lessen the effects of armed conflict on cultural property.

McDaniel, Heather

[27] *Ethical Consumption and Archaeological Ethics: A Case Study in the Responsible Treatment of Cultural Collections and the Resulting Lessons Learned*

The backlog of curated archaeological collections can be overwhelming; and the notion of taking on another's "work" can seem very daunting and at times, considering who the "other" might be, downright intimidating. So many variables add to the challenge of assuming the responsibility of a curated collection, but they also offer great potential for personal, academic and professional growth. It is the prospect, after all, of finding the missing piece to the puzzle and making sense of the conundrum of artifacts, field notes and the like that motivates us as archaeologists. This presentation will focus on one budding archaeologist's experience with a significant site, deliberated by an impressive assemblage of established archaeologists, and a resulting collection which had sat dormant for over 30 years – the Burton Mound collection of CA-SBA-28. In retrospect, the capabilities gleaned from conducting research on an existing collection have proven invaluable and stretch far past just the scholarly familiarity which would be expected. The opportunity to follow in the proverbial footsteps of an esteemed archaeologist and to employ his former research as a blueprint for future examination has provided invaluable lessons that the presenter hopes will inspire others to consider doing the same.

McDonald, Erin (University at Buffalo)

[63] *Re-use and Recycle: The Various Lives of Prehistoric Monuments*

There are innumerable examples throughout prehistory (and history) of ancient monuments repurposed for a variety of reasons, such as the legitimization of power, land ownership and ancestry,

among others. Today, many people, in particular Neo-Pagans, attempt to identify with past peoples and to incorporate ancient sites into their modern day religious beliefs. Although not inherently bad, interpretations of ancient sites through a Neo-Pagan lens tend to gloss over archaeological evidence and interpretations of sites. In recent years, a greater emphasis on multivocality has emerged, and the question of how to incorporate modern people's beliefs about prehistoric monuments into site interpretations and presentation to the public has arisen. If prehistoric communities reinterpreted and re-used monuments built by previous generations, then can Neo-Pagans' understanding of those same monuments be viewed as just another iteration of a practice that has existed for thousands of years? Using case studies from Britain and Ireland, this paper explores modern people's (including archaeologists') relationships with past peoples and monuments, how such relationships help and hurt the preservation of sites and knowledge, and what the implications are for how past societies may have used and understood the ancient monuments in their own landscape.

[63] *Chair*

McDonald, Jo [138] see Catacora, Andrea

McDonald, Josephine (University of Western Australia), Gregory Haverstock (Bureau of Land Management) and David Lee (Western Rock Art Research)

[138] *Volcanic Tableland Rock Art: Research and Management in the Western Great Basin*

The Volcanic Tableland north of Bishop, California has been the focus of significant previous research (e.g. Bettinger, Basgall, Giambastiani), which has been mobilized by proactive BLM Archaeologists (E. Levy, K. Halford, and G. Haverstock) to generate a predictive model for managing cultural sensitivity against recreational impacts. Further innovation has been the use of specialized rock art recorders (represented by Western Rock Art Research) to document the petroglyphs and petroglyphs of this important GB style province. This paper presents the results of collaborative research building on earlier research, modeling and intensive recording to present a new interpretive layer for rock art in the predictive model. It shows the importance of rock art researchers, specialists and land-managers working together to achieve a better understanding of the heritage resource.

McDougle, Alexandra (University of Hawaii at Manoa) and Adam Lauer (University of Hawaii at Manoa)

[205] *Ifugao Neonate and Infant Oral Health*

The Ifugao Archaeological Project (IAP) seeks to develop a holistic understanding of the peoples of the Philippine Cordillera, specifically the biocultural adaptations to colonizing forces and environmental change. Presently relatively little is known about dental development and its relationship to long bone growth given that current evidence regarding prehistoric Ifugao neonate and infant health is scarce. This study examines a dental sample from 15 neonate and infant skeletons excavated during the 2013 IAP field season and seeks to address the process, significance and methodological problems associated with the analysis of dental remains in an archaeological context. This research provides a better understanding of Ifugao sub-adult health and encourages future researchers to include sub-adult dental analysis as a basis for understanding population health in general. Subadult Dental analysis is of particular importance given the present day gaps in subadult focused research as well as our lack of understanding of health in during colonization and environmental transitions. This poster will examine neonate and infant dental health to address some of these underdeveloped research questions by providing information about the health of the Ifugao. This research contributes to a greater understanding of the bio-archaeological record of Island Southeast Asia.

McDougle, Alexandra [238] see Lauer, Adam

McElhoes, Jennifer [95] see Brennan, Candice

McEwan, Colin (Dumbarton Oaks)

[246] *Discussant*

McGeough, Kevin (University of Lethbridge) and Jerimy Cunningham (University of Lethbridge)

[153] *Framing the "Ethnoarchaeological" Other: The Direct Historical Approach in Victorian Bible Customs Books*

One of the most popular genres of late-Victorian literature was the Bible Customs book. Often written by missionaries who had lived in Palestine for years, these books were intended to help illuminate the Bible based on observations of the flora, fauna, topography, and especially of the people living in the land in the 19th century. Organized according to subject or by Biblical verse, these books presupposed a connection between the people of Biblical times and 19th-century Palestine. In these books, a form of "ethnographic analogy" was used to better understand Biblical passages and reconstruct the ancient cultural practices of the region. This paper explores the ways that analogies derived from (amateur) ethnographic observation helped missionaries interpret a Biblical past. Whereas most Near Eastern ethnoarchaeologists were inspired by Jesse Fewkes's direct historical approach in the Americas, the widespread popularity of these Biblical studies (some of which were amongst the best-selling books of the 19th century) suggests that they may also have been influential antecedents for the analogical reasoning now used in archaeology. We compare the use of analogy in this Victorian literature with a sample of contemporary ethnoarchaeological approaches.

McGill, Kendall

[7] *Geospatial Analysis of Cedar Mesa Settlement Patterns*

Settlement pattern analyses published by Matson, Lipe, and Haase (1988) contributed basic understandings of the distribution of the many small dispersed sites in the Cedar Mesa area of SE Utah, and of the environmental factors that influenced these settlement behaviors. This project applies geographic information systems (GIS) and remote sensing techniques to supplement their settlement pattern study and gain additional insight into Ancestral Pueblo occupation of the region. Processing and analyzing satellite imagery produced maps of individual environmental characteristics believed to be influential in site selection. Overlaying resulting maps with archaeological site data discerned associations between environmental factors and site location. Using combinations of maps and locations of necessities (e.g. water source), a cost-path analysis identified favorable settlement regions. Future comparison of the cost-path output and recorded site locations will serve as the foundation for developing a predictive model of site locations on Cedar Mesa.

McGill, Dru (Indiana University)

[173] *Standardization and Variability of Decorated and Undecorated Pottery Vessels from Angel Mounds, Indiana*

At the Mississippian site of Angel Mounds (12Vg1), people crafted both plain, utilitarian-appearing vessels, and a variety of highly decorated wares, including Negative Painted plates that are frequently associated with the site. Previous researchers have suggested that Negative Painted vessels were made by ceramic or ritual specialists, who were perhaps sponsored by a chief or other elite individual. These decorated vessels are indeed rare at Angel Mounds, but no evidence has been found to suggest they were made in workshops or in elite-controlled areas such as on mound surfaces. Standardization (as seen in the lack of diversity of manufacturing attributes) is a form of indirect evidence archaeologists frequently use to evaluate production type and degree of specialization or skill of the producer, with the assumption that specialized potters develop skill over their lifetimes, and their products thus become more standardized in appearance than those made by non-specialists. In this paper, I present results of a recent study examining the variability of several vessel manufacturing variables across whole undecorated and decorated vessels from Angel Mounds. The goal of this research was to address the question: are decorated pots more standardized within and between vessels than undecorated pots at Angel Mounds?

McGillivray, Tegan and Nam Kim (University of Wisconsin-Madison)**[286]** *The Environmental History of Settlement at Co Loa, Vietnam: A Preliminary Pollen Sequence*

Co Loa is a 600ha Iron Age settlement located in the Red River Delta of northern Vietnam. Recent excavations of the three earthen ramparts at Co Loa are illuminating the processes of site construction begun during the Dongson cultural period (600 B.C.-A.D. 200). The scale and organization of these efforts reflect a highly centralized and institutionalized authority; however, little is known about the nature of settlement and urban form. Using preliminary palynological data from cores and excavation, this paper explores the environmental history of Co Loa at different phases of its construction. These data have implications for understanding the impact of settlement construction and associated changes in landscape transformation for activities such as agricultural production at the site through the first centuries A.D. The findings can also provide insights into patterns of urbanism within the wider region.

McGough, Alexandra [132] see Cirillo, Laura

McGovern, Thomas**[351]** *Hard times at Hofstaðir Iceland: Medieval Climate Impact and Cultural Responses*

In 1257, a major volcanic eruption in modern Indonesia produced rapid cooling in the North Atlantic region, and multiple climate proxies indicate the onset of a summer sea ice in the Denmark Strait and northern Iceland. Zooarchaeological and paleoclimate research has documented the impacts of summer sea ice onset in the Norse Greenlandic settlements (Ogilvie et al. 2009), and documentary sources from Iceland report weather-related famine in the 1270's. An archaeofauna excavated in 2011 from the site of Hofstaðir in N Iceland dated to ca. 1275-1300 by artifacts, AMS C14, and volcanic tephra may reflect a "hard times" signature in the unusually complete processing of bone fragments and apparent slaughter of the farm's dog pack and cat. Despite its location 60 km inland, the same deposit showed a concentration of harp seal probably taken on the newly arrived sea ice. During later centuries, communal harp seal hunting on the sea ice in Northern Iceland provided a major supplement to farming and fishing, representing an adaptive response to climate impact. The Hofstaðir late 13th century archaeofauna may thus document both climate impact and ultimately successful human adaptive response to the onset of the LIA.

[161] *Discussant*

McGovern, Thomas H. [288] see Hicks, Megan

McGrath, James [324] see Starr, Isabel

McGrath, James (University of Iowa)**[356]** *Late Holocene Occupations at the Pinnacle Point Shell Midden Complex*

Surveys identified a series of Holocene Later Stone Age shell middens along the westernmost extent of the Pinnacle Point estate near Mossel Bay, Western Cape, South Africa. Excavations during 2006 and 2007 revealed a well-preserved record of human activity ranging from 3000 ± 75 BP to 890 ± 30 BP across six spatially and temporally distinct shell middens. Dubbed Areas 1 - 4 of the Pinnacle Point Shell Midden Complex (PPSMC), each midden presents a picture of human subsistence patterns that varies through time. Area 3, the youngest and most extensively excavated of the middens, displays a stone-lined, heat-retaining earth oven, extensive spatial patterning, and the presence of pottery. When compared against the other, older, shell midden complex occupations, Area 3 provides a unique opportunity to examine changes in subsistence patterns through the introduction of pastoralism into the southern coast of Africa. As a whole, the PPSMC represents some of the youngest Stone Age occupations within the archaeological record of Pinnacle Point.

McGuire, Randall (Binghamton University)

- [348]** *Of Braudel & Beams: How Tree-ring Dating Enables the Study of Transformative Social Changes in the Ancient Southwest U.S.*

Fernand Braudel said, "History may be divided into three movements: what moves rapidly, what moves slowly and what appears not to move at all." Archaeologists gravitate towards the *longue durée*—cultural continuities and traditions—but our most important questions have traditionally focused on transformative changes such as the rise of the state, the collapse of empires, or the origins of agriculture. Armed with imprecise dating methods, archaeologists have tended to view transformative changes as events, for which we then struggle to identify prime movers or causes. Chronological precision, however, allows us to study the past at the scale of lifetimes and generations, allowing us to understand how qualitative transformations unfold in multiple dimensions. We illustrate our point with a case study from Aztec—a monumental Chacoan complex in the Southwest United States. Earl Morris originally used stratigraphic dating to argue for rapid change at Aztec—an early "Chacoan" followed by a later "Mesa Verdean" occupation. Today, hundreds of tree-ring dates allow archaeologists to see nuanced shifts over several generations at Aztec. Chacoan building ideas were initiated by colonists, carried forward by the next generation, and ultimately translated into the McElmo style as part of a qualitative social transformation.

- [257]** *Discussant*

- [189]** *Chair*

McGuire, Kelly [341] see Hildebrandt, William

McGuire, Heather (University of Tulsa)

- [397]** *A Comparative Study of the Barn Owl (Tyto Alba) Pellet Taphonomic Signature Across Regions: Implications for Paleoenvironmental Reconstructions in Archaeological Sites.*

Barn owls (*Tyto alba*) are the most common accumulators of micromammal assemblages in archaeological sites. These assemblages have been shown to be a good proxy for local environments and thus, for paleoecological reconstructions. Previous research assumed all comparative samples of micromammal assemblages from barn owl pellets have a taphonomically similar signature. Surprisingly, this has never been tested; thus, reducing the overall robusticity of current paleoenvironmental reconstructions. This study proposes to systematically test these assumptions by comparing the taphonomic signatures of micromammal assemblages accumulated by Barn Owls from northern Israel, South Africa, southwestern United States, and augmented with data from the literature. All bones were observed through an S8 APO Stereomicroscope and, a sample through a backscatter electron microscope (BSE). Variables included digestion and post regurgitation processes of weathering, fragmentation and abrasion. Preliminary results suggest that differences between barn owl assemblages from different regions are minimal. These results indicate that the taphonomic pattern of micromammal assemblages from barn owl pellets can be used as a modern comparison in archaeological studies regardless of their geographic origin and provide useful methodological information for conducting paleoecological studies in archaeological sites.

McHugh, Sean [405] see Veit, Richard

McIntosh, Brandon

- [130]** *Bird and Fish Remains from Isla Cilvituk: Evidence of Ecological and Market Niche Construction in a Postclassic Maya Lacustrine Environment*

The archaeofauna of Isla Cilvituk, a Postclassic (A.D. 900-1520) Maya site in the state of Campeche, Mexico, offers a unique opportunity to understand differential subsistence and economic strategies across the Postclassic Yucatan. With significant ecological diversity found throughout the peninsula, the production of empirical data from the zooarchaeological record can provide a contextual framework through which the evolution of prehistoric human behavioral ecology may be interpreted in terms of resilience following the so called "Maya Collapse."

In this paper, the archaeofauna assemblage of the inland lacustrine site of Isla Cilvituk is compared to Mayapan and the Postclassic settlements on Cozumel Island. As these three sites are located in

various ecological regions, an account of relative taxonomic abundance across sites will provide context for how people at Isla Cilvituk, Mayapan, and Cozumel utilized their local environments and related faunal resources to sustain daily life and participate in market exchange. Such comparison can highlight differential market niche construction strategies across the Maya landscape. People across the Maya region likely extracted commodities specific to their local ecosystems as a way to remain socially, politically, and economically relevant during the Postclassic.

McIntosh, Susan [140] see Babalola, Abidemi

McKeown, Ashley [206] see Green, Kirsten

McKey, Doyle (Center d'Ecologie Fonctionnelle et Evolutive, University of Montpellier), Mélisse Durécu (Center d'Ecologie Fonctionnelle et Evolutive, Univ), Marion Comptour (Center d'Ecologie Fonctionnelle et Evolutive, Univ), Christine Raimond (Laboratoire de Géographie, PRODIG, UMR 8586 CNRS,) and Axelle Solibiéda (Laboratoire de Géographie, PRODIG, UMR 8586 CNRS,)

[350] *Living Systems of Raised-Field Agriculture in Africa: What Can They Tell Us About Precolumbian Systems in the Neotropics?*

The study of precolumbian raised-field agriculture is marked by several unresolved questions: How did raised fields function as agroecosystems? Were they cultivated continuously or were fallow periods incorporated? What population densities did they support? Did making and managing raised-field landscapes require top-down control in a hierarchical society (or supervision by specialists)? Can raised-field agriculture play any role in reconciling food production and ecosystem services in wetlands today? Attempts to answer these questions have drawn on three main kinds of data: geoarchaeological data; information on rare surviving systems such as the chinampas, probably atypical; and information from experiments in rehabilitated raised fields. Living African systems provide new kinds of data. Forty years ago Denevan and Turner drew attention to extant raised-field agricultural systems in the Old World tropics. However, there has been no sustained attempt to use these living systems as mirrors on the past. We present data from ongoing studies of extant raised-field agriculture in seasonal wetlands of the Bangweulu Basin in Zambia and the cuvette of the Congo. These studies are providing information pertinent to unresolved questions surrounding precolumbian raised-field agriculture in the neotropics and the agronomic potential of this technique in the past, now and in the future.

McKey, Doyle [350] see Renard, Delphine

McKillop, Heather (Louisiana State University)

[413] *Wild Cane Cay, Southern Belize: Major Classic to Postclassic Maya Trading Port*

A natural harbor, strategic location in the mouth of a navigable river and opposite the Paynes Creek salt works, Wild Cane Cay developed from a fishing village in the Early Classic (A.D. 300-600) to a major trading port from the Late Classic (A.D. 600-900) through the Postclassic (A.D. 900-1500). As skilled mariners, the Wild Cane Cay Maya were familiar with the shoals, storms, and other hazards of the sea, as well as the endless opportunities for travel on the sea. During the Classic period, sea trade along the Yucatan brought jadeite and other greenstones, obsidian and pottery from the Maya highlands of Guatemala, the Rio Motagua, and from Honduras, visible on a clear day. Wild Cane Cay likely brokered the inland trade of marine resources, including salt from the Paynes Creek salt works, as well as jadeite, obsidian, and other resources from sea trade. With the abandonment of nearly all inland cities at the end of the Classic period, the Paynes Creek salt works were abandoned. The mercantile Maya on Wild Cane Cay took advantage of emerging polities in the northern Maya lowlands, the expansion of circum-Yucatan sea trade, and expanded their repertoire of goods from nearby and distant sources.

[42] *Discussant*

[413] *Chair*

McKillop, Heather [243] see Feathers, Valerie

McKinnon, Jennifer [72] see Scott-Ireton, Della

McKnight, Jules [236] see Pollack, Rebecca

McLaren, Whitney [90] see Ericson, Jessica

McLay, Eric [80] see Grier, Colin

McLay, Eric (University of Victoria)**[152]** *Ancient Clam Gardens of the Southern Gulf Islands*

Clam Gardens of the Southern Gulf Islands and southeastern Vancouver Island, British Columbia

This paper describes a comprehensive, five-year archaeological project to identify and document the location of ancient intertidal clam garden features in the Southern Gulf Islands and southeastern Vancouver Island, British Columbia. It was discovered that clam gardens in the Southern Gulf Islands region were extensive, exhibited clear patterning in location and morphology, and were monumental in size, several reaching over a kilometer in length. These rock-walled landscapes, however, are visible only at the lowest zero tides of the year, which likely attests to their antiquity relative to regional sea level rise. Their location and size suggest large-scale community works. While current resource management literature emphasizes food scarcity, the sheer size and scale of clam gardens in this key archaeological region points towards economic interests in food production for surplus, regional trade and exchange. The discovery of these intertidal landscapes transforms our normative understanding of “seasonal” settlement activity in the Southern Gulf Islands to reframe the islands as a center for past shellfish and marine-oriented economic production on the Northwest Coast.

McLeod, Christopher (Toby) (Sacred Land Film Project)**[30]** *Standing on Sacred Ground*

In 40 years of filmmaking, I have explored indigenous peoples' relationship to sacred places threatened by extractive industries spawned by a culture that values profiting, owning and collecting material artifacts of great worth. Archaeology – like filmmaking – has evolved in the last 40 years to include the concerns and perspectives of cultures all over the world, including indigenous people. Previous methods labeled Euro-centric, racist or exclusionary have been intensively questioned. If the earth is sacred, if a place is sacred, if a burial is sacred, digging and extracting are considered desecration by many vocal critics. If a ceremony is sacred, many native people feel filming the ceremony is sacrilege. There are now many archaeologists and filmmakers raised in indigenous traditions, and many “outsiders” who have worked with indigenous communities and built trust over decades. The dialogue about what is sacred, what should be respected and left alone, is one of the most important conversations on the planet. Understanding sacred places, apologizing for past injustices, recognition of history and pursuit of reconciliation will heal, restore balance and move us all forward on a better path.

McManamon, Francis (Center for Digital Antiquity)**[123]** *Best Practices for Good Digital Curation*

Archaeology is awash in digital data. Archaeologists generate large numbers of digital files in their field, laboratory, and records investigations. We use digital mapping, digital photography, digital means of data analysis, and our reports are drafted and produced digitally. Good curation of digital data provides easy means by which it can be discovered and accessed, as well as ensuring that it is

preserved for future uses. In many ways the planning for and carrying out good digital involves similar steps as does good curation of artifacts, samples, and paper records, however, the digital techniques are different. We summarize best practices in this emerging part of archaeology with real world examples.

[5] *Discussant*

McManus, Ellen [337] see Britton, Kate

McMichael, Crystal (Florida Institute of Technology), Dolores Piperno (Smithsonian Tropical Research Institute), Eduardo Neves (Laboratório de Arqueologia dos Trópicos, Museu de) and Eduardo Tamanaha (Laboratório de Arqueologia dos Trópicos, Museu de)

[186] *Signatures of Human Occupation in Amazonian Soils*

The extent and intensity of precolumbian human impacts on Amazonian forests have remained important topics of debate for decades. Traditional views of precolumbian Amazonia as a 'pristine forest' have recently been replaced by predictions of vibrant cultures frequently scattered across the Basin. A primary form of evidence for the latter includes the presence of terra preta soils, which are nutrient-enriched anthrosols that were formed in prehistory. Archaeological and paleoecological investigations are typically site-specific, but soil phytoliths and charcoal can be analyzed from any point across the ~6 million km² tract of Amazonian forest. Here, we use both proxies to reconstruct fire and vegetation changes from sites with known precolumbian human occupations (terra preta sites). We compare these data with previously published soil charcoal and phytolith data from sites with no known or unknown occupation histories. The terra preta sites contained large amounts of charcoal, and phytolith assemblages were dominated by palm taxa. These results corroborated previous findings in areas with lesser human impacts, which contained less charcoal and were dominated by forest taxa (not palms). These comparisons will allow us to calibrate charcoal and phytolith signatures along a gradient of ancient human impacts.

McMurry, Sean (Enviroscientists, Inc.), Opal Adams (Enviroscientists, Inc.) and Richard DeLong (Enviroscientists, Inc.)

[90] *I Can See Clearly Now!: Successfully Implementing Visual Analysis into Cultural Resource Management Projects*

Visual analysis is one method used to assess indirect effects of an undertaking on cultural resources that are eligible or potentially eligible for the National Register. Viewshed analysis is commonly used to implement the visual analysis; however, to accurately assess the indirect effect, the overall scope of a project must be tied to the project activities. Perspective analysis can be used to determine the project's visibility distance, or the maximum distance at which project activities are discernible by the human eye. Using perspective analysis combined with viewshed analysis, it is possible to determine the extent to which project activities are visible more accurately than just calculating viewsheds. Data generated from viewshed and perspective analysis can then be used to in visual simulations to represent the indirect effects. This presentation will discuss several case studies where visual analysis was used to assess the indirect effects of a project on cultural resources.

McMurry, Sean [392] see Hauer, Craig

McNabb, John [174] see Cole, James

McNeil, Jessica-Louise (University of Queensland), Alex Marginson, Chris Clarkson (University of Queensland) and Alex Mackay` (University of Wollongong)

[121] *Color Signature Analysis: A New Refitting Method*

Although the analytical worth of lithic refitting is rarely disputed, it is widely acknowledged that the technique is time- and labor- expensive. This project describes a new method aimed at improving the efficiency and efficacy of refitting studies by using color scanning technology to capture the discrete color signatures of individual lithic artifacts. This technique allows an assemblage to be digitally and objectively divided into small color-based raw material units (RMUs) that have a high probability of

containing potential refits. Two purpose-built software programs are employed within the project - an iOS application that works in conjunction with color scanning hardware to rapidly and accurately collect data, and a Windows.NET application built to test the viability of the technique. These applications are used in conjunction with a relatively inexpensive and portable chroma-meter (NODE+ Chroma 1.2). Whilst the technique aims primarily to facilitate refitting studies, this study also demonstrates the continuing value of incorporating new and innovative technologies within the archaeological analytical sphere.

McNeil, Cameron (Lehman College, CUNY)

[366] *Identity on the Edge of the Kingdom: The Artifacts, Residences, and Ritual Areas of Río Amarillo, Copan*

Excavations at the site of Río Amarillo, an ancient Maya town, reveal a community with complex affiliations influenced by the waxing and waning of Copan's power. While seemingly autonomous during the Early Classic period, the Late Classic inhabitants of Río Amarillo's ritual core from the time of Ruler 12 through the reign of Ruler 16 embraced important aspects of the ideology and identity of the Maya city of Copan. These affiliations extended to an elite residential sector where a censer with a lid in the form of K'inich Yax K'uk' Mo', the first Copan Maya king, was uncovered. The Late Classic contexts contain a mixture of Ulua polychrome and Copador ceramics echoing similar patterns found in Copan's ancient center. With the breakdown of the political structure of the southern Lowland Maya cities, including Copan, the inhabitants of Río Amarillo, concentrated their settlement in higher areas, and returned to a reliance on predominantly locally-produced ceramics while continuing to trade for goods from El Salvador, highland Mexico, and the interior of Honduras.

[183] *Chair*

McNeil, Cameron [183] see Barrios, Edy

McNiven, Ian (Monash University, Australia)

[105] *Increase Rituals and Risk Management on the Precarious Small Sandy Cays of Central Torres Strait*

The Kulkalgal of central Torres Strait are marine specialists who established a series of viable hunter-horticultural communities on small sandy cays highly vulnerable to seasonal drought and associated water and plant food shortages. Here risk management strategies focused on the well-known buffering mechanisms of high mobility, translocation, food and water storage, and plant food importation. However, for the Kulkalgal, risk management strategies for survival also involved a broad range of ritual practices aimed not only at increasing the material productivity of key terrestrial resources but also maintaining social organizational structures underpinning more secular buffering mechanisms. Many of these ritual practices centered on specialized shrines marked by clusters of human skulls, marine mammal bones, large marine shells, and imported cobbles. This paper documents these shrines and develops a theoretical and methodological framework to document the form, function and developmental history of these shrines.

McPherron, Shannon [139] see James, Emma

McPherron, Shannon P. [53] see Martisius, Naomi L.

Mcrostitie, Virginia

[247] *Pre-Inka and Inka (A.D. 1000-1500) Agriculture in the Atacama Puna. Evidences through Microfossils Attached to Lithic Hoes*

This research is part of the ongoing Conicyt-NSF project "Water Management and Agrohydraulic Systems in Desert Environments: The Upper Loa from A.D. 1000–1500". Complex irrigation systems and extensive terraces are silent testimony to the outstanding achievement of these agricultural societies in a highly arid and extreme environment. Within an interdisciplinary framework, archaeobotanical analyses are providing preliminary and novel information about the crops that were

planted during Pre-Inka and Inka times in two sites: Panire and Topain. Residue analyses have been done for hoes collected on the surfaces of the terraces and farm fields. Pilot screenings reveal a dense presence of starch grains, whose characteristics resemble highland tubers: *Oxalis tuberosum*, *Tropaeolum tuberosum*, *Ullucus tuberosum* and/or potential varieties of *Solanum tuberosum*. The lack of non-indigenous evidence on these sites and their extreme isolation argues against contamination. Future work is aimed towards further discriminating the taxonomy of these archaeological starch grains. These findings contribute to a better understanding of the local prehistory, and the impact that the Inkas produced in the local economy. They also allow us to begin to understand local agroecological practices, which today have practically vanished due to desertification and urban migration.

McTavish, Rachel [331] see Picard, Jennifer

Means, Bernard (Virtual Curation Laboratory)

[124] *Bring Out Your Dead: Pondering Passenger Pigeons (and Projectile Points) While Building Digital Type Collections at the Virtual Curation Laboratory*

With support from the Department of Defense's Legacy Program, I am working with undergraduate students in the Virtual Curation Laboratory to create digital type collections of chipped stone tools and zooarchaeological elements. These efforts include scanning stone tools from classic projectile point guides at the New York State Museum (Ritchie's "Typology and Nomenclature of New York Projectile Points") and the Research Laboratories of Archaeology at UNC-Chapel Hill (Coe's "Formative Cultures of the North Carolina Piedmont"). The zooarchaeological type collection includes a wide range of animals, with special attention paid to the passenger pigeon--a species that "celebrated" the 100th anniversary of its extinction in September 2014. Most of our zooarchaeological efforts have drawn on the extensive collections of the Virginia Museum of Natural History, with a few elements provided by the Smithsonian Institution's National Museum of Natural History. These 3D digital type collections enable more accurate and faster identification of archaeological items. 3D replicas printed from the digital models are well suited to creating physical type collections, for incorporation into K-12 and undergraduate education, and for integration into public outreach efforts. The generation of 3D models and printed replicas also encourages co-creation projects by undergraduates working in the Virtual Curation Laboratory.

[282] *Discussant*

[124] *Chair*

Meanwell, Jennifer (MIT)

[25] *Function-Based Processing Decisions in the Middle Balsas Region of Guerrero, Mexico*

Petrography has long been recognized as a powerful way to understand pottery provenience and production decisions. Despite this, few studies focus on production decisions made by potters working in a single community, especially potters who practice household-level production. In this paper, I investigate decisions made by potters at the site of La Queseria, Guerrero, Mexico during the Classic Period (A.D. 200-900). Petrographic analysis of their vessels suggests that two major clay sources were utilized for production at this site and chemical sourcing techniques confirm that the fabrics identified in thin section are distinct enough to be distinguished using multi-variate statistics. Despite this, vessels of various shapes and functions were produced from both sources over at least 1000 years of occupation at the site, suggesting an enduring potting tradition. Data gleaned from ethnographic interviews of modern potters in the area, experimental reconstructions, and analysis of replica test bricks have allowed us to reconstruct many aspects of this ancient technology, including forming techniques, firing temperatures, and likely properties of the finished vessels. This case study demonstrates that the Middle Balsas potters developed a production tradition that performed adequately and was passed on practically unaltered for the next thousand years.

Medina, Gilmer [78] see Guillen, Sonia

Medina, Paulo (Boston University)**[193]** *Discussant***[193]** *Chair*

Medina-Arona, David [183] see Welch, Jacob

Medrano, Angélica María**[81]** *The Caxcans of Nueva Galicia, Nahuatl Warriors of the Northern Mesoamerican Frontier*

When the Spanish entered northwest Mexico in 1529 they confronted a bellicose people, the Caxcans, occupying numerous settlements in the southeastern drainages of the Sierra Madre Occidental, los Altos of Jalisco and Zacatecas. The Caxcans—ethnically and culturally related to Nahuatl-speaking groups of Central Mexico, including the Mexica—were one of the northernmost Mesoamerican cultures in sixteenth-century New Spain. Data from recent investigations are presented, clarifying the position of the Caxcan people in the cultural geography of Mexico before and during the Conquest era, and the significance of their interactions with the Spanish as the frontier rebellion known as the Mixtón War of 1541-42 erupted.

Meehan, Pascale (Université de Montréal) and Rachel Egan (University of Colorado-Boulder)**[153]** *Ethnohistory, Oral Tradition, and Archaeology: Examples from Oaxaca, Mexico and the Four Corners Region of the United States*

Increasingly, archaeologists recognize the value of oral tradition and ethnohistorical records in as sources of regional historical knowledge that can contribute to archaeological interpretation. This paper will combine examples from two regions, the Pueblo area of New Mexico and Colorado and the area of Santa Maria Zacatepec, Oaxaca. The section on the Pueblo area will examine how Pueblo oral migration stories and traditional knowledge have directed archaeological investigations and informed interpretations. The information from Oaxaca will discuss oral indigenous Tacuate migration stories in conjunction with 16th century ethnohistorical histories. Both these examples explore how oral tradition and ethnohistorical sources have the potential to add to our insight of indigenous understandings of the past as well as inform on potential avenues for future archaeological study.

Meeks, Scott [173] see Cyr, Howard

Meer, Kelsey [74] see Miller, D. Shane

Megarry, Will [199] see Comer, Douglas

Megarry, Will (Cultural Site Research and Management), Gabriel Cooney (University College Dublin), Robert Sands (University College Dublin), Douglas Comer (Cultural Site Research and Management, The Johns H) and Bryce Davenport (Cultural Site Research and Management)**[199]** *Mapping Marginal Landscapes – A Study from Neolithic Shetland*

The Shetland Islands are the northernmost part of Europe where farming was practiced in the Neolithic, between 3800 and 2500 B.C.E. The islands' isolated location coupled with distinct environmental factors resulted in distinctive and localized customs and economies. These are most clearly manifest in the production and distribution of felsite polished stone axes and Shetland knives sourced from linear grey-blue dykes in the elevated North Roe region of the islands. These artifacts are found throughout the islands but never further afield. This paper presents data and some preliminary findings from a project undertaken by University College Dublin School of Archaeology. Geographical information systems form the backbone for storing and viewing the many datasets used in the project. They also facilitate multi-scalar analysis allowing us to explore questions of landscape and environmental interaction at different scales from the regional sourcing of felsite to

individual quarry site morphologies and topographies. This paper will explore some of the work undertaken using GIS, remote sensing and more quantitative analytical techniques including site prediction, exploring economies of movement and transportation and understanding the role of the perceived environment in site situation.

Mehta, Jayur (Tulane University) and David Abbott (Mississippi Department of Archives and History)

[173] *Mound Summit Archaeology at the Carson Site, Coahoma County, Mississippi*

In 2014, the Carson Mounds Archaeological Project (CMAP) excavated a structure on the summit of Mound D. In addition to a cache of Mississippian chisels, or woodworking tools, excavations revealed several rebuilding episodes associated with this structure. Furthermore, a well-fired and compact earthen floor was discovered underneath the daub fall. This presentation focuses on excavations and findings, radiocarbon dates from the structure and Mound D, and also includes a discussion on thin-section analysis of the structure floor.

Meierhoff, James (University of Illinois at Chicago) and Joel Palka (University of Illinois at Chicago)

[76] *Close to the Edge: 19th Century Maya Refugees at Tikal, Guatemala*

In the second half of the nineteenth century, the ancient Maya city of Tikal, Guatemala, was briefly reoccupied by Yucatec refugees fleeing the Caste War of Yucatan. The Tikal village was poised on the confluence of the frontiers of Mexico, Guatemala and British Honduras, as well as the belligerent Santa Cruz Maya from Yucatan. Despite the limited presence of settled European diasporas in the northern Petén, colonial institutions were still able to reach indigenous communities seeking refuge within the frontier zone. However, due to the positioning of these remote communities, they were well equipped to interact and attempt a renegotiation to outside pressures and markets on their own terms. Communities in the frontier zone had forest products desired in the informal regional exchange spheres, such as game animals, incense, bee's wax, and tobacco. In the case of the Tikal village, the inhabitants exploited the differing conceptual uses of the same space to obtain a wide array of exotic and foreign manufactured goods, including metal tools, guns, and decorated pottery, while seeking a new life and autonomy within the "Last Maya Frontier."

Meissner, Nathan (Southern Illinois University Carbondale) and Prudence Rice (Southern Illinois University Carbondale)

[219] *Postclassic Petén Maya Bow and Arrow Use as Revealed by Immunological Analysis*

The bow and arrow has long been recognized as a key component of weaponry in the Postclassic and Contact period (A.D. 1400–1697) Maya Lowlands. Although fragmentary accounts from Spanish sources exist to complement the archaeological record, no current research has reconstructed use patterns of the bow and arrow from artifact data. This paper provides the first immunologically-based study of protein residues on small projectile points in the Maya region. A large sample of 108 small points from the central Petén lakes region was submitted for cross-over immunoelectrophoresis (CIEP) analysis, resulting in 25 positive matches to available antisera. Immunological positives for human, local fauna, and introduced fauna were identified by this study, indicating a wide range of use activities for the bow and arrow that include subsistence, ritual, and possibly defense.

Mejia-Rangel, Minerva [129] see Muñoz, Maria De

Mekonnen, Habtamu [379] see Perlingieri, Cinzia

Melendez, Juan (Washington University in St. Louis)

[338] *The Rebirth Of The Maize God: Contextualizing Burial 37 From El Perú-Waka'*

At the core of the ancient Maya site of El Perú-Waka', Petén, Guatemala, an elaborate burial was discovered inside Structure M12-32 dated to around A.D. 600. The burial contained human remains of a ruler, who probably belonged to the centipede dynasty, known in the past as Wak. The diversity

of artifacts placed with the ruler, including a greenstone mosaic, pyrite mirror, and an alabaster vessel, suggest not only that this person was wealthy, but also asserts the important influence of El Perú with regards to trade in the Southern Maya Lowlands during the end of the sixth century. However, not much was known regarding the significance of this funerary precinct, therefore its meaning was explored through the application of the contextual analysis method, which takes into consideration the arrangement of offerings and the iconographic study of symbols depicted on material culture. The results suggest that the ruler in Burial 37 and the grave goods that accompanied him into the afterlife are narrowly associated to the conception of the world tree, considered the axis mundi in Maya cosmology. Moreover, some of the artifacts could refer to the potential name of this king.

Melgar, Emiliano (Posgrado UNAM)

[346] *The Jewelers of the Palace Crafting for the Gods: The Lapidary Objects and the Development of the Imperial Technological Style*

After the defeat of Azcapotzalco in A.D. 1428, the rulers of Tenochtitlan employed different strategies to recreate and reinforce their identity during the Triple Alliance. One of them was the regional request of master artisans, called tolteca, for working at the Aztec capital. Some of these craftsmen and their workshops were located inside the palaces of the tlatocue. Among them were the jewelers that crafted sacred objects for the gods and prestige goods for the elites. The technological analyses of the lapidary objects from the Great Temple, using experimental archaeology and characterization of the manufacturing traces with SEM; and their comparison across the different constructive stages, allowed us to identify the development of the Tenochcan Imperial Style.

[346] *Chair*

Melgar Tisoc, Emiliano Ricardo [217] see Valtierra Vega, Daniel

Meliconi, Ilaria

[418] *Publishing Masterclass*

This is a publishing masterclass covering five major aspects of the publishing process: (1) copyright (what it is and what it's for); (2) ethics (plagiarism, fabrication, and falsification; retraction, expression of concern, correction (or erratum)); (3) Open Access and CC licenses: what are the options; (4) Impact Factor and other metrics: what they are, how they are calculated; (5) how to be not just a reviewer but a great reviewer. The topics will of course be relevant for all disciplines and all academic journals, not just those published by a specific publisher. There will be time for questions and discussion, and the participants will choose which modules will be covered.

Melton, Mallory (University of California Santa Barbara)

[109] *Communal Food Processing and Culture Contact: An Analysis of Plant Foods and Architecture in the Protohistoric North Carolina Piedmont*

Communities cannot be fully identified by their built landscapes; they must also be understood in terms of mundane activities that enact communal bonds. In this paper I use plant remains and pit features to examine communal food processing events at two Protohistoric sites in Hillsborough, North Carolina: Wall (A.D. 1400-1600) and Jenrette (A.D. 1650-1680). By combining a functional analysis of features with a spatial analysis of plants, I have identified two types of discard patterns: larger pits filled with staple foods in public space versus smaller pits filled with mostly supplemental foods in domestic space. Based on these analyses, I present evidence of communal processing activities and examine diachronic change in the types of plants processed. In interpreting these data, I consider why certain foods were processed (and perhaps consumed) in communal contexts by women engaged in food production and how changes in communal food processing relates to the destabilizing effects of European contact on Native communities.

Melton, Terry [202] see Boyd, Charles

Melton, Judith (Texas A&M University) and Jesse W. Tune (Texas A&M University)**[220]** *On The Waterfront...Or Not: Investigating the Relationship Between Late Archaic Landuse Patterns and Hafted Biface Curation in the Midsouth*

During the Late Archaic period in the Midsouth United States people appear to have practiced seasonal landuse patterns. Warm weather aggregation sites were located along major rivers in the region, while upland site locations reflect occupations of dispersed populations during colder periods. To understand how people organized biface technology within such a seasonal mobility pattern, we analyzed the relative curation rate of hafted bifaces from multiple sites. Magnolia Valley (40RD314) and Fernvale (40WM51) are both Late Archaic sites in the Harpeth River Watershed in middle Tennessee. Magnolia Valley is located in an upland valley, while Fernvale is located on the South Harpeth River. We predict that the level of biface curation was not constant throughout the year, and thus, biface curation values will vary between site types. With this lithic curation analysis, relationships between locale and technological organization will be identified.

Meltzer, David [35] see Andrews, Brian

Meltzer, David (Southern Methodist University)**[296]** *What If the Restaurant Isn't at the End of the Universe but in a Much Nicer Place?*

In their 2012 paper, 'The restaurant at the end of the universe,' O'Connell and Allen developed a speculative and far-reaching model for the colonization of Sahul, one that sees initial populations as small, spatially concentrated in scattered 'sweet' spots, and which exhibited only occasional growth spurts and geographic expansion along extant coastlines. Although granting the obvious differences between the environmental stage and historical conditions under which the Pleistocene colonization of Sahul and the Americas took place, their model provides an opportunity to riff on the process (processes?) by which North America may have been colonized in the late Pleistocene; what may have served as triggers for the movement of people across what was arguably a far richer landscape than Sahul, and perhaps at faster rates; and serves as a useful heuristic device for identifying the types and availability of archaeological evidence by which the model can be put to the test.

Menaker, Alexander (University of Texas-Austin)**[393]** *An Archaeological and Historical Inquiry of Andagua, Peru, 1000-1800 A.D.*

This paper outlines developing dissertation research that integrates archaeological and historical evidence about the community of Andagua and the Ayo Valley in the Southern Peruvian Andes. Constructed as a Spanish colonial *reducción*, Andagua resides in a seldom-visited highland area, and today is merely considered a rural, provincial neighbor of Arequipa. Andagua, however, has a striking past evident in the substantial prehispanic remains that surround and lie buried beneath the contemporary town. Andagua and the surrounding valley have not received any systematic attention from archaeologists, while an intriguing court case from the mid-18th century recounts how Spanish officials burned ancestral mummies and attempted to eradicate Andean religious beliefs and practices around Andagua. This paper provides preliminary research of the cultural history of the area along with further exploring the "tensions of empire," and asks, how and why did ancestor veneration and mummy worship continue into the mid-18th century among the colonial Andean community of Andagua, and yet at the same time the Andean community identified as subjects of the king of Spain?

Ménard, Clément [401] see Khalidi, Lamya

Mencos, Elisa (Universidad San Carlos de Guatemala)**[193]** *Conjunto Los Árboles: Its Use*

This paper is about the iconographic analysis of the stucco decoration that is part of the exterior facade of the Joint Trees, which shares certain characteristics with the structure of the site called El Diablo at El Zotz, Guatemala Petén, dated to the Early Classic. Likewise Structure 10L-26, whose different layers constitute constructive states within buildings housing royal tombs, shared

iconography and preservation techniques with El Conjunto Los Árboles. To complement the iconography, the use of the interior of buildings will be analyzed by defining the architecture and decoration. Briefly I will talk about the location of this acropolis in the site, making reference to the northern area where there is a steam bath featuring stucco decoration made with the same technique and colors. The aim is to reconstruct the history of the dynasty at Early Classic Xultun and expand the information expand our knowledge of the lowland dynamics during this time.

Mendelsohn, Rebecca (University at Albany, SUNY)

[151] *New Discoveries in the Izapa "Protoclassic" and Early Classic Periods*

Izapa is best known as a Formative period (850-50 B.C.) monumental center with elaborately carved monuments. The site is also known for its Late Classic period monumental construction in Group F, at the northern end of the site. Considerably less attention has been paid to the transitional Terminal Formative or "Protoclassic" period Hato and Itstapa phases (50 B.C.-A.D. 250), as well as the Early Classic period Jaritas phase (A.D. 250-400), which bridge the temporal gap between these two centers. This paper presents new data from the 2013 excavations of the Izapa Household Archaeology Project and addresses this transitional period. It will summarize the recently refined ceramic chronology for the Hato, Itstapa and Jaritas phases, present new C14 dates, and discuss the interactions between people at Izapa with other regions of Mesoamerica during this time.

Méndez, César (Universidad de Chile), Omar Reyes (Centro de Estudios del Hombre Austral), Amalia Nuevo Delaunay (Universidad Alberto Hurtado), Héctor Velásquez and Valentina Trejo

[2] *Alero las Quemadas, a Key Site for the Study of Human Occupations of Andean Forest in Patagonia (Aisén, Chile)*

The hunter-gatherer occupation of the Andean forests is a major issue for understanding the variability of human adaptations in Patagonia. The paucity of sites at key locations and the incomplete understanding of the climate-human dynamics undermine the full comprehension of the exploration and colonization of such habitats. We present recent work on Alero Las Quemadas, a rock shelter with occupations starting at 6110 cal BP, currently located in the forest-steppe transition of the Aisén region (44° S). Among other topics, we focus on the site context, geoarchaeology, rock art description, and the study of the lithic assemblage. We compare this record with locally available environment reconstructions of lake sediment cores that characterize the fluctuations of the forest-steppe boundary since the Post Glacial. The results consistently suggest that the main occupations extended between 2430 and 2950 cal BP, a period that fully coincides with the most significant Holocene contraction of forests and the highest frequencies of fire episodes as shown by the analyses of pollen and charcoal particles, respectively. The new results herein presented are discussed within the frame of the archaeological data at other contiguous environments and in relation to the current models of forest occupations. FONDECYT# 1130128 grant.

[2] *Chair*

Mendez-Quirós, Pablo [318] see Vidal Elgueta, Alejandra

Mendizabal, Tomas, Jordi Tresserras (Ibértur - Universitat de Barcelona), Javier Laviña (Universitat de Barcelona), Ricardo Piqueras (Universitat de Barcelona) and Marta Hidalgo (Universitat de Barcelona)

[170] *Afrocolonial Archaeology in Panama: La Villa de Santiago del Príncipe, the First Free African Peoples of the Americas*

The first free African peoples of the Americas were the inhabitants of the town of La Villa de Santiago del Príncipe, founded in 1579 when Don Luis de Mozambique and his followers became the first group of cimarrones (escaped slaves) to negotiate a peace with the Spanish Crown, after decades of what came to be known as the "Cimarron wars". These were a conflict in which cimarrones would predate upon Spanish isthmian trade routes and even support foreign attacks on the mainland. Weary of the fighting, the Crown called upon those cimarrones who wanted peace and granted them a full pardon and their freedom, and after negotiations, also land to settle and goods to trade. Archival documentation and cartography state that Santiago lay not more than one league to

the east of Nombre de Dios, the Caribbean terminal of the Camino Real across the Isthmus. Following these leads, archaeological surveys and test excavations in the area in early 2014 located evidence of a 16th century occupation that due to its location, size, ceramic typology and chronology, we contend is the town of Santiago. We present the documentary and material evidence to support our claims.

Mendizabal, Tomas [381] see Myers, Emlen

Mendizábal, Tomás [170] see Martin, Juan

Mendonça de Souza, Sheila [415] see Dos Santos, Isabel

Menéndez, Damaris [338] see Cagnato, Clarissa

Meniketti, Marco (San Jose State University)

[44] *Work and Models of Efficiency in Eighteenth and Nineteenth Century Sugar Factories: A Caribbean Case Study*

Industrial design can increase labor management and mobility, increase efficiency, and structure worker behavior. As the industrial period evolved during the eighteenth century, experiments in factory layouts produced efficient modes of production. But when the labor is enslaved, efficiency cannot always be defined in terms of time or cost. This paper presents the industrial foot-print and spatial design of factories at several sugar plantations spanning over two centuries of operation on a former West Indian British colony. Archaeological investigation of nine factories offers insights into work regulated by confinement, patterned by punishment and managerial surveillance. These were non-negotiable spaces, consciously designed to maintain product quality, a uniform flow of sugar, and the maximization of labor with a whip. Although workers were property, and labor was being perceived as part of the machinery, there was, nonetheless, covert space for individual pride among the skilled who held more power over the final product than plantation owners might have cared to admit. It is hypothesized that changes observable in factory layouts are representative of reconceptualization of the individual, and of space itself, as much as efforts to increase labor efficiency, during a period in which significant societal changes were occurring.

[44] *Chair*

Mennear, David

[299] *Making the Bioarchaeology of Care Methodology Public: Understanding the Roles of Ethics, Communication and Public Engagement in a Novel Approach to Physical Impairment in the Archaeological Record*

This presentation will discuss the public perception and communication of the Bioarchaeology of Care approach and the accompanying Index of Care program. The ethical considerations of the methodology, as an integral feature of working with human skeletal remains, will also be considered and discussed within a consideration of who 'owns' the past and, more specifically, who (if anyone) owns the remains of individuals. In particular it will focus on individuals who are described as disabled, or as physically impaired, in the archaeological record, and who are often only understood through the context of the researchers' own cultural understanding of the nature of disability, and are often only the focus of a case study. Communication and public engagement are burgeoning areas of interest to bioarchaeologists as archaeology seeks to go beyond academic and commercial boundaries. As such, new media methods will be discussed, such as blogging and education outreach, in the context of advertising the methodology for potential researchers and members of the public. Therefore this presentation will focus on the novel open approach that the Bioarchaeology of Care offers by contextualizing the methodology within an academic and public sense, highlighting the importance of recognizing care-giving in an archaeological setting.

Mensan, Romain [181] see Bon, François

Mentesana, Roberta (University of Sheffield - UK), Peter M. Day (University of Sheffield - UK), Vassilis Kilikoglou (NCSR "Demokritos" - GREECE) and Simona Todaro (Università di Catania - ITALY)

[79] *Technological Variability in Ceramics of the Neolithic to Early Bronze Age Transition at Phaistos, Crete: An Integrated Approach*

Since the Final Neolithic, Phaistos hosted consumption events leaving deposits of pottery and animal bones, and was a pottery production location from at least the earlier phases of the Early Bronze Age (EBA). A recent re-examination of this important site has produced not only a Neolithic-EBA sequence unrivalled in Crete, but also a deep understanding of the ceramics, tracing change and continuity over this key time of transition, which some have seen as a transformation with an exogenous origin. In order to investigate change over this time, a substantial program of analysis by thin section petrography, SEM, FTIR and pXRF has been carried out to investigate the dynamics of technological choices made in pottery manufacturing over time and to intertwine that information with the contexts of consumption of the site. By integrating macroscopic observation with an analytical protocol, it aims to reconstruct the operational sequence of pottery manufacture. This is integrated with a recent investigation of raw material availability in the area in the context of major geomorphological transformation. The results present a complex picture of continuity and change in pottery manufacture and their relation to consumption practices and architectural transformation at the site.

Mentzer, Susan [35] see Andrews, Brian

Mentzer, Susan (Eberhard Karls Universität Tübingen) and Christopher Miller (Eberhard Karls Universität Tübingen)

[190] *From Kebara to KwaZulu-Natal: Integrating Micromorphology and Mineralogical Analyses in the Study of Diagenesis in Combustion Features*

Since the 1990's, Paul Goldberg's micromorphological analyses at Kebara and Hayonim Caves (Israel) as well as his collaborative efforts to understand chemical diagenesis in caves have served as benchmarks for the high-resolution study of Paleolithic combustion features. This paper highlights the results of micromorphology, Fourier transform infrared (FTIR) microspectroscopy and microscopic x-ray diffraction measurements, which were employed together in order to understand different diagenetic pathways that impacted combustion features at the sites of Sibudu (KwaZulu-Natal, South Africa), Diepkloof Rockshelter (Western Cape, South Africa) and Üçağızlı Cave I (Hatay, Turkey). At Sibudu, phosphate- and sulfate-bearing minerals were identified in the field using portable FTIR analyses of loose sediment samples. The impacts of these minerals on both the physical and chemical preservation of combustion features were addressed using microcontextual analyses. At Diepkloof, mineralogical analyses indicate that burning activities likely impacted secondary sulfate minerals in underlying deposits. Finally, at Üçağızlı Cave I, micromorphological observations of variability in the degree of post-depositional cementation of ashes were corroborated using infrared measurements.

Menzer, Jeremy [7] see Klehm, Carla

Menzer, Jeremy (Department of Geosciences, East Tennessee State University), Eileen Ernenwein (Department of Geosciences, East Tennessee State Un) and Jay Franklin (Department of Sociology and Anthropology, East Ten)

[8] *Combining Geophysics, Photogrammetry, and Archaeological Testing at the Mississippian Pile Mound Site, Upper Cumberland Plateau, Tennessee*

The Pile Mound survey includes magnetometry paired with targeted ground-penetrating radar (GPR), electromagnetic induction (EMI), low-altitude aerial photogrammetry and test excavations over the ca. 6.5 ha site. The EMI survey focused on the mound proper and several distinct magnetometry anomalies to the south and east. The aerial imagery was used to create a photomosaic and digital elevation model (DEM) of the mound and immediate surroundings, and to topographically correct the GPR data. From the GPR survey, we have delineated the location of at least two large rock piles

within the mound. Knowledge of mounds in the Upper Cumberland Plateau is lacking (the closest large excavation occurred at the Croley-Evans sites (15Kx24) mound in Kentucky, some 80 km away), so it is unclear if this is atypical, but this type of mound construction distinguishes it from other Mississippian mounds. In addition, the associated ceramic assemblage appears to reflect more similarity to the East Tennessee Valley rather than the Middle Cumberland region. All together these data provide a unique opportunity to better understand the Mississippian occupation in the Upper Cumberland Plateau of Tennessee.

Meredith, Steven (Panamerican Consultants, Inc.) and Daniel Turner (Panamerican Consultants, Inc.)

[118] *Excavation of an 11th Century Living Surface Buried Underneath a 19th Century Railroad Bed*

Often construction of transportation features from the 19th Century or later is considered to be destructive to earlier archaeological components. The excavation of an 11th Century site in north central Alabama has demonstrated that a 19th Century railroad bed has enhanced preservation of several features that preceded its construction by 800 years. This poster will present a comparison of features found beneath the railroad bed with those located outside of that area.

Meredith, Clayton [155] see Thompson, Jessica

Meredith, Clayton (University of New Mexico), Willa Trask (Texas A&M University) and Keith Prufer (University of New Mexico)

[249] *Examination of Paleoindian and Archaic Subsistence in Southern Belize*

Recent excavations at Tzib'te Yux, a small rockshelter in Southern Belize, have revealed evidence of human occupation in the area spanning the Paleoindian and Archaic periods. Strata dating to the Late Pliocene contain abundant faunal remains, lithic debitage, and highly fragmentary human remains. Preliminary indicators suggest that a broad spectrum of food resources was exploited including considerable input of lotic protein sources as early as the Late Pliocene with continued exploitation into the Classic Period. Evidence for cooking methods lends insight into the utilization of perishable materials to process food resources. Faunal remains were subjected to stable isotope analysis to examine changes in animal diets and forest structure aimed at evaluating how climate variation over this time period impacts the ecology of the region, as well as to establish some baseline data for diet reconstruction of Paleoindian and Archaic peoples inhabiting lowland tropical wet forest environments.

Merewether, Jamie [85] see Schleher, Kari

Merkel, John [371] see Shimada, Izumi

Merriman, Christopher [155] see Thompson, Jessica

Merriman, Christopher (University of New Mexico)

[300] *Addressing Surface Site Palimpsests with GIS and Lithic Technology*

Archaeologists contend with palimpsests and multicomponent surface sites on a regular basis. Although it is interesting to know that one spot on the landscape repeatedly attracted people, these sites present interpretive and methodological problems. Specifically, how can we interpret the behaviors behind non-diagnostic artifacts from multicomponent sites? In this presentation we discuss using a combination of GIS modeling and lithic analysis to better articulate the relationship between non-diagnostic and diagnostic artifacts. The assumption being that closer spatial relationships and technological consistency indicate a stronger temporal affiliation. Buffering, nearest neighbor, correlation, and correspondence analyses in GIS are used to examine spatial relationships between artifact classes. Technological and morphological attributes of flaked stone assemblages can further differentiate between broad time periods (e.g. Paleoindian, Archaic, and/or Late Prehistoric).

Together these analyses can help to eliminate erroneous associations. We have selected a series of multicomponent lithic scatters with high precision spatial data from the Northern Jornada del Muerto in central New Mexico and the Lake Fork Valley in southwestern Colorado. These sites include numerous Paleoindian, Archaic, and Late Prehistoric projectile points, as well as debitage, scrapers, gravers, bifaces, and other tools that spatially overlap.

[223] *Discussant*

Merritt, Stephen (University of Alabama at Birmingham)

[397] *Using a Specimen-Scale Approach and Butchery Traces on the Elbow to Refine Paleoeological Interpretations of Early Stone Age Carnivory*

Assemblage-scale proportions of modified specimens are difficult to link with hominins' early versus late carcass access because fragmentation and other taphonomic processes affect assemblage composition and taphonomic trace visibility. This work advocates butchered specimen interpretation and describes the skeletal location of butchery traces inflicted during the sequence of carcass consumption behaviors. Tool-assisted carcass consumption is divided into early (defleshing limbs), middle (defleshing ribs, vertebrae and head) and late (metapodial tendon removal, element disarticulation, marrow fragmentation) consumption stages. This interpretive model uses actualistic cut mark location and morphology on large mammal elbow specimens to distinguish archaeological defleshing and disarticulation cut marks, which are incised on the elbow during different consumption stages. These observations are integrated with interpretations of other modified specimens to support inferences about hominin and carnivore carcass resource consumption. Three Okote Member zooarchaeological assemblages from Koobi Fora indicate early access to large and small mammal flesh, late stage marrow consumption, and minimal activity from primary and scavenging Carnivorans. Abundant small animal butchery and middle stage resource exploitation stands out at one locality. This corroborates a generalist carnivorous role for *Homo erectus*, who likely hunted small animals, enjoyed early access to large animals, and completely consumed certain carcasses.

Merwin, Daria (Stony Brook University) and Roger Flood (Stony Brook University)

[284] *Multibeam Swath Bathymetry for Underwater Archaeological Investigations*

Remote sensing technologies have long played an important role in underwater archaeological survey, and among the most recent (and increasingly used) additions to the toolkit is multibeam swath bathymetry, which operates by transmitting sound beams perpendicular to a research vessel's track and then processing the returned sonar data to produce a three-dimensional image of the sea floor. Multibeam survey can be particularly useful in water bodies where conditions are not conducive to other forms of study such as photography or scuba diver investigation, as is the case for the Hudson River, where hundreds of anomalies likely to be archaeological sites (mostly shipwrecks) have now been mapped. Thanks in part to funding from the National Center for Preservation Technology and Training, our team was able to experiment with three multibeam systems in the Hudson to determine which works best for examining archaeological sites, and to refine the methodology for field survey as well as for data collection, reduction, and interpretation. In many cases, the high resolution multibeam imagery alone allows us to accurately characterize different ship types. Subsequent work has focused on refining the survey protocol and conducting ground truthing with divers on selected sites.

Mesén, Róger [246] see Benfer, Adam

Mesia, Christian (Universidad San Ignacio de Loyola)

[371] *A classification of Middle Formative (1200 – 800 B.C.E.) Ceramics from Chavin de Huantar*

Recent research has expanded drastically the sample size available for performing ceramic analyses at Chavin de Huantar during the last decade. Initial efforts have showed that the ceramic complexity previously described during the end of the last century has fallen short and that it is necessary to rethink Chavin ceramics in terms of the new data available. In this regard this paper attempts to organize and classify the corpus of ceramics dated from the Middle Formative (1200 – 800 B.C.E.) that came from culturally stratified deposits from the Wacheqsa sector, located immediately at the

north of the monumental core. In this sector two spatial units from the Middle Formative were recorded; one yielded evidence from an early domestic occupation, while the other provided evidence for an early canalization of the Wacheqsa River. A methodological insight is provided as well as the initial results of this classification and their implications in the study or relative chronology for this period in the Central Andes.

[371] *Chair*

Messer, Andrea (Penn State)

[136] *Maya Apocalypse 2012 in the Media: The Cataclysm that Never Was*

December 21, 2012 was supposed to be the Maya apocalypse, the end of the world as we know it. In reality, it was only the end of one Maya calendar cycle of 5122 years -- the end of the 13th Baktun. Even at that, the Maya saw the ending of calendars as a renewal, not an end. But somehow, somewhere this event was interpreted as a coming cataclysm of immense proportion. In the popular press and online, the Maya apocalypse was imminent. How was the coming of this supposed event covered by the press both in the U.S. and elsewhere? Who got it right and who piled misconception upon misconception? What can an event like this tell us about archaeological coverage and how it can go very, very wrong?

[136] *Discussant*

Messner, Timothy (SUNY Potsdam)

[186] *Early Holocene Foraging Strategies in the Eastern United States: A View from Koster*

Over the last several decades, Dolores Piperno has made significant methodological and theoretical contributions to our archaeological understanding of the past. This paper draws on these insights to explore Early Holocene foraging strategies in the Lower Illinois River Valley and how these practices fit within their paleoenvironmental and social contexts. The data presented here offer insights into the long trajectory toward plant domestication in eastern North America and the construction of space and place in the ancient past. Findings from this study emphasize the positive influence Piperno's work has had, and will continue to have, on the archaeological community for decades to come.

Meyer, Georg (University of Liverpool, UK) and Natalie Uomini (University of Liverpool)

[33] *Using Neuroimaging in Archaeology to Investigate Cognitive Evolution*

A big question in cognitive archaeology is whether complex tool-making and language co-evolved in the human lineage. There is considerable overlap in the brain structures that support complex body actions, including pantomiming and tool use, but also making music and using language. The activation of shared brain areas for separate skills is the basis of this popular theory. The aim of this talk is to review some of the difficulties - and possible solutions - to measuring the degree of overlap in neural activation patterns across tasks. Action means motion, but most neuroimaging methods (such as fMRI, which identifies areas in the brain where blood-flow is up-regulated during cognitive processing) require participants to lie still during the scans. We review recent results that correlate blood-flow signatures, obtained using functional Transcranial Doppler Ultrasound, to show how tasks that draw on common networks in the brain cause similar blood-flow patterns. We discuss recent work on multivoxel pattern association that shows how specific mental states or representational content can be decoded from fMRI activity patterns to evaluate whether common tasks draw on common representations. Our talk will give cognitive archaeologists guidance for making the best use of modern neuroimaging techniques.

Meyer, Jack (Far Western Anthropological Research Group)

[62] *Holocene Transformation of San Francisco Bay and Transbay Man Site Stratigraphy*

San Francisco Bay was created by post-glacial sea-level rise during the span of prehistoric human occupation. The Bay is the single largest Pacific estuary in the Americas (4,160 square kilometers) and is the outlet for California's largest freshwater drainage system that carries 40% of the state's runoff. The earliest known evidence of widespread human use of the estuary or tidal resources in the Bay Area first appears at shell midden sites located around the Bay in the middle Holocene (6300-

4600 cal BP). Recently, however, an intact human skeleton ("Transbay Man") was found at an elevation of 12.8 meters (42 feet) below sea level in downtown San Francisco, which is the fourth, and oldest (~7600 cal BP) such skeleton recovered from a submerged context in the region. The stratigraphic sequence and paleoenvironmental context of this rare and unusual find are examined in relation to Holocene sea-level rise and landscape changes that transformed the Bay Area into an ideal place for prehistoric human settlement.

Meyer, Brian [178] see Bishop, Gale

Meyer, Dominique (University of California, San Diego), Eric Lo (University of California, San Diego), Aliya Hoff (University of California, San Diego), Mike Hess (University of California, San Diego) and Falko Kuester (Professor- University of California, San Diego)

[409] *Utility of Low-Cost Drones to Generate 3D Models of Archaeological Sites from Multisensory Data*

With the emergence of low-cost multicopters on the market, archaeologists have rapidly integrated aerial imaging and photogrammetry with more traditional methods of site documentation. UAVs serve as simple yet transformative tools that can rapidly map archaeological sites with increased efficiency and higher resolution than manual measurements while contextualizing the site within the landscape at costs significantly cheaper than plane-based aerial LIDAR systems. Though structure from motion alone produces excellent results, more sophisticated diagnostic imaging systems must be adapted for low-cost aerial deployment to produce multi-modal datasets. This paper proposes a workflow for selecting sensors appropriate for a given environment and combining different modalities and resolutions of data for improved documentation and analysis. We present detailed optimization and automation techniques for structure from motion developed during a multitude of data collection initiatives. Furthermore, we discuss a collection of efforts to incorporate additional diagnostic imaging systems- such as LIDAR, stereovision, and thermal onto low-cost UAV drones to increase archaeologists' access to multispectral and 3D imagery. UAV drones serve as a cost-effective platform, and structure from motion an ideal entry point for further adoption of diagnostic imaging to facilitate efficient site mapping and offer archaeologists innovative ways to visualize and analyze data.

Meyers Emery, Katy (Michigan State University)

[5] *Discussant*

Michael, Daniel (UCDenver) and Julien Riel-Salvatore (Université de Montréal)

[407] *Human Ecology and Lithic Technology in Late Pleistocene SE Asia: A Whole Assemblage Perspective*

Analyses of lithic assemblages have revealed that Late Pleistocene foragers in Western Eurasia practiced strategies that fall on an expedient-curved continuum of lithic organization linked to shifts between residential and logistical mobility. Here, we apply this model to reconstruct mobility strategies in tropical SE Asia to see whether it works in non-temperate settings. Data from over 42 lithic assemblages from across SE Asia indicate that they appear to reflect a distinct environmental adaption even if it broadly conforms to the expected negative relationship between retouch frequency and artifact density seen Neanderthals and AMH. These data thus show the utility of an alternative approach to address lithic variation in SE Asia that transcends some of the limits imposed by having disparate typologies to study them in the past. They also provide a theoretical benchmark anchored in human behavioral ecology on what kinds of environmental contexts different assemblages are expected to reflect adaptations to. A brief reference is also made to the rather peculiar pattern displayed by the Liang Bua assemblages in the context of this analytical approach. The implications of these environmental expectations are also explored at length.

Michelaki, Kostalena (Department of Anthropology, McMaster University)

[126] *Chair*

Mickleburgh, Hayley [153] see Mol, Angus

Mickleburgh, Hayley

[372] *Armchair Archaeoethanatology: Post-Excavation Archaeoethanatology in the Caribbean*
Archaeoethanatology is increasingly important in the study of mortuary practices, as it allows us to study aspects of mortuary behavior that were traditionally hard to assess. However, the archaeoethanatomological approach entails a detailed and very time-consuming excavation and documentation methodology that requires thorough training. Increasingly refined excavation and documentation methods have clear advantages for our understanding of the mortuary record, but there is a danger of rendering data from older excavations incomparable. Some recent studies have shown that post-excavation analysis can provide valuable archaeoethanatomological data, using photographs and field drawings. This paper presents case studies from the precolonial Caribbean, of excavations that were carried without the archaeoethanatomological approach in mind, and assesses valuable archaeoethanatomological data may be derived post-excavation. These data are compared to those derived from archaeoethanatomological investigations in the region, and some suggestions are made for the development of guidelines for post-excavation archaeoethanatology.

Miguel Quesada, Francisco J. (Sociology Department, UAB), Eduardo Tapia (GSA.D.I, Dept. Sociology, Universitat Autònoma de Ba), Débora Zurro (Complexity and Socio-Ecological dynamics (CaSEs),) and Jorge Caro (CaSEs-IMF-CSIC & Barcelona Supercomputing Center ()

[48] *Agent Based Modelling on the Origins of the Sexual Division of Labor*
Social differences between men and women are still an object of debate. These differences are the result of a long historical process that led to the establishment of the sexual division of labor as we know it, although we do not know the original circumstances and steps that initially originated it. In order to shed light on this, we are focusing on hunter-gather societies. Ethnographic and historical documentation about these human societies points to sexually differentiated cooperative strategies. This paper presents the first theoretical and methodological results of a research project that aims at evaluating the role of the variables that could have been involved in the original design of the sexual division of labor and its subsequent 'institutionalization' as a social rule. Social simulation, as a kind of virtual laboratory, allows the generation of an "ad-hoc" scenario and a set of agents in order to explore a question like this. Using artificial intelligence, different starting scenarios will be created. Each will consider specific intentional strategies of labor distribution or appropriation, including a number of mechanisms related to the sexual division of labor.

Mihailovic, Danica [260] see Carter, Tristan

Mijangos, Tito (Centro INAH Oaxaca)

[132] *Interpretaciones entorno a un contexto funerario múltiple en el valle de Etla, Oaxaca, México*
En el año 2012 en el Valle de Etla, Oaxaca, México, se realizó el hallazgo de un contexto funerario múltiple, ubicado cronológicamente en la fase Tierras Largas (1400-1150 a.C.), por su ubicación se encuentra aparentemente relacionado con el asentamiento arqueológico de San José Mogote; la particularidad del depósito radica en que, aparentemente el espacio fue utilizado durante un periodo de tiempo relativamente largo –tres o cuatro generaciones- y con un uso exclusivamente funerario, dicho uso del área se acerca conceptualmente a lo que se conoce como cementerio; debido a que este tipo de contextos no son comunes para la época ni para la región [conociéndose solo un antecedente similar], el análisis e inferencias entorno a este hallazgo, se presentan como una oportunidad importante en la documentación e interpretación de la organización social y costumbres funerarias de las antiguas sociedades Zapotecas.

Mijangos, Tito [410] see Cervantes Perez, Jose

Milbrath, Susan (Florida Museum of Natural History) and Carlos Peraza Lope (Centro Regional de Yucatan, INAH)

[303] *Postclassic Murals of Mayapan as a Mirror of Cultural Transformation*

The changing pictorial imagery in the murals of Mayapan offers a rich picture of cultural transformation in Postclassic Yucatan. The archaeological chronology of Mayapan and comparisons with murals elsewhere in Mesoamerica provide an anchor for the mural chronology. Between 1350 and 1400, Mayapan's murals represent imagery that apparently was inspired by different sources. One mural program can be compared with the hybrid Maya painting style of the Madrid Codex, which also uses the same pigments seen in Mayapan murals. Other murals that seem to be later are more closely linked with the Mixtec Codex Nuttall and Mixteca-Puebla pottery. The last phases of architecture at the site can be associated with evidence of contact with the Valley of Mexico, also apparent in Landa's account that the Cocom Maya rulers fostered trade with the Mexicans to increase their own wealth, and later resorted to Mexican mercenaries to support their reign. Maya accounts in the Chilam Balam books note that the foreigners began to "afflict" the people of Mayapan in Katun 1 Ahau (A.D. 1382-1401). Between 1400 and 1450, Aztec artists introduced stylistic changes in sculpture, architecture and mural painting that ultimately resulted in a revolt against the foreign intrusion.

Milella, Marco (Institute of Anthropology, University of Zurich)

[299] *Modeling Care in Prehistory through an Analysis of Hunter-Gatherers Social Systems*

Questions about the timing and modalities of the evolution of care-giving behaviors have a direct impact on our understanding of human cultural evolution and early social dynamics. Hypotheses on care-giving behaviors in prehistory are usually developed on skeletal evidences documenting survival with seriously debilitating conditions. However, a theoretical framework to test these hypotheses is still missing. Therefore, we propose a model for care-giving behaviors in prehistory starting from data on hunter-gatherers' societies. Due to their ecology and social organization hunter-gatherers represent a good proxy of early humans' social systems. Accordingly, we postulate that by isolating factors correlated to social support in those communities it is possible to build a theoretical reference for reconstructing similar behaviors in prehistory. To this aim, we collected a large body of ethnographic data on environmental, demographic, social, and epidemiological variables characterizing various small-scale societies. These data are then compared through network analysis and multidimensional scaling with data on social cohesion and care-giving behaviors. Results, though stressing the complex nature of care-giving behaviors, evidence a suite of factors (environmental and demographic) relevant in predicting care-giving attitudes in the past. Altogether, our study demonstrates the usefulness of a model-based approach for testing biocultural hypotheses in prehistory.

Miles, Wesley (Gila River Indian Community-Cultural Resource Management Program) and Kyle Woodson (Gila River Indian Community Cultural Resource Mana)

[225] *Documenting Ancient Hohokam Irrigation Systems along the Middle Gila River and the Social Organization of Irrigation*

The Gila River Indian Community's Cultural Resource Management Program has conducted a long-term study of canal irrigation along the Middle Gila River in south-central Arizona. The work has been conducted in conjunction with the Pima-Maricopa Irrigation Project with funding by the United States Bureau of Reclamation. These efforts have provided a wealth of information on prehistoric Hohokam canal systems, which were used between A.D. 450 and 1450. Principal contributions of these studies are a greatly clarified map of the canal systems, a major increase in the number of excavated canal segments, and a new understanding of the layout, size, and capacity of the canal systems and their development through time. Soil studies of irrigated fields within these systems, along with experiments in traditional crop production, have greatly augmented our knowledge of Hohokam irrigated agriculture. Other studies have focused on the social organization of irrigation management and canal labor. This paper gives an overview of the major highlights of these studies on canal irrigation.

Milideo, Lauren (Penn State University Department of Geosciences)

[136] *Media Portrayals of Viking Rune Stones in North America*

In North America, rune stones of purported Viking origin have been the subjects of excitement, scrutiny, and dispute. The stones have been called hoaxes, and archaeologists and other workers remain unconvinced about the stones' Viking origin and validity. Nevertheless, claims have appeared over time that rune stones, which have turned up in such diverse locations as underwater and on hillsides, contain the inscriptions of Scandinavian explorers in North America, including inland areas, long before the arrival of Columbus. From Minnesota to Maine, the stones have attracted interest from the media and public alike, with both supporters and skeptics of the stones' Viking origins weighing in. Newspaper, magazine, and television stories have covered rune stones and the controversies surrounding their creation. This paper focuses on how the media has portrayed the study and debates of rune stones in North America, including an examination of how their origins are discussed in various media outlets.

Miljour, Heather (Statistical Research, Inc./ University of Arizona) and Karen R. Adams (Independent Consultant (Archaeobotany))

[343] *The Homol'ovi Settlement Cluster (ca. A.D. 1260–1400): Reconstructing Environment and Ancient Hopi Lifeways through Charred Botanical Remains*

The Homol'ovi settlement cluster, a group of Hopi villages occupied A.D. 1260–1400, shared common utilization of a wide range of wild and domesticated plants for both subsistence and non-subsistence needs. Inhabitants had an extremely well-rounded and informed view of the plant world that surrounded them, as well as plant resources obtained from afar. The ubiquity of domesticates in the archaeological record indicates a heavy reliance on agriculture for food, household items, clothing, fuel, and perhaps even trade and economic gain. Wild plant remains signify an equal dependence on the natural environment for subsistence, as well as for medicine, fuel, clothing, crafts and construction materials. Over 325 botanical samples have been examined from five sites within the Homol'ovi settlement cluster; this paper is a combined synthesis of these analyses, used to contribute to a better understanding of the past local environment, as well as human-plant interactions and lifeways within. The synthesis also provides for the interpretation of possible changes that occurred over time within the local environment, as well as within the Homol'ovi settlement cluster itself.

Millaire, Jean-François [404] see Downey, Jordan

Millar, Donald [273] see Fernandez, Andrew

Miller, Kye [48] see Purcell, David

Miller, Sophie (University of Auckland)

[52] *Whose Bone is this? An Investigation into Modern Histological Methods of Species Identification with Application to Archaeological Faunal Assemblages in the Pacific*

Bone fragmentation is a potential issue for anyone who works with skeletal remains. If a bone is burned or fragmented in a way that prevents morphological identification, it can be nearly impossible to identify which bone it is, or to what taxa it belongs. However, there are techniques for identifying bones based on their microstructure, as the microstructure of human and non-human bone has distinct differences. These differences allow for microscopic comparisons of bone cross-sections and the evaluation of taxa in fragmented remains. There has been, however, little study of limiting or biasing factors that can influence these histological analyses, particularly for archaeological material. In this research, these factors were evaluated in relation to the Pacific, where there has been minimal previous histological research. The archaeological assemblage of interest derives from Aitutaki in the Southern Cook Islands, as well as modern reference specimens of pig, dog, and human bone. Preliminary findings suggest that breed and age are both influential factors for qualitative identification, and taphonomic diagenesis of characteristic features can hinder and prevent quantitative measurements in degraded archaeological specimens. These results support the hypothesis that modern histological techniques are problematic for the identification of unknown archaeological fragments.

Miller, D. Shane (Mississippi State University), David Anderson (University of Tennessee) and Kelsey Meer (Mississippi State University)

[74] *The Pleistocene-Holocene Transition in the Tennessee and Cumberland River Valleys of the Mid-South United States*

The Tennessee and Cumberland River Valleys have a rich history of archaeological research and provide a valuable dataset for exploring the relationship between climate and culture during the Pleistocene-Holocene transition. In this paper, we provide an overview of available archaeological and environmental data in this area, and argue that there were significant changes in diet, technological organization, and landscape use that are most likely related to environmental change. Home to some of the largest and most heavily collected Clovis assemblages in North America, adaptations during the subsequent Younger Dryas period/chronozone and immediately after, during the early centuries of the Holocene, are much less well known away from cave and rockshelter sites. Analyses of site distributions indicate an expansion of settlement into areas previously largely ignored, probably a result of population growth. We conclude by highlighting recent, ongoing research in the region, and provide some future directions for continuing research for this time interval in the Mid-South.

Miller, Sarah

[98] *Project Archaeology in Florida: Teaching and Understanding Slavery at Kingsley Plantation*

The Florida Public Archaeology Network was established in 2005 and within a year hosted its first Project Archaeology: Intrigue of the Past workshop. As a proud sponsor of Project Archaeology in Florida, regional center staff partnered with the National Park Service and University of Florida to publish the first Investigating Shelter investigation in the southeast. It was also the first in the Investigating Shelter series to feature a National Park site. Investigating a Tabby Slave Cabin teacher guide and student handbook were produced through an internal NPS grant which combined the efforts of Teacher-Ranger-Teachers, Park Service interpreters, FPAN staff, and cooperating archaeologist Dr. James Davidson from University of Florida. By investigating a Kingsley tabby cabin through a series of lessons (geography, history, archaeology, preservation), we hope teachers and students will better understand slavery and the families who occupied the cabins. This poster will feature some of the highlights of the past 8 years, including teacher training and professional development for archaeologists. Preliminary data on our new Shelter unit, Investigating a Lighthouse Keeper's House to be launched in the summer of 2016, will also be presented.

[329] *Discussant*

[98] *Chair*

Miller, Melanie (University of California, Berkeley)

[107] *An Investigation of Dietary Histories and Skeletal Health in a Muisca Population (950-1350 A.D., Sabana de Bogotá, Colombia)*

Highly stratified societies are characterized by differentiation between groups along various socially defined axes. The Tibanica community (950-1350 A.D.), part of the Muisca culture from the Sabana de Bogotá, Colombia, is an ideal population to study how social roles and identities are intertwined with human diet and skeletal health. Here we present stable isotope data to investigate the complexity of human diets across the life course by comparing childhood diets to adulthood diets for the same individuals in order to understand how access to particular foods may be mediated by age, sex, and social status variables. Additionally, we report an indicator of metabolic stress quantified through the measurement of cortical bone. The development, maintenance, and loss of bone may be tied to both biological factors (i.e. hormones, etc.) and social experiences (physical activity, diet/nutrition, etc.). Through the combination of these data sets we can also investigate the complex relationships between diet (nutrition) and skeletal health (bone maintenance or loss).

[107] *Chair*

Miller, Caitlin (Columbia University), Siu Ying Ng (Columbia University) and Adam Watson (American Museum of Natural History)

[165] *Resilience and Continuity in Iroquoia: An Analysis of Animal Remains from the 17th-Century Seneca Iroquois White Springs Site*

In the summer of 1687, the Marquis de Denonville led a punitive expeditionary force from New France against the Seneca Iroquois in what is now western New York State. As a response to imminent invasion, the Senecas fled under the protective umbrella of the Cayugas. Upon returning to their homeland the following year, with all four settlements destroyed, the Senecas constructed two nucleated villages, one of which was located at White Springs, near present-day Geneva, New York, where they remained until 1715. Since 2007, Cornell University excavations at White Springs have recovered large quantities of artifacts, plant remains and animal bone, in addition to identifying widespread evidence of daily life at the site, including hearths, post molds and trash deposits. The extent to which Seneca behaviors reflect the political uncertainty and threat of hostilities dominating the region during this period remains unclear. Through an analysis of faunal material recovered from a large extramural pit feature, the present study addresses this central question by examining evidence for Seneca Iroquois hunting strategies, economic endeavors and subsistence practices that indicate the persistence of Seneca lifeways despite turbulent times.

Miller, Melissa (University of Tulsa)

[171] *An Attribute Approach to Differentiating Artifacts from Geofacts*

The need for a method to determine if a lithic flake is a product of human manufacture or a product of natural forces is an essential one in archaeology. This project directly compared known geofacts with known artifacts sampled from Oklahoma and Jordan at the attribute level. The comparisons were evaluated statistically in order to determine which attribute characteristics are statistically significantly different between the sampled geofact and artifact assemblages, with the objective of empirically and statistically determining which, if any, flake attributes are diagnostic of human manufacture, using a large sample size and a multitude of attributes.

Miller, Christopher and Susan Mentzer (Institute for Archaeological Sciences, University)

[190] *It's All About Scale—Thoughts on Paul Goldberg's Contributions to Geoarchaeology*

Geoarchaeologists, like their colleagues in the geosciences and archaeology, are required to understand the archaeological record at a variety of scales: from the sub-microscopic to the continental. We track human behavioral change across millions of years and geographic expansions across continents. Yet, our data come from archaeological sites, individual layers, and single artifacts. As archaeologists who investigate past human interactions with various geosystems, we are required not only to think at different scales, but we are also required to conceptually link observations made at a variety of scales. These observations form the basis for interpretations about landscape change, site formation, and human behavior. For the past 40 years, Paul Goldberg's research has challenged us to understand the significance of scale in geoarchaeological work. His work on almost every continent, and from almost every time period, has shown that even the smallest microscopic observation can be significant for understanding the human past.

Miller, Kye (Northern Arizona University)

[209] *An Overview of Architectural Practice at the Ironwood Village, Northern Tucson Basin, Arizona*

This paper provides a brief review of the Ironwood Village site structure, an overview of architectural styles observed at the site, a discussion of variation in architectural practice observed at the site, and a regional comparison of Hohokam pit structure architecture within the greater Tucson Basin. Data recovery at the Ironwood Village site resulted in the discovery of nearly a hundred Pioneer and Colonial period architectural features. The area investigated was centered around a large Pioneer period plaza and Colonial period ball court, as well as adjacent residential, roasting, and cemetery areas that presents a unique opportunity to explore site structure and changing practices in residential architecture between the Pioneer and Colonial periods.

Miller, Naomi (Univ of Pennsylvania Museum-ISAW)

[226] *Beyond Seeds and Charcoal: Constructing a Past for the Future*

The "big issue" of my career has been long-term human impact on the environment, an inherently processual concern. Working on ancient west Asian plant remains, ethnographic analogy and modern vegetation analogs helped me explain how the demand for energy lead to deforestation and increasing dung fuel use, both of which are traceable through archaeobotanical study. Seeds preserved in dung fuel, in turn, allow us to identify agropastoral practices that created new environmental niches for plants, animals and people. At present, human impact on the environment has become a short-term affair. The analogs that we rely on for archaeological interpretation, both cultural and "natural," are fast disappearing. Much of my current work is concerned with protecting and maintaining as much of the cultural and "natural" context of archaeological resources as possible, most directly the historical landscape at Gordion, Turkey, because today is the past of the future.

Miller, Heather (University of Toronto)

[241] *Invented, Adopted, Shared, Acquired, Inspired? Technological Change and the Talc-Faience Complexes of the Indus Valley Tradition*

A bewildering assortment of materials utilizing siliceous pastes were used to make small objects such as figures, beads and containers, in ancient Egypt, Mesopotamia, the Indus Valley, the Mediterranean, and regions beyond and between. From very early beginnings in the sixth millennium B.C.E. or earlier in some regions, the assortment of these materials reached great diversity of production technique and material in the third and second millennia B.C.E., with much less diversity of appearance. In places where these materials have seen more analytical study, such as Egypt and the Indus Valley, similarities but also striking differences occur in the regional assortments of materials and techniques employed to produce quite similar appearing materials, used to make objects clearly belonging to the local corpus of style and topic. What was involved in the spread of these materials and their manufacture? Can we find clues to the social process involved in the innovative development of these materials from analysis of the objects and their production? In this paper, I particularly address the third question posed for this session: how does the spread of technology across significant social, cultural and geographic boundaries differ from the spread of technology within social groups?

Miller, G. Logan (Ohio History Connection)

[331] *Perishable Technology in the Great Lakes Region during the Late Pleistocene: Evidence from Microwear Analysis*

Lithic artifacts typically dominate the assemblages of Late Pleistocene sites in North America. Paleo Crossing (33ME274), a Clovis site in northeast Ohio, provides an excellent example of this pattern. Thousands of chipped stone artifacts have been recovered at the site during surface collections and subsurface excavations. However, lithic microwear analysis on a sample of artifacts from Paleo Crossing indicates that the site's inhabitants expended a great deal of effort on the production of hide, plant, and bone artifacts. Results indicate that most of the end scrapers were used to process fresh, wet hides. Additionally, much of the plant processing at Paleo Crossing was geared toward plant fiber production. These findings provide further evidence that perishable technologies were important elements of the Clovis toolkit.

Miller, Mackenzie

[331] *A Re-evaluation of Oneota Cultural Phases in the La Crosse Locality*

The Oneota culture is dated in La Crosse, Wisconsin, to between A.D. 1300-1625 (Boszhardt 1994). Single component sites have allowed for definition of specific ceramic types and attributes as diagnostic of each of three phases. Previous excavations and analysis of materials recovered from the Tremaine site (47-LC-95) by the Wisconsin Historical Society revealed pottery and radiocarbon dates corresponding to all of the phases (O'Gorman 1995). During the summers of 2011 to 2014, new excavations by the University of Wisconsin-La Crosse have taken place at the site, allowing for more evidence to be collected. Rim sherds from these excavations show attributes that are intermediate between the last two phases. This has created a need for refined criteria for each of the

phases and, perhaps, an additional transitional phase. Two specific measurements that are indicators of each phase, rim notching and rim height, were not systematically quantified from the earlier excavations. Therefore, a sample of sherds from the original and more recent work have been measured and the data analyzed to evaluate the pattern of change. The original 42 radiocarbon dates and two new dates will also be recalibrated and have Bayesian analysis performed on them to help refine the three phases.

Miller Wolf, Katherine (Indiana University East)

[366] *A Bioarchaeological Approach to Diversity and Complexity of Ancient Maya Society at Copan: Results from New Strontium and Biodistance Data*

The UNESCO World Heritage Site of Copan is uniquely situated to address the question of migration and culture contact in ancient Mesoamerica. The city is nestled at the southeastern frontier of the Maya region and the western edge of culturally diverse Honduras. Copan was a dynamic urban city populated by peoples of various places of origin, affiliations, and identities. Research focused on the Copan human skeletal collection, the largest yet recovered in Mesoamerica, to explore the lives of residents in twenty-two patios from eight neighborhoods during the Late Classic period (A.D. 600-820). New biogeochemical and biodistance data are drawn from those who directly participated in the creation and maintenance of social organization and were subsequently interred at Copan. Radiogenic $^{87}\text{Sr}/^{86}\text{Sr}$ ratios from ancient Copanecos are compared to a new baseline for Honduras. Taken together these data provide insights into the complex social and biological relationships of Copan's inhabitants to each other, to their neighbors, and those beyond their borders.

Miller-Sisson, Misha (University of California San Diego)

[24] *Commoner-Elite Interactions: Evidence Subroyal Elite Housemound Excavations at Uxul, Campeche, Mexico*

Interactions between commoners and elites are a poorly addressed area of study in the Maya region. Various excavations of ancient Maya palace structures and royal tombs, epigraphic studies of Maya hieroglyphs, and iconographic analyses of ancient Maya art have revealed a copious amount of information about ancient Maya elite. Similarly, excavations of ancient Maya commoner households and burials have revealed a great deal of information about ancient Maya commoners. However, there are relatively few research programs directly addressing the interaction between elite and commoners. This talk presents data from the excavation of an ancient Maya elite household at Uxul, Campeche, Mexico. The excavatory data is used to reveal social stratification within the Maya elite and demonstrate the lower strata of Maya elite, termed here subroyal elite, were responsible, for amongst other things, interactions with commoners. These interactions change over time and display evidence of greater rigidity and stratification as the sociopolitical structure changed during the Late Classic (A.D. 600-750) when Uxul was incorporated into the Calakmul regional state.

Millhauser, John (North Carolina State University)

[25] *The Social Dimensions of Complex Industries: Insights from a Thin Section Microscopy Study of Aztec Salt-Making Pottery*

In this paper, I show how thin section microscopy enhances our understanding of the social relations and technological sequences of production in the Late Postclassic (1350-1520 A.D.) salt industry of the northern Basin of Mexico. Aztec salt-making sites have dense concentrations of "fabric-marked" pottery, which is a light, friable ware distinguished by impressions of textiles on its exterior surface. Fabric-marked pottery was probably used to mold blocks of salt for sale in the market. Because of its strong correlation with salt-making sites, manufacturing fabric-marked pottery was probably a contingent craft practiced within or near salt-making sites. To clarify the spatial and social contexts of fabric-marked pottery production and consumption, I applied formal, stylistic, and compositional analyses to systematic collections from a cluster of six salt-making sites located along the shoreline of Lake Xaltocan. The results of thin-section microscopy—which included quantitative and qualitative analyses of aplastic inclusions (mineral, zoological, and botanical) as well as voids—reflect a highly localized pattern of consumption and, possibly, production. These data complement the results of bulk compositional analysis, but they contrast with patterns of form and style that reflect a greater spatial scale of social interaction among salt-makers beyond their individual workshops and

settlements.

Milligan, Jenny [3] see Hauser, Neil

Milligan, Jennifer (PaleoResearch Institute) and Linda Scott Cummings (PaleoResearch Institute)

[123] *Moving Forward While Looking Backward*

Many know the curation challenges associated with space and data preservation when it comes to archaeological collections. As we keep digging for answers an intense need has developed for appropriate storage of not only the physical findings, but the intellectual materials as well. Most curation repositories require original paper copies of field notes, maps, and analytical data; however, with today's advancing technologies paperwork is being phased out in preference of digital media such as databases, statistical systems, and GIS mapping. Some government projects now require proposals to include plans for managing and storing this digital data. PaleoResearch Institute is transitioning to meet the demands of this fast-paced world of digital data maintenance through the use of databases, tDAR (the Digital Archaeological Record), and Google Maps. Using these systems we manage the large amounts of analytical and spatial data produced through our studies and make information available, selectively, to our clients, the archaeological community, and the public. tDAR fulfills our need to preserve and share grey literature that is generally hard to access.

Mills, Peter (University of Hawaii Hilo)

[34] *Close to Home: Bringing Heritage Management Graduate Programs to Descendant Communities*

Hawai'i's state regulations require principal investigators in the 26 active archaeological consulting firms to possess "a graduate degree from an accredited institution in archaeology, or anthropology, with a specialization in archaeology, or an equivalent field." Because there have been few opportunities for appropriate local graduate training, many heritage management specialists are hired from regions outside of Hawai'i and begin with little background or connection to descendant communities. As of 2008 none of the PI's in Hawai'i were native Hawaiian, and currently only one of the firms has a Native Hawaiian PI/owner. This first PI was a product of a new track at UH Mānoa in "Applied Archaeology." In 2015, the University of Hawai'i at Hilo will be admitting nine students each year to a new Heritage Management MA program with the specific intent of reaching graduate students from Pacific Island descendant communities. The new MA will address heritage training at the most ethnically diverse 4-year public university in the nation. The local graduate programs allow candidates to develop specialties within heritage management with emphases in community-based research, and foster specific analytical areas of expertise that are within geographic, philosophical, and economic reach of their own lives.

Mills, Barbara (University of Arizona)

[71] *Moderator*

Mills, Courtney [81] see Howey, Meghan

Mills, Steve (Cardiff University)

[297] *Walking to (A)muse: Exploring Senses of Pace with Ruth*

Walking with Ruth Tringham has always been a social and intellectual adventure. I have been fortunate to have the opportunity to muse on past ways of life while walking with Ruth at a range of different heritage sites in the U.S., Bulgaria, and Turkey. Important themes we engaged with during these walks included: exploring different ways to approach contemporary senses of place, thinking about how senses of place may have been significant to prehistoric people, and how to (re)mediate these ideas for the benefit of diverse audiences in the present. As a result of these peripatetic adventures I have come to realize how integral the act of walking to and within places must have been to prehistoric understandings of the world, as well as the extent that the interplay of the senses

mediate the textures, surfaces, shapes, animals, people, weather and the many other things encountered along the way. In this presentation I attempt to convey some of these ideas about walking and senses of place and to show my appreciation for Ruth's enthusiasm to make the process of doing archaeology exciting, creative and, perhaps above all, enjoyable.

Milne, Brooke [185] see ten Bruggencate, Rachel

Milner, Nicky [17] see Little, Aimee

Min, Rui [286] see Jin, Hetian

Minar, Jill [386] see Binning, Jeanne

Minc, Leah [25] see Sherman, Jason

Minc, Leah

[216] *From Clay Survey to Ceramic Provenance: Establishing a Ceramic Geography for the Late Classic Valley of Oaxaca*

As an overall introduction to this session, this paper introduces our methodology for establishing ceramic provenance within the geologically complex Valley of Oaxaca. Natural clays have now been sampled from more than 300 locations throughout the valley, and their chemistry analyzed via INAA. Spatial averaging was used to create a series of smoothed contour maps showing how clay composition varies over space, and to generate a continuous reference grid of element concentrations against which ceramics can be compared. Within our corpus of Late Classic ceramics, we have identified at least 16 chemically distinct signatures which can be mapped on to these element maps, a strategy which allows us to identify where ceramics were produced and the spatial resolution that can be obtained in mapping those sources. The result is a "ceramic geography" useful for shedding light on intra-valley exchange networks within the Late Classic Valley of Oaxaca.

[216] *Chair*

Minnis, Paul (University of Oklahoma)

[226] *Paleoethno...What?*

It is a daunting task to make decades of research appear to be consistent and coherent when it is often ad hoc and opportunistic. During the past four and one-half decades I have tried to meld ethnobotany and archaeology with three themes focusing my work: food, anthropogenic ecology, and the value of research beyond archaeology. On the other hand, I have tended to avoid deep cultural contexts and methodological issues. I will discuss each of these, not only for the past, but for the future of prehistoric ethnobotany.

Minor, Elizabeth (University of California, Berkeley)

[240] *Who Wants to Live Forever? The Practice of Mass Human Sacrifice During Early State Formation in the Nubian Classic Kerma Period*

As the ancient Nubian Classic Kerma kings undertook military campaigns into Egyptian territory (1700-1550 B.C.E.), their mortuary practices grew to include mass inhumation of their subjects within their burial tumuli. The tumulus of the second Classic Kerma king (KX) contains over 300 human sacrifices and is the largest group found at the site. The sacrificed Kermans were arranged in the tumulus corridor alongside Egyptian statues taken as spoils of war, emphasizing the king's control of internal and foreign social capital. Sacrifices range in personal adornment from simple circlets to beaded tunics, skirts and appliquéd hats. Placement of sacrifices varies from being arranged singly to clusters of potential family groups. Rather than a selection of servants or a 'harem', the diversity of social groups within the Kerman community is represented among the sacrifices. The Kermans were

involved in the preparation of their singular mass burial event, both as subjects coerced into death by the king and as members negotiating relationships within the community. The violent act of sacrifice provided a cultural arena for Kermans to construct their identities during a period of rapid social stratification, and presents an important comparative case for the practice of human sacrifice during early state formation.

[240] *Chair*

Miraglia, Rita

[302] *Results of Section 106 Fieldwork at Three Archaeological Sites in Alaska: Producing Meaningful Research Results Under the Shadow of the Sequester*

This paper presents results of recent Section 106 fieldwork undertaken by archaeologists with the Bureau of Indian Affairs, Alaska Region, in 2013 and 2014. Results from work on sites along the Unalakleet River, the Agulokwak River, and Little Lake Louise in central, southwestern and southeastern Alaska, respectively, are presented. The problem of producing research that represents a contribution to the field of archaeology, within the constraints of agency mandates, the Section 106 process, and the sequester, is also discussed.

Miranda, Laura (Laura Miranda, Esq.)

[160] *Discussant*

Mires, Ann Marie and Claire Gold (Adjunct, Clark University)

[19] *Forensic Archaeology Recovery Case Studies, Finding the Unfound*

Forensic archaeology can be a useful tool when searching for "unfound" missing persons. Forensic Archaeology Recovery (FAR, non-profit) has worked on a number of missing persons cases in Massachusetts and New Hampshire. Three case studies are presented that highlight FAR's involvement and assistance in generating new knowledge. The first case study is the search for Maura Murray, a University of Massachusetts student who went missing in 2004. The second case is Melanie Melanson, a fourteen year old girl, who went missing in 1989. The final case is that of Angelo "Andy" Puglisi, a ten year old boy abducted from the Lawrence, MA, swimming pool in 1976. All of the individuals remain unfound. By offering the assistance of non-profits in both expertise and personnel, each one of these cases has yielded additional information in the unresolved case. This has moved the investigation forward, as well as, reactivated these cases and offered families some measure of comfort in knowing that the case has not been forgotten. Unique environments presented challenges and the opportunity to field test grave-detection technologies. These cases have furthered our knowledge in "unfound" missing person cases and informed the field of forensic archaeology.

Miron, Esteban [86] see Liendo, Rodrigo

Misaka, Kazunori (The University of Tokushima)

[145] *Beginning of Agriculture and Immigrants from the Korean Peninsula in Prehistoric Japan*

In Japan a transition from the hunting-gathering Jomon economy to the food producing Yayoi economy took place at some point in the first millennium B.C., and this transition resulted in considerable cultural change. It is widely accepted among Japanese archaeologists that this transition was greatly facilitated by immigration from the southern Korean peninsula where agriculture had already been practiced, including wet rice cultivation. In order to approach relationships between the Korean immigrants and native Japanese people in the first millennium B.C., the author has analyzed pottery in the southern Korean peninsula and northern Kyushu island of Japan, with special reference to the pottery function and production techniques. As a result, it is impossible to distinguish the "Korean type" of pottery from the local pottery assemblage in Kyushu, which suggests that Korean immigrants quickly and peacefully incorporated themselves into local population through marriage.

Misarti, Nicole [119] see Funk, Caroline

Miss, Christian [360] see Kopperl, Robert

Mistretta, Brittany (The Catholic University of America)

[250] *Symbols of Transformative Power: Wari Split Eye Iconography in the Middle Horizon*

Feline eyes have a refractory nature that relates to the dichotomy of light and shadows in Andean traditions in Peru and suggests they are significant in Wari iconography. Andean ethnographies have expressed an importance of binary concepts that play a role in understanding cosmology, mythology, and ritual. I will use Susan E. Bergh's (1999) classification of Wari elite textile iconography and apply it to ritual ceramic iconographic data from excavations at Conchopata to identify the characteristics of eye imagery. Located in the heartland, Conchopata was a center of production for ritual ceramics and should have been the perfect place for elites to demonstrate their power with ritual iconography. I will use ethnographic sources to propose a variety of interpretations of the analyzed subset of Wari imagery and to determine the possible importance of the cultural category of eyes during the Middle Horizon. I believe that feline or split eye iconography in a ritual context represents states of transition and transformation that justify an elite status of political power.

Mitchell, Spencer (Humboldt State University), Jessica Blinman (Humboldt State University) and Erik Marinkovich

[103] *An Analysis of the Factors that Impact Accuracy During the Acquisition of Archaeological Geospatial Data Through the Use of GPS Units*

In recent decades, archaeology has seen an increase in the use of geospatial technology. This paper weighs the factors that impact the accuracy of the acquisition of geospatial data in the field and seeks to establish a system to determine the ideal times for data collection with GPS units. Control points were established both within the United States and in northwestern Belize. Each point was input into a database in which we recorded a set of factors including; constellation density, PDOP and weather conditions. Satellite constellations were recorded off the Global Navigation Satellite System Planning Online website and compared to the satellites that were actually present at the time of collection. The data were then subject to differential correction and inlayed into ArcMap 10. We conducted a comparative study and found which variables were ideal for accurate data collection. Accuracy was determined by the amount of displacement between points at the given location.

Mitchell, Peter [135] see Stewart, Brian

Mitchell, Douglas (PaleoWest) and Teresa Ingalls (PaleoWest)

[209] *The Ironwood Village Cemeteries: Exploration of Burial Customs at an 8th Century Hohokam Village*

Studies of burial practices in southern Arizona and the Tucson Basin have been limited to data from small scale excavations. Recent excavations were conducted at the Ironwood Village site, a late Pioneer and Colonial Period Hohokam village along the Santa Cruz River. Eleven cemeteries were identified surrounding a central ball court and plaza, which included over 250 cremations and 4 inhumations. This paper explores burial methods, physical anthropology, funerary accompaniments, and spatial patterning within the village to better understand internal and regional social relationships during this time period. Based on this site and comparisons to others in the region, suggestions are made about the nature of 9th century Hohokam religious and secular organization.

Mitchell, Juliette (University of Aberdeen) and Gordon Noble (University of Aberdeen)

[332] *Early Medieval Landscapes of the Dead: The Monumental Pictish Barrows of North-East Scotland*

During the 5th and 6th centuries the dead become more visible in the landscapes of eastern Scotland. Elaborate square and circular burial mounds were constructed to commemorate certain

members of society, possibly a newly emerging elite. These barrows are often sited along ridges and form grouped, sometimes linear distributions in the landscape. Few have been excavated and most are known through aerial photography alone. This paper presents some of the results from a project that consolidated and reviewed the evidence of burial practices of the northern Picts, and also evaluated the position of these sites in their wider social, cultural, political and religious landscapes. A variety of methods were utilized, including full transcription of the cropmark sites; analysis of the barrow types and morphological characteristics; and the wider landscape context through GIS analysis of the relationships with natural topography, boundaries, routeways and relation to prehistoric features.

Mithong, Supalak

[407] *An Analysis of Reptile Bone from an Excavation at Moh-Khiew Cave, Krabi Province, Thailand*

A study of animal in species are very few especially reptiles bone when compared to mammal bone in Thailand. And considering the amount of reptile bones found in archaeological sites in southern Thailand were plenty. About half of all animal bones in a site such as the amount of Reptiles bone an excavation at Lang Rongrian rockshelter, Thailand by Douglas Anderson (Mudar and Anderson, 2007) and from Moh-Khiew cave, Krabi province, Thailand analysis by Dr. Prasit Auetrakulvit (Auetrakulvit, 2004) to estimate the amount of reptile bones in archaeological excavations from Moh-Khiew cave in 2551 by Dr. Prasit Auetrakulvit. The concentration of animal bones, mostly reptiles, especially turtles.

Mitnik, Alissa [396] see Krause, Johannes

Mixter, David (Washington University in St. Louis)

[291] *Liberty on the Periphery: How Actuncan, Belize Escaped the Classic Maya Collapse (for a Time)*

In recent years, scholars working in the Classic period Maya periphery questioned traditional narratives of the 9th century Maya collapse by pointing to settlements along the periphery of the lowlands that appear to have maintained relative cultural and demographic stability. However, this generalization obscures dramatic sociopolitical changes these communities implemented to remain successful through the collapse. In this paper, I argue that populations on the periphery relied on a locally contingent set of factors that included global connections and local particularities to build successful collapse-era communities. I focus particularly on the contingencies that allowed the site of Actuncan to flourish as its neighbors failed. Located on the eastern Maya periphery of western Belize, Actuncan is situated within a fertile landscape along the major Belize River trade corridor. This location provided economic security that may have sustained the site during the collapse era. Additionally, the peripheral location may have allowed for variances from the orthodoxy of Classic period political organization, which provided Actuncan flexibility as the core sites failed. In sum, Actuncan's location along the periphery provided political and economic conditions the local population exploited to build a successful community under precepts that foreshadow the underlying structures of the Postclassic Maya.

[244] *Chair*

Mixter, David W. [244] see LeCount, Lisa

Miyoshi, Gen (Osaka Prefectural Board of Education)

[145] *Transition from the Yayoi to Kofun Periods in Third Century A.D. Japan*

The beginning of the Kofun Period in the middle third century A.D. in Japan is often explained in terms of the class distinction of chiefs from ordinary members of the society. This explanation is widely accepted because of the appearance of giant keyhole-shaped burial mounds of more than 270 meters and of "elite mansion." Japanese archaeologists discuss the social complexity of the Kofun Period with reference to social stratification with the chief at the top. In this paper, I apply "Dual-Processual Theory" to explain this phenomenon, and examine the complexity of a society in

which elites were not distinguished. In this way, it becomes possible to present a model different from unilinear evolutionary scheme. Specifically, I consider Middle Yayoi society (first century B.C.) representing a typical corporate strategy, where elites were not distinguished in mortuary practices and residential patterns. I consider Middle Kofun society (fifth century A.D.) representing a typical network strategy, where giant keyhole-shaped burial mounds were dedicated to individual elites. I intend to explain temporal change in social strategy from the first to fourth centuries A.D. within this framework. It is my hope to contribute to the Dual-Processual Theory utilizing rich archaeological data from Japan.

Mizoguchi, Koji (Kyushu University, Japan)

[340] *Contextualizing the Theory of Archaeological Theorization*

The controlled discursivization of various undiscursivized/practical archaeological taken-for-granted, ranging from micro-culturally-constituted traditions in artifact classification to grand meta-theoretical inclinations, is a constitutive function of archaeological theorization. How can it be implemented in the manner which most effectively enhances the potentiality of one's archaeological investigation and practice depends on the purpose of the investigation and practice, and on the characteristics of the context in which theorization takes place. This paper focuses on the latter constraint, and proposes that different discursivization strategies should be adopted in accordance with the target population(s) one aims to 'affect' through one's archaeological practice/praxis. The argument will be supported by some concrete examples.

Moe, Jeanne (Project Archaeology-BLM)

[236] *The Times Are Changing: Project Archaeology Makes a Difference*

Over the last 25 years, Project Archaeology has had a profound impact on educators, students, and archaeologists. Project Archaeology curricular materials and professional development have shown teachers how to transform their teaching into inquiry learning in all subjects. Students have developed deep cultural understanding of the Native peoples who have inhabited our nation before Europeans came to these shores and are still here today. These students demonstrate a profound respect for all archaeological heritage and its importance for today's living descendants. Project Archaeology is an interface between archaeology and Native Americans and archaeology education can be an agent for changing the conversation about honoring our shared heritage, ownership of the past, and repatriation. Archaeologists have a duty to provide teachers with the engaging and interdisciplinary subject of archaeology to help them fulfill their requirements and to help them teach cultural understanding. We have the tools, we see the path, and the time is now. If we do not do this work, who will?

[236] *Chair*

Moehlecke Cope, Silvia [157] see Cárdenas, Macarena L.

Moges, Rezenet [310] see Wiley, Nancy

Mohanty, Sudarsana

[232] *Analysis of Mortuary Rituals at Panquilma*

In the Early Intermediate Period (A.D. 1-700) there was a notable development of belief systems or "ideologies of power." These systems reinforced and naturalized the relations of the dominant classes over the less important social groups. The use of ideology to exert control is an efficient tool, especially when applied to concepts of life and death. Funerary practices effectively serve to promote social cohesion, whether related to kinship ties or political and economic means. The intent of this paper is to delve into the traditions of mortuary rituals, with a particular focus on the implications and functions of ancestral veneration within Andean societies. Through a cross-study of the archaeological finds of burials from the domestic and funerary sector of Panquilma (1000-1470 A.D.), an Ychsma site in the Lurin Valley of central coastal Peru, and Patricia McAnany's analysis of Mayan ancestral veneration, the goal of this paper is to examine the ideological processes that form

tradition and communicate political and economic power.

Mohanty, Sudarsana [232] see Kelleher, Anna

Mohlenhoff, Kathryn (University of Utah), Christopher Parker (University of Utah) and Brian Coddington (University of Utah)

[119] *The Potential Integration of Niche Construction Theory into the Framework of Human Behavioral Ecology*

Throughout the history of hominid evolution, our ancestors developed the ability to adapt to extremely different environments and eventually colonize the entire world. The capacity to adapt to environments as different as the Amazon Rainforest and the Arctic tundra is complex, and has led some anthropologists to question the utility of Neo-Darwinian evolutionary frameworks. The debate over the utility of these frameworks has become more heated recently, with some proposing the use of Niche Construction Theory (NCT) as an alternative to Human Behavioral Ecology (HBE). Here, we propose that, instead of viewing NCT as an alternative to HBE, niche constructing behavior can (and has been) integrated within HBE models. We discuss three examples to show how these two theoretical frameworks articulate with one another, including a discussion of animal domestication in the Near East, human fire use in California, and clam garden construction on the Northwest Coast.

Moholy-Nagy, Hattula

[295] *Monuments as Artifacts: The Significance of the Hiatus at Tikal, Guatemala*

The long hiatus of A.D. 557-692 in the sequence of dates on Tikal's carved stone monuments is widely assumed to indicate a period of decline and troubled times for the city. This assumption, however, is clearly contradicted by archaeological evidence, which demonstrates a high level of material prosperity and cultural innovation during this period. An archaeological approach to the study of stone monuments as items of portable material culture can provide cultural context for recent exciting advances of epigraphy that have permitted the construction of dynastic sequences of named rulers. Archaeology and epigraphy together can provide a better understanding of the causes and significance of hiatuses in dates on monuments at Tikal, and elsewhere in the Classic Maya Lowlands.

Mol, Angus, Lesley-Gail Atkinson (Jamaican National Heritage Trust) and Hayley Mickleburgh (Leiden University)

[153] *At the Edge: Jamaican Amerindians and the Colonial Encounter*

This paper presents a new study of archaeological sites, collections, and historical documents bringing to light a poorly known chapter in the study of Caribbean colonial encounters: the interactions of Jamaican Amerindians with the Spanish, and later the British and Maroons. The island of Jamaica held a special position in the Spanish colonial empire, due to its peripheral position in the global shipping and trade networks that emerged in the early Spanish main and its lack of the precious metals that were so important to the colonial endeavor. Yet even before the colonial encounters, Jamaica and its Amerindian population occupied a singular position in the greater regional interaction sphere. The unique social and cultural character of the island previously meant that its position in regional archaeological debates was once again peripheral. Based on archaeological and historical investigations in north-central Jamaica, we address some notable characteristics of the Amerindian role in colonial encounters. Jamaican Amerindian negotiation, integration, and resistance formed a crucial survival mechanism in the colonial period, and despite appearances to this day, Amerindian heritage is still strongly represented in the island.

Molist, Miquel (UAB / Spain)

[16] *Aspects of Ritual and Domestic Life in First Farming Village (PPNB Period) : Contribution to Tell Halula (Euphrates Valley Syria)*

In this communication we will deal with the symbolic documents that the archaeological excavation at Tell Halula (Syria) (7800-6500 cal B.C.) has provided. The documents are essentially symbolic paintings on the walls of houses, figurines, and a rich array of funerary objects.

This documentation provides an exceptional discussion of the symbolic world of the first farmers while at the same time illuminating the economic and social communities of emerging farmers.

Molle, Guillaume (CIRAP)

[388] *Exploring Religious Practices on the Polynesian Atolls: A Comprehensive Architectural Approach towards the Marae Complex in the Tuamotus*

The Tuamotu Archipelago consists of one of the largest concentrations of atolls in the world. However, the archaeological history of these islands remains much less documented in comparison with the other high islands of French Polynesia. The harsh environmental conditions of the atolls have not favored the preservation of archaeological structures, with the exception of the coral-built marae. Since the pioneering works of K.P. Emory in the 1930s, around six hundred of these ceremonial sites have been recorded all over the archipelago. The surface inventories have showed that the basic architectural features of the marae were organized according to a large diversity of patterns reflecting the complex histories of local communities. In order to investigate the variability of these monuments, we developed a detailed database that allowed us to build the first wide-scale classification of these marae sites. Relying on archaeological and ethnohistorical evidence in addition to oral traditions, we attempt here to explain the development of these sites with regards to external influences, endemic socio-political process, and adaptations to specific rituals.

[388] *Chair*

Monge, Janet [264] see Williams, Sloan

Mongelluzzo, Ryan (San Diego Mesa College)

[295] *Harrison's View: The Importance of Small Scale Analyses in Maya Archaeology*

Peter Harrison's work in Maya archaeology was important in many ways. One of the most important, and perhaps overlooked, was the scale of focus at which he often worked. Single features, single rooms, single buildings, and single plazas: all of these are commonly uncovered when digging in Maya site centers. However, due to a lack of artifacts, analyses at these scales are not often conducted. Harrison's work exemplifies that much can be learned from small-scale architectural analyses and in that way inspired many of my own endeavors.

Mongeló, Guilherme [326] see Ozorio De Almeida, Fernando

Montalvo, Nathan [122] see Shelley, Steven

Monteagudo, Guni [203] see Kellett, Lucas

Monteith, Daniel [302] see Yesner, David

Monteleone, Kelly [192] see Dixon, E. James

Montgomery, Lindsay

[34] *From Consultation to Collaboration: Expanding the Scope of Archaeology's Engagement with Indigenous People*

Consultation with descendant communities is now a widely accepted reality of doing archaeology in North America. Since the passing of NAGPRA twenty-five years ago, a robust body of scholarship has developed around the methodological and theoretical aspects of consulting with indigenous communities. Although many scholars today point out the need for "collaboration" in addition to "consultation", the constraints of archaeological research and tribal politics often make true collaboration difficult. In this paper, I will draw on my own experiences working with the Comanche, Ute, and Jicarilla Apache to discuss the pitfalls of consultation as it is currently practiced and to offer some alternative strategies we can employ to move towards a more collaborative framework.

Montiel, Rafael [231] see Vallebuena, Miguel

Montúfar López, Aurora (Instituto Nacional de Antropología e Historia) and Julia Pérez Pérez (Instituto Nacional de Antropología e Historia)

[298] *Botanical Analysis of Sediments in Offerings and Fill at Tenochtitlan's Great Temple*

In this paper, botanical remains in sedimentological samples from offerings and fill are analyzed for biological identification. Seeds, fibers, resins, and other vegetal structures recovered using Struever's floatation technique, modified by members of the Paleobotanical and Paleoenvironmental Laboratory, in the Institute of Anthropological Research (IIA), at the National Autonomous University of Mexico (UNAM), yielded propagules, charred bits of textiles, copal, thorn fragments, splinters, and faunal matter such as micromollusks, ostracods, shark dermal denticles, etc. Taxonomic identification was conducted through comparison with present-day examples and specialized literature. Our modest results indicate the presence of cultivated plants such as squash, chia, maize, and gourd, along with a large variety of seeds of natural, particularly lacustrine deposition, mainly reeds and bulrushes. The cultigens reveal intentional deposition of some taxa (squash, chia, gourd), as well as copal, which derives from tribute. Finally, the lacustrine plants associated with micromollusks and ostracods inform us about the biome surrounding Tenochtitlan five centuries ago.

Moody, John (The University of Western Ontario), Linda Howie (HD Analytical Solutions | The University of Western Ontario) and Lisa Hodgetts (The University of Western Ontario)

[25] *Expanding the (Micro)Scope: Exploring the Technological and Provenance Characteristics of Inuit Pottery Containing Atypical, Animal-Deriving Organic Paste Ingredients*

The extensive research on pottery manufacture in past and contemporary societies suggests that the pallet of tempering materials potters select from includes a relatively limited range of options deriving from the geological landscape, plants (e.g., chaff) and animals (e.g., bone). This tendency is significant considering that almost any material or substance can be incorporated into a paste mixture; what is included in any specific instance is a matter of choice, shaped by the potter's learned knowledge of appropriate procedures. Blood, hair, feathers, fat and internal organs are not typical ingredients of ceramic pastes, yet ethnographic reports of pottery making among the Inuit of Arctic North America indicate that they were commonly used. Accurate identification and quantification of these animal-deriving constituents in archaeological pottery is critical to our understanding of the logic of craft practice among hunter-gathers of the circumpolar region, as well as the interactions and movements of people, resources and material objects within this natural and social environment. In this paper we present a descriptive-systems-based approach for the characterization of ceramic bodies containing atypical organic tempers which expands: 1) current methods of ceramic thin section analysis and description, and 2) the evidentiary basis of technological and provenance interpretations.

Mooney Digrius, Dawn (California State University)

[99] *Teaching Archaeology from a Sustainability Perspective*

In the twenty-first century, archaeology should be applied and should include scientists and engineers. Why? The reason is simple: because the discipline contributes to our understanding of contemporary issues such as global warming and environmental degradation as well as the past. As a paleoethnobotanist (and now historian of paleobotany), I saw a need for more collaborative work. Thus, in my classroom, I utilized a multi-disciplinary perspective, one that drew from anthropology, water resources engineering, and plant science. Once my students were trained in the necessary theoretical and methodological practices, they went into the field (Ecuador) to conduct their own fieldwork under the auspices of sustainable development. Students conducted interviews with the local community, undertook survey work, took water and soil samples, and drew maps of the study region. Upon their return, they created a design plan that took into account the prehistoric and historic use of the land in order to develop a more sustainable development program. In this fashion, archaeology was seen as contributing to global sustainable development projects in a more relevant way, for it allowed the students to tackle real-world problems in a deep and meaningful way.

Moore, Jerry [11] see Carini, Claudio

Moore, David (Warren Wilson College), Christopher Rodning (Tulane University) and Robin Beck, Jr. (University of Michigan)

[188] *A Way Forward with Public and Professional Archaeology: The Exploring Joara Foundation in North Carolina*

The Exploring Joara Foundation, Inc. is a not-for profit, 501(c)3, organization whose mission is to support public archaeology in the western Piedmont region of North Carolina. Formed in 2008, the foundation has grown around the long-term research project at the Berry site, near Morganton, NC; now known to be the location of the Native town of Joara and the Spanish Fort San Juan built by Juan Pardo in 1567. Archaeological investigations at the Berry site since 2001 have involved the public in all aspects of the project and today the Exploring Joara Foundation reaches more than 4,000 school children and other members of the public each year with hands-on programming including classroom visits, field and lab experiences, and summer camps. This paper explores the challenges and rewards of an intentional public approach to professional archaeology.

Moore, Henrietta L.

[297] *Feminism and Experimentation*

This paper discusses the relationship between conceptual development and material experimentation in feminist research. It uses the work of Ruth Tringham as a fulcrum for wider discussions on how we can and should drive new forms of experimentation as we enter the fourth wave of feminism.

Moore, Andrew (RIT)

[334] *Brian Fagan, Climate Change, and Us*

Brian Fagan has been a leader in illuminating the human past for students, and the public of all ages. From his writings and lectures thousands of people have come to understand how human societies have shaped the world in which we live. In recent years Fagan has built on these insights to bring a compelling message to his many audiences: that climate change has profoundly impacted human communities in the past and that it continues to do so in the present. He invites them to ponder these lessons and to consider how they should respond in the light of past human experience, now intensified by increasingly dense populations, large-scale exploitation of the earth's resources, and modern technology. This paper will examine Fagan's recent publications on the theme of climate change, explore the development of his thinking, and offer an assessment of the contributions he is making to present-day debates.

Moore, Elanie (Citrus College, Glendora, California)

[352] *"Beyond the Solstice"*

The Great Murals of Sierra de San Francisco, Baja California, Mexico, have been the subject of in-depth study (Gutierrez 2013; Hyland 1997; Rubio 2013; Vinas 2013). The latter include recordation of major sites and reconstruction of age, cultural affiliation, and hypotheses as to meaning and function.

Growing evidence supports that these sites display light patterns correlating with winter / summer solstice timings. Arguments have been presented that light manifestations exhibit similarities to central mythological subjects. The latter are documented in the regional oral traditions of the indigenous people (cf. Jones 1995; Rubio 2013; Smith 1985). Ethnographic documentation provides a basis for an interpretive reading of the murals on themes of world renewal, seasonal rebirth and cyclic continuity.

This presentation extends beyond solstice markers. There is substantial evidence that painters included sunlight, not just on the solstice, but also on other times of the year. Painters appear to employ movements of light and shadow as an important factor in the creation of the paintings. This

paper explores these phenomena and their ramifications for understanding Baja California hunter-gather cosmology, symbolism, metaphor and the overall deeper meaning of the images.

Moragas Segura, Natalia

[39] *Talking about Epiclassic at Teotihuacan: The Urban Question*

The collapse of Teotihuacan has traditionally marked the passage of the Classic to Epiclassic period in central Mexico. However, concepts like Epiclassic or collapse, have different consequences if we analyze the urban center of the city or the Teotihuacan territory. In this paper, we focus on the collapse of the urban center of Teotihuacan, analyzing the variability of the archaeological record that shows a very complex social process.

[355] *Discussant*

Morales, Juan [21] see Esparza Lopez, Rodrigo

Morales, Jorge, Jose Carlos Beltran (Centro INAH Nayarit) and Katrin Sieron (UNAM)

[189] *Possible Causes for Major Cultural Change between Classic and Postclassic Occupations in Western Mexico*

Preclassic and Classic occupation on the West Mexico has been dominated by the shaft-tomb culture. In Nayarit there is evidence for shaft-tomb occupation from 300 B.C. to about 900 A.D. Recent archaeological rescue projects related to the construction of the highway from Guadalajara to Puerto Vallarta have documented archaeology covered by extensive volcanic deposits belonging to a cataclysmic (VEI 6) Plinian eruption from nearby Ceboruco volcano. Postclassic Aztatlán culture buildings are situated directly above the volcanic deposits marking a major cultural change at 1000 years BP. The Plinian eruption of Ceboruco volcano can easily explain sudden abandonment of preclassic sites in the surroundings of the volcano. This kind of eruption comes along with meter-thick pumice and ash fallout covering hundreds of square-kilometers, as well as thick (cm to meter thick) deposits left by fast-moving hot pyroclastic flows and surges. These deposits buried croplands and natural vegetation and animals have been severely affected for years to decades.

Morales, Reinaldo (University of Central Arkansas)

[352] *From Borinquen to Barbados: A Caribbean Cave Art Ritual Complex*

Caribbean archaeology has provided us with evidence of a cultural mosaic that united diverse ecologies, ideologies, and identities in sophisticated networks of art and ritual. Caves and cave art were fundamental to these networks. This paper outlines a complex of cave-related ritual activity across the Antilles, supported by art-historical, archaeological, and ethnohistoric evidence. This proposed "Cave Art Ritual Complex" may turn out to have far-reaching implications for issues of cultural identity and political interaction in the precolumbian Americas.

Morales Gamarra, Ricardo (Ricardo M)

[303] *Murales prehispánicos en la costa norte del Perú: la imagen del poder y el poder de la imagen*

La costa norte del Perú ofrece impresionantes evidencias de una intensa actividad artística, asociada al manejo geopolítico de las sociedades desarrolladas entre desiertos y valles (3000 a. de C. a 1542). Una muestra del ingenio y habilidad de artistas al servicio de los grupos de poder. Colosales templos de tierra policromada, con impresionantes espacios ceremoniales que fueron acondicionados para pintar en sus paredes un ordenado discurso iconográfico que evidencia la función ceremonial de los patios, murales ejecutados como pinturas planas y relieves. Una práctica que se registra desde el Formativo hasta los Incas. Una compleja descripción de dioses, escenas y mitos, que expresa cambios ideológicos, estilísticos y tecnológicos. Estas representaciones no fueron decoraciones ambientales, pues, constituyeron sistemas de comunicación asociados a la función ritual del espacio. La iconografía expresa a través de imágenes una relación litúrgico-estilística entre murales, indumentaria de oficiantes y objetos de uso ceremonial. Frente a este frágil

y fatigado patrimonio de tierra, se enfrenta el reto de su conservación sin alterar su autenticidad y valores intrínsecos.

Morales-Aguilar, Carlos (Université Paris 1 - Panthéon Sorbonne)

[183] *Classic Maya Households in Northern Peten, Guatemala: An Overview*

The Northern Peten is composed by a complex network of monumental sites that proliferated in the Preclassic during a time period that witnessed the maximal centralization of power in the area. Afterward, during the Classic period, this region experienced a cultural shift and a reoccupation forming a different political panorama. However, little is still known about the Classic Maya settlements of Northern Peten, especially about their households. Recent archaeological investigations at Naachtun and El Mirador have recovered intriguing new data for Late Classic Maya residential architecture. Preliminary results demonstrate that Late Classic residential units in Northern Peten were built on top of Preclassic constructions or next to older buildings. This paper focuses on residential units through the analysis of settlement structure, architecture, and ceramics that evidences the traces of activities that their inhabitants left behind at this particular region. Also, this paper seeks to provide a comparative perspective of elite and commoner households in order to examine the roles of domestic ritual, household economies, and sociopolitical networks in a regional context.

Morales-Aguilar, Carlos [408] see Johnston, Kevin

Morales-Arce, Ana and Norma French

[317] *Exploring the Ancient Mitochondrial DNA of Precolumbian Populations Inhabiting Basin Mexico during the Post-Classic Period (900-1521 A.D.)*

The genetic study of precolumbian populations that inhabited the Basin of Mexico has recently begun. The genetic analysis of different periods in specific spatial territories could contribute to understanding patterns of interaction for precolumbian populations that lived in Mesoamerica. I use ancient mitochondrial DNA analysis to explore genetic similarities and differences within and between precolumbian bone samples provided by the Instituto Nacional de Antropología e Historia (INAH) in Mexico. The samples from post-Classic (A.D. 900-1521) Cholula, Tlatelolco and Teotihuacan will be compared to samples from the pre-Classic period (1200-600 B.C.) from Tlatilco and the Classic period (A.D. 1-900) from Jaina; to assess their biological affinities and the possible movements and origin of populations that lived during the post-Classic Period. This goal of this research is to contribute our understanding of theoretical patterns of migration, cultural fusion, or replacement of Mesoamerican populations through contrasting material culture evidence of social changes and genetic consequences.

Moran, Kimberlee (Forensic Outreach)

[19] *Forensic Archaeology: A Ten Year Retrospective*

In 2004 the first symposium dedicated to forensic archaeology was organized at the Society for American Archaeology's annual meeting. At that time, forensic archaeology was struggling to be defined within the archaeological community and was mostly non-existent to forensic practitioners in the USA. The events of 9/11, several domestic high profile mass casualty events, missing persons and some homicide investigations began a gradual momentum towards the recognition of archaeology's use within a forensic context. This session will look back at the past ten years of the Forensic Archaeology symposium at the SAA and how it reflects forensic archaeology's growth and persistent challenges. Has anything been achieved since 2004? Where does forensic archaeology in the United States go from here?

[19] *Chair*

Morehart, Christopher (Arizona State University)

[180] *Socio-Spatial Isomorphism and Ancient Farming Systems: Nominal versus Practical Tenure in the Basin of Mexico*

The recognition that similarities exist between the form of agricultural systems and the form of society is a fundamental archaeological contribution to the social sciences. This view of socio-spatial isomorphism is especially notable in research on irrigation. The spatial and temporal properties of water require particular forms of cooperation. Organizational configurations are contingent upon scale, integration, and number of users. In the Basin of Mexico during the Postclassic period, the organization and conveyance of land was tied to multiple institutional domains: household, community, state. The creation of named systems of tenure was one means by which the state exerted control over land, at least by the Late Postclassic Aztec Empire. However, the state exerted little direct control over production, and no relationship existed between systems of nominal tenure and the physical characteristics of farming systems. The first step to understand tenure in practice is to map social relations from the physical structure of agricultural systems, a basic method in archaeology. But to elucidate how local and non-local circumstances also shaped practical tenure, archaeologists must study multiple lines of data that go beyond socio-spatial isomorphism.

Morell-Hart, Shanti (McMaster University)

[38] *Fedickschrift: Notes on a Prominent Historical Figure in Ethnoecology, Ethnoarchaeology, and Landscape Studies*

The legacy of Scott Fedick in ethnoecology, ethnoarchaeology, and landscape studies cannot be understated. Aside from years of active collaborative work and mentorship, the dissemination of his research has led to rich interpretations far beyond his immediate influence.

In the first part of this paper, I follow impacts of Fedick's scholarship in several fields, as tracked through citations and students. I also trace his impacts on public policy and common understandings of Maya lifeways. In the second part of this paper, I address Fedick's work at the site of T'isil, Yalahau Region of Quintana Roo, where he carried out over a decade of research. I report my findings from paleoethnobotanical analysis at a well-to-do ancient household in the center of the site, including macroremains and microremains. I consider shifts in plant practices and relationships with the landscape as indexed by these residues.

These findings are illuminated by those from Fedick's own experimental studies and publications on ethnoecology and the landscape. I pay particular attention to his writings on the "managed mosaic" that both reflected and inspired ancient Maya ethnoecological practice. Such work has guided countless scholars, whether field school students, graduate student advisees, or collaborators in archaeology.

Morell-Hart, Shanti [370] see Chatters, James

Morello, Flavia [251] see San Roman, Manuel

Morello Repetto, Flavia (Instituto de la Patagonia, Universidad de Magallanes), Fabiana Martin (Universidad de Magallanes, Instituto de la Patagonia), Mauricio Massone (Universidad de Magallanes, Instituto de la Patagonia), Marta Alfonso-Durruty (Kansas State University, Department of Sociology,) and Manuel San Roman (Universidad de Magallanes, Instituto de la Patagonia)

[251] *Archaeology of Fuegian Islands: Tierra del Fuego, Dawson and Navarino, Human Settlement and Cultural Interaction (Patagonia, Chile)*

The Fuegian archipelago, dominated by three major islands named Tierra del Fuego, Dawson and Navarino, is located in the southernmost end of South America. Peopled by hunter-gatherer societies since c. 10.500 BP, the interior sea formations date to the Early Holocene. Shoreline environments have evidence of specialized marine adaptation since c. 6.500 BP, after which colonization has been generally interpreted as homogenous, stable and continuous. Ethnohistoric and ethnographic records account for an overlapping network area of three groups: selk'nam land hunters and alacalufe or kawésqar from central-western Patagonia and yamana or yagan, south of Beagle channel, both maritime nomads. This subsistence dichotomy -terrestrial/marine and pedestrian/canoe- has restrained research and comprehension of the archaeological record.

Therefore a broad and comparative assessment has been undertaken, with a methodological focus on objects or artifacts whose origin can be traced as transport evidence and face to face relations (e.g. lithic and bone raw materials). Also, technological traits related to certain cultural elements that involve more complex teaching-learning processes, sharing and information flows have been studied (e.g. complex core reduction, cranial modification techniques).

Moreno Guzmán, María Olvido [194] see Filloy, Laura

Moreno Valle, Jesús Emmanuel [156] see Gallaga, Emiliano

Moreno-Galeana, Miguel [129] see Muñoz, Maria De

Morenon, Pierre

[268] *Think Small: What Charcoal Fragments and Tiny Sites Teach Us about Indigenous Land Modifications and Farming around Narragansett Bay, Rhode Island*

Are eye-witness descriptions in 1524 of extensive farming and intensive habitat modifications around Narragansett Bay by indigenous people just fantasies? Pollen evidence in now urban industrial Rhode Island remains unconvincing. To date, less than a dozen pre-Contact Rhode Island sites containing Zea maize have been found. This paper examines ongoing experiments with charcoal, particularly from RI 1898 – a tiny intact spot with a remarkably preserved stone tool manufacturing assemblage on the coastal edge – to evaluate broad questions about changing indigenous land use, deforestation and farming in a New England coastal setting.

[268] *Chair*

Morgan, Christopher (University of Nevada, Reno)

[341] *Environmental Limitations, Alpine Villages and Logistical Strategies in the Northern White Mountains*

Recent investigations in the extremely remote and previously unsurveyed northern White Mountains have identified a pattern of alpine land use consistent with many other alpine regions in and around the Great Basin: one focused mainly on artiodactyl hunting. But sites similar to the alpine villages in the southern portion of the range were discovered at the subalpine-alpine ecotone. GIS analyses suggest the relative dearth of high elevation villages in the north is explained by environmental limitations, in particular difficulty of access to markedly smaller stands of piñon pine at lower elevations, which are thought to have helped subsidize residential occupations in the south. Complementary GIS analyses suggest the villages in the north served as residential bases from which long-range logistical hunting parties exploited game in alpine meadows on the northern summit ridge, this standing in contrast to the residential pattern seen in the south. Though superficially similar – both the northern and southern portion of the range contain high-altitude villages – the less intensive and logistical pattern in the north points to just how close to the margin the more intensive pattern in the south really was and to how limiting high altitude environments are to intensive human occupation.

[1] *Discussant*

Morgan, David, Dave Conlin (National Park Service) and Charles Lawson (National Park Service)

[29] *The Intersection at Biscayne National Park of Looting as a Traditional Form of Recreation, Submerged Cultural Resources, and Management Practice*

Protecting archaeological sites from looting is one of the constant challenges facing the 66 park units in the Southeast Region of the U.S. National Park Service. One park in particular--Biscayne National Park--eclipses the others in terms of the quantity and destructiveness of looting it suffers. Research since 2010 at the HMS Fowey, English China, Black, Pillar Dollar, Brick, Long Reef Cannon, and other shipwrecks illustrates the severity of the problem. The submerged nature of the resources is part of the explanation of why this particular park is targeted for looting, but it is only part of the

picture, as other maritime park resources elsewhere do not receive the same degree of illicit attention. Logistical and institutional barriers have impeded law enforcement as a deterrence method, and it is unclear what alternative strategies, such as stewardship education, might most effectively be brought to bear.

Morgan, Thomas (UC Berkeley), Natalie Uomini (University of Liverpool), Luke Rendell (St Andrews University), Ignacio de la Torre (University College London) and Kevin Laland (St Andrews University)

[33] *The Social Transmission of Oldowan Lithic Technology*

Flint flakes appear in the archaeological record from 2.5mya and the skill to produce them is believed to have been socially transmitted. However, how this occurred remains a mystery. In an experiment involving 184 participants, we investigated how effectively five different forms of transmission facilitate the acquisition of the ability to produce Oldowan flakes. We compared i) reverse engineering of discarded flakes, ii) observational learning, iii) basic “ape-like” teaching, iv) gestural teaching and v) verbal teaching. We found that teaching, particularly verbal teaching, allowed participants to produce a greater number of flakes from a single piece of flint, to do so more rapidly and with more efficient use of raw materials and energy, than did reverse engineering. There was no evidence that observational learning improved performance relative to reverse engineering. We conclude that reliance on stone tools during the Oldowan would have generated selection for enhanced means of communication and it is likely that forms of teaching were present during the Oldowan. We also suggest that the appearance of Acheulean technology 1.7 mya relied, in part, on the prior evolution of novel forms of communication, which, given the complexity of Acheulean tool-making, plausibly involved a simple form of symbolic communication.

Morgan, David [44] see Rooney, Clete

Morgan, Sarah (WCRM Inc.)

[90] *Utilizing Visual Resource Management to Assess Effects on Historic Properties; Working within the BLM VRM Framework*

This paper will provide an overview of using the established Bureau of Land Management (BLM) Visual Resource Management (VRM) system to assess indirect visual effects on historic properties. Per Section 106 of the National Historic Preservation Act, the introduction of visual elements that diminish the integrity of the property's significant historic features constitutes an adverse effect. The VRM system was designed to inventory landscapes, identify those with high scenic values worth protecting, and use Contrast Rating to determine if proposed projects or actions would be within the range of acceptable change to the landscape. Though VRM was not designed to measure effects on historic properties, by using the Contrast Rating portion of the VRM system, potential changes, which may constitute adverse effects, to the landscapes and settings of historic properties can be identified and quantified. With the introduction of BLM guidelines in 2012 for the management of National Trails, quantifying potential adverse visual effects to National Historic Trails, in addition to effects on other site types, is becoming more common as part of CRM.

Morgan, Jessica (University of South Florida) and Tristan Carter (McMaster University)

[91] *Obsidian Source Selection in the Early Bronze Age Cyclades*

While the obsidian used by southern Aegean prehistoric communities has long been known to derive primarily from Melos, there has been little investigation regarding the relative importance of the two Melian quarries – Sta Nychia and Dhemenegaki. This study employed portable X-ray fluorescence spectrometry to investigate this question and begin to map regional traditions of obsidian source selection during the 3rd millennium B.C. The 715 artifacts analyzed derive from 11 Early Bronze I - late Early Bronze II cemeteries on the Cycladic islands of Naxos and Kouphonisi. The material is dominated by pressure blades manufactured specifically for funerary consumption. Contextually, they reflect the social significance of body modification amongst these islanders, the blades likely used for depilation, scarification, and tattooing. Our results display a clear overall trend. While unsurprisingly, the raw materials are overwhelmingly Melian, the data show a clear preference for

Sta Nychia products (> 85%). Whether this procurement bias is Naxos-Kouphonisi specific is currently difficult to say, though contemporary data from Mochlos on Crete show a similar pattern. Future research integrating source selection with previously defined regional distinctions in pressure-blade technology is necessary to begin mapping synchronous 'communities of practice'.

Morgan, Brooke (Southern Methodist University)

[148] *Folsom Households and Community Structure: A New Look at Hunter-Gatherer Lifespace*

The presence of four contemporaneous Folsom-age structures at the Mountaineer site near Gunnison, Colorado suggests these hunter-gatherers had broader adaptations than previously recognized. Mountaineer provides a unique setting for investigating Folsom socio-economic structure as it relates to domestic architecture, through analysis of lithic assemblages and spatial patterning. A multi-scalar analysis has provided new insight into Folsom lifeways and raised questions concerning how archaeologists operationalize concepts from the ethnographic literature. Though documenting "activity areas" has been fruitful in ethnoarchaeological settings, accurate identification of such areas through k-means cluster analysis was unsuccessful in this case. At intensively occupied, open-air sites like Mountaineer, archaeological deposits are subject to diverse post-depositional c- and n-transforms (sensu Schiffer 1987), precluding meaningful behavioral interpretation at the grossest scales of analysis. However, finer-grained scales of analysis at the level of macro- and microdebitage reveal actual patterning may be preserved over time. These fine-grained data, evidence for offsite foraging, and multiple smaller Folsom sites within the Gunnison Basin point to reduced residential mobility and implementation of a logistical foraging strategy.

[148] *Chair*

Morgan, Colleen (University of York)

[297] *A Chimera Spider at Play: Making, Creativity and Collaboration in Digital Archaeology*

In an interview with Michael Shanks and Christopher Witmore, Ruth Tringham describes her experiments with digital remediations of the past as "expressing and sharing the complex web of relationships and ambiguities that is an essential dimension of the feminist practice of archaeology" (Rathje et. al 2013). As such, Tringham's practice of digital making was an explicitly political expression of archaeological investigation, not as explanation, but as an interpretive process. She shared the excitement and engagement of creating archaeological narratives through New Media with her students, teaching digital media expression as a legitimate form of academic enterprise that can yield a "playful surprise." Tringham's digital remediations, founded on archaeological evidence, explored a vast array of media--photography, videography, hypertext, virtual reality, augmented reality, gaming, and database narratives, to name a few--bringing an unheralded creativity and irreverence to archaeological interpretation. In this presentation I engage with Tringham's contributions to archaeology with particular attention to critical making and play as political, productive methods for thinking about and with the past.

[235] *Discussant*

[297] *Chair*

Moriarty, Ellen [413] see Moriarty, Matthew

Moriarty, Matthew and Ellen Moriarty (Community College of Vermont)

[413] *Overland Trade in the Central Maya Lowlands: The View from Trinidad de Nosotros, El Petén, Guatemala*

Although the largest Classic Maya political capitals are frequently assumed to have served as the critical nodes in long-distance trade networks, empirical data from decades of research suggest that ancient Maya trade was more nuanced in its organization. This paper presents a view on Maya trade from the perspective of Trinidad de Nosotros, a port on Guatemala's Lake Petén Itzá. Trinidad's position, astride overland trade routes and intermediate between these routes and a major political capital, provides an ideal vantage point for exploring the intersection of trade and politics at the local level. Drawing on obsidian analyses, ceramic data, and the architecture of harbor facilities at

Trinidad, we explore the structure of trade in an emergent Late Classic Maya polity. These data demonstrate both the complex and heterarchical structure of ancient Maya trade, and the need to consider small and medium-sized centers as potentially critical to long-distance trade networks.

Morin, Eugene [190] see Mallol, Carolina

Morin, Eugene (Trent University), John D. Speth (University of Michigan) and Julia Lee-Thorp (Research Laboratory for Archaeology, Oxford)

[396] *A Critical Reappraisal of Middle Paleolithic Diets*

This paper examines dietary patterns amongst Middle Paleolithic foragers in Europe and southwest Asia from ca 300 to 40 thousand years ago. In both regions, faunal studies show that a relatively narrow range of presumably high-ranked animal species—mostly medium- to large-sized ungulates—was hunted. The present review stresses the importance of considering fat procurement and the effects of transport constraints on faunal assemblages while assessing the diet composition of Middle Paleolithic hominins. Overall, the published evidence hints at significant regional and temporal variation in dietary patterns during this time period.

Moritz, Ryan and René Vellanoweth (CSULA)

[383] *Expedient Stone Tool Analysis from Tule Creek (CA-SNI-25)*

San Nicolas Island is the most remote of the California Channel Islands and has been inhabited since the Early Holocene. The island has an abundant supply of highly indurated sandstones as well as quartzites, metavolcanics, and metasedimentary rocks associated with densely packed conglomerate beds. Although there are no microcrystalline rocks such as obsidians, cherts, and fused shales, the local island toolstone is ideal for expedient tool technologies and for working sandstone. The Native islanders made use of local materials for everyday activities such as hunting, food processing, shell fishhook production, and other important domestic undertakings. In this paper we examine expedient tool technology at a late Holocene village site located on the north coast of the island that has been dated to between A.D. 1200 and European contact. We conducted our spatial analysis by selecting several units associated with fishing technologies and comparing the expedient tools with units selected from the same loci (East Locus) but without association to fishing technologies. These expedient tools were then compared to units selected from Mound B, another loci within the site, which is primarily associated with residential habitation. The results of this expedient tool analysis from CA-SNI-25 will be discussed in this presentation.

Morris, Annelise (University of California, Berkeley)

[34] *Materializing the Momentary: Community Engagement Through Ethnographic Practice*

Community engagement is a growing aspect of archaeological practice; not only are archaeologists realizing that these kinds of projects are increasingly important to the movement of decolonization in regards to the histories of under-represented communities, but also that these relationships produce valuable knowledge about sites and their life histories. This paper specifically examines the unique ethnographic moment that arises when descendants and archaeologists come together in the practice of archaeological investigation. I assert that the sensory experience of the materialities of the past create a moment for engaging with memories, ideas, and emotions about sites, their inhabitants, and their artifacts which cannot be accessed or explored any other way. As such, this requires a re-orientation of research design and theoretical interpretations to account for this knowledge. To discuss implications of this reorientation, I'll present examples from my work on the Historic Archaeology Project of Lawrence County, a project which examined processes of racialization during the 19th and early 20th century through excavations centered around rural Black-owned farmsteads in Southeastern Illinois. I will conclude by asserting that collaborative community archaeology offers a rich anthropological opportunity to examine how we, as both archaeologists and community members, know and reproduce our histories.

Morris, Ian

[36] *Discussant*

Morris, Alan [264] see Williams, Sloan

Morrison, Bethany (Western Connecticut State University)**[38]** *Beyond the Death March: Scott Fedick's Legacy as a Field School Director*

Beyond his career as a professor and researcher, Dr. Scott Fedick has been a patient and dedicated teacher of archaeological field schools. In this capacity he leaves a legacy of changed lives. This paper looks back on the BRASS and Yalahau field schools and the lasting impression they left on participants. It also discusses field school pedagogy, looking at what has changed and what remains the same since the days of Scott's famous death marches.

Morrison, Alex E. [77] see Allen, Melinda

Morrison, Alex (University of Auckland)**[388]** *Exploring the Spatial Distribution of Rapa Nui Ahu with Costly Signaling Theory: An Agent-Based Model*

Despite its small size and marginal environment, Rapa Nui (Easter Island, Chile) boasts some of the world's most impressive monumental ceremonial architecture. While the production of ahu and moai have been linked to an assumed collapse of Rapa Nui society, we suggest instead that the construction of these stone monuments contributed to social stability by reducing inter-group violence and endemic warfare. To examine this hypothesis, we develop a theoretical agent-based model using concepts from costly signaling theory. Our model investigates the degree to which monumental architectural construction may have played a significant role in the persistence of Rapa Nui populations.

[233] *Chair***Morrow, Juliet (Arkansas Archeological Survey) and Sarah Stuckey (Arkansas Archeological Survey)****[185]** *Sourcing Burlington Chert in Missouri and Arkansas*

This presentation is a continuation of research on the intersource and intrasource variability of Burlington chert and its implications for interpretations of pre-contact period settlement and procurement. Our results presented in 2013 suggest that Burlington look-a-like cherts (e.g., Lafayette Formation chert, etc.) display the same mid-infrared spectral range as Burlington Formation chert from quarries and secondary deposits (St. Louis area, northern-central Missouri, and southwest Missouri). Testing of additional chert samples is being conducted in order to verify our 2013 results by exploring spectral similarity to other cherts.

Morrow, Sara [273] see Watson, Adam

Morrow, Sara (University of Notre Dame), Ian Kuijt (University of Notre Dame) and Katie Shakour**[315]** *Materialized Mourning: House Wakes and Pipe Use on Inishark and Inishbofin, County Galway, Ireland*

19th and 20th century Irish house wakes memorialized the dead in a spirit of remembrance, revelry, and community healing. A central aspect of the wake was the smoking of pipe tobacco, with funeral goers smoking in the house and at the burial ground often discarding their clay pipes after smoking. Archaeological excavations on Inishark Island, County Galway, Ireland, revealed complete and incomplete clay pipes in a deposit within building 8, a home dating to the late 19th century. By comparing clay pipes from building 8 with other excavated sites from Inishark, and neighboring Inishbofin, we examine how unique properties of the building 8 assemblage reveal information on use and discard of pipes and other contextual material regarding funerary practices. This poster examines how pipes were used in a daily context of island life, but also how they may have

transcended that role and were repurposed into ceremonies of death and burial given the relative isolation and unpredictable access to goods on the island. As a result, islander wake customs during the 19th and early 20th century fostered local community ties, shared regional identity and engagement with symbols of resistance to colonial rule.

Morton, Ethan [300] see Reid, Kenneth

Moses, Sharon (Northern Arizona University)

[19] *A Missing Person Body Recovery Case: Maintaining Professionalism and Best Practices as a Forensic Archaeologist Amidst Escalated Tensions*

In Fall 2012, I was contacted by a county sheriff's department in South Carolina and their Coroner as well as by the family members of a missing person, to request my assistance as a forensic archaeologist in a body recovery. A 54 year old male had been missing for nearly two years until a timber worker stumbled upon a human bone in the course of marking trees for harvest. What followed was a body recovery wherein I witnessed growing tensions between family members towards law enforcement resulting in misguided efforts by the family that compromised the search area. Insinuations of a police cover up and homicide were among the unfounded and inflammatory speculations introduced by previous search and recovery volunteers on the scene before we arrived. Ultimately, I and my crew became unwitting negotiators between parties to quell hostilities. This paper is an attempt to address issues of professionalism amidst tensions that have escalated and complicated a body recovery.

Moses, Victoria (University of Arizona)

[51] *Temple, Tavern, and Table: Zooarchaeology at the Area Sacra di Sant'Omobono from the 7th Century B.C.E. to the 13th Century C.E.*

The Area Sacra di Sant'Omobono in Rome, situated on the banks of the Tiber River at the base of Capitoline Hill, contains evidence of Rome's people from the earliest inhabitants to modern day. This research utilizes zooarchaeological analysis to investigate how the space was used in three time periods: Archaic, late Roman, and Medieval. The diachronic analysis of the faunal remains reflects the range of uses at the site during its occupation and highlights the integration of quotidian activities in a sacred space. The Archaic faunal assemblage, associated with the late 7th to early 6th century B.C.E. temple, contains the remains of sacrificed animals. The sacrifices consist mostly of very young sheep/goat, but pig, cattle, and dog are also represented. The late Roman assemblage is a 3rd to 4th century C.E. tavern. In contrast to the sheep/goat dominated Archaic assemblage associated with the temple, these later remains are dominated by pig. The 12th to 13th century C.E. midden contains remains of domestic consumption that are more varied and show a marked increase in chicken consumption.

Moshenska, Gabriel (UCL Institute of Archaeology)

[235] *Digital Public Archaeology in the UK - A Review*

This paper offers an overview of recent and emerging trends in digital public archaeology in the UK. It draws on examples of research and practice in public archaeology by academic, museum, amateur and professional archaeologists engaged in public engagement activities, as well as the emerging field of crowd-sourced and/or crowd-funded public archaeology in which digital public engagement has played a leading role. I take a skeptical view of some of the more extravagant claims made for digital public archaeology, and question the utility and - in particular - the sustainability of some categories of projects. The role of funders and in particular the Heritage Lottery Fund will be considered as a factor (and a potential hazard) in the growth of digital public archaeology, alongside the growing academic archaeological engagement with digital humanities. I hope that insights from the UK experience of the financial, cultural and knowledge economies of digital public archaeology will be of wider interest and value.

[290] *Discussant*

Mosher, M. J. (Western Washington University)

[415] *Can Epigenetic Mechanisms Illuminate Dietary Ancestry in Populations?*

Illuminating genetic and environmental factors underlying complex traits is a daunting task. Dietary nutrients provide continuous and evolving influence on gene expression, thus affecting individual growth and development and adaptive capacities over the life course. Metabolic traits represent the culmination of many gene-by-nutrient interactions. Genes set parameters for susceptibility to environmental factors, and variation in both internal and external environmental dynamics mediates the ultimate response. Epigenetic mechanisms, such as DNA methylation, register environmental signals and mediate gene expression without altering gene sequencing. These mechanisms provide a more rapid, flexible and even reversible response to the environment than natural selection pressures on DNA. Nutrients play a pivotal role in the ongoing modification of these mechanisms. While we may extrapolate from abundant research in animal studies, studies examining normal human variation are lacking. Here we discuss the role of nutrients in DNA methylation and confounding environmental factors also affecting its variation. We present the modern migration model used in our previously reported pilot studies of four populations, examining methylation variation in the leptin core promoter, a gene regulating energy homeostasis, adipogenesis and reproduction. Maternal/offspring duos from three continents were compared: two African populations, one North American, one SE Asian.

Moss, Madonna (University of Oregon)**[415] *The Nutritional Value of Pacific Herring: an Ancient Cultural Keystone Species on the Northwest Coast of North America***

Pacific herring play a special ecological role in North Pacific marine ecosystems by converting phytoplankton into energy consumable by a variety of animals, including humans. Northwest Coast peoples have been consuming herring since the early Holocene, and patterns of usage likely changed over time. Herring are available in different forms during different times of the year. This paper will evaluate the nutritional value of herring and seasonal herring products vis à vis other Northwest Coast animal foods by comparing values for protein, fat, calories, and brain-selective nutrients including Omega-3 fatty acids DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid), in addition to iodine, iron, zinc, copper, and selenium. Herring are found to be remarkably rich nutritionally and function as the linchpin within complex ocean food webs. Their seasonal patterns of abundance attract a wide range of animals, almost all of which have been of economic value to Alaska Natives and First Nations for thousands of years.

Mothes, Patricia [46] see Pratt, William

Motsinger, Thomas**[209] *Digital Archaeology at Ironwood Village: A Model for Archaeology's Paperless Future***

The particular challenges at the Ironwood Village excavations—time constraints, burgeoning data opportunities, and management of a complex array of excavation staff and machinery—begged for a modernized approach to data collection and workflow management. PaleoWest Archaeology's digital workflow system—already four years in development—was customized for the project and implemented throughout. The result was one of the world's first all-digital major excavation projects, the success of which could serve as a model for a high-quality, efficient, and cost-effective archaeological workflow, in both cultural resource compliance and academic field research settings.

[209] *Chair***Motta, Laura (University of Michigan) and Laura Jessmore (University of Michigan)****[54] *Analysis of Plant Remains from the Bronze Age Site of Pecica Șanțul Mare***

The site of Pecica Șanțul Mare, Romania is among the most important settlements of the European Bronze Age to understand the origins and control of metalwork networks that redistributed the metal resources of the western Carpathian Mountains throughout prehistoric Europe. The study of the ways vegetal resources were used by the inhabitants of Pecica will provide crucial information about

the level of social, political, and economic complexity achieved during the Bronze Age. In particular archaeobotanical remains are examined to explore how Pecica acted as a center of food production and redistribution, how the people of Pecica shaped their environment, and why they may have abandoned the site after a period of rapid increase in social complexity. Initial findings indicate that cereals, especially einkorn wheat (*Triticum monococcum*) and barley (*Hordeum vulgare*), were grown as a principal food source throughout the Bronze Age. In addition, several species of weeds and wild plants have also been found across the site and there is a clear difference in taxon distribution between earlier and later phases of occupation.

Motuzaitė Matuzeviciute, Giedre (Lithuanian Institute of History) and Martin Kenneth Jones

[345] *Earliest Direct Evidence of Crop Consumption in the central Tian Shan (Kazakhstan and Kyrgyzstan)*

The main goal of this research is to explore the contribution of plant foods to the diet of pastoral societies. It is still a subject of debate whether domesticated plants were being consumed and grown or just traded in this region during the Bronze Age, as the role of domesticated crops and their intensity of consumption in pastoral societies has been overlooked. This research presents the first results of stable carbon/nitrogen isotope analysis and archaeobotanical investigations from prehistoric sites in the central Tian Shan mountains of Kazakhstan and Kyrgyzstan. AMS dates of human bones and charred cereal macrofossils allow for the identification of the earliest established agro-pastoralists in this region.

Mountjoy, Joseph (Universidad de Guadalajara, México)

[352] *Huichol Symbolism and the Interpretation of Rock Art in the Western Sierra of Jalisco Mexico*

The Huichol are not known to have inhabited the western sierra of Jalisco in historic times. However, it has been possible to use Huichol symbolism to interpret rock art at several locations in this region. This was first done with the large pictograph panel at La Peña Pintada in the Tomatlan river valley, indicating the use of the sun's position on the eastern horizon as a dry season/wet season calendar and individual pictographs depicting plants and animals important for native subsistence. Subsequently, Huichol symbolism was used in the valley of Mascota to interpret petroglyphs in the Canon del Ocotillo as they relate to the transitional dry season/wet season Huichol ceremony of the Sacred Deer Hunt, done preparatory to planting. Most recently, Huichol symbolism has been used to understand associated deer and scorpion petroglyphs at the El Bordo II site as they relate to the growing season of maize. The El Bordo II petroglyphs can be dated to about 2,000 years ago, suggesting that major sites of rock art may have been visited seasonally over perhaps hundreds of years in order to conduct rituals related to the agricultural cycle.

[189] *Discussant*

Moutsiou, Theodora [260] see Carter, Tristan

Moutsiou, Theodora

[412] *From Raw Material to Symbol of Social Value: Obsidian Movement in the Paleolithic*

Recent research has demonstrated the extensive use of obsidian throughout the Paleolithic in all the areas where obsidian sources were available at the time. Further analysis revealed that obsidian covered a wide range of distances on the Paleolithic landscape but in the majority of cases its movement was linked to long distances, i.e. ≥ 100 km. This surprising conclusion cannot be satisfactorily explained on purely functional terms. Obsidian's physical properties could have been the primary reason for its use in short site-to-source distances but this explanation fails to explain why our early ancestors would have undergone the effort of traveling far to acquire obsidian when other good quality materials were locally available. A more likely explanation, discussed in this paper, seems to be associated with obsidian's aesthetic properties, specifically color, brilliance and iridescence. These features transformed obsidian into a material of social value that allowed early humans to control their global social landscape and negotiate otherwise completely unrelated individuals.

Moy, Rachel (UCLA)**[53]** *Neolithic vs. Late Stone Age: The Neolithic Revolution in the Horn of Africa Reconsidered*

This poster assesses the applicability of the term “Neolithic” to describe the beginning of sedentism and agriculture in Ethiopia, and whether we can compare it to similar periods in other regions. The use of the term “Neolithic” has been criticized in recent years (Finlayson 2011; Zeder 2009) both for the implication that the period was one of revolution and its associated package of characteristics. This designation originally derived from the definition of the term as including the birth of agriculture and increased sedentism in the Near East (Childe 1951), but has now become a blanket term to describe prehistoric societies across the globe. Scholars now recognize that the adoption of separate components of the “Neolithic package” happened at various rates and scales in different regions. Though designations of Late Stone Age are more common in African archaeology, the term “African Neolithic” is still regularly used. This poster reconsiders evidence for when components of the “Neolithic package” were first adopted in the Horn of Africa, and through this discussion, considers if the term “Ethiopian Neolithic Revolution” is appropriate for the region's prehistory.

Moyer, Teresa [83] see Furlong Minkoff, Mary

Moyes, Holley [193] see Arksey, Marieka

Moyes, Holley (University of California, Merced), Shayna Hernandez (University of California, Merced) and Lauren Phillips (University of California, Merced)**[355]** *Little Finds Big Results: The Utility of Small Artifacts in the Spatial Analyses of Looted Sites*

Ethnographically cave use in Mesoamerica is well-documented and there are many accounts of modern rituals occurring in or near caves. These analogies provide excellent evidence for understanding the meaning of caves and provide supporting evidence to demonstrate that they functioned as ritual spaces in ancient society, yet analogies have little resonance when considering ancient rites occurring deep within caves. For this type of question we are much more dependent on the archaeological record itself. To complicate matters, most cave sites have been heavily looted destroying artifact assemblages and disturbing contexts. In spite of these challenges, caves still contain a great deal of information and new methods of recording provide new data for analyses, hence new interpretations. In this paper we examine the use of small finds in archaeological analyses using two case studies from ancient Maya cave sites in Belize, Chechem Ha Cave and the cave at Las Cuevas. In both instances, spatial analyses using GIS reveal the contexts and structure of rituals occurring within the sites allowing us to better understand the nature of ritual practice as well as its changes over time. This has broader implications in understanding how ritual practice articulates with larger socio/political processes.

Mrozowski, Stephen (Fiske Center for Archaeological Research, University of Massachusetts Boston)**[340]** *Empirical Imperialism and the Development of Indigenous Archaeologies*

One way of situating the empirical research that often accompanied European colonialism is to view it as an instrument of imperialism. This legacy stands a major impediment to the kind of collaboration that is an essential part of the growth of indigenous archaeologies. Yet empirical research remains an important part of archaeology. Used in a collaborative framework it can provide powerful evidence that can augment and refine indigenous histories, especially those being disputed by governments that seek to deny those very histories. This paper provides an overview of the Hassanamesit Woods Project that involves collaboration between the Fiske Center for Archaeological Research at the University of Massachusetts Boston and Nipmuc Nation of Massachusetts. It presents an example of the manner in which the Nipmuc Tribal Council has embraced empirical archaeological evidence as a way of extending the temporal depth of their cultural and political history. The strength of this research is aiding the Nipmuc in appealing a denial of federal recognition that was initially granted by the Clinton administration only to be reversed by the Bush administration.

Mt. Joy, Kristen (Texas Army National Guard)

[363] *More than a Picture: Experiments in Terrestrial Lidar Documentation in Archaeological and Architectural Management at Texas Army National Guard*

Texas Army National Guard is responsible for management of archaeological and historical buildings at several locations across the state. In order to more effectively integrate preservation concerns into the many internal systems of the Guard's organization, the Cultural Resources team has been reaching out to other departments for expertise and access to technology. This poster summarizes the efforts to utilize terrestrial LiDAR not only for detailed documentation of historic properties, but as part of a longer view plan of tracking structural conditions and changes.

[70] *Moderator*

Muckle, Robert (Capilano University)

[99] *Teaching Archaeology with Campus Trash*

Student participation in campus trash audits connects to multiple principles of curricular reform articulated by the SAA, including making them aware of basic methodological and cognitive skills used by archaeologists, real-world problem solving, and becoming effective communicators. Their physical participation helps convey field and laboratory skills. Having them draw behavioral inferences from trash provides experience in cognitive skills of interpretation. Results of trash audits can be used to significantly reduce waste, improve recycling, and increase campus sustainability, making the real-world problem solving aspect of archaeology clear. At Capilano University, the trash audit is a theme that runs through the Introduction to Archaeology course, incorporated into course components on rationalizing archaeology; research design; field and lab methods; reconstructing behavior, and the archaeology of contemporary times. Students have a prefatory orientation on how the waste audit works. On the day of the audit, students work in 90 minute shifts sorting 100 percent of the accumulation of the trash from the previous day. Students write a report in standard scientific format, including background, methods, results, and discussion. Feedback from students has generally been positive.

Mudar, Karen (Archeology Program) and Leah Burgin

[83] *The Listing of Outlaw Treachery (LOOT) Federal Clearinghouse: 35 Years of Data*

Despite the development of sophisticated online legal search engines and ready availability of certain types of court documents, the 35-year-old LOOT Clearinghouse continues to collect unique information about looting and vandalism of archaeological sites on Federal lands. Comparison of LOOT data with data from other sources suggest that legal search engines provide more extensive information about litigated cases, while LOOT contains more information about non-ARPA cases and cultural resource violations that are not referred to Assistant United States Attorneys (AUSAs). A more complete picture of trends in law enforcement efforts and attorney's practices emerges when both sources are utilized.

Mueller, Melissa (Texas A&M University, Center for the Study of the First Americans), Ted Goebel (Texas A&M University, CSFA), Julie Esdale (Colorado State University, CEMML) and Kelly Graf (Texas A&M University, CSFA)

[112] *Archaeology of the Terminal Pleistocene McDonald Creek Site, Central Alaska*

In 2014 archaeologists from Texas A&M University and Colorado State University began a long-term excavation of the McDonald Creek site (FAI-2043), located in the Tanana valley of central Alaska. In this paper we present our initial results. At least two terminal Pleistocene cultural components with preserved living floors, lithic artifacts, faunal and floral remains have been unearthed, respectively dating to about 14,000 and 12,600 cal BP. At the end of the 2014 field season, a probe unearthed even earlier artifacts, so far only known to predate 14,000 cal BP. Two additional Northern Archaic components occur. This site's context in Beringian archaeology is considered.

Muller, Antoine [33] see Shipton, Ceri

Mullins, Patrick [11] see Longo, Julia

Mullins, Patrick (University of Pittsburgh)

[404] *A Fortified Frontier - LIP Defensive Settlement in the Moche Valley*

During the Late Intermediate Period (LIP, 1000-1476 CE), the florescence of the Chimú Empire in the Moche Valley on the coast corresponded with an explosion of fortified and defensive settlement up-valley and into the nearby highlands. Previous scholarship has associated these forts with tentative stages of Chimú expansion into the middle and upper reaches of the Moche Valley, placing the imperial frontier as located in the transitional zone between the river valley and the highlands above. While work by pioneering scholars provides a general outline of settlement during the LIP, many questions remain unanswered regarding the affiliation and origin of fortified valley and highland communities during this time, in addition to the variety of interactions which may have structured this frontier zone. Since 2010, I have mapped and conducted preliminary surface collection at several fortified sites in the Moche Valley in order to gain a better understanding of the nature of defensive settlement on the valley-highland frontier during the LIP. Using a synthesis of original data supplemented by previous scholarship, this paper presents current understandings of fortified settlement in the Moche River Valley and its tributaries while outlining avenues for future investigations aimed to better understand the complex frontier.

Mulrooney, Mara (Bishop Museum), Andrew McAlister (University of Auckland), Christopher M. Stevenson (Virginia Commonwealth University) and Alexander E. Morrison (University of Auckland)

[412] *Sourcing Rapa Nui mata'a from the Collections of Bishop Museum Using Non-destructive pXRF*

On Rapa Nui (Easter Island), four geological sources of rhyolitic obsidian were utilized to manufacture obsidian artifacts, including tanged implements known as mata'a. In this study, a total of 332 mata'a from the collections of Bishop Museum were analyzed using portable X-ray fluorescence (pXRF). Two analytical methods, Discriminant Function Analysis and Support Vector Machines Classification, were used to assign geographical provenance to these artifacts, which appear to be manufactured using obsidians predominantly from Orito, one of the four geological sources on the island. This study demonstrates how non-destructive analyses of museum collections can contribute to our understanding of obsidian procurement and production on Rapa Nui.

Munoz, Cynthia [229] see Kemp, Leonard

Munoz, Lizette (University of Pittsburgh)

[347] *Methodological Considerations for Examining the "Slave Diet" at Colonial Wine Producing Estates in Nasca, Peru*

The 2012-2013 season of the Haciendas of Nasca Archaeological Project focused on the recovery of material correlates of domestic production, consumption, and discard from two Jesuit coastal haciendas, San Joseph and San Xavier, where the majority of the labor was enslaved and of African descent. Our systematic analysis of macrobotanical remains and sediment samples aimed at branching our understanding of: a) colonial foodways beyond the Native Andean/European dichotomy, as several years of incorporation into a flourishing global economy had been underway by the time the Jesuits acquired the properties in the early 17th C; and b) the impact of the use of dry screening vs. flotation as processing techniques that yield different results with regards to quantity and quality of the materials recovered. The results of dry screening demonstrate that the enslaved population of San Xavier and San Joseph consumed fully domesticated animal and plant species of both New and Old World origin that either grew within or around the haciendas or that could be obtained through market transactions. Flotation results, on the other hand, were more sensitive to the presence of wild species.

[347] *Chair*

Munoz, Victoria (Shumla Archaeological Research and Education Center), Jeremy Freeman

(Shumla Archaeological Research and Education Center) and Carolyn Boyd (Shumla Archaeological Research and Education Center)

[353] *Taming the Beast: Rock Art Data Management and Archival Strategies*

One of the most important, yet often neglected, components of any archaeological project is what happens outside of the field—processing the data. Without meticulously organizing and archiving the data we collect, these fast accumulating pieces of information become no more useful than a pile of papers pushed to the corners of our desks. Worse yet, irreplaceable data could be lost. Shumla Archaeological Research and Education Center is taking measures to avoid this pitfall by developing methods for long-term management and storage of vast data sets. The organization currently manages more than 2 terabytes (TB) of visual and textual rock art data. With increasing use of sophisticated digital technology, the demand on storage space is rapidly increasing. For example, three weeks in the field this past year generated almost 750 GB of raw data alone. In the interest of inciting further discussion on archaeological data management, this paper will present the strategies employed by Shumla to organize and manage large data sets. This will include discussions on hardware and software considerations, as well as field and lab procedures implemented to ensure data integrity and longevity.

Muñoz, Maria De (CINVESTAV-IPN), Minerva Mejia-Rangel (Centro de Investigación y de Estudios Avanzados de), Miguel Moreno-Galeana (Centro de Investigación y de Estudios Avanzados de), Gerardo Pérez-Ramírez (Centro de Investigación y de Estudios Avanzados de) and Yoko Sugiura-Yamamoto (Universidad Autónoma de México)

[129] *Análisis de redes haplotípicas del DNA mitocondrial (parcial) de los pobladores del Valle de Toluca.*

El valle de Toluca es una región que ha jugado un papel histórico importante dentro del altiplano central de México. Hasta el momento se desconoce el origen de estas poblaciones, aunque la primera aproximación basada en el estudio genético ha sugerido que podrían haber sido conformados por los grupos de raigambre otomiano. El presente estudio a través de la secuenciación del DNA mitocondrial y su análisis filogenético tiene el objetivo de conocer el origen materno de las poblaciones antiguas que habitaron en dichos sitios en tiempo del Clásico tardío al Epiclásico (450-900/1000 d.C.). Es, por ello, que analizaremos la región hipervariable I (RHV-I) del A.D.N mitocondrial de los restos óseos de los entierros provenientes de Santa Cruz Atizapán y San Mateo Atenco. Hasta el momento se ha realizado la extracción del DNA y la amplificación de uno de los fragmentos más informativos de la RHV-I. Asimismo, contamos con la secuenciación de 6 de estos fragmentos. Basados en estas secuencias y mediante PCR Tiempo Real hemos identificado los haplogrupos y, mediante el análisis de redes haplotípicas, sugerimos su posible origen materno y su asociación con otras poblaciones.

Muñoz, Victoria L. [149] see Lindsay, Audrey

Muñoz Rojas, Lizette [347] see Costion, Kirk

Munro, Natalie (University of Connecticut) and Mary Stiner (University of Arizona)

[40] *Faunal Evidence for the Neolithic Colonization of Franchthi Cave, Greece (ca. 7000-6500 cal B.C.)*

Franchthi Cave is a pivotal case in research on the mechanisms of the forager-producer transition in the southern Balkans region. Publications on this site have documented the geological, artifactual and macrobotanical records, but detailed information on the faunas is lacking. This zooarchaeological study focuses on the Final Mesolithic and Initial Neolithic periods and the question of whether livestock were adopted as isolated components by late Mesolithic foragers or the site was colonized by people who possessed a fully agricultural lifestyle. This question is addressed using zooarchaeological and taphonomic data, since minor stratigraphic mixing may underlie earlier perceptions of a gradual inclusion of domestic animals into the diet. Changes in taxonomic abundance, contrasting patterns of burning damage, and caprine demographic and body-size data together reveal an abrupt shift from a broad spectrum diet during the Final Mesolithic period to a

highly domestic economy in the Initial Neolithic that centered on caprines (sheep and goats). The caprines that the colonists brought to Franchthi were small in size, and these animals were intensively managed to optimize meat production. The evidence indicates a wholesale replacement of Mesolithic economies by a Neolithic package at Franchthi Cave soon after 7000 cal. B.C.

Munro, Kimberly (Louisiana State University)

[250] *The 2014 Excavations at the Early Horizon Period Ceremonial Complex of Cosma, Ancash, Peru*

The Cosma Archaeological Complex was first documented during a survey in the summer of 2013, outside of the small community of Cosma, Peru. Cosma is located 2600 M.A.S.L at the headwaters of the Nepeña river valley, in the Department of Ancash. This past season was the first to map and excavate within the site complex, which includes three Early Horizon temple mounds, a domestic area, and a hilltop fortress. The 2014 work focused on the main mound of Karecoto, a multi-storied ceremonial mound, and the smaller mound known as Ashipucoto. Preliminary data points to the earliest construction of the site to the Initial Period, with a final capping episode at Karecoto during the Early Horizon. Testing at Ashipucoto reveals that it was utilized from the Early Horizon well into the Late Intermediate Period. This poster will present on a sample of the first year's findings that include the a tradition of circular walls and rooms throughout the site, and the interments of four children and an underground gallery going through a quadrant of the main mound center of Karecoto.

Munson, Jessica [191] see Scholnick, Jonathan

Munson, Jessica (University of California, Davis), Matthew Looper (California State University Chico), Yuriy Polyukhovych (California State University Chico), Jonathan Scholnick (University of California, Davis) and Martha Macri (University of California, Davis)

[248] *Dynastic Traditions and Patterns of Ritual Variation in Classic Maya Writing*

Inscriptions found on Classic Maya monuments largely document important historical events and record the political achievements of named royal individuals. Previous onomastic studies of these king lists identify striking patterns in naming conventions which may mark ethnic boundaries as well as signal important attributes or transitions in the life history of Classic Maya rulers. This study investigates the hypothesis that divergent dynastic traditions existed during the Classic period based upon ritual acts recorded on hieroglyphic monuments dated between 250 and 900 CE. Inscriptions compiled in the Maya Hieroglyphic Database provide comprehensive evidence for a range of ritual practices tied to monument construction, feasting, sacrifice, deity impersonation as well as various priestly duties. According to anthropological theories of signaling, extravagant displays by high status leaders are essential to effectively communicate specific information about an individual's beliefs or status. This perspective provides a framework for interpreting the cultural variation and transmission of dynastic traditions in Classic Maya society.

Murakami, Tatsuya (Tulane University), Shigeru Kabata (Universidad de las Américas-Puebla), Julieta M. López J. (UNAM), José Juan Chávez V. (ENAH) and Hironori Fukuhara (University of Saitama)

[317] *Early Urbanism in Central Mexico: Preliminary Results of the Tlalancaleca Archaeological Project, Puebla*

Tlalancaleca was one of the largest settlements before the rise of Teotihuacan in Central Mexico and likely provided cultural and historical settings for the creation of Central Mexican urban traditions during later periods. Yet its urbanization process and socio-spatial organization remain poorly understood. This paper presents preliminary results of mapping, ground survey, surface collection, manual auger probe, and test excavations, which were carried out over the three seasons of fieldwork since 2012. It discusses the timing and extent of urban development along with the presence of discrete urban zones and their spatial relationships. The site is characterized by a complex natural landscape, consisting of a large plateau and its surrounding areas. Current evidence suggests that there was an extensive occupation both on the plateau and in the surrounding areas

during the Middle Formative, whereas population was concentrated on the plateau during the Late to Terminal Formative.

[317] *Chair*

Muro, Luis Armando, Nino Del Solar (University of Bordeaux, France), Luis Jaime Castillo (Pontifical Catholic University of Peru, Peru) and Remy Chapoulie (University of Bordeaux, France)

[411] *Characterizing the Relationship Between Two Early States of the Andes: The Moche, The Wari and the Product of their Contact. An Archaeological and Archaeometric Perspective*

This paper explores from an archaeological, anthropological, and archaeometric standpoint the relationships between two early states in Andean prehistory: the Moche of the North Coast (A.D. 400 - 850) and the Wari of the Southern Highlands of Peru (A.D. 600 – 1,000.) In spite of many theoretical models that have been proposed to explain the nature of this relationship, little attention has been paid to analyzing the material expressions of such interaction. This paper focuses on one such expression of this contact: the Moche-Wari hybrid ceramic styles found at the archaeological site of San José de Moro (SJM), an important Moche ceremonial center located in the Jequetepeque Valley. An archaeometric analysis on a set of Moche as well as hybrid pieces coming from SJM was conducted in order to characterize, chemically and structurally, these styles and their technological relatedness. The methods employed in this study were OM, CL, SEM, XRD and pXRF. Our results revealed that new technological styles emerged not only as a consequence of interchanging design motifs, but also as a product of the technological transfer of raw materials, and manufacturing, decoration, and firing techniques that occurring in the context of high dynamism and variability in the Andes.

Muros, Vanessa [121] see Warmlander, Sebastian

Muros, Vanessa (UCLA/Getty Conservation Program), Nikos Zacharias (Laboratory of Archaeometry, Dept. of History, Arch), William Shelley (UCLA/Getty Conservation Program) and Ioanna Kakoulli (Dept. of Materials Science and Engineering, Henry)

[140] *The Technology and Trade of Glass in SE Europe: Analysis of 12th-9th Century B.C. Beads from Lofkënd and Methone*

The archaeometric study of glass provides not only an understanding about the technology and manufacture of this material, but can also shed light on aspects of ancient societies such as trade, craft specialization, and cultural connections. The research presented looks to answer questions about glass production and trade in southeastern Europe during the LBA and EIA through the analysis of glass and faience beads from the sites of Lofkënd (southwest Albania) and Methone (northern Greece). This study applies a multi-analytical approach to identify the raw materials used to make these 12th-9th c. B.C. vitreous artifacts and source their origins. Specifically major, minor and trace element analysis conducted with SEM-EDS and LA-ICPMS, along with radiogenic isotopic studies using SIMS, is used to determine the composition and sources of the raw materials in order to provide information on the glass manufacturing industry and interregional trade during the LBA-EIA transition in this area. These techniques are also used to analyze severely corroded beads from both Albania and Greece in order to understand the mechanisms that led to their current condition and the types of information that can be obtained from such deteriorated objects in order to determine their composition, technology and origins.

Murphy, Reg [56] see Look, Cory

Murphy, Melissa (University of Wyoming)

[81] *First Contact: Friend or Foe?*

Native Andeans' first contacts with foreigners were not necessarily with the Spanish foreigners themselves, but with the foreign pathogens that were introduced prior to the arrival of the Spaniards through trade networks and early incursions in the northern extent of the Inca Empire. Violent encounters with indigenous peoples followed the Spaniards as they made their way down the

northwestern half of the Central Andes, such as the fateful battle in Cajamarca. Yet not all native Andeans perished by epidemic disease or fought battles against the Spaniards; some allied themselves with the Spaniards in the hopes of liberating themselves from Inca imperial rule. This paper theorizes these material traces of the first contacts in the Central Andes from a bioarchaeological perspective, such as the (lack of) evidence for epidemic disease, aberrant and hybrid mortuary treatment, and perimortem trauma. These examples are compared to the growing corpus of research on the bioarchaeology of colonialism from the coast of Peru and then discussed in relation to the legacy of colonialism. This paper takes a literal interpretation of "first contacts," noting that contact, conquest, and colonialism were fluid, dynamic and ongoing processes.

Murphy, John (University of Chicago), Louise Purdue (Université de Nice, CEPAM) and Maurits Ertsen (Delft University of Technology)

[84] *Changing Channels: Simulating Irrigation Management on Evolving Canal Systems for the Prehistoric Hohokam of Central Arizona*

Societies that rely on irrigation face challenges arising from the variability and unpredictability of water supply and the physics underlying the flow of water through open channels; they overcome these through structured social interactions and institutions ranging from simple to complex. To better understand these past interactions we combine geoarchaeological studies with flow simulations and Agent Based Modeling. Fieldwork conducted during CRM projects on Hohokam irrigation structures in central Arizona has revealed new details about canal morphology, including shape, size, elevation, slope, and cleaning events. The micromorphological study of the sediments that fill these structures allow finer resolution in discerning the performance (velocity, discharge, etc.) of the canal channels and their evolution through time. We couple this with an agent-based model to explore how these constraints might have required alternative strategies for cooperation. The combination of both approaches is key to discerning both broad differences between periods and fine variation within major chronological periods. We show that the coupling of social and physical models on very fine time scales can offer insight into the social arrangements and day-to-day life of people in the prehistoric past and inform our understanding of those societies' long-term changes.

Murphy, Terence (University of California, Davis), Karen R. Adams (Crow Canyon Archaeological Center, Cortez, Colorado) and Keith L. Johnson (California State University, Chico, California)

[127] *DNA Identification of Prehistoric Puebloan Quids*

Quids are small wads of fiber that were chewed or sucked by prehistoric Native Americans and then spit out. To identify the plants used for making a selection of quids from Antelope Cave, we extracted DNA from 10 quids, used polymerase chain reaction to amplify a 250-base section near the chloroplast trnL gene, and determined the sequence of the amplified fragment. DNAs from the 10 quids had identical base sequences, and these matched corresponding sequences from authentic samples of *Yucca baccata* and *Y. glauca* (the two species had identical sequences in that region). The amplified DNA sequences from the quids differed from those of *Agave angustifolia*, *A. deserti*, and *Nolina microcarpa*, and from *Nicotiana attenuata*, the putative contents, by at least seven bases.

Murphy, Beau (University of New Mexico)

[247] *A Spatial Analysis of Surface Artifact Distributions at the Inka Administrative Site of Turi, Northern Chile*

While it is well established that mineral acquisition motivated Inka imperial expansion into the high-altitude Atacama Desert of northern Chile, finer points of the area's political economy during the Late Horizon are the subject of ongoing research. The site of Turi in the Antofagasta region offers a unique opportunity to investigate this topic, as the site represents a preexisting local settlement co-opted for use as a regional administrative center by imperial authorities. This study contributes to our understanding of this complex political and economic situation with a spatial analysis of production loci within the site. A pilot study centered on the surface distribution of the remains of different production activities was conducted. Results suggest that production loci of several kinds are distinguishable, though complications of artifact displacement and a lack of temporal resolution necessitate interpretive caution. The location and contextual characteristics of suggested loci serve

as the basis for a preliminary discussion of the organization of small-scale production activities at Turi, with particular attention paid to considering this organization in the context of a mixed Inka-local settlement.

Murphy, Amanda (University of Manchester, UK)

[265] *Publishing the Perished: Uniform Collection Standards and the Future of Cemetery Excavations in the United States*

As research in historic archaeology progresses, it is possible to explore numerous facets of past cultures from health to funerary practices through cemetery excavations. Despite this, only a handful of historic cemetery reports in the United States include certain categories of data or the most basic anthropological analysis necessary to address specific research questions. Fewer still have been widely disseminated. As part of one of the largest surveys of historical cemetery excavations to date, 109 reports were studied for their analysis and inclusion of available data in five categories: osteology, artifacts, grave features, secondary data sources, and synthesis. The average number of pages per report was 248, with African-American cemetery reports tending to be the most comprehensive. Reports have focused on artifacts and historical background with information limited in the remaining categories. Biological anthropology and synthesis are particularly lacking, however gaps exist in every other area from basic grave depth measurements to biochemical analysis. Excavation and publication requirements vary by state so report content strongly reflects the personal values and specialist skills of the excavators. This study offers guidelines detailing the wealth of information that historic cemetery excavations may yield and proposing uniform standards for collecting it.

Murphy, Elizabeth (Institute for the Study of the Ancient World, NYU)

[398] *Tinker, Tailor, Soldier... Potter? Roman Legionary Ceramic Production and Its Organization*

One of the most iconic images of the Roman Empire was and is that of the Legions, citizen-warriors clad in shiny lorica segmentata and with gladius in-hand. These soldiers were however skilled not only in the art of war, but also in crafts and trades – supplying and supporting the operations of the Roman imperial military through their daily activities. One such industry about which we have relatively extensive evidence is ceramic production (of tile, brick, and pottery). While most ceramic production in the Roman period has been attributed to private investment, semi-permanent sites of production directly associated with military activities have also been identified. Such legionary production sites present unusual features in terms of their organization of the manufacturing process and its skilled labor, which offer insights into wider questions concerning imperial interests and crafts production. This paper investigates the spatial organization of Roman (A.D. 50 – 250) legionary ceramic production sites, assessing the extent to which the scale and organization of production were influenced by and integrated into larger military and imperial structures of the period.

Murphy, Charlene (University College London, Institute of Archaeology)

[414] *Un-entangling Pulse Domestication in South Asia*

India possesses a unique Neolithic transition to sedentism and agriculture which has shaped the cultural and ecological trajectory of the subcontinent. In the early Holocene South Asia was a subcontinent of hunter-gatherers. By 2000 years ago it was mostly inhabited by farmers, supporting densely populated river valleys, coastal plains, urban populations, states and empires. South Asia appears to have been host to a mosaic of processes, including local domestication of plants and animals, the dispersal of pastoral and agro-pastoral peoples between regions and the adoption of food production by indigenous hunter-gatherers from neighboring cultures. While some of the crops that supported these early civilizations had been introduced from other centers of origin (Near East, China, Africa), a large proportion of important crops were indigenous wild plants from the subcontinent. This paper will incorporate the relatively new complimentary theories of Niche Construction and Entanglement theory to examine the local transitions from foraging to farming in India. Specifically, this paper will focus on patterns in the available data for native Indian pulses including Horse gram (*Macrotyloma uniflorum*), Urd Bean (*Vigna mungo*) and Pigeon Pea (*Cajanus cajan*) to explore current ideas on evolutionary change and plant domestication in the subcontinent

of India.

Murphy IV, Timothy (Northern Arizona University, University of Central Lancashire)

[143] *Contextual Implications: Excavating Open Air Sites Adjacent to Cache Cave*

This paper outlines the cultural context of a complex of sites (known as the LCC sites) nearest to Cache Cave in South Central California. Results from LCC test excavations provide new information that help characterize cultural occupation of this Chumash and Yokuts borderland area in the San Emigdio Hills. The paper focuses on artifact assemblages from excavations near bedrock milling features associated with LCC sites. Artifacts recovered during excavation, such as lithics, fragmented faunal bone, beads, and shell, indicate varying types of food procurement and possible goods manufacturing. Bead and lithic typologies and a single successful AMS date offer the first interpretation of chronological activities of the closest open air sites to Cache Cave. While the data recovered from the LCC sites provide a context for behavior and status of people that occupied the area, it also poses questions concerning the relationship of these open air sites to that of Cache Cave itself. Data from these excavations may help characterize occupational histories and cultural relationships of the San Emigdio Hills.

Murray, John [93] see Battaglia, Mario

Musser-Lopez, Ruth (San Bernardino County Archaeological Heritage Association)

[352] *Ancestral Abstract Art of the Mojave Desert*

The "archaic" abstract rock art style in the midst of the revered, fiercely defended cultural sanctuary of the Yuman-Hokan speaking tribes in the Mohave Valley along the lower Colorado River links culture with style, particularly when considering the absence of styles associated with linguistic family branches later expanding into surrounding areas. Further, that an archaic abstract style regionally associated with historic period Hokan speakers is also found throughout the Mojave Desert, strengthens the supposition supported by archaeological remains and linguistic evidence that Hokan speakers were more widely spread prehistorically. Examined is the regional archaeological evidence along with the physical occurrence of variations in rock art styles together suggesting that drying pluvial lakes and the abstract rock art were left behind during the Holocene climate optimum for wetter shores on the lower Colorado River, leaving a void in a tempered desert for Uto-Aztecs to fill.

Mussington, John

[290] *Archaeology and Community Development: A Perspective from Within*

Citizen science has been a relatively new component of the curricular activities at Sir McChesney George Secondary School in Barbuda. This approach is designed to more effectively engage youth living in a technologically advanced age in a small island community. By using science to understand and develop solutions to everyday challenges associated with climate change and development, classroom work is made more relevant and science comes alive and is transformed from the abstract to the reality. In the process, our young people are provided with more options and possibilities for the future. This presentation will discuss some of the challenges facing small island communities and highlights some successful breakthroughs which provide examples for a way forward.

Musteata, Sergiu [199] see Davenport, Bryce

Muzzall, Evan (Southern Illinois University Carbondale)

[207] *Burial and Social Organization in Italian Iron Age Necropoleis: Testing a Biodistance Approach*

Using correlations between biodistance and tomb distance, this poster examines how mortuary practices of two central Italian Iron Age (1000–27 B.C.) ranked societies partially encoded responses to increasing sociopolitical instability. This time period witnessed reorganization of clan-based, transhumant, agropastoral societies immediately prior to long periods of conflict and Roman

encroachment. Although they used similar mortuary arrangements, local groups had different attitudes towards these new spheres of interaction. Despite small and incomplete samples, data suggest that Samnites from Alfedena have weak, but patterned correlations between cranial, dental, and spatial tomb distances when compared to the Pretuzi from Campovalano, whose associations are indiscriminate. This is possibly due to the strategic geographic and economic position of Campovalano near the Adriatic coast, where further reaching contacts potentially allowed for nonbiological rules in the definition of kinship and access to burial rites. However, weakened correlations are detected in the Alfedena Samnites from the Orientalizing-Archaic (800–500 B.C.) to Classical periods (500–400 B.C.), a possible result of shifting power structures and new rules for burial treatment. This research suggests the utility of incorporating quantified spatial tomb distances as another line of evidence for creating a more robust intracemetery biodistance measure.

Myers, Kelsey Noack [125] see DeMuth, R. Carl

Myers, Jordan

[333] *Holocene Precipitation Variability in Northern Baja California: Correlating Lithic Abundance and Climatic Change from Scorpion Shelter*

In order to understand human adaptation to climatic regimes, I compare lithic assemblages and oxygen isotope values from kangaroo rat remains found at the hunter-gatherer shellfish-collecting site of Scorpion Shelter in coastal northwestern Baja California. Scorpion Shelter is important because it contains a continuous faunal record for a coastal community that spans from the terminal Pleistocene through the Holocene (~11,600 BP – present). Using Human Behavioral Ecology, we would expect to see a reduction in human activity at the site as a result of the rapid increases in precipitation brought on by an El Niño event. Precipitation variability is important because it can be a strong indicator of local ecology. Specific events, such as El Niño, can decimate or change access and abundance of wildlife and vegetation for human subsistence. Patterns that emerged in the abundance of lithic tools and the amount of precipitation in different occupation levels suggest that during times of precipitation increase at the site, tool use declined. This supports the assumption that climatic conditions at this site strongly influenced human behavior and diet.

Myers, Emlen (ERM) and Tomas Mendizabal (Independent Consultant)

[381] *History and Prehistory of the Panama Canal Zone Revealed by the Current Canal Expansion Program*

A wide array of archaeological resources has been identified by the Panama Canal Expansion, a civil construction effort that began in 2008 and will end late in 2015. Over 40 separate cultural resource studies have been contracted by the Panama Canal Authority since the start of the project. Located at the narrowest point of the Central American isthmus, the project area has been an environmentally rich and strategically important location since Prehispanic times. Pre-construction survey and construction-phase finds have yielded artifacts and information from ca. 700 B.C. through to the mid-20th century. The prehispanic data are of scientific interest. The majority of the finds, however, are Historic period sites and artifacts, which are unique, providing a rich and varied record of both the French (1881-1904) and U.S. (1904-1914) construction periods; and the U.S. Operation Period (1914-1999). This data set is further enriched by the copious primary and secondary records maintained by the Panama Canal Authority, and other sources. The presentation focuses on historic period finds including construction camps, abandoned construction equipment, numerous cemeteries, and early operational infrastructure. Themes addressed by the data include, Central American and Afro-Caribbean labor history, industrial history and U.S. military history.

Myles, Franc [315] see Lash, Ryan

Mytum, Harold (University of Liverpool, UK)

[177] *Monumental Biographies: Structure and Agency in European Hillfort Construction*

European hillforts contrast greatly in scale and complexity, and different regions of the continent have experienced varied historiographies of research. Using a few key examples to illustrate the

different approaches to hillfort monumentality, this paper addresses the contrasting emphases on function and meaning seen in such studies. Particular focus will be placed on three aspects, through the theoretical lens of structure and agency: the role of earthwork construction in the creation of meaningful places; entrances and what have been termed 'guard chambers' in the management of access to site interiors; and the role of the cheaux-de-frise in creating significant zones beyond the main physical perimeters of hillforts. Much remains to be done to understand individual site biographies and then place these in regional and wider comparative contexts, but those few sites which have received intensive long-term research programs can offer far richer understanding of space, place, and monumentality than the limited data from partial excavations available from the vast number of hillforts.

Nadal de Masi, Marco (UNISUL)

[157] *Tha Archaeology of Lower Canoas River Valley*

The results of an archaeological project in the Lower Valley of the Canoas River in the Highlands of southern Brazil show a cultural system of proto-ge groups formed by residential bases, camp sites, cultivation fields, storage pits, hunting camps, ceremonial centers, and burial mounds. Burial mounds show evidence of social hierarchy and the storage pits show variability in their size, indicating different functions for those pits. Pollen from a few pits shows how the environment evolved near the settlements in disagreement with the regional data.

Nadeau, Jaclyn (University at Albany)

[171] *Studying Debitage, Analyzing Behavior*

There is little evidence to support widespread changes in subsistence and settlement practices from the Late Archaic through the Mid-Late Woodland in Eastern New York. Analysis of lithic assemblages from a multitude of sites suggests a gradual settling in of past populations. Specifically, it does not appear that methods of procurement, manufacture, or use differed in any significant way. The question, then, is what forces were driving those cultural changes apparent throughout the Eastern Woodlands during this time. This presentation will explore alternatives to techno-functional and environmental change as factors influencing cultural dynamics.

[171] *Chair*

Nadel, Dani [342] see Buonasera, Tammy

Nadel, Dani

[342] *Boulders, Outcrops, Caves: A Proposed Method for Documentation of Cultural Landscape Features Demonstrated in San Diego County, California*

Ubiquitous cultural features such as mortars, basins and slicks on rock outcrops, boulders, and cave floors attest to the long history of human use of landscape features. Although widely noted, methods for systematic investigation of such features lag behind well-developed study protocols for other archaeological material categories. Answers to questions such as how cultural landscape features were manufactured, how they were used, and how they were incorporated into the spatial organization of sites remain speculative. Even accurate documentation of such features is rare; this, along with terminological issues, hinders intersite comparison and regional synthesis. As a first step in addressing the situation, we recently piloted a new methodology for the efficient and precise documentation of cultural landscape features at two sites in San Diego County, California. In this paper, we describe steps in the creation of a high-resolution model of each site, of specific rock outcrops or boulders within each site, and of individual cultural features by using Structure from Motion photogrammetry. Use of a handheld microscope camera improves discrimination between culturally-modified and natural stone surfaces, as well as providing a basis for suggesting wear mechanisms. We present preliminary comparisons between the two sites and some possible interpretations.

[342] *Chair*

Nadel , Daniel [342] see Crater Gershtein, Eli

Nagaoka, Lisa (University of North Texas)

[228] *Two Archaeologies? Costly Signaling and Human Behavioral Ecology in Archaeology*

Archaeological research using human behavioral ecology (HBE) models has significantly increased over the past decade both in number and scope. Originally most HBE research was relatively narrow, focusing on prey choice, diet breadth, and resource depression. Since then, it has expanded into areas beyond examining efficiency of foraging strategies. Driven mainly by anthropological and ethnoarchaeological research, these studies have investigated the influence of factors such as age, gender, and social capital in foragers' subsistence decision making. Interpretations involving costly signaling, in particular, have become a popular alternative explanation for patterns in large game abundance. The utility and validity of costly signaling, however, within archaeological research has been questioned. In this paper, I examine why proponents and opponents of costly signaling find it difficult to reach a middle ground. The impasse can be explained by fundamental differences in how the two sides view the goals and methods of archaeological research. These differences are not limited to HBE and costly signaling but can be seen in many areas of archaeological research where "camps" have formed, such as the overkill debate.

Nagaoka, Lisa [272] see Brown, Andrew

Naidoo, Navashni [294] see Sealy, Judith

Najjar, Mohammad [241] see Howland, Matthew

Nakazawa, Yuichi (Hokkaido University) and Fumito Akai (Hokkaido Government Board of Education)

[115] *An Application of Obsidian Hydration Dating to Prehistoric Sites in Japan*

Recent progress of obsidian hydration dating (OHD) has now extended the utility of OHD to evaluate chronometric dates of prehistoric sites in various climatic conditions. The present paper discusses the reliability of OHD as the dating method, through a comparison of multiple specimens that were recently obtained from prehistoric sites in temperate and subarctic regions in the Japanese Archipelago. Besides effective hydration temperature estimation (EHT) using annual and diurnal variances of the temperature history recorded in weather stations, we will consider underlying factors that potentially affect hydration rates. The present case study will investigate to what extent OHD plays a role to provide reliable site dates distributed in different climatic zones and geological backgrounds.

Napolitano, Matthew (University of Oregon) and Matthew C. Sanger (Columbia University)

[178] *Transformation by Fire: Human Cremation, Metalworking, and the Transmogrification of Bodies by Flame in the Late Archaic American Southeast*

A copper band recovered from a Late Archaic burial located on St. Catherines Island, Georgia, demonstrates the earliest use of metal objects in the region. This discovery shows that copper usage in the American Southeast, largely thought to relate to Hopewellian and Mississippian influences, has a greater antiquity and distribution than previously assumed. A reassessment of the copper found within the burial dates to the Archaic throughout the Eastern Woodlands; chemical analysis shows the existence of wide-ranging trade networks between the Great Lakes region and the American Southeast. These networks are discontinuous and focused on specific locales, which distinguishes them from the more evenly distributed trade routes found in later periods. This variability is best interpreted as relating to different types of trading partnerships based on diachronic political, demographic, and mobility patterns. The placement of copper within a cremation—a practice also found at contemporaneous sites along the Great Lakes—suggests that copper was not simply traded but was instead part of a larger cosmological vision that likely included a particular conception of personhood, bodily composition, and relation between fire and material

transmogrification.

Naranjo, Alden (Southern Ute Indian Tribe)

[369] *Discussant*

Narvaez, Alfredo

[78] *Una Nueva Visión del Rol de Kuélap en el Valle del Alto Utcubamba*

Nuestros trabajos en Kuélap han permitido la excavación de un centenar de estructuras circulares, densos rellenos, estructuras ceremoniales y secciones de la muralla exterior y la muralla del Pueblo Alto. Estas excavaciones han afinado una secuencia estratigráfica apoyada en una veintena de fechados de radiocarbono y permitido el hallazgo de diversos contextos que sustentan una nueva hipótesis respecto del rol del monumento. Estos estudios han concluido en lo siguiente: a) el monumento comenzó a construirse aproximadamente entre los siglos V y VI, estableciendo conexiones con la costa norte, la región Cajamarca y Huari y se abandona alrededor de 1570; b) las estructuras circulares sirvieron como viviendas con gran cantidad de basura doméstica asociada; c) la muralla exterior fue realizada con una tecnología de relleno basado en segmentos de construcción, recordando la modalidad de trabajo comunitario de los monumentos contemporáneos de la costa norte. Este relleno contiene entierros secundarios asociados al largo proceso de construcción, sacralizando al lugar y generando una sujeción ideológica de los diversos pueblos convocados. Kuélap por lo tanto, se debe considerar como un axis mundi, un centro político teocrático capaz de movilizar a las comunidades del valle para emprender la gran obra pública por varias generaciones.

Narvaez, L. Alfredo [78] see Toyne, Jennifer Marla

Nash, Stephen (Denver Museum of Nature & Science)

[90] *The Pine Lawn-Reserve Area Archaeological Project: Results and Prospects*

Between 1939 and 1955, Paul Sidney Martin and John Rinaldo of the Field Museum excavated or tested more than 30 archaeological sites in the Pine Lawn/Reserve region of New Mexico. Researchers from the Denver Museum of Nature & Science, the United States Forest Service, and elsewhere have since 2010 been working to re-locate and record those sites, many of which were never properly registered with state and federal authorities. This paper shares results of that research as well as exploratory Ground-Penetrating Radar studies at Three Pines Pueblo, AMS radiocarbon analysis of sandals from Tularosa Cave, and X-ray fluorescence analysis of obsidian from Tularosa Cave. Finally, we outline plans for future research, including a large collaborative project that utilizes collections at the Field Museum, takes advantage of non-invasive analytical techniques, includes collaborative ethnohistorical analysis, and engages new fieldwork opportunities.

[27] *Discussant*

Nash, Sean (Coastal Environments, Inc.)

[171] *Indurated Sediment Masses (ISMs) from Southern Texas*

Baked-clay nodules are reported at many archaeological sites across southern Texas. These nodules are indurated sediment masses (ISMs) and are found in many contexts. William A. Duffen first found ISMs within a hearth at the Morhiss site in Victoria County. His discovery led researchers to conclude that these were heating elements used in place of stone and analogous to Poverty Point Objects. Ricklis came to the same conclusion about ISMs found in a hearth at 41NU2. The heating element interpretation is convincing when ISMs are found within a hearth. However, most ISMs are not found in hearths but they are still assumed to be heating elements. Contradicting this interpretation, others posit that ISMs are natural concretions, the result of fires used in historic land clearing, or the remains of clay linings from hearths. This paper will show that ISMs from southern Texas sites represent both naturally occurring concretions as well as cultural features and artifacts. A method will be presented to separate the cultural ISMs into types that resulted from incidental

formational processes (e.g. field clearing) and those created to be functional tools (e.g. heating elements) and constructions (e.g. clay linings).

Nash, Donna [250] see Fortin, Louis

Nassaney, Michael (Western Michigan University)

[405] *The Future of the Past at Fort St. Joseph, Niles, Michigan*

The Fort St. Joseph Archaeological Project was initiated in 1998 as a collaborative partnership between Western Michigan University, the City of Niles, and various community groups. After 10 seasons of site investigations, scholarly publications, and public archaeology at this eighteenth-century French fur trading post, the Fort St. Joseph Archaeology Advisory Committee invited historic preservation professionals, economic development planners, educators, students, and community members to assist in developing a strategic plan to manage the archaeological heritage of Fort St. Joseph and assess the feasibility of presenting Fort St. Joseph as a cultural heritage tourism destination. Recommendations were solicited from various stakeholders on the future of the past at Fort St. Joseph to generate ideas regarding viable possibilities for facilities, programs, and partnerships in support of the community's archaeological heritage. The process and results of our deliberations are the focus of this paper, including how to protect a site after it has been excavated, the disposition of the recovered data (artifacts, notes, and samples), analysis and publication of results, the effects of research on the local community and the environment, the ramifications of heritage tourism, and sustainable practices for site interpretation, among other issues.

[405] *Chair*

Naudinot, Nicolas (University of Nice)

[35] *Take Shelter! The Contributions of Rockshelter Archaeology to Understanding the Socio-Economic Organization of Final Paleolithic/Mesolithic Societies in Western France*

In some areas of France, the first archaeological investigations were conducted in rockshelters, and allowed archaeologists to establish the Paleolithic chronology. Later, in other regions, and influenced by Leroi-Gourhan's research, archaeologists focused on open-air sites, using spatial organization to create "paleoethnography." In Western France, even if the first excavation of a Paleolithic site, in 1874, was that of a rockshelter, later, all the investigations focused on coastal open air sites. This is partly a consequence of the geology as the region's crystalline massif lacks limestone formations. But there are rockshelters in the region; in fact, they are numerous though often small: marine erosion caves, rifts in sandstone cliffs, and granitic boulders. Our research program is investigating these small rockshelters, and first results of the excavation of two early Azilian sites and one Mesolithic shelter, shows that since these sites are usually short, task-oriented occupations, their study is essential to understanding the complexity of past land use strategies.

[35] *Chair*

Nauman, Alissa [10] see Rubinstein, Emily

Nava, Alberto (UCSD), Alex Alvarez (Proyecto de Espeleológico de Tulum), Franco Attolini (Proyecto de Espeleológico de Tulum), Susan Bird (Bay Area Underwater Explorers) and Roberto Chavez (CINDAQ)

[370] *The Development of Techniques and Methods Used to Record Hoyo Negro: A Submerged Cave Site on the Yucatan Peninsula*

The Underwater Caves of the Yucatan Peninsula have become central to understanding the climate, paleontological and anthropological records from the Late Pleistocene in Central America. Archaeological recording of those hostile environments is extremely complex and requires innovative techniques. In Hoyo Negro, remains of a human, gomphotheres, two giant ground sloths, cave bears, and, sabertooths have been found directly associated by depth and/or position, all in unburied contexts. Over the last 4 years we have applied a range of techniques to record this site: Starting with traditional methods including photography, videography and cave cartography, followed by more advanced reality capture techniques including spherical giga-pixel imaging, and venturing out by

experimenting with Structure for Motion techniques that allow for 3D models of remains and cave features to be captured for later study and analysis.

Navarro, Mariana (PACJ), Ricardo Higuelin (IUB), Verónica Pérez (SUNY-ALBANY; PACJ) and Antonio Martínez (SUNY-ALBANY; PACJ)

[249] *The Symbolism of Prehispanic Twins from Ñuu Savi, Mixteca Alta, Oaxaca*

In Mesoamerica twins were associated with a rich symbolism and imagery. The study of this topic has focused mainly on Nahua and Maya societies because of the large number of available stories and associated imagery. In archaeological contexts, finding twins is unusual. During the 2014 season of the Cerro Jazmin Archaeological Project two infants were found and excavated in a domestic terrace dating to the Ramos phase (300 B.C.E.-300 CE). Osteological analyses indicate that they were two premature individuals who died at the same age (around 32 weeks gestation). The archaeological and osteological data, integrated with information from Mixtec codices and ethnohistoric chronicles allow us to investigate infant mortuary practices in the Mixteca Alta and the role that twins and their symbolism played among the ancient Ñuu Savi.

Navarro Castillo, Marx [151] see Neff, Hector

Navarro-Farr, Olivia [95] see Aleshire, Rachael

Navarro-Farr, Olivia (The College of Wooster), Francisco Castaneda (Universidad de San Carlos), Griselda Perez (Universidad de San Carlos) and Juan Carlos Perez (Proyecto Arqueologico El Peru-Waka')

[306] *A Forest of Queens: The Legacy of Royal Calakmul Women at El Perú-Waka's Central Civic-Ceremonial Temple*

In 2012 archaeologists discovered Waka's main civic-ceremonial temple was enshrined by numerous offerings as well as the construction of a monumental hearth and the placement of various fragments of carved stelae adorning the final platform phase. These fragments included previously unknown Stela 43 mentioning an ancestress and royal woman of Calakmul origin, Lady Ikoom. Excavations in the interior of the fronting platform revealed the tomb of Waka's renowned Late Classic queen, Lady K'abel, built into an earlier construction phase. Also buried along the building's centerline and in association with the sealing of Lady K'abel's tomb was Stela 44. This monument features a standing ruler and bears lateral texts that also mention Lady Ikoom, in this instance with clearer historical context. Together, these monuments, the funerary assemblage, and the structure in which these elements are interred comprise an impressive tableau commemorating the importance of both these Early and Late Classic royal women from Calakmul who made their mark on Waka's dynasty, sealing its role as a loyal vassal to that great superpower to the north.

Navas, Ana (University of Texas, Austin), Franz Scaramelli (San Francisco State University) and Kay Scaramelli (Universidad Central de Venezuela)

[371] *Mitología y tecnología: el hierro en la cosmovisión guayanesa, Venezuela*

La alusión a la tecnología metalúrgica del hierro en las construcciones narrativas (relatos, mitos) y prácticas rituales es un fenómeno común de muchas sociedades alrededor del mundo. La importancia de esta tecnología se evidencia en los diversos significados otorgados a las etapas del proceso productivo y en las representaciones de deidades o personajes legendarios vinculados a la herrería en los relatos provenientes de África o Europa, pero qué ocurrió en aquellas sociedades en las que el hierro fue un elemento nuevo y disruptivo durante el período colonial. En este trabajo se estudia la percepción de las comunidades indígenas del Orinoco sobre la naturaleza del impacto de la tecnología del hierro, como una forma de interpretación histórica complementaria al análisis de la evidencia arqueológica recuperada en sitios misionales del siglo XVIII en esta región. La evaluación de narrativas mitológicas de grupos indígenas de Guayana revelan una percepción positiva del papel que tuvieron los artefactos metálicos, muy diferente a la visión trágica proveniente de otras regiones latinoamericanas. La mitología guayanesa demuestra la agencia local en el contexto de introducción de la tecnología de producción metalúrgica y de sus productos, destinados al

intercambio con las poblaciones indígenas y al sostenimiento del régimen colonial.

Nazaroff, Adam (Stanford University)

[185] *Calibrating pXRF Instruments for Chert Provenance: A How-to from the Anatolian Plateau*

In the past decade, a tremendous increase in the use of portable X-ray fluorescence (pXRF) instruments in archaeological provenance research has warranted several critical reflections on the analytical protocols which underpin their application in various material and regional contexts. This paper approaches the use of pXRF analysis for determining chert provenance with particular emphasis placed on tailoring empirical calibrations to best suit the dynamic properties of chert materials. In so doing, it highlights the need to set in place specific procedures relevant to each context of study in order to develop a productive and successful study of chert provenance. Using as a case-study chert consumption at the Neolithic community of Çatalhöyük, Turkey, this paper reveals how pXRF instruments, when properly calibrated to specific geologic contexts, are capable of distinguishing between multiple geochemical sources of chert, and can be used to produce probable provenance determinations for chert artifacts.

Neal, Lynn [48] see Purcell, David

Nedelcheva, Petranka [211] see Gatsov, Ivan

Neeley, Michael (Montana State University)

[300] *The Beaucoup Site: A Bison Kill in Northeastern Montana*

Communal bison kills are among the most visible archaeological sites in the northwestern plains. They can originate from a variety of hunting practices, including jumps, pounds, corrals, traps, etc. Because of the group nature of the activities, these sites can be rich in archaeologically interpretable materials and behaviors. The Beaucoup site (24PH188/189) is a large Late Prehistoric site on the Milk River in northeastern Montana consisting of a kill, drive lines, cairns, and tipi rings. First recorded in the 1970s, it was interpreted as a "jump" based on the location of the bone bed in a coulee bottom; however, recent test excavations suggest an alternative explanation. Of particular concern regarding the original interpretation, is the absence of a suitable gathering area and the discontinuity between the drive lines and the bone bed. This paper synthesizes bison behavior and ethnographic accounts in concert with a recent geomorphological investigation to hypothesize that the Beaucoup site bison were moved up into the coulee from the Milk River rather than down from above.

Neely, James (University of Texas at Austin)

[241] *Large-scale Prehistoric Water Management Projects by Small Cooperating Corporate Groups in Mexico and Arizona*

Two large-scale water management systems, one in the Tehuacán Valley of Puebla, Mexico and the other in the Safford Basin of southeastern Arizona, are briefly described and compared. In the Tehuacán Valley, the Purrón Dam exhibits a massive construction effort totaling about 370,000 m³ of earth and stone. In contrast, the 28 "hanging" canals of the Safford Basin are small but extensive in nature, with the longest about 9.5 kilometers in length and the total length of all canals exceeding 80 kilometers. A short history of technological change leading to each of these phenomena is presented. Evidence for the hypothesized engineering and construction of these sophisticated large-scale systems by small cooperating corporate groups is discussed.

Neff, Hector [79] see Masucci, Maria

Neff, Hector (California State University-Long Beach), Paul Burger (California State University Long Beach), Sachiko Sakai (California State University Long Beach), Timothy Garfin (California State University Northridge) and Marx Navarro Castillo (State University of New York at Albany)

[151] *Izapa's Industrial Hinterland: The Eastern Soconusco Mangrove Zone during Archaic and Formative Times*

LiDAR coverage of a portion of the eastern Soconusco mangrove zone due south of Izapa has identified nearly 300 archaeological mounds within an area of 56 km². The vast majority of these mounds contain Formative period deposits. Surface and subsurface investigation indicate a major movement of people into the zone around 1600 B.C., followed by population growth through the Late Early Formative (Cuadros phase). Middle through Terminal Formative (900 B.C. through A.D. 200) deposits consist of superimposed firing features and abundant coarse pottery inferred to have been used in the production of salt. The Late and Terminal Formative peak in industrial activity within the mangrove zone coincides with the apogee of monumental activity and, presumably, population at Izapa.

Neffe, Angelique (Université Paris1 Panthéon-Sorbonne)

[139] *Jade Polishing Techniques in NW Alaska, from the end of the 1st Millennium A.D. to the 18th Century*

The study applies a qualitative and quantitative characterization of polished jade tools from Cape Espenberg in Northwestern Alaska, dated from the Thule period. An experimental study of polishing techniques on jade was carried out in order to reproduce diagnostic use-wear traces associated with different polishing techniques, processing, and craft activities. The study was carried out at the Laboratory of Tribology and Systems Dynamics - Ecole Centrale Lyon 2 and was based on different scales of observation (interferometry, confocal microscopy). Different parameters of characterization (bearing area, various topographic parameters) and the method of continuous wavelets were applied. This methodology allowed for the identification of different use wear patterns related to various tool functions and polishing processing: wood processing, hide processing, butchery, and resharpener of the active part of the tools.

Negre, Joan [176] see Zurro, Debora

Negrino, Fabio [181] see Riel-Salvatore, Julien

Nehlich, Olaf [337] see Britton, Kate

Neiman, Fraser (Monticello)

[228] *Costly Signaling and the Dynamics of Consumption in the Early-Modern Atlantic World: The Case of Clay Tobacco Pipes*

For 60 years archaeologists studying the early-modern Atlantic world have relied on the decline in the stem-hole diameters of clay-tobacco pipes to date their sites. But they have been incurious about the causal dynamics responsible for the ocean-spanning secular trend and variation around it. In this paper I draw on costly signaling theory to build a simple model of change in marketing strategies of producers and the signaling strategies of consumers that might account for the trend. I use data on clay pipes from seventeenth-century Jamestown and other sites in the Chesapeake region to evaluate predictions from the model. Predictions fit for well imported pipes, but less well for locally-made pipes. The lack of fit raises a question: Why might we expect signalers faced with a choice between two or more equally costly but stylistically distinctive signaling strategies, might prefer the one with which their socially salient superiors are more familiar. A tentative answer to that question promises to illuminate causal dynamics behind "identity" not only in the early Chesapeake but in colonial situations more generally.

Neitzel, Jill (University of Delaware)

[229] *Color Symbolism of U.S. Southwest Jewelry*

The colors of turquoise and shell jewelry in the prehistoric U.S. Southwest were imbued with a diversity of inter-related symbolic meanings. To begin to understand these embedded messages, we

must consider the results of cultural anthropologists' different approaches to color perception and archaeologists' reliance on ethnographic analogy. Stephen Plog's seminal publication on the color symbolism of Pueblo pottery describes the religious significance of blue/green, the color of turquoise, and white, the color of marine shell. This sacred content all related to water and fertility -- factors that were critical for survival in the prehistoric Southwest. For jewelry, these religious meanings reinforced the colors' other inter-connected messages about status, long distance connections, heritage, and cultural affiliation. The symbolism was more powerful when it was broadcast redundantly by greater quantities of ornaments and intricate composite pieces.

Nelson, Ben [21] see Torvinen, Andrea

Nelson, Peter (UC Berkeley)

[34] *Engaged Research, Management and Planning at Tolay Lake Regional Park*

Archaeology has a long history of extracting knowledge and physical resources from Indigenous communities without redistributing resources or benefits to these communities. The ideas of giving back or "paying in our own currency" are well-meant, albeit simple, attempts to atone for our discipline's history. However, the historical traumas in Indigenous communities from political, economic and scholarly colonialism are complex, and cannot be remedied with simple fixes. Research that seeks to engage communities should therefore begin with the recognition that decolonizing research is a long and difficult process, and justice in the face of historical trauma is never finished. Research begun in this context is better suited to address the ongoing needs of Indigenous communities. I will discuss the examples of my dissertation work, inevitable side projects, and other involvements with the Federated Indians of Graton Rancheria at Tolay Lake Regional Park. The Tolay Valley is a sacred landscape that Sonoma County Regional Parks Department is developing for public recreational use. My research was designed in collaboration with the tribal community. As such, this research and researcher have the ability and responsibility to advocate for the community's views on policy, management and interpretation of cultural resources at this park.

[224] *Moderator*

Nelson, Shaun (Utah National Guard)

[70] *Discussant*

Nelson, Sarah (University of Denver)

[104] *Discussant*

Nelson, Zachary (Cardno ENTRIX)

[136] *Atlantis and the Hall of the Ancients*

The enduring myth of Atlantis is an amazing example of probable history turned fable and developing a life of its own. While the subject is vast, a careful synopsis of new tales and discoveries will be presented and contrasted with the Hall of the Ancients, a purported repository of ancient documents believed to be located at Piedras Negras, Guatemala. Belief systems and archaeological data will be examined to understand the interplay between fact and fiction.

[136] *Chair*

Nelson, Amy (University of Oregon) and Jordan Pratt (University of Oregon)

[150] *Investigation and Analysis of Anthills Found in Archaeological Settings in the Northern Great Basin*

Anthills are ubiquitous across the Great Basin, with the potential to affect archaeological sites through bioturbation. This study considers if lithic debitage found on the surface of anthills (and within) represents the redistribution of specific size grades, with an emphasis on vertical redistribution of smaller flakes from below ground to the surface. Our study targeted anthills near previously analyzed lithic plots around the perimeter of Rimrock Draw Rockshelter (35HA3855), a

Paleoamerican site in Harney County, southeastern Oregon. Two sampling methods were used to collect debitage and gravels that compose anthills. Samples were taken above ground, and auger sampling was used to explore the relationship between debitage cast on the surface and in the heart of the colony. Mass-analysis of debitage and particle size-analysis of the gravels was conducted to create a profile of sedimentary and archaeological size grades that may inadvertently be interpreted as rejuvenation pressure flaking events for the former and high energy stream transport episodes for the latter, further advancing the way archaeologists interpret site disturbances.

Nelson, Margaret (Arizona State University)

[288] *Vulnerability and Human Security in the Face of Climate Change*

Vulnerability to climate change is a central issue in contemporary policy at local, state, national, and global scales. Facing an uncertain future, public and private organizations, policy makers, and resource managers are concerned about our ability to develop social-ecological systems resilient to climate change. "Long-term sustainability" in the face of present and anticipated climate impacts is a national and international goal. However, planning for long-term sustainable management is a daunting task, as the future is inherently unknowable. Further complicating planning is the limited nature of scenarios of possible futures, which are based on information drawn from present and very recent past. Such short observational spans or artificially restricted case examples hamper sustainable management. Long sequences documented by archaeologists and historians provide knowable changes in human-landscape-climate interactions that represent sets of completed experiments in human eco-dynamics. Scholars from two research teams— North Atlantic Biocultural Organization (NABO) in circumpolar North Atlantic region and Long-Term Vulnerability and Transformation Project (LTVTP) in arid and semi-arid deserts of southwestern US and northern Mexico – are investigating the relationship between aspects of climate change and social change in extremely different settings and over many centuries. In this presentation we describe outcomes of our comparative research.

[351] *Discussant*

Nelson, Erin (University of North Carolina at Chapel Hill)

[289] *Courtyards, Plazas, Paths: Empty Spaces Full of Meaning*

In recent years, geophysical survey techniques have allowed archaeologists to identify subsurface cultural features—a dataset that has filled previously empty spaces on our site maps and made our interpretations of ancient landscapes all the richer. Significantly, geophysical datasets reveal not only features, but also the empty spaces in between those features. This paper explores the spaces between geophysical anomalies—the courtyards, plazas and paths that are common yet rarely investigated spatial components of Mississippian Period (A.D. 900-contact) sites in the southeastern United States. Plazas, courtyards and paths are spaces between built architecture that can have potentially different meanings and allow for different types of social interactions. I review some of these possibilities before turning to Parchman Place, a case study that illustrates the organizing yet flexible nature of such spaces. At Parchman Place and sites like it, it is the spaces between more visible archaeological features that structure daily interactions among people and that give us important clues about changing sociopolitical relationships in the past.

Nelson, Norman (NM Historic Preservation Division)

[390] *Discussant*

Nelson, Elizabeth (University of North Texas Health Science Center, Dept. Physiology and Anatomy) and Christine Halling (Louisiana Department of Justice)

[415] *Don't Drink the Water: Differential Diagnosis of a Pathological Process Present at the Ray Site and Discussion of Environmental Context*

In environments with naturally high or anthropogenically increased fluoride levels (>1.5mg/l), communities are at risk for toxic exposure to fluoride. Groups exposed to toxic levels of fluoride have higher incidence of maladies of the musculoskeletal, reproductive, and neurological systems. With chronic exposure individuals may develop skeletal fluorosis, a condition characterized by

osteosclerotic activity evidenced by the ossification of ligamentous and tendinous attachments, along with an increased incidence of fractures. During the course of a complete survey of skeletal remains recovered from the Ray Site (50 B.C. to A.D. 450) eight individuals were found to share a constellation of abnormal bony changes. This Middle Woodland site is located the Illinois River Valley, an area rich in natural fluoride. In this study we evaluate the prevalence of symptoms consistent with skeletal fluorosis at the Ray Site while also presenting personal, environmental, and genetic factors influencing manifestation of the condition. This paper describes the observed abnormal bony changes while providing a differential diagnosis and discussing possible environmental influence on community health.

Nelson, Wendy

[415] *Diet, Sex, and Fitness: The Nutritional Potential of the Fish Slough Cave Diet Revisited*

Archaeological investigations conducted in the late 1980s at Fish Slough Cave, Owens Valley, California recovered over 300 well-preserved human coprolites. When the nutritional profile of the diet inferred from coprolite analysis was compared against optimal foraging model predictions, based on energetic returns, the diet was considered to be deficient. However, when the same data were considered from a nutritional ecological perspective using macronutrients (e.g., water, protein, fat and carbohydrates) as the currency, the diet was more favorable. The current study goes a step further by taking a holistic approach and addressing nutritional needs based on age, sex, and level of activity and the role both macro- and micro-nutrients play in an individual's overall fitness. This research, based on nutritional ecological principles, suggests that the variation in nutritional needs may in part have contributed to shifts in settlement and subsistence patterns observed in the Late Prehistoric Period.

Neme, Gustavo [91] see Salgán, Laura

Neri, Francesca (Northern Arizona University)

[12] *Modern Material Culture Studies in Modern and Past Populations*

This project presents data from a month long archaeological survey of refuse conducted on a university campus in New York City and uses it in conjunction with conventional theoretical methods applied to the analysis of the material culture. The previous archaeological analyses of secondary aggregates or deposit sites in which localized, high concentrations of refuse are examined, provide hypotheses regarding human behavioral patterns (Johnson, 1999) and serve as a comparative model from which to derive further inferences about the modern refuse sample. The identification of secondary aggregates involves determining the frequency of relevant artifacts, their density, diversity, and deposit location resulting in a link between behavior and the materials examined in situ. The constant presence of material culture and its discard in human life acts as an analogous correlate to human behavior. This project highlights the importance of material culture research for a greater understanding of human interaction with surrounding environments, both past and present.

Nesbit, Ryan [415] see Eerkens, Jelmer

Nesbitt, Jason (Tulane University), Yuichi Matsumoto (Yamagata University), Michael Glascock (University of Missouri Research Reactor), Yuri Caverro (Universidad Nacional de San Marcos) and Richard Burger (Yale University)

[292] *Sourcing the Obsidian from Campanayuc Rumi: Implications for Understanding Chavín Interaction*

Campanayuc Rumi is a large civic-ceremonial center located near Ayacucho in the south-central highlands of Peru. Dating to the late Initial Period (1100-800 B.C.) and Early Horizon (800-300 B.C.), Campanayuc Rumi is notable for its close association with the Chavín sphere of interaction. In particular, the site has been considered significant because of its geographical proximity to Quispisisa, the most important obsidian source during the early first millennium B.C. Recent excavations at Campanayuc Rumi recovered large quantities of obsidian in temple, offering, and residential contexts. In 2014, pXRF was utilized to chemically source a sample of 394 obsidian

artifacts. This analysis demonstrates that the overwhelming majority of the obsidian comes from the Quispisisa source. The pXRF data coupled with excavations of a probable lithic workshop lead us to conclude that Campanayuc Rumi was the locus of processing and eventual circulation of obsidian to other locations in highland and coastal Peru during the Early Horizon.

Nespoulet, Roland (National Museum of Natural History (France)), Dominique Henry-Gambier (PACEA-A3P, Bordeaux University (France)) and Laurent Chiotti (National Museum of Natural History (France))

[181] *Domestic Space or Burial Space? Interrogating the Final Gravettian at the abri Pataud*

The status and significance of the assemblage of human remains in the Final Gravettian of the Abri Pataud (level 2, 22 kya) had never really been broached during the excavations of H.L. Movius (1958, 1963). A three-pronged approach (archive analysis, study of old collections, and targeted excavation), started in 2005, allows us to propose a new interpretation of these remains as well the entirety of level 2. This study takes into account the natural configuration of the rock shelter, its geological history, the detailed analysis of sedimentary deposits, the archaeological context of human remains, and their revision through an archaeothanatological approach. The result is a new interpretation of the human remains and the discovery of unexpected mortuary practices in the Final Gravettian at differs from known mortuary practices in other Gravettian sites in Europe. The link between habitat and burial place (succession or synchrony) is discussed. Our results and assumptions contribute to the cultural definition of an original facies of the French Gravettian. Our approach highlights the importance of reinvestigation in key Paleolithic sites and emphasizes a major methodological challenge: how to integrate old and new data and interpretations separated by 40 years?

Netherly, Patricia (Vanderbilt University)

[411] *Spondylus and Ideology: 5000 Years of Interaction between Manabí, the Circum-Gulf of Guayaquil Region and Northern Peru*

Interaction and cultural exchange between the coastal societies of northern Peru and the cultures of Manabí and Guayas are evident from the late Preceramic in Peru and early Valdivia in western Ecuador. While spondylus is the best-known material manifestation of this exchange, there is evidence of early cultural influences which predate the heavy movement of spondylus to the south and Lambayeque metalwork to the north. Other influences which can be called ideological are seen in the iconography of textiles and ceramics and myths of political validation. These relations may have developed from earlier exchanges dating from the Terminal Pleistocene and Early Archaic for which there is now material documentation.

Neubauer, Fernanda (University of Wisconsin-Madison, CAPES Foundation)

[280] *Lithic Technological Organization on Grand Island, Michigan, during the Late Archaic Period*

This paper presents the results of a study of subsistence, chipped stone and hot rock technologies, settlement variability, residential mobility, and landscape interactions of the Late Archaic (c. 5,000-2,000 BP) people on Grand Island, in Michigan's Upper Peninsula. Recent excavations by the Grand Island Archaeological Program (GIAP) have yielded a sizable body of evidence for Late Archaic occupations on Grand Island, which is the largest island of Lake Superior's southern shore. Direct evidence is drawn from six archaeological sites excavated by GIAP that span the entire Late Archaic period and allow for a study of socioeconomic changes through time. I focus on the social-technological relationship between lithic raw material availability, raw material choice, and the manufacture of different stone tool types by Late Archaic hunter-gatherers occupying Grand Island. There, people utilized local materials for the production of expedient tools, and non-local cherts to manufacture curated formal tools. Faunal data indicates that the island was seasonally occupied in the autumn. Hearth features and the density and diversity of lithic artifacts suggest that the location was repeatedly used and represented an important place in the landscape.

[280] *Chair*

Neurath, Johannes [379] see Burtenshaw, Julia

Neusius, Sarah (Indiana University of PA)

[69] *Discussant*

Neuzil, Anna (EcoPlan Associates, Inc.)

[278] *Renegotiating Identity in a Cultural Crossroads: Salado in the Safford Basin*

Current perspectives on the origin and nature of the Salado phenomenon vary amongst Southwest archaeologists. Evidence from the Safford Basin in southeastern Arizona suggests that in this area, Salado came about as a response to multiple waves of migration of various sized groups from the Kayenta and Tusayan regions of northeastern Arizona. Following the arrival of these migrants, the archaeological record shows that both migrants and groups indigenous to the Safford Basin renegotiated their identity to provide community cohesion in this new social milieu.

Neves, Eduardo (University of São Paulo)

[157] *The Interrelated Establishment of Sedentary Lifestyles in Tropical Lowland South America in the Late Holocene*

The archaeological record of lowland South America shows the widespread establishment of sedentary life styles, associated with marked signs of landscape modification, starting around the mid first millennium B.C. Such changes had a large scale, ranging from the lower Orinoco basin in the north all the way to the mouth of the Plata river in the south, albeit with earlier dates towards the north. This paper argues that this process of change needs to be understood from a continental perspective, associated to the establishment of the wet tropical climatic conditions verified today in this area.

[348] *Discussant*

Neves, Eduardo [186] see McMichael, Crystal

Neviska, Reagan [314] see Griffith-Rosenberger, Jacob

New, Briana, Merisa Stacy (University of California, Santa Cruz), Sarah Blessing (University of California, Santa Cruz), Jessa Ripley (University of California, Santa Cruz) and Susan Kuzminsky (University of California, Santa Cruz; Universidad)

[204] *Testing the Applicability of Non-destructive Methods and Databases for Determining Biological/Cultural Affiliation within NAGPRA*

Determining biological/cultural affiliation of prehistoric human skeletal remains for NAGPRA compliance is standard protocol in museums and academic institutions. However, the biological affiliation of skeletons of unknown provenience is not always straightforward, especially when they preclude the use of destructive analytical methods (e.g., DNA extraction). Although software is available for the estimation of ancestry of human skulls in forensic cases, few comparative datasets are available for assessments involving prehistoric crania in California and other regions of North America. To circumvent this problem, a digital database using non-destructive 3D scanners was created for biological assessments of potentially Native American crania. The dataset contains high-resolution scans of over 400 North American human crania from archaeological sites and five "unknown" crania, two of which may be affiliated with Native American groups. To test the biological affinities of the "unknown" crania, we recorded 34 craniofacial landmarks for a subset of adult individuals in the database. These data were then subjected to a series of 3D geometric morphometric analyses comparing the "unknowns" to individuals in the North American database. Although preliminary, our analyses show that this North American comparative database serves as a viable, non-destructive alternative for conducting biological assessments of Native American skeletal remains.

Newcomb, Elizabeth (Northern Arizona University)

[274] *Relations in the Zuni Region: A Comparative Study of Ceramics*

In the Cibola region of the American southwest, the Pueblo III to Pueblo IV transition saw a major increase in the local production of red ware and polychrome vessels. In addition, the period is characterized by a dramatic increase in ceramic decorative style diversity in the Cibola region. In this poster, I present evidence for shifts in settlement patterns and community organization, including collective actions and social transformations in the Zuni region during the Pueblo III and Pueblo IV periods. Specifically, I address ceramic variation of design elements on the exterior portion of White Mountain Red Ware bowls. The evidence from this variation suggests a concerted reorganization in the Zuni region from A.D. 1200-1500. Through analysis of design motifs in the ceramic assemblages from the Sandstone Hill Pueblo Ruin and the Zuni Airport Project (NM:12:L3:141), I investigate the interaction between potters residing at local sites to potters in the broader region.

Newland, Michael

[106] *Discussant*

[106] *Chair*

Newlander, Khorl (Department of Anthropology, Hamilton College)

[185] *Assessing the Validity of pXRF for Sourcing Cherts in the North American Great Basin*

As a cost-effective and non-destructive method for multi-element analysis, portable x-ray fluorescence spectrometry (pXRF) has the potential for broad archaeological application. Several studies have demonstrated the validity of pXRF for sourcing obsidian and fine-grained volcanic artifacts. In this study, I assess the validity of pXRF for sourcing chert artifacts from Paleoindian sites in the North American Great Basin. Because chert artifacts dominate many archaeological sites, the ability to effectively source these artifacts using compositional data generated by a comparatively inexpensive method like pXRF could significantly enrich our understanding of prehistory, but we must demonstrate this potential before we can celebrate it.

Newman, Sarah (Brown University)

[22] *Ritual in the "Great Household": Termination Deposits in Classic Maya Royal Residences*

In a certain sense, the Classic Maya royal court can be seen as an expanded, intensified household, a comparative model for which can be found in the "Great Households" of early medieval Europe and elsewhere. Closely linked to governing political structures and notable for their size, complexity, and levels of expenditure and waste, royal courts mimic the patterns of interaction that define the household as an archaeological unit, but on a grander scale. This paper examines ritual at the "Great Household" level, focusing specifically on examples of termination deposits associated with royal residences. Compiling examples from across the Maya area, temporal and regional patterns in these deposits are evaluated, showing their content and character to reflect tensions between regional and local influences, exclusivity and access, and integration and instability experienced by the Classic Maya ruler and his sprawling "family."

Newman, Elizabeth (Stony Brook University)

[76] *Landscapes of Labor*

During the last quarter of the 19th century, Mexico experienced a period of rapid social and economic modernization under the leadership of dictator Porfirio Diaz. Central to this was the dismantling of community-held lands, a practice that was intended to undermine the social aspects of the agrarian/indigenous lifestyle. The nineteenth century architects of Mexico's progress believed that by dismantling communal villages lands and thus communal indigenous communities, they were moving Mexico's indigenous people away from an outmoded past and into modern forms of industrial capitalist production. This paper will explore the ways in which settlement and architecture reflect those transformations in the decades leading up to Mexico's Revolution of 1910. I integrate archaeological data with archival and oral sources to explore the ways in which the physical transformations of landscape and the structures that marked it impacted Nahua communities in Puebla's Valley of Atlixco.

Newsom, Lee (Penn State University) and Lourdes Pérez Iglesias (Departamento Centro Oriental de Arqueología, CISAT,)

[339] *Ancient Caribbean-Mainland Plant and Animal Translocations: Cultural, Biogeographic and Biodiversity Legacy*

The Caribbean's pre-peopling flora and fauna were the culminations of both vicariant and long-distance dispersal processes, coupled with evolution in relative isolation spanning more than 20 Mya. Human colonization beginning around 7,000 years ago coincided with the extinction of the archipelago's only large terrestrial vertebrates-- probably precipitating the first human-induced trophic cascades and initiating the first of a series of human-environmental legacy effects. Early migrants translocated familiar home garden trees and root crops from mainland sources, the cultivation of which signals the earliest evidence for biotic resource management. Large accumulations of shell midden and burning outside the natural fire regime are additional expressions of human niche construction over time. Later migrants from South America introduced additional plants and animals-- both domesticated and wild or tamed-- and transferred some native taxa among individual islands. These circumstances enhanced the agrobiodiversity and affected food security. These activities also suggest a broader range of managerial practices, encompassing both food and non-food purposes and behaviors, generally tracking increasing social complexity. A final phase, known as the "Columbian Exchange," involved European introductions of additional taxa, such as pig and watermelon, from the Old World and Pacific Islands.

Newsome, Seth [163] see Jones, Emily Lena

Newsom, Paul (American University of Beirut)

[325] *The Archaeology of Conflict Damaged Sites: Hosn Niha in the Biqa' Valley, Lebanon*

When faced with the destruction of archaeological sites through conflict, and the accompanying loss of knowledge, what can archaeologists do? Archaeologists, politicians, and many others recognize that damage to heritage is irreversible and has very serious, lasting consequences. The impact of war on archaeological sites is rightly an area of great significance and concern to archaeologists and other heritage professionals, and is increasingly an area of research and debate, both within and outside academic circles. In this paper we use the example of a site in Lebanon which has been severely damaged by multiple conflict episodes to show that by careful fieldwork and analysis a great deal can be learned from an apparently destroyed site. Following an initial appraisal of the site damage, it was felt that by using an appropriate range of fieldwork methods useful information not only in assessing the effect of conflict on a site, but also about the development of the site could be gathered and meaningful results produced.

[325] *Chair*

Nez, Nanabah (Arizona State University / Tonto Nat. Forest)

[374] *Apache Use of a Sacred Site. Oral History of Apache Elders*

The area known as Fossil Creek in Central Arizona is of significant cultural importance to the Western Apache people. It is known to them as Tu'dotliz (TWO DOE CLIZ), or "blue water." Tu'dotliz is associated with the Dilzhé'é (Tonto Apache) creation story, and a clan origin location imbued with ancient place names. It is a venue for ceremonies, home of the Gáân (Apache mountain spirits), a source of holy water and herbs, and place where prominent Apache historical figures once lived. As one elder put it, "Tu'dotliz is as important as it gets." With a growing awareness in Indian Country regarding the need to take proactive measures to protect sacred sites, this work represents the efforts of Apache historians and tribal advocates to utilize oral history to increase awareness of tribal affiliations to holy landscapes. To support a Traditional Cultural Property nomination, historical documentation and ethnographic testimony document historic and contemporary use of Tu'dotliz as a venue for prayer, healing, ceremony, and the collection of natural resources for subsistence, ceremonial, and medicinal use.

Ng, Siu Ying [165] see Miller, Caitlin

Nials, Fred (Desert Archaeology, Inc.)**[55]** *Agriculture at Las Capas: Tales Told by the Canals*

Las Capas is an Early Agricultural period site in the Tucson Basin, Arizona. Canal irrigation began at the site as early as 1200 B.C. and the canal system encompasses more than 50 hectares.

Agricultural features are unusually well-preserved, and more than 250 canals of various sizes and over 1000 bordered fields were exposed in multiple stratigraphic levels during excavation. The unusual degree of preservation provides an exceptional opportunity to examine the mode of construction, hydrology, agricultural technology, and operation and maintenance of the canal system at the site. Water requirements and limitations, delivery options, and time and labor needed for completion of individual watering cycles have been calculated. Despite major environmental changes, the irrigation system shows no signs of significant experimentation, changes in operation methodology, or major technological advances during the 800 years of occupation at the site.

Nials, Fred [55] see Homburg, Jeffrey

Nicholas, George (Simon Fraser University)**[340]** *"Knowledge Without Action...": Shifting Frames of Reference in Archaeology Theory and Practice*

Following 15th-century philosopher's Wang Yangming's statement that "Knowledge without action is not real knowledge," I explore the value of knowledge that emanates from evidence-based practice grounded in descendant community's engagement with heritage, and its subsequent application in two realms. The first is research at the interface of Traditional Knowledge (TK) and Western science; the second a series of community-initiated and -directed studies funded by the Intellectual Property Issues in Cultural Heritage (IPinCH) project. I discuss the benefits (and challenges) of work in these realms for both communities and universities in terms of applied research; the relationship between intangible and tangible heritage; and the value of ethnoarchaeological studies that foreground community needs and interests while also making substantial contributions to the field of archaeology.

[42] *Moderator*

Nicholas, Linda [216] see Fauseit, Ronald

Nichols, Deborah (Dartmouth College)**[194]** *Frances F. Berdan and "Finding a Good Road:" Anthropology and the Aztec World*

Frances F. Berdan and Patricia Rieff Anawalt begin their magnificent four-volume edition of the *Codez Mendoza* by offering the following words to Mesoamerican scholars, "ce qualli obtli." "May you find the good road." Frances Berdan's road to understanding the Aztec world crosses subfields of anthropology, ethnography, ethnohistory, archaeology and linguistics. As one of the most influential and productive scholars of the Aztecs, her road runs opposite the trend in anthropology of increasing divergence among its subfields. Drawing on her biography, this paper considers Berdan's contributions and how her research has so successfully intersected subfields and disciplines to yield new information and new insights about one of the most complex societies of the prehispanic Americas.

[144] *Discussant***[194]** *Chair*

Nicholson, Daniel (The University of Texas at San Antonio), James Hinthorne (The University of Texas-Pan American), Shelia Pozorski (The University of Texas-Pan American) and Thomas Pozorski (The University of Texas-Pan American)

[378] *Pigment Identification as a Proxy for Intercultural Interaction in Casma, Ancash during the Initial Period (2100-1000 B.C.E.)*

Differential distribution of mineral resources in the Andean area has necessitated a long history of interaction between coastal and highland peoples. However, when it comes to the Casma Valley, it is

not clear when these interactions began. This paper addresses this issue through an examination of the mineralogy of a set of pigment samples collected from tools found at four sites of the Sechin Alto Polity identified by way of X-ray diffraction (XRD). The results of the XRD findings will be linked to the most probable source regions where people collected minerals that were processed, distributed, and consumed for purposes such as the adornment of structures and body decoration during the Initial Period (ca. 1500 B.C.E.). This information, coupled with GIS derived least-cost paths, allows an understanding of the extent of movement of coastal Casma people within the river valley and whether or not they were in contact with highland peoples who lived near modern-day Huaraz. Additionally, this paper will advocate for more widespread use of XRD analysis due to the benefits it offers in the protection and preservation of cultural resources.

Nicolas, Richard (California State University Los Angeles)

[355] *An Analysis of Lithic Production at the La Milpa Sinkhole (RB-25-A5)*

Caves are prominent earth openings in Maya sites that are widely recognized as being important sacred landmarks. There is a wide range of earth openings at sites, however, that are rarely recognized as possible landmarks and this can impact the interpretation of associated artifacts. Investigation of the La Milpa Sinkhole (RB-25-A5) is a case in point. Investigation in 2012 classified the feature as a trash pit. The recovery of large quantities of what were thought to be chert flakes led to the interpretation of the feature as being associated with a lithic workshop. Examination by a California State University, Los Angeles team in 2014 recognized the feature as a sinkhole with a possible ritual function. Excavation also recovered large quantities of chert but a unit within the cave-like portion found similar pieces still within their matrix of soft dolomitic limestone. A meticulous analysis eliminated most of the recovered material as natural shatter while confirming the presence of 27 formal lithic artifacts.

Nicole Boudreaux, Sarah [316] see Marinkovich, Erik

Nielsen, Jesper [88] see Helmke, Christophe

Nielsen, Jesper (University of Copenhagen) and Christophe Helmke (University of Copenhagen)

[88] *Bellicose Relations between Cacaxtla and Xochicalco in the Epiclassic Period*

Whereas the Epiclassic (A.D. 600-900) has long been recognized as a period characterized by increased conflict and warfare between the dominant city-states of central Mexico, concrete evidence for actual military actions has been rather limited. Here we discuss epigraphic and iconographic evidence that suggest that two of the major Epiclassic powers, namely Cacaxtla and Xochicalco, were involved in a violent conflict, and that Cacaxtla succeeded in capturing several prominent individuals from Xochicalco, which were subsequently portrayed on the tread of the hieroglyphic stair of the Red Temple at Cacaxtla. The tradition of displaying and naming important captives on stairs is known from other areas of Mesoamerica and at Cacaxtla their origin is betrayed by a probable toponymic reference to Xochicalco recorded in the glyphic text on the frontal riser of stair, as well as a distinct type of headdress that during the Epiclassic was worn by prominent individuals at Xochicalco and may even have served as an ethnic marker in the Postclassic. While the Epiclassic writing system remains undeciphered, we hope to show that important insights can be achieved based on careful analogies with other Mesoamerican scripts coupled with structural analyses of the texts and their accompanying imagery.

Nielsen, Christina

[256] *A Microstratigraphic Approach to Evaluating Site Formation Processes at Eagle Cave*

Eagle Cave (41VV167) is a large dry rockshelter with deep stratified deposits spanning the Early Archaic through the Late Prehistoric periods. My thesis research focuses on the deposits in the northern sector of the shelter sampled during the 1963 excavations by UT-Austin and again a half century later by Texas State University in 2014. My goal is to use multiple lines of evidence to evaluate the natural and cultural formation processes that resulted in the complexly stratified,

culturally rich deposits present in Eagle Cave. By using data derived from stratigraphic documentation, geoarchaeological sampling, artifact analysis, macrobotanical and faunal identification, constituent size distribution, and radiocarbon dating, I hope to develop a viable protocol for understanding the site formation processes evident at Eagle Cave and many other Lower Pecos rockshelters. This presentation summarizes the preliminary results of my thesis research.

Nielsen-Grimm, Glenna, Greg Farley, Edgar Ortega and Richard D. Hansen

[408] *Central Plaza Excavations at El Mirador*

The Great Central Plaza of the West Complex at El Mirador lies on an early and important alignment for the entire city. Excavations of two small altar platforms, and test units of structures on the boundaries of the plaza and the Leon Plaza suggest that this was probably among the earliest areas of the city, and continued to have symbolic and ritual importance throughout the Middle and Late Preclassic periods at El Mirador. The Central Acropolis creates the southern boundary, the east and west boundaries are delimited by Leon Temple on the west and an elongated structure on the east (E group complex) and the Cascabel Complex creates the northern boundary. The two small altar platforms are situated on the center line of the Central Plaza, creating a symbolic trajectory accessing the lower plaza and main stairway to the palaces of the Central Acropolis, with the center line extending through the E group and ending at the Cascabel group, the earliest grouping of temples yet known at the site. Evidence suggests that this may have been the earliest ritual center of the city and remained ritually significant to the inhabitants of El Mirador throughout its history.

Niespolo, Elizabeth [126] see Scarlett, TimothyJames

Nightingale, Shiela [118] see Davis, Jacob

Nightingale, Sheila (City University of New York, Graduate Center), Marina Bravo Foster (School of Earth and Space Exploration, Arizona Sta), Jessica Thompson (Emory University), Jeong-Heon Choi (Korea Basic Science Institute) and David Wright (Department of Archaeology and Art History, Seoul N)

[174] *Spatial and Chronological Components of Middle Stone Age Artifact Assemblage Variability in Deeply Buried Alluvial Fan Contexts*

Alluvial fan deposition characterizes the geological setting of many Stone Age sites in the East African Rift System. In these settings, researchers must consider multiple origins of technological variability, such as chronology, spatial trends, and depositional history. Because of logistical constraints, deeply buried artifacts in alluvial fans can only be examined through small excavation windows or where deposits have been heavily eroded. Under both scenarios, variability in in situ artifact attributes cannot be assessed over large areas. The Chaminade II (CHA-II) site in Karonga, northern Malawi, is situated within the Chitimwe Beds, a remnant alluvial fan dating to the Middle-to-Late Pleistocene. It preserves a Middle Stone Age (MSA) archaeological record whose interpretation is largely dependent on understanding the complex cycles of successive alluvial deposition, exposure, and erosion. By first mechanically removing 2m of largely archaeologically sterile fan deposit, a 32-x-2m trench containing over 15,000 in situ MSA artifacts was hand-excavated, screened and 5572 of the artifacts were plotted using a total station. Combined with excavated material from elsewhere in Karonga, the site demonstrates how both chronological and spatial factors affect the visibility of MSA technological variation—seen in lithic reduction patterns and site preservation—in this region of Africa.

[174] *Chair*

Nigra, Benjamin [169] see Weinberg, Camille

Nigra, Benjamin (UCLA)

[169] *Excavations at Huaca Soto: 2000 Years of Ritual Reuse at a Paracas Platform Mound,*

Chincha, Peru

Huaca Soto is one of the best preserved precolumbian platform mounds in the Chincha Valley and perhaps the largest standing example of Paracas monumental architecture on the south coast. Excavation in the huaca's western-most sunken court in 2014 yielded a sequence of ritual deposition stretching from the Paracas Formative through the Inka Period. While the mound's substructure and earliest occupation levels are squarely associated with Paracas post-fire resin painted wares and architectural techniques, subsequent offerings in the site's uppermost sunken court demonstrate Topará, Wari, Chincha, and Inka ritual participation. Deposition of high-value spondylus shell ornaments, hundreds of guinea pigs, dozens of camelids, and standardized serving wares attest to the site's significance as a major arena for communal events. On the other hand, isolated and idiosyncratic offerings of adobe and copper figurines, appearing in various forms, may represent more ad-hoc depositions left by particular individuals or itinerant visitors. Overall, Huaca Soto brings to light new data on processes of ritual appropriation on Peru's south coast.

Nims, Reno (Portland State University) and Virginia Butler (Portland State University)

[168] *On the Role of Sablefish (*Anoplopoma fimbria*) in Northwest Coast Fisheries: The View from the Tse-whit-zen Site (45CA523), Coastal Washington*

Though the study of human-prey animal relationships in the Pacific Northwest has focused largely on salmonid species (family Salmonidae) and their hypothetical connections to ancient increases in social complexity, a growing body of research demonstrates that many more fishes than have been previously recognized played key roles in the diets and social systems of peoples past and present. The Tse-whit-zen fauna, with over 80,000 fish bone specimens identified by ongoing zooarchaeological analysis, provides a unique opportunity to explore the importance of non-salmonid fishes. Preliminary results indicate sablefish (*Anoplopoma fimbria*) – a species rarely discussed in ethnographic and archaeological literature and scholarship – may have been equal to salmonids in dietary importance during part, if not all, of the village's occupation. This poster will explore how the diachronic and synchronic patterns of sablefish representation at Tse-whit-zen might be related to taphonomy, resource procurement, relative social status of house occupants, and gradual and sudden environmental changes. While sablefish remains represent a single line of evidence, close analysis of this species may generate novel hypotheses about ancient environments and past human behavior, and help to emphasize the roles played by "secondary" resources.

Nissley, Claudia

[197] *Discussant*

Nivens, Joelle

[53] *Red and Yellow Tracks in the Aurignacian: The Spatial Distribution of Colorants at Abri Castanet (Dordogne, France)*

Abri Castanet is one of the most important Early Aurignacian sites in the Dordogne (France). First excavated in the mid-20th century by early pioneers of modern excavation techniques, the site yielded invaluable insights into Paleolithic art and personal ornamentation. More recent excavations continued this trend, using total stations to precisely provenience artifacts and sieved sediment. Such rigorous methods and others have elucidated production and use patterns of stone tools, personal ornaments, and hearths. Adding to these studies, this poster addresses colorants' contribution to our understanding of Aurignacian inter-site spatial organization. Geoarchaeological studies of the recently excavated South Sector found substantial quantities of iron oxides within the site's hearths (Lévêque and Mathé 2010). Coupled with earlier analyses that found XRD spectra associated with heat treating goethite into hematite, the Abri Castanet assemblage fits data suggesting calcining was a regular Paleolithic colorant exploitation technique (Pomiès 1998). To better understand the technique's role within the wider operational chain(s) of iron oxide processing, I analyzed the spatial distribution of mineral finds. The analysis explores the differential distribution of hematite and less well-represented goethite fragments. Combined with previous analyses, these findings help add paleoethnographic detail traditionally reserved for well-preserved open-air sites in a rockshelter context.

Nkirete, Freda [194] see Robertshaw, Peter

Noack Myers, Kelsey [125] see Yerka, Stephen

Noack Myers, Kelsey (Indiana University Bloomington), Stephen J. Yerka (University of Tennessee, Knoxville) and R. Carl DeMuth (Indiana University, Bloomington)

[125] *Ouiatenon and Its Informational Analogs: Making Connections in Colonial Archaeology Less Hard to Handle with the Digital Index of North American Archaeology (DINAA)*

The archaeological remains of forts, outposts, settlements, extraction sites, and other activity areas established during European colonial ventures in North America span several hundred years and thousands of kilometers. The intricacies and interconnectedness of these sites are not easy to quantify or describe within the traditional limits of archaeological data management. The Digital Index of North American Archaeology (DINAA) can reveal colonial sites and their neighborhoods of effect on a multiscalar basis of regions defined by research designs. The ontological bridging vocabularies of DINAA also permit consideration of relationships of sites from colonial contexts across spatiotemporal divides, cultural categories, and active behaviors. The characteristics of the French-American and Algonquian sphere of interaction in and around Fort Ouiatenon (1717-1791), Indiana, are used as an example against which to compare and contrast the data representation of colonial archaeological sites in eastern North America. DINAA is constructed on a model of linked open data (LOD) which facilitates the connection of numerous data sets across a variety of networked systems; the rich-yet-incomplete record of Fort Ouiatenon helps to suggest what forms of data may be most useful for larger research collaborations into colonial archaeology.

[125] *Chair*

Noah, Mark [132] see Pantel, Agamemnon

Noble, Gordon [332] see Mitchell, Juliette

Nohe, Sarah (Florida Public Archaeology Network) and Michael Thomin (Florida Public Archaeology Network)

[261] *Slippery Oysters and a Cold Beer: Incorporating Food into Archaeology Education*

Through outreach and education, The Florida Public Archaeology Network, promotes the public appreciation and value of Florida's archaeological heritage. Food has regularly been used as a fun learning device in classroom settings: from teaching excavation techniques using a chocolate chip cookie to finding core samples in a PB&J. Public events held in cafés or over a pizza seem to break down social barriers and garner greater community cohesion. Recently, we have taken this one step further by having dining events that incorporate the tasting of historically-authentic food as a way to enhance the public understanding of Florida's archaeological heritage. This paper examines the effectiveness of using food to facilitate public archaeology, looking specifically at how food is used to bring archaeology to the classroom, provide a social and more relaxed atmosphere, and incorporate taste in the learning process.

Nolan, Kevin (AAL, Ball State University) and Mark Hill (Ball State University)

[9] *Exploration of Wet and Dry Portable X-ray Fluorescence for Archaeochemical Prospection: A Pilot Study in Comparative Method*

Geoscience approaches are being applied for prospection and intra-site analysis with increasing frequency in a variety of contexts around the world. There currently are a variety of archaeochemical procedures in use, each of which suffers from inherent limitations. Colorimetric measurement is limited in the number of elements measured simultaneously. Inductively Coupled Plasma techniques are expensive and restricted to a narrow range of institutions. Yet the recent availability of Portable X-ray Fluorescence (pXRF) offers a more flexible (wide spectrum of elements) and relatively inexpensive piece of equipment that is potentially more widely applicable to archaeological issues.

However, pXRF is most often used for whole-sample, dry chemistry which introduces a potentially geological confounding factor. In contrast, weak acid extraction preferentially extracts weakly adsorbed, and more likely anthropogenic, ions. We perform a comparative analysis of colorimetric measurement of phosphate, ICP-OES measurement of multiple elements, and both wet and dry pXRF of soil samples from a variety of glacial till plain contexts to assess the ability of pXRF to comparably measure the chemical imprint of human activity in till plain soils.

Nolan, Kevin [280] see Hill, Mark

Noldner, Lara (Iowa Office of the State Archaeologist and the University of Iowa)

[85] *Isolated Human Remains from the Central Mesa Verde Region: Taphonomic Distribution Patterns across Sites*

This paper examines the taphonomic distribution of isolated human remains at several archaeological sites in southwestern Colorado, an area occupied by Ancestral Pueblo people from the A.D. 500s to around A.D. 1280. The Crow Canyon Archaeological Center defines isolated human remains as fewer than five disarticulated elements. The majority of isolated skeletal elements analyzed were recovered from Pueblo II and III (A.D. 900-1280) contexts, but earlier Basketmaker III (A.D. 500-750) contexts will also be discussed. Isolated human remains that are identifiable by element will be analyzed for their location within each site, their proximity to architectural features, and the type of matrix in which they were found. The goal is to identify any discernible patterns in the types of elements that are most often redistributed by taphonomic processes and where they are found in relation to both built structures and intact burials.

Noll, Christopher (Versar, Inc.)

[6] *Using the Lithic Technological Organization at Procurement Sites to Parse the Multiple Occurrences of Browns Bench Obsidian in Southern Idaho*

Volcanic rocks such as obsidian were commonly used for the formation of chipped stone tools by people during prehistoric times. Archaeologists have been able to learn a great deal about the movements of prehistoric people by charting the procurement sites and use locations of these stones through x-ray fluorescence (XRF). Typically XRF can determine the procurement location of volcanic tool stone within a few square kilometers. Occasionally sources are characterized that are widely scattered and XRF alone does not provide precise locational information; Browns Bench obsidian, which is found at scattered outcrops within a 37,500 square kilometer area, is one such source. The Browns Bench outcrops are highly variable due to the environmental factors that have acted on the nodules at each location. The physical properties and reduction strategies identified at each Browns Bench procurement site help generate expectations about which sources were used to produce tools transported over long distances, and those that were only suitable for locally used informal tools. The analysis shows that many of the occurrences of the Browns Bench source are not suitable for large formal tools that could be transported and curated.

Noriega, Aldo

[227] *Expansión de la Cerámica Chancay en el valle de Checras en la Sierra Norte de Lima*

La presente investigación brinda los primeros resultados de los trabajos exploratorios de excavación llevados a cabo en el sitio arqueológico de Tupish, localizado en el valle de Checras, en la sierra norte de la región Lima en Perú. Encontrándose evidencia cronológica relativa de su ocupación cultural que abarcaría de manera discontinua desde el periodo formativo medio hasta la época Inca. Esta convergencia cronológica y foránea mostraría indicios de los intercambios culturales o influencias políticas venidos de otras regiones a la zona del valle de Checras, tanto de la sierra central andina como de la zona costera próxima de Chancay, esta última para el Intermedio Tardío. Precisamente la investigación pone a consideración la presencia de alfarería Chancay hallada en el contexto de investigación documentada y no documentada en Tupish. Se propone una nueva área de expansión de la cerámica Chancay y los posibles factores de su presencia en el valle de Checras.

Norman, Garth (ARCON, Inc.)**[130]** *13th Baktun Rebirth at Izapa: Discovery Vistas with New Technologies in Applied Structural Archaeology Are Writing Preclassic History*

Norman's latest "Izapa Sacred Space" book will be introduced, highlighting shared culture contacts near and far. Izapa popularity peaked at the end of 2012 and is being rekindled with the 13th baktun zenith sun (August 13) and new year (Sept 21) calendar monuments and applied technologies. Recent discoveries at Izapa have been examined with Reflectance Transformation Imaging (RTI) digital imaging technology recording of Izapa sculpture. This work initiated in 2013 and was completed in 2014 under an INAH project permit by CIR (Center for Izapan Research, ARCON Inc.) with Dr. Jason Jones (University of Warwick, England) that dovetails with Robert Rosenswig's Lidar mapping of Izapa. These new technologies confirm the precision of the NWAF's Izapa topo map and superior accuracy of NWAF's primary Izapa reference works, challenged by artistic sculpture re-drawings. These re-drawings can be added to the corpus of Izapa work, but for analytical purposes, the improved outline tracings of Norman, prepared from photographs made with optimum lighting should be used.

Norman, Neil (William and Mary)**[177]** *Negative and "Natural" Monumental Spaces: Ditches and Sacred Groves in Pre-Colonial West Africa*

This paper builds on recent archaeological efforts to theorize the active role landscape features had in framing social relations, delineating zones of safety and inclusion/danger and exile, and marking spaces where cosmological actors tend to reside. In the coastal forests of pre-Colonial West Africa, ditch features and sacred groves did such social work, and as such, these powerful and liminal features held prominent positions within the kingdoms of West Africa. This paper explores massive ditch systems and expansive forests as monumental public works. Further, it and builds upon recent efforts to theorize them within the statecraft of complex societies and the theatrics of political economies.

Norman, V. Garth [249] see Jones, Jason

North, Darsita [277] see Simon, Arleyn

Notroff, Jens [16] see Clare, Lee

Novak, Grant [358] see Sparks, Shane

Novelo Perez, María Jesús [24] see Fernandez Souza, Lilia

Novelo Rincón, Gustavo [183] see Toscano, Lourdes

Novic, Juliana (ASU School of Human Evolution and Social Change)**[237]** *Neighborhood Organizational and Interactional Variation in Comparative Perspective*

The degree to which the residents of neighborhoods form integrated communities with uniform social, political, and economic conditions is highly variable. I define neighborhoods, in agreement with most earlier definitions, as based on place and presence in an urbanized environment. The forms and functions of neighborhoods, and their relationships to larger socio-political urban processes, is not well understood for preindustrial societies. Are neighborhoods fully integrated communities or are people's primary social networks not connected to place? Does class, ethnic and occupational clustering feature as an important component in neighborhood life? Are all neighborhoods in a city tied to the same economic networks? Using available data from Mesoamerica, Asia, and Europe, I show that neighborhoods can be arranged along a continuum from integrated administrative units to fragmented and acephelous residential zones. Within the

same city, neighborhoods often have different socio-spatial conditions. Despite the small sample size, my comparative data offer a glimpse into the processes that produce these varying neighborhood conditions and dynamics that may lead to healthy or decaying cities.

Novotny, Claire (University of North Carolina - Chapel Hill)

[188] *Shifting Perceptions of Local Heritage: Community Archaeology in Aguacate Village, Toledo District, Southern Belize*

The recent expansion of community-based approaches to archaeological research signifies a renegotiation of how, and for whom, historical knowledge is produced. This paper reviews the implementation of a community-based archaeological heritage program in the Toledo district of southern Belize. Research conducted by the Aguacate Community Archaeology Project seeks to understand the degree of social, political, and economic integration of ancient Maya households with regional political centers during the Classic period (A.D. 250-850). Archaeological excavations conducted in collaboration with Aguacate, a Q'eqchi' Maya village, and Tumul K'in Center of Learning, a Maya-run high school, not only enhance our understanding of how ancient rural farmers negotiated regional social and economic relationships, but also become a nexus of negotiated engagement between Aguacate villagers, Maya high school students, and archaeologists. This paper explores how engagement with diverse publics over multiple field seasons revealed differing claims, perspectives, and priorities surrounding archaeological resources. Ultimately, incorporating public perceptions of archaeology resulted in the protection of archaeological sites and renewed interest in local Maya heritage.

Novotny, Anna (Arizona State University), Jaime Awe (Northern Arizona University), Catharina Santasillia (University of California Riverside) and Kelly J. Knudson (Arizona State University)

[338] *Bioarchaeological Analysis of an Ancient Maya Ancestral Context at Cahal Pech, San Ignacio, Belize*

Interaction of the living with the bones of the deceased is a tradition practiced in various forms throughout ancient and modern Mesoamerica. Among the ancient Maya the manipulation of the deceased's body is associated with powerful ancestral rituals likely carried out to reinforce and legitimate sociopolitical power. Structures placed on the eastern perimeter of plaza groups often contain multiple inhumations and are interpreted as ancestral locations. Structure B1 at Cahal Pech, located within the Belize River Valley, is one such structure. Ongoing excavations have revealed numerous burials and caches placed within B1 over the course of its use. Recently recovered Burial 7 consists of a tomb of cut stone blocks containing the remains of at least three adult individuals of both sexes and additional isolated human remains. Artifacts and body positioning suggest a possible origin outside the Belize Valley for at least two of the occupants. In this paper we use taphonomic, isotopic, and carbon-14 data to reconstruct the sequence of interment and residential history of the tomb occupants. We compare Burial 7 to other collective interments from eastern structures in the Belize Valley and nearby sites to refine current perceptions of ancient Maya ancestral ideology.

Nowak, Jesse (Texas State University), Daniel Bigman (Georgia State University), Daniel Seinfeld (Florida Bureau of Archaeological Research) and Grant Stauffer (Texas State University)

[8] *A Deeper Look at Lake Jackson: New Insights into Settlement Patterns and Ritual Space at a Florida Mississippian Center*

This poster presents the results of magnetometer and ground penetrating radar surveys as well as excavations conducted in 2014 at the Lake Jackson site located in northwest Florida. The geophysical and excavation results augmented with previously recorded site data provide a new view of occupation and architectural placement in and around the mound complex. Evidence from the remote sensing survey reveals several anomalies that represent probable Mississippian-style structures, while shovel test data provides occupation evidence in previously unexplored areas. These findings lead to an identification of the functionality of certain sacred spaces and associated ceremonial behavior.

Nowell, April (Univ of Victoria-Dept of Anthropology) and Daniel Stueber (University of

Victoria)**[64]** *Good Things Come in Small Packages: Acheulian Small Tool Assemblages from the Shishan Marsh site (Jordan)*

Over the past century, prehistorians studying Acheulian assemblages have focused their energies largely on the handaxe arguing that its iconic symmetrical, tear drop shape can be a window onto the origins and evolution of modern cognition, sociality, language, teaching, skill acquisition, and even symbolic behavior. This focus on the handaxe, and by extension big game hunting, has largely been at the expense of Acheulian small tool and microlithic assemblages and their associated tasks. These assemblages, comprised of small cores and utilized flakes and tools of less than 5 cm in length, are known from sites in Europe, the Levant, Africa and Asia. A comprehensive study of these assemblages may challenge our definitions of what constitutes the "Acheulian" and alter our understanding of Lower Paleolithic subsistence practices, craft production and technical knowledge. In this paper, we present a detailed study of the small tool assemblages from the Shishan Marsh site, a newly excavated Acheulian paleomarch site in Azraq, northeast Jordan and explore the role these assemblages played in hominin survival in a shifting paleodesert environment.

Nowell, Sarah (University of Montana) and Anna Prentiss (University of Montana)**[312]** *Variation in the Lithic Technological Organization Accompanying Household Expansion at Housepit 54, Bridge River Site, British Columbia*

The degree of preservation of Housepit 54 at the Bridge River site located in south-central British Columbia provides a rare look at a long series of intact occupational floors within a single pithouse. As data collection continues, a vast number of opportunities emerge to examine behavioral variation at the household level. During the 2014 field season, excavation revealed a household transition that reflected shifts in the organization of space within the household. Changes included fluctuations in the extent and spatial positioning in pit-storage along with shifts in hunting, fishing, and plant gathering strategies. This poster examines lithic artifacts collected from these floors in order to determine whether or not a parallel change can be observed in lithic technological organization. Variability in decision-making regarding the organization of tool production, maintenance, and use is reconstructed from functional and technological analyses of lithic debitage, cores, and tools. Understanding the nature of relationships between technology and subsistence decision-making can inevitably lead to further research questions to deepen our understanding of socio-economic history at Housepit 54, and the Bridge River site.

Nuevo Delaunay, Amalia [2] see Méndez, César

Nuevo Delaunay, Amalia (Universidad Alberto Hurtado), Juan Bautista Belardi (UNPA-CONICET), Flavia Carballo Marina (UNPA), Hernán de Angelis (CA.D.IC-CONICET) and Maria José Saletta (AIA-CONICET)**[251]** *Incorporation of New Raw Materials by Hunter Gatherers in Patagonia since the Sixteenth Century*

Since the arrival of sixteenth-century Europeans to Patagonia, different indigenous societies inhabiting the region were forced to deeply modify their ancient lifeways. The incorporation of new raw materials (for example glass and stoneware) in the production of traditional instruments (for example scrapers and projectile points) was one of several modified aspects recorded both archaeologically and historically. At first glance, the use of new raw materials appears to have been equally incorporated all over the region; however, this is far from true. In this paper, we analyze data obtained from chronicles and archaeological contexts from continental Patagonia and Tierra del Fuego Island. We also bring into discussion data from experimental replication. We compare both sub-regions and evaluate their particular characteristics. In a deeper analysis, differences arise in the ways indigenous societies incorporated new materials. These differences could be related to both the existence of reservations and marginal settlements, as well as a market for guanaco hides in the continent; while in the island, inhabitants were not immersed in permanent commercial relationships, but rather contacted through religious missions. Finally, data herein presented has wider implications in that they reveal various ways in which hunter-gatherers coped with contact.

Nugent, Selin (The Ohio State University) and Hannah Lau (University of California Los Angeles)

[380] *The Walking Dead: Osteological and Isotopic Indicators of Mobility from Middle Bronze Age Commingled Human and Faunal Burials in Naxcivan, Azerbaijan*

Tracing the mobility patterns of pastoralists and their herds is a critical part of illuminating the lifeways of people who inhabited the southern Caucasus in the past. During the 2014 season, the Naxcivan Archaeological Project excavated several Middle Bronze age kurgans overlooking the Şərur Plain. In these burials humans and animals were interred together, speaking to the significance of the animals in the lifeways of the people inhabiting the area during the Middle Bronze Age. We correlate data from bioarchaeological and zooarchaeological analysis with isotope analyses of $\delta^{18}\text{O}$.

We performed an analysis of $\delta^{18}\text{O}$ ratios on both the human and animal remains from these burials, sampling human molars to determine movement over a lifetime and sequentially sampling across animal molars to determine seasonal grazing patterns. These results are compared to known environmental bioavailability ranges of $\delta^{18}\text{O}$ in Naxçivan. This allows us to calculate both likely elevation and geographical locality during enamel deposition of each individual. Our research is part of a long-term study to understand patterns of movement of people and, by their agency, animals throughout the landscape.

Núñez, Luis

[86] *Regional Distribution of Mortuary Domestic Rituals in the Upper Usumacinta Basin: A Burial Practice Comparison from the Palenque Region and Its Neighboring Areas during the Late Classic*

From a macro regional perspective, ancient Maya mortuary practices seem to be highly variable in many features, like skeletal position, head orientation, type of grave, offerings, and successive reentering events. But, from a closer view, micro-regional similarities can be found suggesting the use of common burial rituals, practices, and beliefs. The Palenque region provides an interesting example. The available burial data from Palenque, El Lacandón, and Chinikihá are discussed to show the existence of a common domestic burial set of rituals. The results are compared with the burial collection from neighboring areas influenced by larger and autonomous sites like Piedras Negras, Bonampak, Altar de Sacrificios and other sites from the San Pedro Martir basin. Each of the mentioned sites also shows similarities but enough differences as to suggest particular or exclusive ways of disposing the dead as primary and secondary deposits.

Núñez Aparcana, Bryan (Universidad Nacional Mayor de San Marcos)

[232] *Ancestor Veneration in a Domestic Space in Panquilma. A Preliminary Approach Based on the Ceramic Analysis*

One of the characteristics of the funerary practices in the central coast during the late periods is the presence of interments inside domestic spaces. It has been proposed that this type of funerary practice in the region is related to an increase in ancestor veneration practices due to the proximity of the Inka invasion. This study presents the analysis of ceramic materials associated with secondary burials recovered from a Central Household Compound in the domestic sector at the site of Panquilma. Characteristics, including attributes such as the high variability of ceramic forms and decoration, coupled with the identification of sumptuary and exotic artifacts will be used to assess the social identity of the buried individuals. The study of the social identity of the individuals buried in Panquilma's domestic compounds will help us understand better the effects that the Inka presence in the region.

Núñez-Cortés, Yajaira (University at Albany-SUNY)

[246] *Traveling and Trading in Ancient Costa Rica*

Evidence for the increase in trade between Greater Nicoya and the Central region of Costa Rica during the later Precolumbian periods (A.D. 800-1550) is likely tied to the expansion of commercial networks from more complex chiefdoms. Different trading routes have been proposed, including the Central Pacific as a possible gateway to the Central Valley. The feasibility of trade routes in the

region is explored and evaluated here taking into account the known archaeological sites and routes followed by the first Spanish explorers during the period of conquest. Local as well as inter-regional exchange included more archaeologically visible goods such as polished stone, gold, and polychrome ceramics. However, perishable items such as cacao, maize, salt, cotton, animal skins, and other items could have been part of an established trading network moving across the territory of modern Costa Rica by land and river routes, and even beyond it by sea routes. Ethno-historical documents, which will also be discussed, provide insight into prehispanic trade and economics.

Nystrom, Kenneth (State University of New York at New Paltz), Niels Lynnerup (University of Copenhagen) and Dario Piombino-Mascali (Department of Cultural Heritage and Sicilian Ident)
[299] *Mummy Studies and the Soft Tissue Evidence of Care*

Evidence of care in the bioarchaeological record has focused on two broad circumstances: (1) long term survival with disability in which functional independence is impossible and (2) healed/healing trauma or illness that would have necessitated intervention or care to ensure recovery and survival. These conditions reflect relatively extreme, life-or-death circumstances and thus provide the clearest opportunity to observe care. The preservation of soft tissue, however, not only affords the opportunity to observe a wider range of pathological conditions but presumably a greater chance of observing, or inferring, evidence of care. The first part of this paper is a synthesis of the degree to which researchers have engaged (explicitly or otherwise) with the concept of care in the analysis of mummified remains. The second component of the presentation will focus on the case of an 18th-19th century mummy from the Piraino Mother Church, in the province of Messina, Sicily. This individual exhibits evidence of pleural adhesions, whipworm infection, and skeletal evidence of multiple myeloma. Some level of care may be inferred based on our understanding of the progression of this cancer. Care is more directly supported based on results of palynological analyses through which plants with known medicinal properties were identified.

Oas, Sarah (Arizona State University)

[167] *Examining Settlement Reorganization and Plant Food Use in the Greater Cibola Region A.D. 900-1400*

Investigations at varying scales have been undertaken to understand the role of maize in the diets and daily lives of prehistoric societies in the U.S. Southwest. In the Cibola region, around the modern Pueblo of Zuni, archaeological studies provide a detailed temporal and spatial picture of rapid settlement reorganization and aggregation in the Pueblo III and IV periods between A.D. 1150-1400. Less well understood, however, is how daily subsistence practices and interactions with local environments changed in relation with widespread increases in settlement size and density over time. This research draws on a large number of archaeological plant analyses to explore spatial and temporal patterns in plant subsistence practices. In particular I examine evidence for changes in maize agriculture and the use of wild plant resources over the Pueblo II-Pueblo IV periods (A.D. 900-1400) in the Cibola region of the U.S. Southwest. The comparison of macrobotanical and microbotanical assemblages from across the Cibola region suggests an increased investment in agricultural activities and possibly the use of other plant food resources with the establishment of large nucleated PIV settlements across the Cibola landscape.

[167] *Chair*

OBoyle, Virginia M. (Integrity Resources Archaeology, LLC), Erich Longie (Spirit Lake, North Dakota Tribal Historic Preserva), Conrad Fisher (Northern Cheyenne, Montana Tribal Historic Preserv), Jason Brown (Heritage Consultation Solutions) and Robert O'Boyle (Integrity Resources Archaeology, LLC)

[95] *CRM as Heritage in Communities on the Great Plains: Northern Cheyenne and Spirit Lake Nations*

Federal Agencies have long been required to consult with Tribal Nations; however, true consultation has been lacking. The table was tilted in favor of local land managers who have been free to make decisions on consultation and resource management, often with little or no insight from the descendant communities; however, that is changing. Coinciding with the rise of Tribal Higher Education, Tribal Nations on the Great Plains have begun to take charge of the consultation process,

and change the cultural resource management process into a vehicle for cultural heritage. Recognizing the government to government relation the Northern Cheyenne Nation and Spirit Lake Tribe Nation have passed tribal law on how to carry out cultural consultation with Federal Agencies on the 106 process. Archaeology and the 106 process have turned into a blooming cultural heritage program within Spirit Lake and Northern Cheyenne Nations. As sovereign governments, they are utilizing an online consultation submission with a fee to cover the direct costs associated with the consultation process to collaborate with agencies on their undertakings. The process has created a wide variety of positions and activities, providing work for tribal members and resources for developing the cultural resource management needs of each community.

OBoyle, Robert (University Of Montana), Conrad Fisher (Northern Cheyenne Nation) and Erich Longie (Mni Wakan Oyate Spirit Lake Nation)

[336] *CRM as Heritage in Communities on the Great Plains: Northern Cheyenne and Spirit Lake Nations*

Federal Agencies have long been required to consult with Tribal Nations; however, true consultation has been lacking. The table was tilted in favor of local land managers who have been free to make decisions on consultation and resource management, often with little or no insight from the descendant communities; however, that is changing. Coinciding with the rise of Tribal Higher Education, Tribal Nations on the Great Plains have begun to take charge of the consultation process, and change the cultural resource management process into a vehicle for cultural heritage.

Recognizing the government to government relationship, the Northern Cheyenne Nation and Spirit Lake Tribe Nation have passed tribal law on how to carry out cultural consultation with Federal Agencies on the 106 process. Archaeology and the 106 process have turned into a blooming cultural heritage program within Spirit Lake and Northern Cheyenne Nations. As sovereign governments, they are utilizing an online consultation submission with a fee to cover the direct costs associated with the consultation process to collaborate with agencies on their undertakings. The process has created a wide variety of positions and activities, providing work for tribal members and resources for developing the cultural resource management needs of each community.

O'Boyle, Robert [95] see OBoyle, Virginia M.

O'Brien, Lauren (Southern Methodist University) and Jennie O. Sturm (TAG Research)

[273] *Exploring Pithouses: Using GPR to Identify and Map Taos, NM Sites*

In June of 2014, multiple pithouse sites within the Taos Valley were surveyed with ground-penetrating radar (GPR). GPR survey was employed to map two known pithouse sites and two possible pithouse sites. The Taos Valley ranges dramatically in elevation and terrain, many times leaving the surface indications of sites nonexistent. Also, the components (features) of each site exist at different depths. Because GPR is a high resolution mapping method that allows features of interest to be analyzed in 3D, using this method allowed us to map the structure of the pithouses and determine the presence of possible extramural features and additional structures without large scale excavation. These maps will be used to create a database of pithouse sites across the Taos Valley, giving us a more complete understanding of this period.

O'Brien, Michael (University of Missouri)

[89] *Discussant*

O'Brien, Michael [124] see Selden, Robert

O'Carroll, Finola [332] see Scott, Rachel

Ochoa-Winemiller, Virginia (University of Montevallo)

[213] *Visualizing Prehistoric Artifacts: 3D Scanning, GIS, and Data Sharing*

Since 2009, the 3D Scanning of Molded and Modeled Artifacts Project has collected a sample of

approximately 100 specimens. The main goals of our project include the assessment of mold and stamp use as methods of standardized mass production of clay artifacts in prehistoric Mesoamerica and beyond, as well as, digitally archiving images housed in various collections. In this presentation, we aim to introduce a virtual catalogue of clay artifacts that contains digital raw 3D data. The Digital 3D Catalogue provides an opportunity to researchers interested in identification and comparison of their site collections with others that may not be reachable, fosters further metrological analyses, encourages data sharing, and will be accessible to the general public in the near future.

[213] *Chair*

O'Connell, James (University of Utah)

[296] *Discussant*

O'Connell, Tamsin [345] see Jones, Penny

OConnor, Ariel (The Walters Art Museum) and Katherine Eremin (Harvard Art Museums)

[37] *A Technical Study of Casting and Inlay on Chinese Ceremonial Weapons at the Harvard Art Museums*

The Harvard Art Museums contain one of the world's largest collections of inlaid Chinese ritual weapons from the Shang dynasty (c. 1600–1046 B.C.E.). These weapons are ornately decorated with turquoise inlay, exemplifying power and elitism in early Chinese society; yet little is known about their manufacture and use. A technical study of 32 inlaid weapons and pre-Shang plaques has yielded new observations on early technology and production organization in ancient China, and concluded that the mold-making process for casting weapons is distinct from early vessels. The turquoise stones and other inlay materials were categorized into groups through observations of shape, size, and finishing marks. The adhesive joining the inlay to the bronze was identified as a fruit tree gum, not lacquer as speculated in most literature. Evidence observed on the objects suggests that early Chinese production for inlaid weapons began with jade working, followed by bronze casting, and finalized with decorative turquoise inlay. This project also compared the museums' collection with contemporaneous, excavated inlaid weapons now housed in Beijing, Anyang, and Taipei.

OConnor, John (University of Oregon)

[233] *Artifact Networks, Cultural Transmission, and Polynesian Settlement*

The colonization of Polynesia was a motivated dispersal of culturally related human populations on a massive geographic scale. The settlement of distant oceanic islands involved the development and sharing of technological information specific to local environments, including exclusively stylistic aspects of artifact design. A reassessment of artifact comparisons from a neo-Darwinian evolutionary perspective continues to provide information regarding social interaction among island communities. Here I measure similarity in line-attachment-devices (L.A.D.) among artifact fishhook assemblages to determine significant cultural relationships among island populations. Artifact classes were documented for each assemblage. Similarity/dissimilarity coefficients were then calculated to remove sample bias and permit the simultaneous comparison of multiple assemblages. A series of non-parametric randomization tests were performed to directly evaluate the influence of geographical distance and sample size on assemblage relatedness, revealing distinct statistical relationships between certain assemblage attributes. Relational networks were constructed based on the degree of statistical similarity among artifact groups. The quantification of artifact similarity among fishhook assemblages allows the construction of undirected network models that illustrate the transmission of technological information in a non-hierarchical structure and contribute to a better understanding of human relations in prehistoric Polynesia.

O'Connor, Sue [407] see De Boer, Deanna

Oda, Noriyoshi [53] see Terry, Karisa

Odell, Molly [311] see Margaris, Amy

Odewale, Alicia (University of Tulsa)

[44] *Opposing Views in African-American Archaeology: Use of Resistance or Risk Management to Explain Cultural Material of the Enslaved*

This paper argues that theories in favor of resistance as the primary cultural response of enslaved African-Americans do not offer a complete picture of the diasporic experience but rather theories in risk management offer a better explanation for the variation inherent in slave responses and material culture. Risk management theories suggest resistance as only one of a myriad of responses a slave community might choose in reaction to their environment. When investigating the residential spaces and subfloor pits of enslaved Africans across Southern plantations, symbols of both resistance and risk management are represented in everyday utilitarian objects such as ceramics, metal housewares, tools, ammunitions, and other European-American materials, which were often adopted and reused in ways that were meaningful to enslaved peoples. While historical narratives indicate that resistance would have been a daily occurrence and would have been a major factor in how slaves formed their identity in an "us" versus "them" framework, this paper argues that resistance would have been only one of many responses to enslavement and evidence suggests that it was most likely not the dominant response in the slave community.

Oesch, Karla (University of Memphis)

[275] *A Stylistic Analysis of Protohistoric Polychrome Ceramics from the Lower Mississippi Valley*

The unique nature of ceramics from the Mississippi Valley provides an important basis for detailed ceramic studies that serve to aid researchers in understanding social agency and processes. These ceramic assemblages, especially those dating to the Protohistoric period, will be the focus of this research. Ceramic vessels from counties in Arkansas and Mississippi will be used to compile database of design motifs, in addition to other ceramic characteristics. Using the dates from these sites, my research will help to better understand the chronological distribution of particular ceramic characteristics. It is the hope that this research will not only further ceramic chronologies, but also better understand processes of change both in society as well as material culture.

Oestmo, Simen (IHO, Arizona State University), Benjamin Schoville (IHO, Arizona State University), Jayne Wilkins (Department of Archaeology, University of Cape Town) and Curtis Marean (IHO, Arizona State University)

[356] *A Middle Stone Age Paleoscape near the Pinnacle Point Caves, Vleesbaai, South Africa*

While MSA caves/rock shelters can provide long sequences of early human residential activities in circumscribed contexts, most resource procurement activities occurred on the landscape in uncircumscribed space. We have a limited understanding of these resource procurement activities at present, making studies of open-air sites crucial. To alleviate this bias, we report on a series of MSA open-air assemblages that are exposed on ancient land surfaces suggestive of intact paleosols at Vleesbaai and Visbaai. These localities are situated within 10 km of the long cave/rock shelter sequences at Pinnacle Point, South Africa presenting the novel potential to study evidence of MSA behavior in closed and open settings where their proximity to each other approximates the typical hunter-gatherer daily foraging radius documented in ethnography. We present a fabric and technological analysis of MSA stone tool assemblages from three "areas." The fabric analysis suggests that the lithic assemblages have undergone limited post-depositional disturbance. The technological analysis and exploratory comparisons between these open-air assemblages and MSA cave and rock shelter contexts at Pinnacle Point Cave 13B and 9, and Cape St. Blaize Cave suggest a dichotomous pattern of retouched tool discard, and that the quartzite artifacts from Vleesbaai were locally procured and field processed.

Oestmo, Simen [356] see Wilkins, Jayne

Offenbecker, Adrienne (University of Calgary), Jane H. Kelley and M. Anne Katzenberg**[328]** *The Relationship between Violence and Geographic Origins at Casas Grandes, Chihuahua, Mexico: Preliminary Results from Strontium Isotope Analyses*

Casas Grandes, also known as Paquimé, was one of the largest and most complex societies in prehistoric northern Mexico, with established trade networks and cultural influences from Mesoamerica, the American Southwest, and western Mexico. Analyses of the human skeletal remains from Casas Grandes have found evidence for interpersonal conflict, human sacrifice, and cannibalism during the Medio period (ca. 1200-1450 A.D.), which coincides with the site's increasing sociopolitical complexity and emerging social differentiation. Unfortunately, the nature of violence at Casas Grandes is still poorly understood. The primary objective of this pilot study, therefore, is to determine whether violence was directed toward members of the local community or outsiders, such as immigrants or captives. We accomplish this by using strontium isotope analysis to examine the relationship between geographic origins and various osteological and mortuary variables. Our preliminary results indicate that $87\text{Sr}/86\text{Sr}$ values are not correlated with mortuary treatment, post-mortem processing, or trauma, though significant patterning by sex was observed. We discuss these results in the context of emerging complexity and inequality and also highlight the strontium results from several distinctive burials, including potential human sacrifices, cannibalized remains, and various interments from an elite burial tomb.

[328] *Chair***Ogburn, Dennis (University of North Carolina at Charlotte)****[247]** *Identifying Possible Inca Census Records in Khipu from Pachacamac*

One of the primary categories of data recorded by the Incas on their knotted string accounting devices (khipu) is detailed census numbers from different administrative units, yet no existing khipu has been identified as containing such population records. In this analysis, Inca concepts of age categories and hierarchical ranking are used to predict a number of different formats for recording census data. Existing data tables of khipu were examined to determine if any matched these expectations, and at least two khipu, both from Pachacamac, were found to closely match one of the primary formats predicted. Analysis showed the numbers on those khipu conform closely to the expected demographic composition that would be represented by Inca age categories, and the numbers on the two khipu further suggest the records are for several hunu (groups of 10,000 tributaries). The two khipu also represent two different levels of an accounting hierarchy.

Ogiogwa, Joan-Mary**[149]** *Cultural Survivals and Social Memories*

Cultural survivals should ordinarily be thought of as anthropogenic in nature as they generally result from the conscious and unconscious influence of humans on their natural environment in an attempt to respond to the cultural, historical, spiritual and environmental challenges facing them.

To this extent, the rock engravings on the Omutedo rock shelter located along the Ijebu-Igbo highway in Ogun state, south western Nigeria have carved a pathway in the way the present inhabitants think about their past as it relates to this cultural survival. The present paper is a report of the survey and documentation work done on the rock shelter with the main aim to know the extent of the shelter, extent of the engravings and to try to understand the motifs of the designs on the rock. Methods used in this project included an inventory study using the surface inspection technique, documentation; that is a thorough description and photography of representative and diagnostic features in situ.

OGorman, Jodie (Michigan State University)**[365]** *Negotiating Migration and Violence in the Precolumbian Mid-Continent: A View from the Village*

Multiple lines of evidence from Morton Village presented in the poster symposium are brought together to consider the social context of marked violence evidenced at Norris Farms 36 cemetery. This current work sheds light on the complexity and context of social interactions whereby migrant and resident populations negotiated a level of cooperation and support by creating new mechanisms

for social integration in the village.

[365] *Chair*

O'Gorman, Jodie A. [365] see Tubbs, Ryan Maureen

O'Grady, Patrick, Joe Collins (University of Texas, El Paso), Michael Rondeau (Rondeau Archaeological, Sacramento, California) and Scott Thomas (Bureau of Land Management, Burns District)

[35] *Near and Far: Spatial Relationships of Inter- and Intra-Site Artifacts at Rimrock Draw Rockshelter (35HA3855), Harney County, Oregon*

Rimrock Draw Rockshelter is located along a relict stream channel in southeastern Oregon. The lithic assemblage includes Western Stemmed (WST) points; Northern Side-notched (NSN) points; and artifacts associated with fluting technology, such as fluted bifaces, fluting flakes, overshot flakes, and bifaces with overshot flake scars. NSN and WST distributions within the rockshelter have vertical and horizontal separations, indicating temporal and areal differences in site use occurred that can be tied to distinct stratigraphic components. Surface distributions outside of the rockshelter also indicate distinct areas of occupation, with WST points found primarily above the rockshelter, NSN points on terraces upstream, and fluted technology on downstream terraces. Obsidian geochemical sourcing of an additional 100 artifacts from the site (250 total) reinforces our perspective that mobility patterns varied through time. WST points were transported from diverse sources in central and eastern Oregon, northern California, and northern Nevada. Fluting technology was localized, with most obsidian originating within 50 km of the site. Sources for NSN points suggest a wide-ranging population. Geochemical sourcing data for fluted and stemmed artifacts from Sagehen Gap, Sheep Mountain, and the Dietz site (all near Rimrock Draw Rockshelter) will enhance our perspective on mobility patterns in Oregon Paleoamerican sites.

O'Hagan, Terry [315] see Lash, Ryan

O'Hara, John (NYU)

[395] *Accessing Social Geographies in Late Glacial Franco-Cantabria through Personal Ornaments*

Besides its rich and complex archaeological record, the Late Glacial of Franco-Cantabria is also a moment of central importance in the population history of Western Europe. This region was the principal demographic source for the post-LGM recolonization of Western Europe, and the influence of cultural trends originating here may be observed across the continent. This paper will present the goals and initial results of an ongoing research project to analyze the internal social dynamics of this critical period of prehistory. It will examine the emergent Late Glacial social geographies, understand the cultural influence exerted by various demographic centers, and chart the principal axes of interaction between these clusters. It will do so by conducting a study of the personal ornaments recovered there from the Initial-Upper Magdalenian periods (approximately 22-14,000 years ago) from the Dordogne to the Pyrenees and Cantabrian Spain. Typological and technological variation across time and space will be analyzed for indications of cultural affiliation or interaction, and stable isotope geochemistry will be used to identify the source of ornament materials, allowing access to networks of mobility and exchange, and how they change through time.

[395] *Chair*

O'Hear, John [8] see Steponaitis, Vincas

Ohman, Alexis (College of William and Mary)

[56] *Exploration in Portable X-ray Fluorescence (pXRF) Applications to Zooarchaeology*

Current research in portable X-ray Fluorescence (pXRF) applications for archaeological research constantly attempts to push the boundaries of what this technology can accomplish. Although research involving lithics, glass, metals and ceramics remain the most common venues of

investigation, bone has also become an innovative focus of inquiry. However, because it has been studied significantly less than these other forms of material culture there is still much that is unknown in terms of how certain elements become represented in bone, such as the relative abundance of elements that contributed to composition during life rather than uptake post-deposition. Fish bones from Betty's Hope plantation provide a range of data that includes a variety of elemental representation, both naturally-occurring and not. This updated analysis will attempt to ascertain how certain elements become represented in archaeological bone samples both during life and post-depositionally.

Oka, Rahul (University of Notre Dame)

[335] *Predatory Commerce, Elite Competition: Economic Conflict and the Downfall of Elite Communitas in the Port of Mtwapa, Kenya, 1600-1750 C.E.*

The premise of this session is that "communities are not merely the byproducts of individual households pursuing their own productive strategies nor are households passive reflections of the larger communities of which they are a part." This paper focuses on Waungwana (elite) communitas at the Swahili port of Mtwapa, Kenya between 1600-1750 C.E. Data from 10 elite wards is used to examine the effects of competition on both household and community. Analysis shows that the external predatory commerce in the Indian Ocean trading world of 17th and 18th centuries is linked to the emergence of new competitive elite households within the waungwana at Mtwapa who: a) invested more in 'foreign' merchant networks rather than local and regional alliance networks, and b) shifted from a local-regional value-added manufacturing economy to a regional-global raw material-based extractive economy. While this enabled greater profit for the emergent elite households, it also led to a breakdown in the Waungwana communitas and ultimately, to capital flight, elite out-migration, and abandonment of Mtwapa between 1750-1800 C.E. It is argued that household engagement in competitive pursuit of their own productive strategies in response to predatory commerce may be a fundamental factor in the breakdown of communitas and communities.

Okaray, Jillian (University of West Florida), Ashley Christianson (University of Denver) and Susan Spencer (University of Southern Indiana)

[265] *Don't Forget Me When I'm Gone: Examining Relationships between the Living and the Dead through Decorated Headstones*

Cemetery grave sites allow a continual dialogue between the deceased and their descendants. Many living relatives choose to decorate graves with flowers, ceramic figurines, flags, letters, and decorative seasonal items. This study was aimed to examine the relationship between the deceased and loved ones who choose to decorate graves after burial. Two cemeteries in Evansville, Indiana were examined in order to investigate the typology of decorations and the length of time graves remained decorated. The activity recorded, along with information obtained from online memorial web pages, indicates an intricate relationship the living share with the departed.

[265] *Chair*

Oland, Maxine (Smith College) and Debra Walker (University of Florida, FLMNH)

[244] *With Turkeys on Spears and Maize on Arrows: Defining and Defending the Province of Chetumal*

Chetumal Bay had political and economic importance for local Maya populations for more than 2000 years. When the Spaniards entered the region in the 16th century, they settled near its political capital and attempted to incorporate it into a larger colonial world system, only to be met with wide-scale resistance. This paper examines the shifting dynamics of the Chetumal Bay territory, from the Preclassic through Postclassic-Colonial Periods, with perspectives drawn from Cerros and Progreso Lagoon. We consider how territorial structures were reworked throughout the history of the region, and the ways in which this history helped to shape Colonial Period interactions.

Olano, Jorge [31] see Sakai, Masato

O'Leary, Owen (JPAC-CIL)

[48] *Predicting the Location of Human Remains on WWII Bombardment Aircraft Crash Sites*

Examination of eight WWII bombardment aircraft loss incidents that have been resolved by the Joint POW/MIA Accounting Command (JPAC) since 2000 has allowed for the creation of a model that predicts where human remains can be expected to be recovered from within a crash scene based upon each crew member's individual duty station. This paper will detail how the remains identification process was utilized in order to determine where each individual was found in relation to the aircraft wreckage at the various crash sites, including those criteria necessary for a case to be included in the model and how hypotheses were developed. These hypotheses were then tested against an additional, previously unexamined, loss incident. Results detailing how far remains can be expected to be found from the individual's corresponding duty station wreckage and maximum spread within a crash site are provided. Additionally, for the cases included in this study, it is determined that the physics of the crash rather than the actions of the crew or post-depositional processes is what primarily dictates where individuals will be found within a crash site.

Oleksyk, Taras [313] see Martinez-Cruzado, Juan

Olguin, Laura [2] see Salazar, Diego

Oliva, Fernando [185] see Barrientos, Gustavo

Oliveira, Hugo [345] see Lister, Diane

Olivier, Guilhem (Instituto de Investigaciones Históricas, UNAM) and Leonardo López Luján (Museo del Templo Mayor, INAH, Mexico)

[298] *The Roseate Spoonbills of Tenochtitlan's Great Temple and Their Relation to Deceased Warriors, Nobles, and Kings*

During recent excavations conducted in the Urban Archaeology Program (PAU) and the Templo Mayor Project of Mexico's National Institute of Anthropology and History (INAH), six offerings containing roseate spoonbill (*Platalea ajaja*) skeletal remains were found at the foot of Tenochtitlan's main pyramid. A careful analysis of these bones reveals that the Mexica buried not only complete individual birds in this important ritual scenario, but also their multicolor feathered skins. Although the roseate spoonbills may have come to the ancient city through usual the commercial or tributary channels, it is also possible that they came from the famous Totocalli (House of Birds) located in Motecuhzoma Xocoyotzin's palace. The comparative study of the archaeological contexts, native pictorial manuscripts, and colonial alphabetic sources indicates that these birds were symbolically associated with the souls of deceased warriors, nobles, and kings. Their location at the foot of the great twin-temple structure, specifically on the side dedicated to Huitzilopochtli, would confirm historical data that maintain that the cremated cadavers of Mexica sovereigns were interred there.

Ollivier, Aaron [35] see Smith, Geoffrey

Olsen, Erica [188] see Collins, Shawn

Olson, Elizabeth (Northern Illinois University), Justin Dodd (Northern Illinois University, Department of Geology) and Mario Rivera (Beloit College, Department of Anthropology)

[333] *Tree Ring Isotope Record of Climate Change at the Ramaditas Site in the Atacama Desert of Northern Chile*

The Ramaditas archaeological site in the Atacama Desert of northern Chile provides evidence for cultural adaptations during wetter environmental conditions in an otherwise arid environment. From 2.0 – 2.5 kyr B.P., regional population increased and a cultural shift toward agricultural based communities occurred. Tree samples collected from the site provide a high-resolution record of increased water availability as recorded by tree ring oxygen and carbon isotopes. *Prosopis tamarugo* logs from structures and stumps in ancient irrigated agricultural fields show a range of $\delta^{18}\text{O}$ values

from 22.8 to 39.4‰. The change in oxygen isotope values is significantly greater than the 33.5 to 34.6‰ range recorded in modern and early Holocene trees. Precipitation runoff and infiltration in the Andean highlands to the west of the site recharges the lowland Pampa del Tamarugal aquifer. Hydroclimate anomalies leading to wetter environmental conditions during Central Andean Pluvial Events in the region have been attributed to ENSO-like variability. Frequency analyses of annual and sub-annual isotope values suggest decadal trends in climate forcing mechanisms. The timing of these paleoenvironmental and cultural events as recorded by our tree-ring isotope record demonstrate the dynamics between human societies and the environment.

Olson, Kyle (University of Pennsylvania)

[402] *No Aryans Needed: Toward Explaining the Distribution of Burnished Grey Ware Ceramics of the Third Millennium in Northeastern Iran*

The Gorgan Plain in Iran has long been considered to be an important part of the northern frontier of the Ancient Near East. Only recently, however, has this region been considered a center of complex society in its own right during the third millennium B.C.E. While no society in this frontier zone would achieve literate statehood until much later, there is nevertheless mounting evidence that the societies of northeastern Iran developed incipient urbanism, craft specialization, and organized irrigation networks, among many other hallmarks of 'civilization' during the Bronze Age. Unfortunately, considerable confusion remains regarding basic cultural sequences of ceramics, architecture, craft production, agriculture, and animal husbandry. Due to the nature of the published materials, discussion tends to revolve around a few key issues; the most widely published and commented upon cultural materials from northeastern Iran are the Burnished Grey Wares made famous by Erich Schmidt's excavations at Tepe Hissar. This paper focuses on integrating the available Burnished Grey Ware materials into a framework that adequately describes the variation in this assemblage over time and space and evaluating different hypotheses that could possibly account for the observed distribution.

Olszewski, Deborah (University of Pennsylvania), Maysoon al-Nahar (University of Jordan), Daniel Schyle (University of Cologne) and Brian Byrd (Far Western Anthropological Research Group)

[64] *Wadi Madamagh, Western Highlands of Jordan: Lithic Evidence from the Late Upper Paleolithic and Early Epipaleolithic Occupations*

Wadi Madamagh, a small rockshelter in the Petra region of the Western Highlands of Jordan, contained high-density deposits of the Late Upper Paleolithic and the Early Epipaleolithic periods. It was first excavated in 1956 by D. Kirkbride, who placed two trenches into the site and briefly reported on the lithics, which have since been studied in detail (B.F. Byrd). A small test along one of Kirkbride's trenches was conducted in 1983 (D. Schyle), and more intensive excavations were pursued in 2011 (D.I. Olszewski and M. al-Nahar, as well as D. Schyle). As a result of decades of exposure due to the open trenches left by Kirkbride, the remaining deposits at Wadi Madamagh are unfortunately quite limited, especially those of the Early Epipaleolithic. In this paper, we address this issue in part by combining data from the lithic assemblages recovered from all three excavation seasons. This is thus the first comprehensive examination of the stone artifacts recovered from this site. It examines their significance for understanding the behavioral strategies of Late Upper Paleolithic and Early Epipaleolithic hunter-gatherer-foragers in this part of the Levantine Middle East.

[64] *Chair*

O'Meara, Kathleen M. [287] see Harrower, Michael

Ontiveros, Joseph (Soboba Band of Luiseno Indians) and Desiree Martinez (Cogstone Resource Management)

[197] *Collaborative Efforts to Preserve Los Angeles' History: Saving The Campo Santo*

In October 2010, human remains were uncovered during the development of Los Angeles County land leased to the La Plaza De Cultura y Artes located in the heart of Los Angeles, California. The remains, which were within the well-known Camp Santo historic cemetery, were that of Los

Pobladores, Native Americans, indigenous Mexicans, and the Gente de Razon, the very people who founded and built the Pueblo of Los Angeles during the early and mid 1800s. Over 90 individuals were removed, unbeknownst to lineal descendants and Native American tribes and without consultation as to the appropriate handling and disposition of the ancestors as is required by state and federal law. This paper will provide a brief history of the Campo Santo Cemetery, describe the impacts to cemetery burials, and most importantly discuss how the various agencies involved worked effectively with the consulting Federally Recognized tribe to carry out adequate preservation methods. Furthermore, it will also look at the current status of the cemetery location and efforts being made for long term preservation.

Opitz, Rachel

[84] *Modeling Behavior in Digital Places Using Low-Level Perceptual Cues*

Serious games and detailed 3D virtual models that allow researchers to explore multiple scenarios and reflect on different hypotheses or potential reconstructions are growing in number and increasingly viewed as serious scholarly tools. These reconstructions tend to heavily foreground the spatial and visual aspects of a place, a natural reflection of the character of the digital media in use. Studies of potential past experiences of these places, typically focused on movement through them and the visual experience as clues to the intentions of their creators or discrepant experiences of inhabitants and visitors, rely heavily on the described experiences of users of the virtual models and games. This raises a number of difficulties, widely acknowledged by the scholarly community, notably the pervasive influence of the cultural baggage of an individual modern explorer of the model. In this paper, using models of Knowth in the Bru na Boinne in Ireland, I present a formal modeling approach that uses the visual perception of space and shape, relying on low-level perceptual cues and scene-structure, to go beyond the individual user's experience and provide a rigorous analytic approach to the modeling of visual experience, on which interpretations can be built.

[5] *Moderator*

Oram, Richard (University of Stirling, UK)

[288] *Stripped Naked, Flayed to the Bone and then Drowned: Settlement Failure in Coastal Scotland in the 14th and 15th Centuries*

Archaeological excavation of medieval settlements in the coastal districts of Scotland has revealed significant evidence of protracted environmental impacts on their material culture exploitation regimes and domestic economies between the later 13th and early 16th centuries. These impacts are represented chiefly by shifts in the marine species being exploited or changes in the levels, species and age profiles of livestock carried on grazing-land, or trends in the suite of cultivars represented, all signifying attempts to adapt to environmental change with varying degrees of success. At several sites dispersed from Orkney to the Outer Hebrides and Buchan to Lothian, however, integrated archaeological and documentary historical research has revealed where failure to adapt practices which emerged in the MCA to the changed circumstances of the 'little ice age' - in soil 'improvement' strategies, fuel resource exploitation or construction-material management - accelerated settlement decline and contributed to system failure and abandonment in even such a resource diverse region as Scotland. This paper will discuss the consequences of adherence to traditional agricultural practices during this era of deteriorating climate, exploring particularly the impact of increased storminess on arable-intensive communities.

Ordoñez, Maria (PhD candidate Universiteit Leiden)

[367] *Forgotten Mummies. Reflections on the Management of Human Remains Exhibits in Ecuadorean Museums*

This paper will address the role of the human remains collections in Ecuadorian archaeological museums through the comparison between the case of the National Museum of Ethnology in Leiden Holland and three Ecuadorian museums: the National Museum, the Sumpa Lovers museum and the Jacinto Jijón y Caamaño museums. This comparison will be done on the basis of archaeological ethical practice in regards to human remains and the experience and points of view of the museum

personnel that work with these collections. These results are considered within the framework of international codes of ethics and treatment of human remains in museum collections, as are being discussed at present in the USA, UK and international associations such as the SAA and ICOMOS. The objectives of this paper are to present case studies using management practices of Andean human remains in collections and exhibitions, encourage discussion on the subject in archaeology and anthropology museums in Ecuador and assess the need for national policies and professional standards for the regulation of the work with human remains, beyond their analysis and conservation.

Ore Menendez, Gabriela (Vanderbilt University) and Steven Wernke (Vanderbilt University)

[287] *Mapping and Feature Classification of Low Altitude Orthomosaics Using Geospatial Image Analysis in a Planned Colonial Town in Highland Peru*

Large archaeological settlements with complex architecture have been always difficult to map. The introduction of unmanned aerial vehicles to fly over sites has helped reduce the time and increase precision of archaeological mapping; nevertheless post-processing time is still a workflow bottleneck. We present a geospatial imagery-based methodology for identifying and mapping surficially visible structures and environmental features at a late prehispanic and colonial settlement with extensive and complex architectural features in the highland Andes of Peru. Satellite imagery and aerial photography has been used before in archaeology to identify archaeological sites at a macro scale. Now, the use of high-resolution panchromatic photography analysis allows the identification of individual features in detail. Using feature extraction principles over a high resolution orthomosaic image, we identify architectural and natural features at the site. The results enable walls, complete structures and collapsed buildings to be readily identified and mapped as vector themes while also revealing swamp and high-density vegetation areas and wall foundations not observable on the ground in the field. The application of this feature extraction methodology in other archaeological context is also discussed.

Origer, Thomas [383] see Elliott, Evan

Orogo, Alfredo [238] see Bolunia, Mary Jane Louise

O'Rourke, Dennis [328] see Stone, Jessica

Orozco, Joseph (CSULA)

[193] *Ritualized Shatter: An Introduction of Obsidian to La Mipla, Belize*

California State University, Los Angeles Archaeological Field Program in Central America conducted an investigation of a sinkhole containing a small grotto at the ancient Maya site of La Milpa, Belize in 2014. Excavation discovered that a rubble-cored platform had been built around the feature, formalizing the space and suggesting that it had functioned as a sacred landmark. During the excavations, a fairly dense concentration of sherds was encountered along with three dozen fragments of obsidian prismatic blades. The recovery of the blades is not surprising in that obsidian has been reported from dozens of caves in the Maya area. What is unique, however, is the extremely fragmented condition of the blades which suggests deliberate breakage. Analysis of fracture patterns and use-wear are currently being conducted in an effort to determine how the blades had been used and fragmented before being deposited in the sinkhole. The material is also being sourced to see if procurement differed for a ritual use.

Orozco, Joseph [355] see Lorenz, Samantha

Orrego Corzo, Miguel (National Archaeological Park Takalik Abaj) and Heber Delfino Torres Estrada

[242] *Current Ritual Materiality at Tak'alik Ab'aj*

Tak'alik Ab'aj since its heyday in the Preclassic and during its long history up to the Late Classic,

was an important trade and cultural center of the southwestern Maya Periphery. After an abandonment of 1700 years of long-lived and uninterrupted history in 900 A.D., this ancient city apparently maintained its significance as an ancestral sacred place. However, rituals were performed as inconspicuously as possible, since the site has passed into private properties. Since the beginnings of the creation of the Archaeological National Park Tak'alik Ab'aj in 1987, indigenous people were invited to the site to perform and unfold their ritual traditions in an ambiance of respect and consideration for the conservation of the site. This has propitiated a growing affluence of ritual activities, set to the sacred calendar days, which has been carefully documented, producing a wealth of details and information about character, patterns, protocol and diversity in materials employed in current rituality. This signals a powerful process of re-invention.

[242] *Chair*

Ort, Jennifer (PAL, Inc.) and Dianna L. Ducette (PAL, Inc.)

[281] *Undiscovered Country: Preliminary Results of Eleven New Sites Identified in the Susquetonscut Brook Valley, Eastern Connecticut, USA*

PAL, Inc (the Public Archaeology Laboratory) conducted archaeological investigations in Connecticut, Massachusetts, New York and Rhode Island in preparation for upcoming modifications to an existing pipeline. The project in particular crossed large areas of Eastern, Central and Western Connecticut that have not previously been systematically surveyed. This paper will focus on those sites identified in Eastern Connecticut, specifically those found along the Susquetonscut Brook, a tributary of the Yantic River. Diagnostic artifacts coupled with 14C dates of 3901 ± 23 RCYBP (PRI-14-065-2820.02-04) and 4026 ± 23 RCYBP (PRI-14-065-2820.02-05) place these sites within the Late/Transitional Archaic Period to the Early Woodland Period. Considering the paucity of previously recorded sites in the Susquetonscut Brook's Valley, these sites offer a wealth of new information for the region. In this paper we focus on specific questions about these sites: (1) What activities took place at each site, what local resources were exploited, and how do these factors relate to site use and seasonality? (2) Are the sites along Susquetonscut Brook related? (3) Why were no earlier or later sites found despite extensive survey coverage?

Ortega, Beatriz [129] see Caballero, Margarita

Ortega, Allan (Centro INAH Quintana Roo), T. Douglas Price (University of Wisconsin), James E. Burton (University of Wisconsin), Andrea Cucina (Universidad Autónoma de Yucatán) and Vera Tiesler (Universidad Autónoma de Yucatán)

[413] *Population Movements, Trading, and Identity along the East Coast of Postclassic Yucatan. Dental Morphology, Isotopic Provenience Analyses and Body Modifications in Human Series from El Meco, El Rey, and Tulum, Quintana Roo, Mexico*

Different hypotheses exist for explaining population development and replacement on the east coast of the Yucatan peninsula after the so-called Maya collapse, one involving the presence of the Putun-Chontal folk fringing the Gulf Coast of Mexico. Here we examine these proposals through the lenses of conventional paleodemography, dental morphology, body modifications (dental decorations and head shaping) of human skeletal series from the Postclassic coastal trader settlements of El Meco, El Rey and Tulum, Quintana Roo, Mexico. We match these with the provenience profiles obtained from 87Sr/86Sr and d18O isotopic analyses in 37 individuals of the collection (both sexes) and put the data in broader contexts of social organization and regional population evolution. The series from the core settlement of Tulum shows higher biological heterogeneity than the two other series, higher diversity in artificial head shapes and a small proportion of non-locals, stemming perhaps from the adjacent northern Peten area. Despite the limitations in sample sizes and diversity in contexts, our results echo broader trends in population movement and cultural cohesion along the Yucatecan coast.

Ortiz, Agustin [176] see Pecci, Alessandra

Ortiz, Jose Raul (University of Arizona)

[196] *Revisiting the Preclassic Ceramic Sequence of the Greater Kaminaljuyu Zone*

In a recent work, Inomata and colleagues present a revised chronology of Kaminaljuyu during the Preclassic period which cross-dates other cultural sequences in southeastern Mesoamerica. This paper provides further ceramic data including a re-evaluation of the various typological sequences already established in the literature and presenting a modal sequence of vessel shape, surface treatment, and decoration based on ceramic analysis of collections from the most important sites in the greater Kaminaljuyu zone (i.e., Kaminaljuyu, Naranjo, Piedra Parada, and Rosario-Naranjo). This paper demonstrates that significant data is still attainable from stored ceramic collections and that implementing detailed modal analysis of Maya archaeological research has the following significance: 1) it refines local ceramic sequences, 2) it highlights the importance of synchronic ceramic developments through ceramic modes and types in order to cross-date extant regions.

[196] *Chair*

Ortiz Barrera, Rosa (Rosa Ortiz), Cindy Cristina Sandoval Mora and José Luis Punzo Díaz**[156] *The Activity of Hunter Gatherers in the Northwest of Durango, México***

The Northwest part of the state of Durango is an understudied area in which it has now been possible to detect, record, and describe archaeological sites and materials. The work carried out at the sites "La Peña" and "El Indio" have marked important milestones in the research of hunter-gatherer groups. The excavation of La Peña, located in a rock shelter, allowed us to learn the specialization that these groups had in the development of lithic artifacts, since a lot of Toyah arrowheads were found, a little common tool associated with the Trans-Pecos, Texas, and Bravo Valley Livemore phase (1200-1800 A.D.) and (900-1200 A.D.). Radiocarbon dating associated with Toyah arrowheads makes clear the obvious link to archaeological sites of the Guadiana Valley, where these arrowheads were found in late sites of the Chalchihuites Culture between 1000 and 1350 A.D. The archaeological site El Indio has a panel with rock art, structures, and associated material. A detailed study of the designs suggests a possible reuse of the site as it has a varied iconographic mix and overlap of elements, many of which are very similar to designs attributed to hunter-gatherer groups, especially geometric shapes and anthropomorphic and zoomorphic naturalist figures.

Ortiz Ruiz, Maria (El Colegio de Michoacán A. C. Centro de Estudios Arqueológicos)**[399] *Archaeometry and Lime Kilns***

Over the past two years the characterization of the ring structures strongly suggests the presence of kilns for lime production by the Classic and Colonial Maya. Archaeometric techniques used in this research were critical in the recovery, mineralogical characterization, and dating of the organic waste associated with lime production. In this paper I present the results of two years of work that have allowed the characterization of limestone used in the production of lime as well as the temperatures associated with these structures.

[399] *Chair*

Ortiz Tenorio, Laura Angélica [298] see Mancilla Medina, Margarita

Ortman, Scott [95] see Johansson, Lindsay

Ortman, Scott (CU-Boulder)**[348] *Uniform Probability Density Analysis and Population History in the Tewa Basin, New Mexico***

One of the basic challenges facing archaeology is translating surface evidence into population estimates with sufficient chronological resolution for demographic analysis. The problem is especially acute when one is working with sites inhabited across multiple chronological periods. In this paper I present a Bayesian method that deals with this situation. This method combines uniform distributions derived from a local pottery chronology with pottery assemblage data to reconstruct the population history of individual settlements. I then illustrate applications of the method at the site and regional

level, using data from Cuyamungue and the surrounding Tewa Basin. The results of these studies allow one to identify periods of significant population movement at the site, sub-regional and regional levels.

Osborne, James (Brown University)

[287] *Visibility Graph Analysis of Monumental Buildings in Iron Age Turkey*

Visibility Graph Analysis, or VGA, is a means of evaluating architectural environments based on a number of properties of intervisibility between points distributed within two-dimensional building plans. Created by Alasdair Turner for modern architects as a way to further space syntax analysis (itself based on patterns of accessibility instead of visibility), archaeologists have slowly been incorporating VGA into their work over the past decade. In this paper I outline the stages involved with the method in the standalone program Depthmap to illustrate how easily archaeologists can experiment with it. I then illustrate two case studies of VGA, one from a royal palace at the site of Tell Tayinat (ca. 9th-8th centuries B.C.E.) and one from two monumental gateways at the site of Kerkenes Dağ (7th-6th centuries B.C.E.). In both cases I show how visibility was deliberately deployed by the ancient architects to further the goals of the building projects, whether to emphasize royal authority in the palace or to highlight different religious principles to people entering and exiting the city.

Oshant Hawkins, Trica [83] see Pavao-Zuckerman, Barnet

O'Shea, John (University of Michigan), Ashley Lemke (University of Michigan) and Elizabeth Sonnenburg (University of Michigan)

[192] *Micro-Regional Approaches to Underwater Landscapes and Submerged Archaeological Sites*

Some of the most pivotal questions in human prehistory hinge on archaeological sites that are now under water. While the discovery of such sites presents technological challenges, they offer unique potentials for investigating time periods, cultures, and adaptations that are only poorly known on land. Unfortunately, underwater research rarely produces the systematic coverage of space and material culture that is needed to conduct anthropologically relevant research.

The investigation of micro-regions as a means to elucidate economic and social relations in the past has been widely adopted in terrestrial archaeology, and yet is arguably even better suited to submerged settings. By defining specific and comparable localities as the target for intensive research, a micro-regional approach can provide the framework for generating the needed systematic coverage of space and material, while still operating within the physical and financial constraints of underwater research. In this paper, the application of a micro-regional approach is illustrated as applied to the study of the Late Paleoindian occupation of the Alpena-Amberley Ridge beneath modern Lake Huron.

O'Shea, John [280] see Sonnenburg, Elizabeth

Osing, Natasha [67] see Wolin, Daniela

Ostahowski, Brian

[319] *Environmental Processes and the Archaeological Record along the Louisiana Coast*

The environmental processes of erosion and subsidence are key post-depositional factors affecting the formation of the archaeological record along coastal Louisiana. These factors contribute to terrestrial archaeological site loss and present researchers with a unique set of challenges for understanding past human behavior at both local and regional scales. From 2010 to 2014, HDR visited a total of 212 sites across 5,293 km during a survey of the Louisiana coast. This paper provides new insights on coastal geoarchaeology and the interplay between site formational processes and beach environments.

Ostapkowicz, Joanna and Fiona Brock (Research Laboratory for Archaeology and History of)**[387] *Black Pitch, Carved Histories: Prehistoric Wood Sculpture from Trinidad's Pitch Lake***

Since 6000 B.C., if not earlier, Trinidad has been the gateway into the Caribbean for waves of South American migrants - the first stepping stone in the long chain of islands that make up the archipelago. Its critical position to the settlement of the Caribbean is reflected in its deep archaeological record, documenting the complex interactions between its diverse peoples over millennia. Unique among its archaeological sites is Pitch Lake, one of the largest natural deposits of asphalt in the world, which over the years has yielded extremely rare wood carvings - to date the largest concentration of ancient wood artifacts in the Lesser Antilles. However, unlike any systematic archaeological excavation, these carvings have been dredged up as a consequence of commercial pitch harvesting, and any association between them, or the skeletal remains that were also recovered, have been lost. The current multi-disciplinary study, supported by the UK's AHRC (2014-2016) and in its early phase, aims to place these objects in a chronological and cultural perspective through AMS radiocarbon dating, material identification and stable isotope analyses.

Oster, Elizabeth (Jemez Mountains Research Center) and Michael Elliott (Jemez Mountains Research Center)**[81] *The Geopolitics of Conquest: The Mixtón War and the Caxcan Diaspora***

The chronicler Tello describes the Caxcans as *rústicos mexicanos* who accompanied the Mexica on their march south from Aztlan in the 1100s, but to the Spanish, they became known as the *gente belicosa*, fierce fighters who did not accept the terms of their conquest, and who ultimately led the Mixtón War of 1541-42. The discussion focuses on the results of the Spanish encounters with the Caxcans and the ways in which these interactions informed the military and political strategies pursued by the colonizers as the conquest and occupation of New Spain moved north, into what would ultimately become known as the Spanish Borderlands and the American Southwest.

Osterholtz, Anna (University of Nevada Las Vegas) and Kyle Waller (University of Missouri)**[245] *Comparative Approaches to Casas Grandes Taphonomy and Violence***

Recent bioarchaeological analyses of human skeletal remains from the Medio Period Casas Grandes region (A.D. 1200-1450) have demonstrated taphonomic indicators variously interpreted as massacre, violent persecution of witches, or anthropophagy. In this presentation, we re-examine taphonomic data from Paquime within a larger southwestern perspective. We combine new approaches to demography and individual well-being with taphonomic and mortuary datasets from Paquime to evaluate the causes, consequences, and social meaning of violence and post-mortem processing. By examining who was subject to trauma, violent death, and body processing, bioarchaeological analyses can show the cultural role that violence plays within society. Based on a comparison with violently killed and processed remains at sites throughout the greater southwest, including Sacred Ridge and Mancos, patterns of violence and trauma are identified. Findings unique to each site are also identified, specific to their cultural contexts.

Osztás, Anett [348] see Banffy, Eszter

Otárola-Castillo, Erik [139] see James, Emma

Otis Charlton, Cynthia and Patricia Fournier (Escuela Nacional de Antropología e Historia, Mexico)**[76] *Conspicuous Consumption in the Basin of Mexico: Chinese Porcelains as Prestige Markers in the Eastern Teotihuacan Valley***

Beginning with the 16th century opening up of the New World, New Spain was integrated into the complex trade networks of the expanding world system as part of the Spanish Empire in the Indies. Prior to the rise of capitalism in Europe, mercantilism dominated sociopolitical and economic development trends. Indirect contact with the imperial power of China by way of the Philippines led to the establishment of the Manila-Acapulco galleon trade starting in the 1570s. Exotic goods, including thousands of pieces of porcelain tableware, sumptuously adorned some residences and the

haciendas of those who were able to afford the most exquisite and expensive ceramics available in New Spain. This paper illustrates the extent of conspicuous consumption of porcelain vessels at haciendas and ranches in the Teotihuacan Valley, a rural area in the Basin of Mexico, briefly comparing these archaeological assemblages with those of the capital of the viceroyalty, Mexico City, at the same period. During the Early and Middle Colonial period, Chinese goods were prestige markers that made and maintained social relationships and fixed public meaning among non-indigenous consumers.

Ott, Aaron

[249] *Center and Satellites The Relationship of Templo Mayor to Similar Twin-Temple Pyramids in Central Mexico*

This poster displays the relationship between the Templo Mayor of Tenochtitlán and four smaller pyramids, of similar architecture, concurrently in use at the sites of Tlatelolco, Tenayuca, Teopanzolco and Santa Cecilia Acatitlan, during the period of Aztec dominance of central Mexico. I will demonstrate how the satellite pyramids worked in conjunction with Templo Mayor to form a cohesive religious network, reflecting shared ideology through common ritual use. Using the ethnographic analogy of medieval Catholicism, I will show how Mexica-Aztec religion utilized this network of ritual centers to strengthen sociopolitical controls at the center of the Aztec empire. My poster will include recent photographs taken of the five sites in question, with comparative analysis regarding their distinct features. This reflects Aztec power cohesion in central Mexico during the Late Post Classic period.

Ouetcho, André-John [77] see Sand, Christophe

Overholtzer, Lisa (Wichita State University)

[253] *Consuming in Empire: The Materiality of Household Consumption at Postclassic and Colonial Xaltocan, Mexico*

Consumption, as Paul Mullins explains, “revolves around the acquisition of things to confirm, display, accent, mask, and imagine who we are and who we wish to be.” Consumer choices of goods in the marketplace relate to the desire to connect oneself with particular networks of people and places on the landscape, and these connections play a role in the formation of personal and household identity. Here, I present research on the social dimensions inherent in economic practices, which are notably absent in many existing models of central Mexican economies. Specifically, I use instrumental neutron activation analysis (INAA) to reconstruct diachronic shifts in the interpersonal relationships formed through the exchange process in one household at the site of Xaltocan. INAA offers evidence of the provenance of 209 decorated serving vessels (Aztec Black on Orange and redwares) recovered in five stratified, firmly dated household middens and reflects changes in the consumption practices of a single household over four centuries, including the rise of the Otomí state centered at Xaltocan, the formation of the Aztec empire, and the arrival of the Spanish. These findings are contextualized via comparison to previous findings for site-wide trends in ceramic consumption.

Overly, Stephen (U.S. Bureau of Land Management)

[138] *The Past, Present, and Future of Archaeological Investigation on the BLM: An Introduction to Public Research on Public Lands*

The overall symposium provides a series of case examples that demonstrate the important role the BLM plays in promoting proactive non-compliance related archaeological research. This introductory paper sets the frame by offering direct experience from multiple perspectives working on BLM land as a field school student, graduate student researcher, volunteer, contractor, and agency archaeologist. This is done to provide additional context for how the BLM has typically supported archaeological investigations on public lands in the past, to offer some comments on the current state of work being conducted, and to consider what the future might look like based on general trends in the discipline.

[138] *Chair*

Overmann, Karenleigh (University of Oxford)**[33]** *Numbers and Time: The Role of Materiality in Numerical Cognition*

Numerical elaboration and the extension of numbers to non-tangible domains such as time have been linked to cultural complexity in several studies. However, the reasons for this phenomenon remain insufficiently explored. In the present analysis, Material Engagement Theory, an emerging perspective in cognitive archaeology, provides a new perspective from which to reinterpret the cultural nexus in which quantification and timekeeping develop. These insights are then applied to representative Neolithic, Upper Paleolithic, and Middle Stone Age artifacts used for quantification.

Owen, Bruce (Sonoma State University)**[184]** *Post-Tiwanaku Settlement Patterns in the Peaceful Coastal Osmore Valley and the Tense Upper Valleys*

Some refugees from the collapsing Tiwanaku province in Moquegua settled in the coastal Osmore valley, where they appear to have integrated peacefully with the Chiribaya population, living in seemingly undefended settlements closely intermixed with their ethnically distinct neighbors. Others moved into the upper valleys of the Osmore drainage, where they apparently experienced a competitive, fearful social environment, living on defensible high points, some with vestiges of what may have been circumvallating walls. Building on recent analyses of settlement patterns associated with peace and conflict, this study tests and explores the contrasting "war and peace" interpretations in the two portions of the Osmore valley through a variety of GIS-based settlement-pattern analyses of full-coverage survey data using measures of topographic defensibility, site spacing and clustering, size distributions, viewsheds and intervisibility, access to water, catchments, and other approaches. The results can be compared to other periods and regions in assessing social conditions on a scale of tranquility to tension based on settlement data.

Owens, Andrew (SWCA Environmental Consultants)**[8]** *Kite Aerial Photography and Archaeology: Grandfather of the Drone, Ancient yet Applicable*

The use of kites in capturing aerial images of archaeological sites has been used by archaeologists in the past, but is quickly becoming overshadowed by the use of drone aircraft. Despite the obvious advantages of drone vehicles, kites still offer practical solutions in capturing aerial site imagery. Kites present affordable, durable, and easily deployed methods of capturing a bird's-eye view of sites without the need for cumbersome and expensive drone technology. The poster is designed to re-invigorate the potential field applications of KAP in the minds of current researchers, and offers inexpensive solutions for various archaeological institutions and professionals. The photos in this presentation provide case studies of aerial site imagery captured over the past several years in Wyoming, Montana, and Colorado. The images from the studies allow for nearly instantaneous advantages over traditional site mapping and interpretation. Kites offer perspectives of site structure and spatial organization, and can be easily incorporated to provide a more encompassing view of the site.

Owens, Hannah [302] see Bruner, Kale

Ownby, Mary [79] see Reed, Lori

Ownby, Mary (Desert Archaeology Inc.) and James Heidke (Desert Archaeology Inc.)**[304]** *Chronological Changes in Pottery Production in the Phoenix Basin: Evidence from La Villa*

Recent excavations at La Villa recovered a large quantity of pottery that spanned a broad range of time from the Vakhí (ca. A.D. 500-700) to Early Sacaton phase (ca. A.D. 950-1020). Binocular and petrographic analysis of this corpus provides insights into changes in pottery production and distribution in the Phoenix Basin, particularly for Hohokam decorated ceramic types. The results from examining early red-on-gray through red-on-gray/buff sherds indicates those vessels were made with crushed schist and sand that mostly derived from sources located along the Middle Gila River. Later red-on-buff types appear to have been produced with sand containing natural schist from areas

along this river, but also from production sources near South Mountain. In addition to an increase in decorated production in this area, plain ware manufacture also occurred here and confirms existing data indicating specialized production around South Mountain. Thus, data from La Villa has corroborated the focused manufacture of plain and decorated wares in specific areas of the Phoenix Basin, while also documenting a technological change in the production of Hohokam buff ware. This has broader implications for clarifying chronological changes in the economic and social connections of people in this area.

Oyuela-Caycedo, Augusto [107] see Garcia, Jorge

Özkaya, Vecihi [16] see Benz, Marion

Ozorio De Almeida, Fernando (Universidade Federal de Sergipe), Guilherme Mongeló (Universidade de São Paulo) and Eduardo Góes Neves (Universidade de São Paulo)

[326] *The Archaeology of Meaningful Places in Amazonia: the Teotônio Site (Upper Madeira Basin)*

The aim of this presentation is to discuss the importance of the occupation of the so called meaningful places in Amazonia, such as rapids and waterfalls, in the development of regional networks which were archaeologically materialized by the concentration of different ceramic styles in the same site, and possibly through the appearance of new ceramic styles. We further argue that the economic viability of some of these places – and we present here the Teotônio site as an example - did not necessarily have to rely on the intensive production of staples, such as manioc and maize.

[326] *Chair*

Pacheco Gonzalez, Marco (Marco A. Pacheco / Drones / Fotografía Aerea México), Gerardo Gutierrez (Universidad de Colorado Boulder) and Felipe Ramirez-Sánchez (Dirección de Estudios Arqueológicos-INAH)

[409] *Los mapas arqueológicos de Cuicuilco y El Salto: Fotogrametría aérea con drones para el registro y preservación del patrimonio arqueológico.*

El desarrollo de nuevas tecnologías (UAVs) han permitido explorar, generar y diversificar nuevos puntos de vista aéreos de sitios arqueológicos y como resultado generar una conciencia social hacia la conservación, investigación y preservación del patrimonio cultural de México. En esta ponencia se presentarán los casos de Cuicuilco y El Salto, México, como ejemplos de modelación fotogramétrica de sitios arqueológicos y monumentos coloniales con UAVs.

Pacheco-Cobos, Luis (Universidad Veracruzana) and Bruce Winterhalder (University of California Davis)

[28] *Economic Benefits of Hunting Dogs in the Context of Tropical Horticulture*

We provide evidence useful to ethnoarchaeological research on the behavioral coordination of hunting movements among humans and dogs. The domestication of dogs (~15000 y BP) is hypothesized to have benefited humans by increasing food supply, saving human energy, and guarding camps or agricultural fields. Drawing on a year of fieldwork in Santa Cruz, Toledo District, Belize, we analyze the economics of hunting and the extent to which dogs could have helped humans to protect cultivated fields from mammalian pests. We observe when hunts were initiated and track hunting trips with GPS units in order to describe quantitatively the coordinated movements of humans and their dogs while hunting. We note the composition of hunting parties, the skills of dogs, hunting returns and the horticultural benefits of this practice. We comment generally on implications of our results for the co-evolution of humans and their canine companions.

Pacheco-Fores, Sofia (Arizona State University)

[247] *Examining Ethnohistory: Cranial Modification and Social Status in Prehispanic Inca Peru*

The social meaning of cranial modification in the Andes has long been debated. Ethnohistoric accounts recorded by Spanish priests and travelers after the conquest assert that within Inca Peru, the practice of cranial modification was related to social status. They claimed that the Inca royal

family preferred a particular head shape, and only certain noble families were permitted to reproduce that shape. In contrast, non-elite Inca supposedly practiced strictly local traditions of cranial modification. These claims are routinely cited within modern bioarchaeological reviews of the practice. Such uncritical acceptance of Spanish reports is problematic, given that these accounts are frequently inaccurate, internally inconsistent, and culturally biased. As such, this study aims to determine whether such ethnohistoric accounts of cranial modification are supported by bioarchaeological evidence. Mortuary and cranial data were collected on 361 individuals from several Imperial Inca period (1400-1532 C.E.) sites. In addition to assessing the veracity of colonial ethnohistoric accounts, this study seeks to gain a deeper understanding both of Inca society and of the practice of cranial modification.

Pacifico, David

[237] *Opening and Orienting Comments: Theorizing and Excavating Neighborhoods*

Dr. Pacifico and Dr. Truex provide opening reflections and orienting comments regarding the diverse perspectives and case studies presented in this symposium on excavating and theorizing neighborhoods.

[237] *Chair*

Pack, Frankie (The University of Tennessee, Knoxville), Kathryn Kulhavy (The University of Tennessee, Knoxville) and Graciela Cabana (The University of Tennessee, Knoxville)

[204] *Validation of a Non-Destructive DNA Extraction Protocol for Ancient DNA Analyses*

The destructive nature of traditional DNA extraction techniques presents one of the primary obstacles to accessing genetic information from museum and archaeological collections. Here we assess a recently published “non-destructive” DNA extraction protocol by Bolnick and colleagues in terms of the amount and quality of DNA extracted from a set of samples of even greater antiquity than those tested in the original analysis. DNA was successfully extracted from archaic period samples from the Eva site in Tennessee. Both quantity and quality of DNA extracted were high enough to obtain mitochondrial sequence data using traditional (Sanger) sequencing. Two samples were successfully amplified using a whole mitochondrial genome amplification kit and underwent next generation sequencing. We also show that the method is indeed “non-destructive.” Dental metrics and weights taken before and after extraction indicate no significant change in the teeth due to the extraction process. Thus, the use of this protocol could not only expand the range of samples available for DNA analysis, but also the amount of genetic information obtained from the analysis.

Pacyga, Johanna (University of Chicago) and François Richard (University of Chicago)

[398] *Crafting the Fringes of French Imperialism: Ceramic Politics in Siin, Senegal*

In this paper, we examine aspects of craft production in west-central Senegal between the 18th and 20th century. This period encompasses turbulent political times marked, in succession, by the apogee of African centralized polities, the abolition of the Atlantic slave trade, the advent of formal colonial empires, and the establishment of the postcolonial state of Senegal. Using a perspective of the long-term blending archaeological and ethnohistoric evidence, we explore the dynamics of ceramic production and circulation in the hinterland of the province of Siin, focusing on the village of Diohine and its surroundings. After reviewing the role of pottery in Siin's pre-colonial kingdom, we analyze the political life of ceramic-making in the context of French imperialism, paying special attention to its entanglements with systems of governance and intercontinental markets. We conclude with a few remarks on the fate of indigenous pottery in Senegal's political economy after independence.

Padilla, Liliana [263] see Baron, Joanne

Padon, Beth (Discovery Works, Inc.)

[418] *Indifference, Inertia, Limited Budgets, and Preservation: Insights from Site Stewardship Programs*

Archaeological sites are fragile and non-renewable, but how do we protect them from visitors, development projects, and natural processes that are accelerated by climate change? People are interested in reports of new archaeological discoveries, but they don't know -- or care -- about local archaeological resources, and publicizing them is restricted by confidentiality requirements. Government agencies are charged with protecting archaeological resources, but they do not have enough resources to fulfill this mandate. Often, one agency archaeologist must manage districts covering thousands of acres that contain a large quantity of historic and prehistoric resources. There are new threats to archaeological sites, but people and organizations are slow to adopt new responses. Archaeologists, professors, and consultants are hired to get the "job done" (analyze project impacts, teach archaeology, evaluate the site) but not necessarily on how to preserve or protect archaeological sites. This report discusses some of the methods that site stewardship programs use to meet these challenges.

[390] *Discussant*

Page, Katherine (University of Central Florida), Tosha Dupras (Department of Anthropology, University of Central), Rimantas Jankauskas (Department of Anatomy, Histology, and Anthropology), Lana Williams (Department of Anthropology, University of Central) and Courtney Eleazer (Department of Biological Sciences, Florida Interna)

[207] *Deviance in Youth: Anomalous Nitrogen and Carbon Isotopic Values among Individual Subadults at Medieval Alytus, Lithuania*

Rapid turnover of bone collagen $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values in subadults can reveal dietary and physiological changes experienced by illuminating chronic stress not apparent as skeletal, pathological lesions. To assess subadult morbidity and mortality in Medieval Alytus, Lithuania, an osteobiographical examination was undertaken of individuals who presented humeral isotopic values $\pm 2\sigma$ from sample and cohort means ($-20.02 \pm 0.43\text{‰}$; $11.09 \pm 1.21\text{‰}$). Four infants (0.1-2.9 years) and four juveniles (5-11.9 years) were found to exhibit isotopic values outside of the expected sample mean. Two individuals, 1.5 year-old (-18.8‰ , 14.28‰) and 11.5 year-old (-19.46‰ , 13.26‰), were $\pm 2\sigma$ from their respective $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ cohort averages (Infant: $-19.70 \pm 0.40\text{‰}$; $12.51 \pm 0.80\text{‰}$; Juvenile: $-20.26 \pm 0.38\text{‰}$; $10.24 \pm 0.88\text{‰}$). Skeletal analyses do not indicate specific disease processes but all infants exhibit at least one non-specific skeletal marker of chronic, metabolic stress (e.g. periostitis, porotic hyperostosis), likely caused by prolonged weaning resulting in malnourishment. Three of the four juveniles did not present skeletal stressors, indicative of death from an acute disease process during a growth spurt and potentially the onset of puberty. This study contributes to growing literature on metabolic variation in isotopic values and paleopathology of Lithuania.

Pagliaro, Jonathan (Santa Clara University) and Travis Stanton (University of California, Riverside)

[244] *Shifting Allegiances at Yaxuna during the Early to Late Classic: Territory and the Loss of Independent Rule*

The site of Yaxuna, Yucatan, Mexico was an independent Maya city from the Formative to Early Classic periods. While the size of its territory during the early periods is unknown due to the lack of regional data on other large early cities in Central Yucatan, the Early Classic dynasty at Yaxuna was violently and abruptly vanquished towards the end of this period. At this time, a 100 kilometer causeway was also constructed connecting Yaxuna to the large metropolis of Coba, which was at its political apex during the seventh century A.D. This paper will discuss data from both Yaxuna and Coba that indicates that the domain of Yaxuna was incorporated into a growing state at Coba and also assumed a new role as the western border of the territory controlled by Coba during the Late Classic.

Pailes, Matthew [92] see Daughtrey, Cannon

Pailes, Matthew (University of Arizona)

[257] *Pochtecas and Pilgrims: Models for Elite and Commoner Exchange in the Río Sonora*

The potential for the river valleys of eastern Sonora to serve as conduits for long distance trade between Mesoamerica and the U.S. Southwest was one of the original impetuses for research in the region. Researchers of the U.S. Southwest, using the same basic data sets, have come to drastically different conclusions regarding the frequency and overall importance of such long distance connections. Previous research in eastern Sonora has produced minimal direct evidence of long distance trade, but the relative dearth of excavation precludes definitive statements. This presentation will take an alternative approach that investigates the structure of local communities and economies as a means to determine what sorts of exchange economies were feasible. Quantitative methods are used to predict the likelihood of goods passing through the region under different assumptions of consumption and transmission. Down-the-line exchange seems like an ineffective way to account for the movement of most material goods, but would be effective for ideational content or goods that are divisible/replicable. Other systems of direct procurement, such as pochteca and pilgrimage economies are more feasible explanations for the rare movement of physical goods. These results offer a means to partially reconcile non-consistent previous interpretations.

[257] *Chair*

Painter, Jeff [365] see Yann, Jessica

Paiz, Lorena [196] see Aju, Gloria

Palacios Linares, Jonathan

[227] *Ideología y rituales de lluvia compartidos por los yungas del Período Cerámico Inicial (1,600 a.C.) y las poblaciones serranas del presente en la cuenca del Rímac, Costa Central del Perú*

Investigaciones en el sitio arqueológico La Explanada de Unión-Ñaña, ubicado a 772 msnm, en las laderas del cerro La Parra en Ñaña, margen norte del valle del Rímac, permitieron vislumbrar inadvertidas modalidades de culto, en el extenso macizo que configura el cerro La Parra, santuario de montaña del Período Inicial (1,600 a.C.) en el valle medio del Rímac. Las excavaciones, revelaron rituales propiciatorios, que evocan los rituales en uso, en la vecina población altoandina de San Antonio de Jicamarca, a más de 3,000 msnm, entre las cuencas del Rímac y del Chillón, 60 km al este de la ciudad de Lima. Rituales como la observación del “huayco” producido por el acto de libar chicha con la huanca, así como “El calentamiento del agua”, aunado al peregrinaje para el corte y traslado del hielo de los nevados limeños, plantea la preexistencia de un substrato común de creencias y prácticas rituales en los Andes. Ideología de lluvia conocida como ceremonia secreta del agua por los jicamarquinos, y que con distintos matices, continúa siendo practicada por las restantes poblaciones que ocupan las cabeceras del río Santa Eulalia, tributario del Rímac, así como en la vecina provincia de Canta.

Palacios-Fest, Manuel, James Vint (Desert Archaeology, Inc.), Fred Nials (Desert Archaeology, Inc.), David Dettman (Department of Geosciences, University of Arizona) and Dirk Baron (Department of Geological Sciences, California Stat)

[55] *Environmental History of an Early Agricultural Period Irrigation Canals Network at Las Capas (Site AZ AA:12:753 [ASM]), Tucson, Arizona*

The Santa Cruz Drainage Basin contains a rich record of prehistoric irrigation for at least 3200 years. Archaeologists and paleoecologists have identified the evolution of this agricultural technology from opportunistic to systematic canal operation. The present study documents the first detailed analysis of a networked canal system during the Early Agricultural Period (1200 B.C. – A.D. 50) using ostracodes, micro-mollusks, calcareous algae and the geochemical signatures of ostracode (*Ilyocypris bradyi*) valves that allowed us to generate an aridity index. The index resulted from the combined data of stable isotopes (d18O and d13C), and trace elements (Mg/Ca, and Sr/Ca). The aridity index suggests the irrigation waters salinization trends at the time of canal operation.

Paling, Jason [246] see Lowry, Justin

Paling, Jason

[292] *Leaving No Stone Unturned: Investigating Preclassic Lithic Production, Consumption, and Exchange at San Estevan, Belize, and K'o and Hamontún, Guatemala*

From the gathering of agricultural surplus to the construction of small homes or large scale monuments, stone tools played a major role in many dimensions of everyday Formative Maya life. This presentation will examine the degree in which the production of stone tools made of chert and chalcedony were controlled by empowered political authorities or social groups at the sites of San Estevan in Northern Belize and K'o and Hamontún in the northeastern Petén region. The dynamics of the subsistence economy and utilitarian industries at major Preclassic centers is an understudied research problem and analysis of lithic tools and debitage found in Preclassic Period contexts at San Estevan, K'o and samples from elite and non-elite household contexts from Hamontún provide valuable comparative, diachronic data set that document the developmental changes in regional economic activities across the Preclassic Period. Inter- and intra-regional examinations of lithic industries at these sites suggest a range of production and consumption activities that are similar and dissimilar to lithic production and consumption activities recorded at other contemporaneous sites. This investigation is suggesting that a multitude of interacting economic mechanisms existed among vertical and horizontal exchange networks and may have varied across several regions.

Palka, Joel [76] see Meierhoff, James

Palka, Joel (University of Illinois-Chicago)

[158] *Where There's Fire, There's Smoke: Contemporary Lacandon Maya Incense Burners and Ritual Transformation*

Lacandon Maya fabricate incense burners ("the gods' ceramic vessels") found by archaeologists in Maya ruins, caves, and abandoned "god houses". Ethnographies and my field notes describe the incense burners and how they are made and used. The function and symbolism of the burners provide clues to the importance of fire and smoke in past Maya rituals, including cremation. The incense burners are formed from clay with human heads, arms, and legs. The anthropomorphic bowls become bodies of gods following firing and painting, like when humans were formed by gods, and after pebbles or seed "organs" are placed in their bowls. Gods inhabit the vessels to partake in burnt incense nodules shaped like people. The fire and smoke transmit these offerings as food or assistants to the gods. The burners die and their souls return to the gods after being exposed to fire to remove their paint and organs. Since Lacandon bodies are similarly viewed as vessels for souls, perhaps cremation by their ancestors released the souls of the dead to the gods. Death, rebirth, and ritual transformations through fire and smoke may ultimately be linked to the Maya slash-and-burn maize agriculture cycle.

Pallier, Céline [35] see Jarry, Marc

Palmer, Carol [210] see Jenkins, Emma

Palo, Jukka [78] see Guevara, Evelyn

Palumbo, Scott (College of Lake County)

[170] *"Conspicuous Consumption" in Ancient Costa Rica and Panama*

This paper reviews the evidence for mortuary ranking in precolumbian Costa Rica and Panama, specifically as it relates to participation in broader trade and exchange networks. An interpretative approach originally developed by Halstead and O'Shea is evaluated against the Binford-Saxe model.

Palumbo, Scott [246] see Berrey, Charles

Pan, Feifei [272] see Brown, Andrew

Panagakos, Anastasia (Cosumnes River College) and Amanda Paskey (Cosumnes River College)

[385] *Uncovering New Opportunities: Community Colleges and Archaeological Lab Experience*

There is a perception that community colleges offer few practical opportunities to students interested in archaeology. Through an agreement with California State Parks and the support of our college, we established the Cosumnes River Archaeological Working Lab (CRAWL) to provide community college students hands-on training with artifacts. This paper discusses the project and findings, logistics of starting a community college lab, and benefits of exposing novice students to archaeological lab techniques. The Enterprise Hotel site in Old Sacramento was excavated thirty years ago but the collection was orphaned and left unanalyzed until 2012. Through a new agreement, State Parks has loaned part of the collection to the college for cataloging and analysis. CRAWL, now in its third year, has trained dozens of students, supported presentations at conferences, and is a step to field school and four-year universities. The lab, run on volunteer hours and virtually no budget, has established connections with area universities which offer assistance in technical analysis and the use of comparative collections. Community colleges can play an active role in providing lab experiences for students and in fostering relationships between the colleges, state agencies, and research institutions to promote cultural preservation and public outreach in California.

Panagiotakopulu, Eva

[256] *Bugs in Eagle Cave, Lower Pecos Canyonlands, Texas*

The desiccating conditions in desert caves provide a unique opportunity for detailed research on organic materials. Previous examples of insect studies from the desert edge in Egypt, from Akhenaten's city at Amarna, have indicated the potential of research with fossil insects, both for understanding environmental change and the nature of agriculture, and also for evidence of the early biogeography of insect borne diseases. However, there is limited information on hunter gatherer societies and origins of any accompanying 'pests' of storage and occupation sites— from bed bugs to corn weevils - and there is virtually no relevant research from US sites. Excavations at Eagle Cave have produced rich and optimally preserved insect remains from deposits long pre-Columbus, associated with food debris. The material involves primarily Coleoptera , and a few Hemiptera, and consists of species which are in their majority pests of stored products, infesting pulses and squash and breeding in moldy materials stored in the cave. This material provides the opportunity to view the transition from hunter gathering to agriculture from the point of view of the uninvited lodgers of Eagle's Cave and also to fill in the gaps for the early establishment of New World pests in stored foodstuffs.

Panich, Lee (Santa Clara University), Sarah Peelo (Albion Environmental, Inc.) and Linda Hylkema (Santa Clara University)

[175] *The Archaeology of Community at Mission Santa Clara de Asís*

In this paper, we examine the challenges associated with understanding indigenous community formation and change through the archaeology of the native ranchería at Mission Santa Clara de Asís. The mission's indigenous population had well-documented and distinct temporal shifts, initially drawing local Ohlone converts but eventually extending recruitment to Yokuts groups in the more distant San Joaquin Valley and Sierra Nevada foothills. These population changes pose an intriguing archaeological problem. We investigate the ways in which the archaeological record may illuminate how native people re-articulated regionally distinct material traditions at Santa Clara during moments of great demographic change within the mission's indigenous community. We focus here on four main issues: 1) Identifying moments of important population movements within the mission; 2) Assessing ways to refine methods for dating archaeological features within the ranchería's approximately 60-year period of occupation; 3) Identifying artifacts or other archaeological patterns that may be related to the expression of native identities rooted in ethnolinguistic background and/or relative status within the mission estate; and 4) Offering preliminary hypotheses regarding how

Yokuts and Ohlone peoples formed community at Mission Santa Clara.

Panich, Lee [175] see Peelo, Sarah

Pantel, Agamemnon, Mark Noah, Kristen Baker and Chester Walker

[132] *Forensic Archaeological Research in the Recovery of WWII MIA's on a Pacific atoll: Tarawa*
Archaeological research on 538 MIA's from WWII has been ongoing on the Pacific atoll of Tarawa over the past two years under the auspices of History Flight, an NGO. Tarawa, one of the bloodiest WWII battles in the Pacific, still has hundreds of MIA's unaccounted for in one of the most densely populated locations on earth. History Flight, with the collaboration of professionals, para-professionals, military volunteers, DOD and the local community have been successful in locating and recovering over 110 individuals. The team has used a trans-disciplinary approach to the research, starting with extensive historical documentation, followed up by extensive archaeological remote sensing, and the use of a cadaver dog. Corroboration of GPR data with cadaver dog alerts and historical information has allowed History Flight to recover over 13,000 human osteological remains, often in direct association and in situ with military artifacts assisting in the field identification of U.S. soldiers versus Japanese. The field detection and archaeological excavation of these "burial" sites has been significantly impeded by the direct impacts to the sites immediately following the cessation of the war, together with impacts of today's dense population. Procedures and results of this public/private partnership work will be presented.

Papadimitriou, Alkestis [25] see Tenconi, Marta

Papadopoulos, John

[36] *Difference in Archaeology Theory and Practice: the Case of Classical Greece*

The dichotomy between the "dirt" and the "word" has loomed large in the study of the Greek past, in a manner not shared by many other regions. This is true, ironically, for both the historical and prehistoric period. The interplay between the material record with the textual and the iconographic records in Greece is rich and complex, and one that extends across a broad time range. Disjunctions across these different avenues of inquiry are numerous, and often ignored. But it is precisely in these disjunctions and discrepancies that a systematic methodology in the way we approach the past can emerge, thereby potentially providing a powerful heuristic discourse. This paper will explore, through selected case studies, the dichotomy between the material and textual and iconographic realms in Greek archaeology in an attempt to incorporate non-correspondences in our interpretations of the past.

[36] *Chair*

Paquette, James [280] see Demel, Scott

Parcak, Sarah (The University of Alabama At Birmingham)

[279] *Geospatial Strategies for Mapping Large Scale Archaeological Site Destruction: The Case from Egypt*

This paper will focus on the use of innovative new tools and technologies for the mapping of archaeological site destruction. Post Arab Spring, the Middle East has seen an increasing amount of looting and general site destruction, yet how is it possible to locate, map, and quantify these activities to save the sites? The author used a series of high resolution satellites images as well as Google Earth to map looting in Egypt from 2002-2013. The methodology is one that can easily be replicated globally, and could be used as a way to map the global problem of site looting. If we do not map affected site, we simply will not know where to start to protect them. The paper will focus on her work in Egypt, but will discuss other countries as well as additional approaches like crowdsourcing.

Parcero-Oubiña, César [180] see Hayashida, Frances

Parcero-Oubiña, César (Instituto de Ciencias del Patrimonio - Spanish National Research Council), Patricia Mañana-Borrazás (Instituto de Ciencias del Patrimonio, Spanish Natl), Alejandro Güimil-Fariña (Laboratorio de Patrimonio, Paleoambiente e Paisaxe), Mariela Pino (Departamento de Antropología, Universidad de Chile) and César Borie (Departamento de Antropología, Universidad de Chile)

[409] *A UAV-Based Approach for a Cost-Efficient Documentation of Agrarian Structures in the Arid Atacama Area (N. Chile)*

The paper summarizes the contribution of UAV to the documentation of a vast group of late Prehispanic agrarian elements (fields, irrigation canals) in the arid Atacama area (northern Chile). Taking advantage of the extraordinary preservation and visibility of fields, canals and other constructions, the general mapping of the area was based on a combination of visual interpretation of high resolution satellite images (GeoEye 1) and fieldwork. However, despite their high resolution, satellite images did not provide sufficient detail of some areas. A more detailed approach was needed to produce an adequate documentation of fields, settlement areas and singular constructions. An SFM-based photogrammetry approach was carried out, based on a low cost UAV (Dji Phantom) and a consumer-grade compact digital camera for the acquisition of low altitude aerial images that allowed the generation of 3D models and orthoimages of some areas. Finally, ground based photogrammetry was also used to capture and represent some elements in greater detail. The main result has been the construction of a highly detailed and accurate map of a complex group of archaeological structures, which has been used since for the analysis and interpretation of the area, and also for the design of new fieldwork seasons.

Parfitt, Anne [91] see Kassa, Sonja

Pargeter, Justin [356] see Fisher, Erich

Paris, Elizabeth (St. Lawrence University)

[291] *People without Collapse: An Introduction*

Eric Wolf's seminal work, *Europe and the People Without History* (1982), drew our attention to the periphery as an important locus of anthropological inquiry. By examining "people without history," Wolf was able to show that social complexity before the modern era was not a process that laid solely in the development and decline of isolated societies. Rather, both ancient and modern forms of social complexity rest upon the interconnections among peoples at global scales. This perspective has especially significant import for the archaeology of collapse, as it suggests that our frame of inquiry needs to be much wider than it has traditionally been. Specifically, we must consider the "peoples without collapse" – groups that are generally excluded from collapse narratives, either because their complexity is non-hierarchical, or because they lie on the periphery of hierarchically-organized states, city-state networks or empires. Some processes of collapse may be most visible in peripheral areas, and the actions and changes that occur in these areas may play important roles in the degree and nature of collapse as experienced in core areas. Ultimately, a focus on periphery areas and peoples provides insight into the relative stability of different social institutions in societies experiencing cultural transformation.

[291] *Chair*

Paris, Elizabeth H. [291] see Lopez Bravo, Roberto

Parish, Ryan (University of Memphis)

[185] *Lithic Procurement Patterning as a Proxy for Identifying Late Paleoindian Group Mobility along the Lower Tennessee River Valley*

The Tennessee and Cumberland River Valleys boast some of the highest concentrations of diagnostic Paleoindian artifact finds in the Americas. However, many of these finds are from secondary contexts void of associated deposits. The study utilizes chert provenance data, obtained

using reflectance spectroscopy, on a large sample of Late Paleoindian diagnostic bifaces from sites along the Lower Tennessee River Valley. The objective of the study is to visualize group mobility at the close of the Pleistocene. Resulting data suggests that band group mobility may have been significantly less than proposed models for adjacent regions. The data may also indicate that groups were settling into resource rich patches in central Tennessee as early as the terminal Pleistocene. Chert source data provides a means to glean useful cultural information even from disassociated materials.

[185] *Chair*

[215] *Chair*

Parish, Ryan [292] see Schmidt, Caroline

Park, Robert [185] see ten Bruggencate, Rachel

Parker, Evan (Tulane University), George Bey III (Millsaps College), Tomás Gallareta Negrón (Instituto Nacional de Antropología e Historia), Stephanie Simms (University of California, Los Angeles) and Amanda Strickland (Independent Scholar)

[113] *Household Socio-Economic Organization in Puuc Maya Suburbia: Excavations at Escalera al Cielo, Yucatán*

Investigation of a hilltop residential complex at the Terminal Classic (A.D. 800-1000) Maya site of Escalera al Cielo in the Puuc region of Yucatán, Mexico has yielded one of the most holistic data sets on household life in this area of the Maya world. Horizontal excavations of over nine buildings, many with on-floor assemblages, have unveiled evidence for both the discrete and general functions of architectural spaces in the complex, including evidence of spaces used for storage, culinary activities, dormitories, and masonry work. Combined with data gleaned from discard areas, the evidence from this suburban hilltop site permits one of the most complete characterizations of consumption behavior and socio-economic organization in the Puuc region. This robust and still burgeoning occupation was interrupted by a planned abandonment with an anticipated return, though an assemblage from a nearby water cistern indicates some ritual re-visitation may have occurred later. The site abandonment is examined in the larger context of the demographic collapse in the Puuc region at the end of the Terminal Classic period.

Parker, Christopher [119] see Mohlenhoff, Kathryn

Parker, Kathryn, Megan Perry (Department of Anthropology, East Carolina University), Drew Coleman (Department of Geological Sciences, University of N) and David Dettman (Department of Geosciences, University of Arizona)

[380] *Strontium and Oxygen Isotopic Evidence of the Origins of Homicide Victims from Middle Islamic Period Qasr Hallabat*

Qasr Hallabat, a luxurious Umayyad (7th – 8th century A.D.) desert retreat in Jordan, declined after the mid-8th century due to political destabilization and earthquakes. Despite official abandonment, the qasr's extensive hydraulic resources were utilized by local groups. Excavation and restoration of the qasr by the Spanish Archaeological Mission discovered the remains of six individuals at the bottom of an internal cistern, a precious regional water source. These individuals, who perished between 772-895 cal A.D., showed perimortem blunt and sharp force trauma. While it is clear that these individuals were victims of homicide, the reason for dumping their corpses into a viable water source remains uncertain. This latter situation makes it likely that the perpetrators were non-locals, but who were the victims? Strontium and oxygen isotope ratios from dental enamel were used to identify their origins, which can shed light on the circumstances surrounding their death. When compared to archaeological faunal samples and published data on regional oxygen and strontium isotope variation, it is possible to determine if these individuals are from geological region similar to Hallabat. If they are indeed locals, this would indicate that the Hallabat region continued to be an economic crossroads even after the post-Umayyad decline.

Parker, Bradley (University of Utah)**[398]** *A Tale of Three Assemblages*

This paper examines ceramic production in the Upper Tigris River Valley of southeastern Anatolia before and during the incorporation of this region into the Neo-Assyrian Empire. Using manufacturing techniques and technologies as windows on the organization of ceramic production, this paper argues that imperial incorporation drastically altered the organization of labor, the distribution of ceramic type fossils and the relationship between producers and consumers. This paper also suggests that, at least in this case study, the distribution of imperial ceramic type fossils is a good indicator of the level of cultural porosity of the imperial frontier.

Parkinson, William A. [47] see Gyucha, Attila

Parkman, Breck (California State Parks)**[30]** *Sacrifice, Litter, and Loss: The Archaeology of the Recent Past atop a Sacred Island in the Sky*

Located in the eastern San Francisco Bay area, Mount Diablo (3,848') rises from an otherwise almost featureless terrain, making it highly visible from much of central California. Because of its visibility, Diablo is a backdrop to ethnographic and contemporary mythologies. The view from the peak is considered one of the most spectacular and unhindered in the world. Easily accessible by vehicle, the summit is visited daily by hundreds of tourists, many whom throw coins and other objects from the observation deck located atop the Summit Museum, an activity that dates back at least fifty years. This paper examines the nature of the archaeological deposit found on the upper slopes of this mountain and uses the evidence to address the nature of intentional versus accidental deposit and to distinguish between the esoteric "sacrifice" of objects versus common litter. The discovery of vast numbers of coins and the remnants of human cremains on the upper slopes suggest that the summit evokes a strong response to the "Sacred" and is thus part of a world-wide tradition deeply rooted in Pagan times.

Parr, Christopher (Virginia Department of Military Affairs)**[70]** *Discussant***Parrish, Allison****[93]** *Independent Women: A Story of Gender and Agency in the Colorado Rockies*

Artifacts can tell us stories, as long as we recognize that those stories include a reflection of us, the archaeologists, within those interpretations. This project comprises a theoretical approach to addressing these issues of reflexivity within archaeology as a practice. In particular, reflexivity is explored with regard to negotiations of feminine gender identity and how the agency of an unmarried, Victorian-era female homesteader parallels the agency of a female archaeologist studying her life. This is a story about how two unique histories (or her-stories, in this case), one past and one present, intersect. The use of digital storytelling, embodied by a short film illustrating the realities and nature of archaeological reflexivity, further enhances this application and exploration of reflexivity as archaeological practice.

Parrish, Otis [392] see Dowdall, Katherine

Parsons, Jeffrey (University of Michigan)**[141]** *Discussant*

Pascal, Camila [198] see Quezada, Osiris

Pascual Soto, Arturo

[198] *Los murales de El Tajin: Excavaciones en un antiguo edificio pintado*

Hay en Mesoamérica, en el arte del período Epiclásico local (ca. 850-1000 d.C.), la clara necesidad de proclamar que sólo los actos del gobernante y no los del pueblo eran verdaderamente eficaces. Es revelador que en los relieves y murales de El Tajín la comunidad en su conjunto esté representada por la figura simbólica del soberano. Sus enemigos aparecen como un montón de desvalidos cuyo ineficaz oposición sólo sirve para resaltar la naturaleza sobrehumana del gobernante. Este es justo el momento en el que la ciudad se encuentra en su máximo esplendor y cuando se emprende la construcción del Complejo del Edificio de las Columnas, un imponente grupo arquitectónico que sorprende por la vastedad de sus dimensiones. Esta ponencia está dedicada a examinar una serie de murales que hemos recuperado en fragmentos en uno de los edificios de este conjunto arquitectónico de El Tajín para proponer una revisión cronológica y una visión más equilibrada de los fenómenos que caracterizan al período Epiclásico en la llanura costera del Golfo de México.

Paskey, Amanda [385] see Panagakos, Anastasia

Pasqual, Theresa (University of New Mexico/Pueblo of Acoma) and Kurt Dongoske (Zuni Cultural Resource Enterprise)**[197] *Mitigating the Sacred? Examining the Role of Native American Associative Values in Resolving Adverse Effect***

Under federal historic preservation legislation, mitigating adverse effects to archaeological sites commonly involves treating the site as a materialistic entity from which scientific information about the past is retrieved through systematic data recovery. Native American values associated with archaeological sites, which view these places as sacred because they are the home of ancestors and exhibit physical affirmations of oral histories and collective cultural identities, are rarely given suitable consideration in a Section 106 process. Utilizing the Amity Pueblo disturbance as a case example, this presentation considers the following issues: Are there ways to measure damage/harm to sacred places? What does that look like for an indigenous community? Are there traditional forms of repairing damage/harm to a sacred place? If so, who are the actors in that reparation? Is the restoration a post-Section 106 process that happens on its own?

Passalacqua, Nicholas V. [332] see MacKinnon, Amy

Patania, Ilaria (Department of Archaeology, Boston University), Paul Goldberg (Department of Archaeology, Boston University), Xiaohong Wu (School of Archaeology and Museology, Peking University), Chi Zhang (School of Archaeology and Museology, Peking University) and Ofer Bar-Yosef (Department of Anthropology, Harvard University)**[53] *Micromorphology and Site Formation Processes at Xianrendong Cave (South China): A Preliminary Analysis of the Late Upper Paleolithic Layers.***

Xianrendong (Jiangxi Province) is one of only two Upper Paleolithic sites in South China that have been systematically sampled for radiocarbon dating coupled with micromorphological analysis. The cave produced the earliest known pottery sherds (20,000 cal BP), together with a typical cobble tool industry. We present a micromorphological analysis of the formation processes of the Xianrendong deposits, investigating both the stratigraphic integrity of the pottery-containing contexts and the nature of the anthropogenic inputs. Results show a differentiation in spatial use within the cave and negligible disturbances within the deposits. A dumping area was identified in the eastern side of the cave, while the western side contains alluvial sediments. This research is part of a wider study involving the early pottery site of Yuchanyan (18,000 cal BP) and aims to reconstruct Late Upper Paleolithic activities at these sites with the earliest pottery yet found. We also demonstrate the advantages of the systematic use of geoarchaeological methods (e.g., micromorphology, FTIR, and XRF) in the study of the Chinese Upper Paleolithic.

Patania, Ilaria [333] see Franklin, Jay

Patel, Shankari (Foothill College)**[146]** *Women, Reproduction, and Fertility: How "Common-Sense" Assumptions of the Present Filter into the Mesoamerican Past*

This paper queries models of Mesoamerican fertility that define women's social roles in terms of dependency, and interrogates narratives that link gender relations to nature where they are beyond critique. The problem with the category women is that it is often thought of as an ahistorical and eternal facet of biology hidden within an implicit model of human nature. Biology becomes a metaphor for social relations and wifehood or motherhood is then characterized as a relation of dependency effectively excluding women from any other cultural contributions to society. The portrayal of women in Mesoamerican archaeological discussions of fertility rituals and goddess cults has reproduced sexist understandings of the past. Using research on the Nepean Collection, the largest collection of artifacts from the Postclassic (A.D. 900-1519) pilgrimage site of Isla de Sacrificios in ancient Mexico, this paper highlights women's important economic, political, and religious contributions to Mesoamerican society. This paper also reclaims and refashions the Mesoamerican fertility narrative by demonstrating that ancient women controlled their reproduction rights within the context of Postclassic religious practices.

Pateman, Michael [387] see Gnivecki, Perry

Patterson, Thomas (University of California, Riverside)**[146]** *Too Much Common Sense, Not Enough Critical Reflection*

This paper explores two different views about common sense--those of Clifford Geertz and Antonio Gramsci. It examines their presuppositions, their utility for archaeologists, and considers the implications of current common-sense explanations of the past

Patterson, Winona [273] see Sartin, Sunnie

Pauketat, Timothy (University of Illinois)**[348]** *A History of Convergences: Timescales, Temporalities, and Mississippian Beginnings*

An early Mississippian world came about at and around Cahokia in the eleventh century CE owing to the convergences of people with other organisms, celestial objects, atmospheric conditions, landforms, and elements, each with their own distinctive temporalities and affects. Understanding those convergences historically entails grappling with timing and duration, and we offer a Bayesian reading of the latest radiocarbon datasets considered against the backdrop of the suspected periodicities of the convergent phenomena. Focusing on the timing of constructions and closures of ritual-administrative facilities at Emerald, East St. Louis, Cahokia and Trempealeau, our larger goal is a rethinking of the relationship of history and ontology.

[1] *Discussant*

Pauketat, Timothy [237] see Betzenhauser, Alleen

Pavao-Zuckerman, Barnet (University of Arizona) and Trica Oshant Hawkins (Environmental Education Exchange)**[83]** *Linking Hispanic Heritage Through Archaeology (LHHTA): Engaging Latino Youth With Our National Parks*

Linking Hispanic Heritage Through Archaeology (LHHTA) is a program that connects Hispanic youth to their cultural history using regional archaeology as a bridge. The program highlights the role of the National Park Service in interpretation and cultural preservation. LHHTA involves high school students and teachers in archaeological field and lab work, visits to museums and National Parks, and experiential learning. Participants explore their personal and cultural histories through the use of ancient and modern technologies including social media. LHHTA, a collaboration between public, private, and non-profit organizations, exposes students to a variety of career opportunities within the

field of archaeology. The program answers the National Park Service's call to action to "fully represent our nation's ethnically and culturally diverse communities".

Pavia, Jenni [77] see Marsaglia, Kathleen

Pavlu, Ivan and Petr Kvetina (Institute of Archaeology CAS, Prague, Czech Republic)

[82] *Development and Idea of Neolithic Longhouses in Middle Europe*

The earliest longhouses of the first agricultural population in Central Europe appear discontinuously, without continuity with the previous settlement; only indirect information about the residence patterns of the latter is available. This is due both to a different settlement strategy by Mesolithic hunter-gatherer groups and to the state of research. Therefore, only the evolution of Central European Neolithic longhouses can be assessed. Their introduction in Central Europe is supposed to be of Carpathian basin origin. The longhouse ground plan pattern varied throughout the Neolithic, occurring not gradually but abruptly and along with changes in other cultural elements. Although the basic type scheme of the pole construction with wattle-and-daub walls seems to be clear, construction details including the interior layout and equipment remain undocumented. Current interpretations of longhouse function are based on the analysis of artifact association. It cannot be ruled out that longhouses served not only as home for the living but also as a place of the rest for the dead.

Pawlowicz, Leszek

[171] *Documentation Of Lithic Artifacts Using An Inexpensive Reflectance Transformation Imaging System*

Reflectance Transformation Imaging (RTI) creates a relightable virtual image of an artifact, allowing interactive manipulation of the light direction and light curve characteristics to bring out details difficult to see with the naked eye or in a photograph. One potential use of RTI is in the visual documentation of lithic artifacts, traditionally done using line drawings because of the difficulty in recording their features using still photographs. Techniques for enhancing lithic artifact detail for photographs, like casting or flake scar decoration with magnesium oxide or ammonium chloride, are time-consuming, present safety risks, and have the potential to leave residues or even damage artifacts; RTI requires no special specimen preparation. One impediment to RTI's adoption has been expense – custom-made systems are extremely costly. We present results on lithic artifacts from an RTI system custom-built for a small fraction of the traditional cost, but which offers performance comparable to more expensive systems. We describe image enhancement techniques that use results from our RTI system to create visual artifact documentation comparable or superior to traditional line drawings or photographs, at a fraction of the time and cost.

Payne, Sarah [188] see Collins, Shawn

Paynter, Robert (UMass Amherst)

[405] *Critical Heritage Archaeology at the W.E.B. Du Bois Homesite*

The University of Massachusetts Amherst has conducted Critical Heritage Archaeology at the W.E.B. Du Bois Homesite in Great Barrington, MA in collaboration with a community group interested in commemorating Du Bois and fostering an understanding of African American life in western Massachusetts. W.E.B. Du Bois was one of the most important scholars and political leaders of the late 19th and first half of the 20th century. A 1969 commemoration at the site was met by local and national opposition that brought to the surface divisions along the lines of class and race in rural Massachusetts. Partly because of this the National Historic Landmark W.E.B. Du Bois Homesite had become virtually invisible. With our collaborators, private funding, and support by the University of Massachusetts, we have recently installed an interpretive trail with signage that introduces the general public to Du Bois's efforts to foster a more socially just world. This paper discusses issues surrounding the presentation of such a prolific, influential, and long-lived global figure with limited space and a tight budget. These issues, along with Du Bois's insights on world history, provide a food for thought about the critical management of archaeological heritage in the 21st century.

Pazan, Kyra (University of Michigan) and Robert A. Cook (The Ohio State University)**[331]** *Diet at the Edge of Fort Ancient: Preliminary Faunal Analysis from an Unusually Positioned House at the Guard Site, Dearborn County, Indiana*

This study analyzes faunal remains from a recently excavated house at the Guard Site in southeast Indiana, which was occupied by the Fort Ancient culture between A.D. 1000 and A.D. 1300 during a period of optimal climate in the American Midwest. During such periods, abundant resources and low stress allow people to pursue more desired resources. In the case of Fort Ancient, the key species was the white-tailed deer. We hypothesize that Guard's inhabitants were free to pursue large deer in the primes of their lives and could afford to ignore other deer and less optimal resources. However, social and seasonal distinctions are important considerations. Our house is outside of the main habitation ring of the village. The odd location of this house could be related to seasonal occupation or to the presence of a distinct social group, either of which could alter the composition of the house's faunal assemblage. These possibilities will be explored against expectations derived from optimal conditions.

[331] *Chair*

Pazmino, Estanislao [367] see Lippi, Ronald

Pazmiño, Estanislao**[367]** *Excavaciones arqueológicas en la pirámide de Huataviro*

A mediados del 2009 en la parroquia de San Antonio de Ibarra, provincia de Imbabura, el descubrimiento casual de una tumba rica en ofrendas dentro una pirámide prehispánica atrajo la atención pública y permitió el inicio de una intervención arqueológica. Las plataformas piramidales constituyen un elemento recurrente en varios de los asentamientos prehispánicos tardíos del denominado País Caranqui. Las investigaciones arqueológicas realizadas en la pirámide de Huataviro, arrojan nuevas luces sobre el desarrollo de los cacicazgos norandinos del Ecuador en una época poco conocida entre el 600 y 1300 d.C. El presente trabajo, precisamente analiza la evidencia obtenida durante las dos fases de investigación y rescate auspiciadas por el Instituto Nacional de Patrimonio Cultural (INPC).

Peacock, Evan (Mississippi State University)**[284]** *Development and Applications of a Minimally Destructive Method of Sourcing Shell via LA-ICP-MS*

Shell artifacts and shell-tempered ceramics can be chemically sourced to point of origin because shellfish are in approximate chemical equilibrium with the waterways they inhabit. Analyzing artifacts or shell temper via Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry is attractive due to the minimally destructive nature of the method. A pilot study in Mississippi funded by the NCPTT verified the potential of the method for sourcing shell-tempered pottery. Subsequent work includes the chemical sourcing of a prehistoric shell "spoon" and application of the method to encrusted pottery from the Hungarian Plain. Other scholars are now applying the method in a variety of archaeological settings, emphasizing the positive effect of NCPTT "seed money" for spurring innovative applications in low-impact archaeological research.

Pearlstein, Ellen [121] see Warmlander, Sebastian

Pearsall, Deborah (University of Missouri)**[226]** *The Nature and Status of Paleoethnobotany: Methods and Approaches for Understanding Site Formation Processes*

Paleoethnobotany is a diverse discipline, with practitioners around the globe. A systematic discussion of methods and approaches is beyond the scope of this presentation. I focus instead on an issue concerning paleoethnobotanical practice and inference that cross-cuts the kinds of

materials being studied, or the geographic or topical focus of research: deposition and preservation of plant remains. Determining what kind(s) of human behaviors and natural processes led to deposition and preservation of plant tissues/pollen/phytoliths/starch grains in archaeological sites/coring localities/artifacts is the interpretive challenge at the heart of paleoethnobotany. I review current methods and approaches for understanding formation processes of the paleoethnobotanical record, and suggest that an approach that integrates multiple biological indicators provides the most promise for drawing strong inferences of past human behaviors.

Pearson, Charles [192] see Weinstein, Richard

Peart, Jonathan [361] see Cannon, Kenneth

Peate, David [53] see Waterman, Anna

Pebe, Edines (Proyecto Qhapaq Ñan - Ministerio de Cultura del Peru) and Camila Capriata (Proyecto Qhapaq Ñan - Ministerio de Cultura del Peru)

[247] *Preserving a Section of the Inca Road in the Lower Lurin Valley, Peru*

The Qhapaq Ñan or great Andean Road was declared World Heritage by UNESCO in June 2014. The road located between the Pachacamac Sanctuary and the Inca administrative center of Hatun Xauxa, located in the central highlands of Peru, not only constituted one of the main sections of this network, but was also one of the segments selected for this declaration. Following this process, a series of conservation projects have started taking place along this network in the segments that have been considered to be best preserved. This is the case of a road segment located near the modern town of Santa Rosa de Chontay, in the lower Lurin valley, central coast of Peru. The project focused not only in the research concerning its function and importance during the Inca period, but also in the conservation of its architecture and its surroundings. From all points of view, this initiative constituted a challenge that aimed not only to ensure its persistence as an archaeological landmark, but also remain relevant to the local community.

Pecci, Alessandra [176] see Madella, Marco

Pecci, Alessandra (University of Calabria)

[176] *Chemical Residues as Anthropic Activity Markers: Food Production and Consumption*

When activities are carried on, the substances used and/or produced during the activities are poured onto the on floors and absorbed by them. Specific analyses can be performed to identify the chemical residues absorbed in porous materials, like plastered and earthen floors. As these residues are strictly related to the activities carried on, and reflect their spatial distribution, they can be considered "anthropic activity markers". A methodological approach concerning the understanding of the markers of activities related with food production and consumption will be presented pointing out the advantages and problems of the use of spot tests and gas chromatography-mass spectrometry to detect and identify organic compounds. Experimental, ethno-archaeological and archaeological examples from different sites in the world will be shown.

[176] *Chair*

Pedersen, Jeannine and Jere H. Lipps (The Dr. John D. Cooper Archaeological and Paleonto)

[106] *Impact of Rising Sea Levels on Native American Cultural Sites in Southern California*

Humans arrived in Southern California about 13,000 years ago, shortly after sea level began rising following the last glaciation. Most of their sites along the shoreline of the time have been inundated and are unknown. Now hundreds of remaining sites on-shore are threatened, or will be threatened, in the foreseeable future by rising sea levels. A survey of prehistoric and historic human site elevations in Southern California reveals the 1.4 m rise in sea level expected in 2100 due only to the

thermal expansion of sea water will impact 194 sites. If the ice on either Greenland or West Antarctica were to collapse or melt into the ocean, sea level would rise some 8 m and impact an additional 295 sites or 17 m and 434 sites if both collapse. While each of these scenarios have different time estimates, the collapse of parts of the Greenland and West Antarctica ice sheets could happen soon and quickly, adding their sea level components to the estimates for thermal expansion (= 18.5 m). Protection of human archaeological and historic sites in coastal Southern California should be coordinated and included with efforts to reduce damage to modern infrastructure and buildings from sea level rise.

Pederson Weinberger, Jennifer (National Park Service - Alaska Region)

[29] *Overview of Archaeological Research in the NPS Alaska Region*

Human occupation of the 54 million acres of land managed by the National Park Service (NPS) has spanned millennia from early use of the ice-free corridors, later migrations and adaptation of tool kits to meet changing needs, and contact with explorers, fur traders, and others from distant lands. Research conducted each year along coasts, in and around mountainous terrain, small towns, and places in between aids efforts to inventory park land for archaeological resources, understand past human use of the land and the deep connections that remain for the descendants, and monitor and minimize/mitigate threats to these archaeological sites. This presentation will provide an overview of current research being conducted at National Park Service units in Alaska.

Pedler, David [331] see Byrnes, Allison

Peelo, Sarah (Albion Environmental), Christina Spellman (Albion Environmental) and Lee Panich (Santa Clara University)

[175] *Maintenance of Tribal Communities in the California Spanish Missions*

In this symposium, we have been tasked with investigating how communities were forged during the Mission Period in California (1769-1834). Some researchers currently suggest that diverse indigenous populations in mission communities formed collective Indian communities and identities (e.g. Lightfoot 1998; Panich 2009; Peelo 2009). However, others maintain that indigenous peoples were not only part of a mission community, but they were simultaneously part of diverse traditional village communities during the colonial period (Haas 2014). When we look beyond the mission walls (e.g. Panich and Schneider 2014; Schneider 2012), we may learn something new about what Indian communities looked like in Colonial California. Within the mission walls it may be true that indigenous peoples were trying to form collective groups sharing in cultural practice. But outside of those walls, people may have maintained diverse communities, tied not to the mission, but to their home village. Here, we investigate community in colonial Alta California by exploring the details of traditional community maintenance that occurred outside the mission walls through investigation of the mission registries. We also propose ideas for archaeologically investigating the persistence of indigenous tribal communities during the colonial period.

Peelo, Sarah [175] see Panich, Lee

Peeples, Matthew [278] see Laurenzi, Andy

Peeples, Matt (Archaeology Southwest)

[335] *Scales of Identity and Scales of Analysis in Western New Mexico*

Archaeologists typically use the term "identity" to refer to the ways in which individuals define membership in larger social groups through direct interaction or the perception of similarities and differences with others. Such social groups can be defined at a variety of scales (e.g., family unit/household, community, ethnic group/culture, etc.) and most archaeological studies tend to focus at only one particular scale. Recent archaeological research across a broad range of social and political contexts suggests, however, that social identities at increasing demographic and/or geographic scales are not necessarily neatly nested and hierarchical. In this paper, using ceramic,

architectural, and chemical compositional data from large settlements dating from the 11th through 14th centuries in west-central New Mexico, I explore the complex interplay among social identities at multiple scales (households, communities, and regions) and suggest that the degree to which these scales intersect is closely related to trajectories of population growth and movement through time. I argue that an explicit consideration of the tensions among these different social and analytical scales can provide insights into the processes driving the creation of discrete social groups or the long-term persistence of diversity.

Pelegrino, Constanza [318] see Ballester, Benjamín

Pelto, Brendan

[128] *19th Century Mining Life in Michigan's Upper Peninsula: The American West on the Wrong Side of the 100th Meridian*

The western Upper Peninsula of Michigan was home to many mining boom towns, similar to those associated more commonly with the American West. Clifton, the town site of the first profitable Copper Mine in Michigan, attracted workers of diverse ethnic backgrounds: Cornish, German, Irish, Native American, and African American. Michigan Technological University has conducted five seasons of field work at Clifton and the Cliff Mine, and has uncovered material remains that aid in the remembrance of this community that served as a gateway to The American Frontier for many. Artifacts that have been extensively studied from the sites include ceramics, faunal remains, and also iron artifacts, many of which have undergone experimental treatments involving polymer impregnation. This discussion of these assemblages and their contextual relationship to boarding houses, taverns, mid-continental shipping, and frontier military forts will illustrate the Upper Peninsula of Michigan's deeper connection to the American West of the 19th Century.

Pelton, Spencer (University of Wyoming) and Joshua Boyd (University of Wyoming)

[122] *A Formal Model of End Scraper Performance on Dry Bison Hide*

End scrapers are a widely recognized tool in the archaeological record, but their performance characteristics are poorly understood. We use experimental results and adapt marginal value theorem (MVT) for use in lithic studies to devise a formal model of end scraper performance that predicts the optimal time at which one should resharpen their end scraper under several scenarios of raw material abundance. Our study is the first to apply MVT to end scraper performance through an actualistic study, and it allows us to make explicit archaeological predictions related to end scraper use, time management, raw material economy, and ultimately dry hide processing.

Pena, Angel [273] see Sartin, Sunnie

Pena, Felicia (Department of Anthropology and Middle Eastern Cultures, Mississippi State Univ.), Molly Zuckerman (Department of Anthropology and Middle Eastern Cult), Nicholas Herrmann (Department of Anthropology and Middle Eastern Cult) and Evan Peacock (Department of Anthropology and Middle Eastern Cult)

[321] *Quantifying Pre-Industrial to Mid-Late 20th Century Anthropogenic Lead and Mercury Pollution in Caribbean Marine Environments*

Various lines of evidence indicate that levels of anthropogenic pollutants, such as lead and mercury, have increased in terrestrial and atmospheric environments since the early 19th century and the advent of industrialization. While exposure to these two heavy metals is a global concern, this study focused primarily on Caribbean marine environments. Using ICP-MS, this study aimed to detect and quantify anthropogenic pollutants, specifically lead (Pb) and mercury (Hg), using skeletonized remains of sea turtles as biological proxies for environmental quality. Archaeologically-derived (n=5) and mid-late 20th century (n=6) Hawksbill and Green turtles were used to create a chronology of pollution exposure in Caribbean marine environments and to establish a pre-industrial baseline for pollution exposure, useful for gauging how human activities in the Caribbean, namely industrialization and tourism, have changed mercury and lead concentrations over time. Results from this study are integral to informing and improving strategies for research and training related to

stable monitoring of patterns of anthropogenic pollutants affecting the health and conservation of large marine ecosystems in the Caribbean.

Peña, Jose

[46] *The Role of the Tambo in the Inka Administration: A View from the Site of Inгатambo, Cajamarca-Jaen, Peru*

Archaeological investigations conducted at the site of Inгатambo highlight the Inka imperial policy in the provinces, which relied on the use of local ethnic groups in the state bureaucracy. Colonial documentation noted the movement of coastal communities within the Inka Empire to the Cajamarca region in order to serve in the tambos. Pottery sherds from the Inгатambo site illustrate that the coastal communities charged with administering this site continued to produce pottery following the style of the northern coast. In addition, the presence of a ceremonial area at this site suggests the importance of this structure in the Inka imperial economy. It is possible that the Inгатambo site functioned as a center in which social relations were reinforced within the communities located in the Huancabamba Valley. This research offers a perspective on the provinces of the Inka imperialism in which the tambos played a significant role in the Inka administration because they symbolized not only the Inka presence but also reinforced social cohesion.

Pendergast, David

[147] *Discussant*

Pendergast, David [147] see Horn, Sherman

Peniche May, Nancy (UCSD)

[24] *Haciendo público lo privado: La arquitectura de las élites de Cahal Pech durante el Preclásico Medio*

Cahal Pech es una antigua comunidad Maya localizada en el Valle de Belice que mantuvo una ocupación continua por más de 2000 años (1200 a.C.-1100 d.C.). Múltiples exploraciones en la acrópolis y en la periferia del asentamiento han revelado que los grupos fundadores edificaron sus primeras residencias en el área de la Plaza B de la acrópolis. Para el Clásico Tardío, esta plaza llegó a funcionar como el principal espacio cívico del sitio. En años recientes, como parte del proyecto "Belize Valley Archaeological Reconnaissance," se realizaron excavaciones extensivas en Plaza B con el objetivo de estudiar la población Preclásica de Cahal Pech y el surgimiento de la complejidad sociopolítica en el Valle de Belice. Como resultado, se expuso una compleja secuencia arquitectónica que permite investigar como el ambiente construido de la acrópolis de Cahal Pech fue cambiando durante el Preclásico Medio. De esta manera, este ensayo tiene como objetivo examinar cómo la arquitectura y el paisaje del Preclásico Medio de la acrópolis fueron modificados, tanto en su función como en su forma, a medida que el estatus de los grupos fundadores fue transformándose hasta convertirse en uno de los primeros grupos de élite del Valle de Belice.

[24] *Chair*

Penkman, Kirsty [294] see Lee-Thorp, Julia

Penkman, Kirsty (University of York), Molly Crisp (University of York), Beatrice Demarchi (University of York), Matthew Collins (University of York) and Julia Lee-Thorp (University of Oxford)

[356] *Building a Better Egg timer: Amino Acid Dating of Ostrich Eggshell from South Africa*

Chronology underpins our understanding of the past, but beyond the limit of radiocarbon dating (~50 ka), sites become more difficult to date. Amino acid geochronology, which uses the time-dependent breakdown of proteins in biominerals, has the potential to date the whole of the Quaternary. Ostrich eggshell (OES) is often associated with archaeological sites in Africa, as early humans utilized them as a food source, water carriers and for artistic purposes. OES's calcitic structure potentially offers a "closed system" of intra-crystalline proteins encapsulated within the calcite, which is imperative for

accurate amino acid dating. We have rigorously tested these intra-crystalline proteins through high temperature degradation studies and independently dated, well-stratified OES from the key archaeological sites of Elands Bay Cave and Pinnacle Point. If OES has been heated prior to or during burial, this can confound the age signal. Using a new UHPLC chiral amino acid analysis method, we have found six markers that enable identification of “heated” OES and therefore significantly increase the age resolutions and accuracies possible. We also demonstrate the potential of mass spectrometry in helping to unravel the complex nature of protein diagenesis, with successful extraction and sequencing of peptides from OES samples ~71 ka

Penny, Dan (The University of Sydney) and Tegan Hall (The University of Sydney)

[36] *The Demise of Angkor: Infrastructural Inertia and Climatic Instability*

The demise of Angkor and its city-region offers insights into the vulnerability of giant low-density cities to climate extremes. At Angkor, the iterative growth of massive, convoluted and intractable infrastructural networks progressively decreased the resilience of the settlement to changing circumstances by restricting or removing adaptive strategies. The nature and consequences of the water crises in Angkor between the 13th and the 16th centuries has been revealed by a combination of remote sensing, paleo-botany, dendrochronology and excavation. Excavation and the new LiDAR remote sensing images have mapped and excavated the massive water management infrastructure of Greater Angkor, revealing the efforts to stabilize a network suffering from water shortages and erosion, damage to the southern canals of the network and the reduction of the urban area. Paleo-climate indicia have shown that from the 13th to the 16th century SE Asia was experiencing drastic variability in summer monsoon strength, from mega-wet to severe drought in the 13th, 14th and early 15th centuries. The infrastructural breakdown that ‘switched off’ Angkor as a viable low-density city was a result of interaction between the rigidity of the urban fabric and extreme climatic variability.

Penny, Dan [407] see Hall, Tegan

Pentney, Sandra (Atkins) and Marc Cavallaro (Atkins)

[106] *Downpours, Storm Surges and Wildfires, Oh My! A Look at How Climate Change Will Affect the Archaeological Record of San Diego County*

The effects of climate change on the physical environment are just recently beginning to be understood by scientists and local planning agencies. Climate Action Plans and Future Proofing studies are being conducted to help planners implement policies and plans to protect communities from the various effects of rising temperatures, fluctuating weather patterns, more intense storm and flood events, sea level rise, and ocean acidification. However, one area of research that has not received much attention is archaeology. This presentation will explore the potential effects of climate change on the archaeological record in San Diego County, California. The study includes preliminary results of a coastal oriented field survey sponsored by the Society for California Archaeology and the San Diego County Archaeological Society that spans the public land of San Diego County’s coast to inventory archaeological sites and their current conditions as well as a look at how to approach the same research question across the rest of the county.

Pepponi, Giancarlo [185] see Risetto, John

Peraza Lope, Carlos [303] see Milbrath, Susan

Perdikaris, Sophia (Human Ecodynamics Research Center CUNY)

[290] *From Theory to Real Life applications: Citizen Science in Heritage and Sustainability in Barbuda*

The small sister island of Antigua, Barbuda, has been the center of archaeological and paleoenvironmental investigations over the last nine years. Archaeological presence on the island has progressed from seasonal projects with some local volunteers to the creation of two museums and a research center with a permanent presence on the island. This transition assisted in the

founding of the first ever NGO on island, The Barbuda Research Complex focusing on research, heritage, education, preservation, conservation and sustainability. This year the historical site of Highland House became the focal point of heritage activity, where university faculty and students funded through grants were joined by a team of local participants that were financed through the local government, Dept. of Labour. Heritage work brings a proactive approach to addressing issues generated by the anthropocene and empowers citizens in better connecting with their past, taking charge of discoveries and innovations as well as incorporating science in solution based approach for the future.

Perea, Ema (Pontificia Universidad Católica del Perú), Ilana Johnson (Sacramento City College) and Luis Jaime Castillo (Pontificia Universidad Católica del Perú)

[250] *Architectural and Functional Characterization of Sector 2 at Cerro Chepén*

Archaeological research in Cerro Chepén started with the purpose of characterizing the cultural manifestations in the Jequetepeque valley, especially the political and social relationships of the inhabitants of these sites and the activities related to the regional center of San José de Moro. The poster includes the results of the research conducted in Sector 2 of Cerro Chepén, which is one of the most important sites for the Late Moche and Transitional periods in the Jequetepeque Valley. The work carried out focused on architectural analysis in order to characterize architectural patterns and construction techniques.

Sector 2 is located on the north slopes of the mountain. Eight architectural compounds were identified there, which, aside from being related through their location in the archaeological complex of Cerro Chepén, are formally related since they are located in a same area that has been delineated by perimetric walls. The compounds share architectural characteristics like the use of platforms and terraces delineated by contention walls adapted to the ground and linked through paths and complex rooms. Evidence of limited access to the sector was found, as well as restricted circulation flow between spaces and visual control of each of the architectural compounds.

Pereda, Maria [73] see Caro, Jorge

Pereira, Gregory (CNRS-Université de Paris I)

[158] *Transforming the Body: Fire in Mortuary Practices in Ancient Michoacán, Mexico*

Ethnohistoric sources from prehispanic Michoacán highlight the symbolic importance of fire for the Postclassic Tarascan state. The fact that Curicaueri, the principal Tarascan god, was a fire god and that cremation was used during the warriors' and ruling elite's funerary rites, emphasizes its symbolic and social importance. In this presentation, I will examine the different roles played by fire in ritual transformations of the human body. I will consider the ethnohistoric sources as well as the archaeological record. Human remains reveal a wide range of practices dated to the Late Postclassic and earlier periods. I will discuss both funerary and non-funerary contexts.

Pereira, Telmo [356] see Wilkins, Jayne

Pereira Furquim, Laura [326] see Pugliese, Francisco Antonio

Peres, Tanya M. [8] see De Smet, Timothy

Perez, Kelita (Kelita Pérez)

[169] *La Ocupación Carmen En El Valle Medio De Chincha*

La costa sur del Perú en la época prehispánica fue un área geográfica donde se concentraron distintos grupos sociales. Entre ellos se evidencia la ocupación Carmen, un grupo social local que se desarrolló en los valles de Chincha y Pisco y se encuentra ubicado cronológicamente entre los 200 d.C. y los 400 d.C. En esta ponencia tratamos sobre la arquitectura y cerámica recientemente recuperadas mediante la excavación de dos sitios arqueológicos (Cerro del Gentil y Pampa del

Gentil) del valle medio de Chincha. A través de las investigaciones realizadas reconocemos que el grupo social Carmen es contemporáneo con la cultura Nasca que tenía como centro principal al sitio de Cahuachi. Los grupos sociales Carmen reocuparon muchos de los sitios Paracas. Sin embargo, la arquitectura de la ocupación Carmen está compuesta por estructuras domésticas y el atributo más representativo de la cerámica Carmen son las líneas diagonales de color rojo y blanco, alternadas en una base negra en el exterior.

[169] *Chair*

Perez, Griselda [306] see Navarro-Farr, Olivia

Pérez, Verónica [249] see Navarro, Mariana

Pérez Iglesias, Lourdes [339] see Newsom, Lee

Pérez Pérez, Julia [298] see Montúfar López, Aurora

Perez Rodriguez, Veronica [26] see Martínez Tuñón, Antonio

Perez Rodriguez, Veronica (University at Albany, SUNY)

[26] *Stephen Kowalewski, su Vida y Obra: A Life of Regional Survey and Looking at the Big Picture*

In this opening paper for the session in honor of Stephen Kowalewski we talk about Steve's life and background, his experience in Southwestern and Mesoamerican archaeology, and about a life of teaching and mentoring in the classroom and in the field. We discuss Stephen Kowalewski's work in archaeology and the rich regional datasets that we now enjoy as a result of his teachings and labors. This presentation also reflects on the theoretical and methodological approaches that Steve has employed and championed and how his professional and personal impacts are felt in archaeological research taking place in a number of world regions today.

[26] *Chair*

Pérez Suarez, Tomás (Centro de Estudios Mayas, IIFL, UNAM)

[242] *Discussant*

Perez Trujillo, Amelia [393] see Dean, Emily

Perez-Juez, Amalia (Boston University), Ricardo J. Elia (Boston University) and Meredith Langlitz (Boston University and AIA)

[93] *Archaeological Field schools: Teaching Heritage Management. An Example from Menorca*

The archaeological field school is a traditional means of training students in the practical skills of survey, excavation, recording, and artifact processing. Recent discussions about field schools have emphasized the need to approach fieldwork from a holistic perspective and incorporate the theory and practice of archaeological stewardship: preservation, interpretation, management, and public outreach of archaeological resources. In this paper we describe our experience in the development of a heritage management component for Boston University's Archaeological Field School held on the island of Menorca (Spain) from 2000 through 2014. For the past five years we have developed different projects that combine archaeological fieldwork and heritage management at different sites in Menorca that range from prehistory to the 19th century. We have also trained students in the complexity of an island that is both a UNESCO Biosphere Reserve and a candidate for World Heritage status. We ultimately view the incorporation of the values of heritage management and stewardship into our field school as important as teaching traditional subjects like excavation and recording, and as a means of approaching Archaeology in a holistic way.

[329] *Discussant*

Perez-Juez, Amalia [418] see Elia, Ricardo

Peréz-Ramírez, Gerardo [129] see Muñoz, Maria De

Perhay, Nathaniel (The University of Montana), Anna Prentiss (The University of Montana), Thomas Foor (The University of Montana), Nathan Goodale (Hamilton University) and Matthew Walsh (The University of Montana)

[312] *One Group or Many? Cultural Inheritance at Housepit 54, Bridge River Site, British Columbia*

The Bridge River housepit village, located in south-central British Columbia, features 80 housepits with radiocarbon dates spanning the past 2000 years. Many of these structures include stratigraphic records indicating multiple generations of household re-occupation. Housepit 54 offers a particularly impressive record with an estimated 15 superimposed anthropogenic floors, the majority of which date to the period of ca. 1100-1500 cal. B.P. Extensive excavations undertaken in 2013 and 2014 demonstrate that the house grew in size over time, mostly dramatically with at least two doublings in floor area. Housepit (HP) 54 offers the opportunity for us to examine the histories of cultural traditions over many generations within a single household. However, we cannot simply assume that this house was occupied by the same group throughout its entire history. This poster presents analyses designed to test alternative hypotheses regarding inter-generational cultural transmission in HP 54. To accomplish this, we draw on data concerning variability in artifact manufacture and style along with the organization of space within floors. We expect to develop conclusions regarding patterns of cultural continuity in this long-lived house. Results should also offer implications for the utility of different methodological approaches to cultural transmission in evolutionary archaeology.

Perlingieri, Cinzia (California State University East Bay), Habtamu Mekonnen (Simon Fraser University) and Michael Harrower (Johns Hopkins University)

[379] *An integrated digital approach for ceramic analysis at Baita Semati, northern Ethiopia*

This paper provides an overview of the methods and results of the ceramic analysis conducted in two study seasons at the archaeological site of Baita Semati, in northern Ethiopia. The work was articulated into three main steps: 1) analytical description of the morphological attributes, 2) typological classification, 3) chronological and cultural interpretation and comparisons. Our goal was to create rich records for all pottery objects that would include standardized descriptions, typological attributions, and media. In order to do so, we adopted the archaeological database Codifi. The database was deployed as a local server without internet access and was made available to multiple users for simultaneous data entry from different devices. Photos of all objects were taken with camera and iPad and uploaded in real time in the database records, optimizing time and resources in the field.

[379] *Chair*

Peros, Matthew (Bishop's University), Amy Daradich (University of Ottawa) and Bill Buhay (University of Winnipeg)

[313] *Reconstructing Caribbean Paleotopography during the Holocene: Implications for Archaeology and Biogeography*

Our understanding of the Holocene sea level history of the Caribbean Sea is improving through the development and analysis of mangrove and coral-based relative sea level data. In this poster we present a time-series of maps showing how the paleotopography of the region changed throughout the Holocene. The maps were generated using a recently developed model of Caribbean sea level change that incorporates the effects of both eustasy and isostasy to model past sea level positions. The results show that shallow water areas such as the Bahamas, south Florida, and parts of Cuba would have been exposed subaerially during much of the Holocene. In addition, a fairly dense archipelago would have existed from the coast of Nicaragua to Jamaica (the Nicaragua Rise). As relative sea level rose through the Holocene, many of these islands and shelves were submerged, most disappearing between 4000 to 5000 cal yr BP. The sea level model does not include the effects of tectonics or sedimentation. Nevertheless, our findings have implications for the peopling of the

Caribbean (as well as the migration of plants and animals) as a range of potential migration routes from Central America would have been available.

Perreault, Charles (Arizona State University)

[191] *Measuring the Complexity of Lithic Technology*

Assessments of the complexity of lithic technologies coming from different time periods, regions, or hominid species are recurrent features of the literature on Paleolithic archaeology. Yet the notion of lithic complexity is often defined intuitively and qualitatively, which can easily lead to circular arguments and makes difficult the comparison of assemblages across different regions and time periods. Here we propose, in the spirit of Oswalt's techno-units, that the complexity of lithic technology can be quantified by counting the procedural units involved in tool manufacture. We define procedural units as mutually exclusive manufacturing steps that make a distinct contribution to the finished form of a technology. As a proof of concept, we use the procedural-unit approach to measure the complexity of 13 Paleolithic assemblages. While preliminary, these results provide a quantitative benchmark confirming that lithic technological complexity increased throughout the Paleolithic period. The method to measure lithic complexity outlined here will allow us to revisit several claims made about change in technological complexity during human evolution.

Perri, Angela (Max Planck Institute for Evolutionary Anthropology)

[28] *Dogs as Weapon Technology: Their Role in Prehistoric Hunting Groups*

Dogs have played a variety of roles in ancient and modern groups, including hunting companions. This role is often suggested as an impetus for domestication or one of the dog's earliest functions. Though advantageous in some cases, the hunting dog's effectiveness (or inefficiency) is linked to external factors, such as environment, prey species, and hunting method. Under optimal conditions, dogs can act as the primary tool in capturing prey, often proving critical to hunting success. In other cases they are a detriment, jeopardizing hunting returns. A survey of ethnographic hunting literature characterizes the relationship between hunting dog effectiveness and environmental factors. This analysis illustrates the vital role hunting dogs may have played as weapon technology in past hunter-gatherer groups.

[28] *Chair*

Perrotti, Angelina (Texas A&M University), Michael Waters (Texas A&M University) and Jessi Halligan (University of Wisconsin- La Crosse)

[119] *Paleoenvironmental Change and Megafaunal Extinction at Page-Ladson, Florida*

Sporormiella sp. is a coprophilous fungi associated with large herbivore dung that can be used as a proxy to track megafaunal extinctions. The data is based on its abundance or absence within dated sediments, which is often presented as a percentage related to the total pollen sum. This poster presents the results of a fossil pollen and *Sporormiella* analysis from a sediment core extracted from the Page-Ladson Site, located in a sinkhole in the Aucilla River, Florida. The 5 meter core spans the Pleistocene-Holocene boundary and most of the Holocene. The types and percentages of fossil pollen combined with the presence/absence of various percentages of *Sporormiella* sp. provide a unique window into the timing and possible causes of megafaunal extinctions in that region of Florida.

Perry, Jennifer [32] see Glassow, Michael

Perry, Gareth (University of Sheffield)

[79] *Pottery Production in Anglo-Scandinavian Torksey (Lincolnshire): Reconstructing and Contextualizing the Chaîne Opératoire*

Ninth-century England witnessed major social upheaval. Viking armies moved throughout the north and east, towns flourished again for the first time since the Roman period, and land ownership was fundamentally transformed. Significant in the material record is a veritable revolution in pottery production; pottery was wheel-thrown, kiln-fired, and made on a near

industrial scale. A number of production centers were established under a Viking elite hailing from regions characterized by their aceramic nature. Whilst the decoration and form of this new pottery has attracted attention, there is little understanding of pottery manufacture itself. Using a range of analytical techniques, including thin section petrology and SEM, this paper characterizes the chaîne opératoire followed by potters working at Torksey. Its potters made specific raw material choices which impacted upon the location of their workshops and the success of their industry. Whilst raw materials remained unchanged over the industry's life, Torksey's potters made significant modifications to their firing regime. Contextualizing these seemingly superficial choices exposes a series of regional potting traditions. In the light of wider social changes that characterize the period, this window into the agency of individual potters provides new perspectives upon the mechanisms that enabled these new technologies to flourish.

Pesesse, Damien [181] see Bracco, Jean-Pierre

Pestle, William [152] see Sierra, Roger

Pestle, William (University of Miami), Christina Torres-Rouff (University of California, Merced and Instituto de) and Francisco Gallardo (Centro Interdisciplinario de Estudios Intercultura)
[203] *Life and Death at the Mouth of the River Loa: Bioarchaeological and Biogeochemical Analysis of Human Remains from Formative Period Northern Chile*

Recent research has shown that during the Formative Period (1500 B.C.-A.D. 500), in northern Chile's Atacama Desert life was sustained and enriched by inter-zonal movement and networks of exchange of both prestige goods and staple materials. In order to further detail these phenomena, a series of five cemeteries in the region of Caleta Huelén were recently excavated. In this work, we present the results of contextualized bioarchaeological and biogeochemical analysis of over 30 individuals, focusing in particular on the distillation of patterns of diet, lifetime residential mobility, relatedness, and ethnic self-representation (in the form of intentional cranial modification). The observed patterns speak to a complex web of social, economic, and ethnic relationships, as well as between the Caleta Huelén sites and their contemporaries on the Pacific coast, oases of the desert interior, and beyond. These data support the contention that the Atacama Desert's Formative Period was one of far-reaching interaction and exchange.

Peters, Joris [16] see Clare, Lee

Peters, Ann (University of Pennsylvania Museum)

[187] *Identity, Presence, and Political Relationships in the Mortuary Rituals Of Paracas Necrópolis*
 Does a Paracas Necropolis mortuary bundle represent the identity of the individual at its core, those who honored that person, or a broader social network? Extraordinary aspects of these mortuary bundles include the quantity and quality of the layered garments and their diverse styles and imagery. Data related to their production indicates their origin in many different communities directly engaged in textile production, agriculture and herding, as well as the management of natural resources from diverse environments. Fiber qualities, dye lots, spin and ply, and weaving practice indicate groups echoed by more visible features such as color use, garment design, image style and iconography. A knowledgeable viewer could have named the producers of each artifact. What sociopolitical model may explain the gathering of diverse styles in groups of equivalent garments as part of postmortem rituals that constructed an ancestral effigy around the mortal remains of an individual? Both indexical and symbolic reference made the addition of a textile to a mortuary bundle a political act, which must have strengthened and renewed relationships of power and leadership among descendent groups.

Petersen, Andrew [409] see Hill, Austin

Peterson, Staffan (Indiana University - Bloomington) and Daniel Eakin (Office of the Wyoming State Archaeologist)

[29] *Archaeology of the Nez Perce War of 1877 in Yellowstone National Park, WY*

The Nez Perce (Nee-Me-Poo) National Historic Trail was designated by Congress under the National Trails System Act in 1986 to commemorate the 1877 flight of the non-treaty Nez Perce from their homelands in present day Oregon, Idaho, and Washington, across Idaho, Montana, and Wyoming, including 85 miles within Yellowstone National Park. In 2008, Yellowstone began archaeological investigations of the trail corridor. This six-year project includes: consultation with the Confederated Tribes of the Colville Indian Reservation, Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Tribe; historical documentary research and broad scale archaeological inventory; site-specific investigations to identify historical association with the trail with participation of tribal archaeological program staff; and creation of park interpretive material and information for park Management plans. Over seventy sites ranging from Paleoindian to the early 20th century were discovered including five previously unverified 1877-related sites and a high-elevation bivouac where the Nez Perce may have rested prior to their descent to the plains on their race to Canada to seek refuge with Sitting Bull. Results are already being incorporated into Fire Management, Interpretation, Concession Management, and Resource Management Plans, and contributing important information archaeological and interpretive information to adjacent parks and national forests.

Peterson, Christian [36] see Drennan, Robert

Peterson, Christian (University of Hawai'i at Manoa), Robert Drennan (University of Pittsburgh) and Adam Berrey (University of Pittsburgh)**[82] *Patterns of Household Refuse and Socioeconomic Differentiation: A Comparative Analysis***

Household garbage constitutes the most ubiquitous and least ambiguous class of information on Neolithic household activities, social standing, and economic well-being available to archaeologists. Unlike the short-lived symbolism of funerary ritual expressed in burials, or the celebration of individuals and institutions in monumental architecture, accumulated household garbage time-averages longitudinal patterns of domestic life. Remains from midden deposits are thus ideally suited to the comparative study of Neolithic social and economic differentiation. Compositional variation revealed through non-metric multidimensional scaling of artifact assemblage data is readily interpreted as evidence for qualitative differences between households. Different configurations of the constituent variables reflect differences in the social structure and underlying bases of differentiation in Neolithic communities. Comparing the average of the Euclidean distances used to produce each scaling provides a direct and quantitative means of assessing differences in the magnitude of household differentiation between cases. For cases where differences in economic well-being can be discerned between households, a Gini-like coefficient of wealth accumulation can be calculated from artifact assemblage data to explore this aspect of differentiation further. These measures are applied to household artifact assemblage data compiled for several different communities drawn from Neolithic societies around the world.

Peterson, John (University of Guam)**[238] *Islamic Trade and Entrepôts in the Second Millennium Philippines Archipelago***

The spread of Islamic influence throughout Island Southeast Asia and into the Philippines Archipelago was rapid and extremely effective in the second millennium A.D. This model of colonization utilized down-the-line and proxy trading through Taosug and Iranun raiders as well as by the establishment of entrepôts established through intermarriage and local exchange. Power flowing through horizontal networks cemented regional networks and exported an extensive power structure into an otherwise acephalous, dispersed, and disconnected lineage and socio-political structure. The Islamic imprint on the region linguistically, with terms for power such as *rajah* and *data*, into the region was enduring and highly successful in competition with hierarchical European models of colonization. Islamic nodal trade networks spread a distinctive material culture and cultural practices such as wet-rice agriculture that were rapidly adopted within two hundred years of the advent of Spanish settlements in the region and remain highly resilient and adaptive.

Peterson, Elizabeth (Simon Fraser University)

[245] *Changing Life Styles: New Lithic Finding from Small Sites in Casas Grades, Chihuahua Mexico*

This paper reports on findings from the analysis on lithic collections from several Medio period small sites uncovered during the 2013/2014 summer excavations in the Casas Grades region of Chihuahua Mexico. While prior excavations within the region have placed focus on the large and medium sized site types found throughout the region, the summer 2013/2014 excavations focused solely upon the small, lesser-understood sites in order to evaluate their relation both spatially and temporally to the rest of the area including the large site of Paquimé. Analysis of the lithic collections from the small sites has revealed changes within the lithic technology occurring from the middle to the end of the Medio period suggesting changes occurring with relation to the selecting of specific behavioral strategies tied to changes within the overall environment. Studying these differences may aid in revealing the role small sites played within the larger Casas Grades interaction sphere.

Peto, Akos [309] see Ball, Terry

Petraglia, Mike [33] see Shipton, Ceri

Petrie, Cameron [345] see Jones, Penny

Petrus, Joseph [140] see Hawkins, Alicia

Pett, Daniel [235] see Bonacchi, Chiara

Pevny, Charlotte (R. Christopher Goodwin & Associates, Inc.), William Barse (R. Christopher Goodwin & Associates, Inc.) and R. Christopher Goodwin (R. Christopher Goodwin & Associates, Inc.)

[275] *Late Pleistocene – Early Holocene Stratigraphic “Marker Horizons” in North Florida*

The recognition of chronologically synchronous paleosols along the Cody Scarp in north Florida reflects broad patterns of deposition, pedogenesis, weathering, and climatic stability at the Pleistocene – Holocene transition. These paleosols, or stratigraphic “marker horizons,” formed during rapid burial of A-horizons under mesic forest conditions. Marker horizons are best understood from the framework of genetic stratigraphy because they contain temporally diagnostic Early Archaic Bolen points. Since Florida notoriously lacks deeply stratified alluvial packages along major river drainages on the Atlantic Seaboard and west of the Appalachian Mountains, identifying chronologically specific horizons places relative sequences in Florida on firmer chronological ground.

Pezzarossi, Guido [76] see Escobar, Luisa

Pezzarossi, Guido (Syracuse University)

[108] *“Under the Volcano”: Assemblages, Causality, and Volcanic Matter at San Pedro Aguacatepeque, Guatemala*

The colonial Maya community of San Pedro Aguacatepeque, located in Pacific piedmont Guatemala, sits on the eastern flank of the Volcan de Fuego, a long-active stratovolcano. The interventions of new materialist approaches, in particular Bennett’s notion of the “vibrancy” and influence of nonhumans in the unfolding of history, are brought into relief when considering the abundant historical entanglements between the Volcan de Fuego and Aguacatepeque. The regular flows and bursts emanating from the Volcan afforded much (productive and destructive) for Maya populations drawn to settle at Aguacatepeque. The continual eruptions of the Volcan contributed to the emergence of a unique corridor linking coast and highlands, and a high altitude microclimate and well-drained soils amenable to cacao cultivation. In turn, the Volcan continued to play a critical role in structuring life and practice at Aguacatepeque. The influence of the Volcan and other nonhuman entities in the affairs of Aguacatepeque provides a compelling case for expanding attributions of historical causality at the community beyond humans. This paper focuses on the Volcan de Fuego,

its capacities, and its place within the assemblage of human and nonhuman actors and emergent effects that afforded Aguacatepeque's unique historical trajectory both before and after colonization.
[108] *Chair*

Pezzutti, Florencia [21] see Solinis-Casparius, Rodrigo

Pfaffenberger, Bryan (University of Virginia)

[241] *Discussant*

Pfau, Justin [300] see MacDonald, Douglas

Pfeiffer, Susan (University of Toronto), Judith C. Sealy (Department of Archaeology, University of Cape Town) and Ronald F. Williamson (Archaeological Services Inc, Toronto, Canada)

[372] *Temporal Trends in Reliance on Maize among Ancestral Huron-Wendat Villages, as Reflected in $\delta^{13}C$ from Human Enamel*

Following the entry of Zea mays to northeast North America, there are indications of human population growth, suggesting crop intensification. Isotopic values from bone collagen have been inconsistent with this hypothesis, showing temporal and regional fluctuations that have led to hypotheses of sporadic overreliance on this super-crop. Following Katzenberg's suggestion that intake of this carbohydrate should be measured through apatite rather than protein tissue, and with the permission of the Huron-Wendat Nation of Wendake, Quebec, we measured tooth enamel $\delta^{13}C$ from 167 permanent tooth crowns (most M1), retained after reburial of the skeletons. Enamel values encapsulate diet from early childhood (3 to 4 years of age). The teeth represent 16 ancestral Huron-Wendat sites in southern Ontario. Isotopic values show a gradual increase in reliance on maize from the 14th to 17th centuries, perhaps reflecting development of crop strains that were more reliable at higher latitudes. This pattern of $\delta^{13}C$ temporal enrichment is not apparent in bone collagen (n=56). Consumption of lake and river fish, known to have been important for these communities, likely complicates collagen $\delta^{13}C$ values.

[372] *Chair*

Phelps, Danielle (University of Arizona), Cristina Garcia-Moreno (Arizona State University) and James Watson (University of Arizona)

[189] *Selective Influence of West Mexico Cultural Traditions in the Onavas Valley, Sonora, Mexico*

Recent archaeological work at El Cementerio, a burial mound located in southeast Sonora, Mexico dated between A.D. 897 and 1635, has identified a local cultural tradition exhibiting selective influence from contemporaneous traditions in west Mexico. The vast majority of material culture reflects local manufacture and evolution, however, the presence of shell (from the Pacific Ocean) jewelry and the incorporation of biocultural practices of cranial deformation and dental modification suggest a link to populations further south in Sinaloa and Nayarit. Although the population of El Cementerio evolved within a local archaeological tradition, we consider the site to represent an example of the intense socio-cultural changes initiated around 700 A.D. and intensified during 900 A.D. in west Mexico. We also suggest that this population was actively managing their identity in response to these macro-regional influences by selectively adopting limited aspects of southern material culture practicing modification of their skulls and teeth.

Phillips, Cassidy (University of Alaska Fairbanks), Jamie Clark (University of Alaska Fairbanks), Lyn Wadley (University of the Witwatersrand) and Silje Bentsen (University of the Witwatersrand)

[7] *Exploring Fire Use at Sibudu Cave Using the Kernel Density Tool in ArcGIS*

This project utilized Geographic Information Systems (GIS) in an attempt to better understand fire use at the Middle Stone Age site of Sibudu Cave, South Africa. Our project focused on the Howiesons Poort deposits (HP; ~65-62 ka). Hand drawn maps of layers/features were digitized by S.

Bentsen; these maps were combined with faunal data from each feature and 50 x50 cm quadrant. Using the kernel density tool, density maps were created which allowed for an assessment of the relationship of calcined bone to hearth features. Initial results revealed that the highest frequencies of calcined bone were sometimes—but not always—in direct association with identified hearths. Furthermore, some hearths were associated with “cool” spots in which calcined bone was rare. The first result may suggest cleaning or sweeping of certain hearths, while the second finding suggests some hearths had a distinctive function in which bone was neither disposed in the fire nor used as fuel. Future work will incorporate additional artifact classes, potentially allowing for the identification of activity areas. We argue that the methods developed here may prove useful for exploring spatial organization at other sites excavated by traditional means (i.e., not subjected to 3D piece plotting).

Phillips, James and Ofer Bar-Yosef (Harvard University)

[40] *Terminal Pleistocene Foraging Societies in the Nile Valley*

This paper is concerned with interpreting the terminal Pleistocene foragers of the Nile River basin, dating between ca. 22,000 to 11,000 years BP. From Wadi Halfa at the Second Cataract, downriver to Qena, at least twelve archaeological traditions occupied and/or utilized the Nile River ecosystem, with subsistence strategies organized around the Nile floods, and the migration of migrating birds. Some settlement patterns within the confines of the Valley shifted seasonally, while others maintained large settlements for most of the year.

Phillips, James [40] see Bar-Yosef, Ofer

Phillips, Laura and Frances Charles (Lower Elwha Klallam Tribe)

[168] *A Regional Perspective on the Etched Stones at Tse-whit-zen*

More than 900 incised and painted pebbles were recovered from the Tse-whit-zen Site in Port Angeles WA, yet, few have been reported elsewhere in the Pacific Northwest region. Similar stones from two sites on the Canadian side of the Strait of Juan de Fuca were reported by an art historian, but no spatial or temporal data was provided. Anecdotal accounts by archaeologists indicate that some incised stones have been found elsewhere in the Salish Sea, but have not yet been reported in archaeological publications. This research attempts to track down these unique and elusive artifacts, then summarize their geographic and temporal distribution throughout the Salish Sea. The specific spatial and temporal distribution of the stones at Tse-whit-zen within the selected households and environmental events defined by the Tse-whit-zen Project will also be presented.

Phillips, Erin (University of Alabama)

[173] *The Associations Model for use of Hemphill-Style Engraved Pottery at Moundville*

This paper will examine one possible model for the use of pottery engraved in the Hemphill style at Moundville, the associations model. The Hemphill style is Moundville's local representational art style. The most commonly engraved themes in the style are winged serpents, crested birds, raptors, paired tails, center symbols and bands, and human trophies in the form of skulls, scalps, and the hand and eye design. It is suggested that these designs represent patron supernaturals relating to the sodalities that would have used this pottery in their rituals or events.

Phillips, Scott (SWCA), Norma Crumbley (SWCA Environmental Consultants) and Paul Burnett (SWCA Environmental Consultants)

[361] *Exploration of Wind as an Environmental Consideration for Campsite Selection at Holocene Dunes*

Cultural material-bearing sand dune deposits are common across the intermountain basins of southern Wyoming, dating from the region's Archaic through Late Prehistoric periods in particular. Investigations there have sought correlations between dune field occupations and plant processing activities in explaining the density of sites in these settings. The abundance of groundstone and fire-affected rock concentrations has led researchers to suggest that the unique plant communities associated with dunes made them favorable environments for food procurement and associated occupations. Our current research in this region, for the Chokecherry and Sierra Madre Wind Energy

Project, has added availability of modern wind-strength data to consider in relation to the positioning of archaeological sites in dune fields. Within our on-going research, here we explore the possibility that campsites at dunes in high wind areas could also represent the selection of more sheltered areas. This, combined with other evidence, such as that for plant processing activities, may have further implications for investigating seasonality of site and area use.

Pi, Teresa [399] see Straulino, Luisa

Picard, Jennifer (University of Wisconsin-Milwaukee) and Rachel McTavish (University of Wisconsin-Milwaukee)

[331] *Ecology, Culture, Conflict and Diet: Comparisons of Two Late Prehistoric Sites in Southeastern Wisconsin*

The late prehistoric landscape of Southeastern Wisconsin was characterized by the dynamic interaction of at least three distinct ceramic cultures. The Aztalan site (47JE001) has yielded both Late Woodland and Middle Mississippian vessels dating between A.D. 1000-1200, indicating a period of cultural coexistence. At the nearby Crescent Bay Hunt Club Site (47JE904), in the Lake Koshkonong locality, Upper Mississippian Oneota ceramics have been recovered; no indication of a coexistent occupation with other cultural groups is present at the site. Radiocarbon dates indicate overlapping occupations at Aztalan and the Lake Koshkonong locality. Recent paleoethnobotanical and zooarchaeological research suggests that differences in ceramic technology mirror differences in diet. Reasons for these differences are explored through an examination of site placement, ecology, intergroup conflict, identity, and larger regional connections.

Piccini, Angela (University of Bristol)

[297] *Archaeology's Moving Images*

Ruth Tringham belongs to a small group of archaeologists who engage seriously with the media practices through which archaeology disciplines itself. She has tirelessly worked to place audio-visual media – from film to networked media – at the heart of how we think about and do archaeology. In a 2009 paper about the UC Berkeley Archaeological Film Database, Tringham sought to move debate beyond reductive critiques of archaeological accuracy to explore how it is that we watch films about the past, how we use them in our teaching and in our research, how we create meaning, and how we watch critically. By introducing archaeologists to the key questions that structure narrative fiction and documentary, Tringham taught us that screen grammar (cinematography, sound, lighting, editing, mise-en-scène), aesthetics, narrative, production contexts, industry structures and audience all shape how archaeology becomes subject matter, practice, and discipline. Where Michael Shanks and Christopher Tilley called upon archaeologists to understand media manifestations as rhetorical performances rather than as representations (1992: 95), Tringham has given archaeologists the precise tools required to become reflexive, critical-creative practitioners. In this presentation, I consider Tringham's engagements with the 'liveness' of the moving image and with archaeology's diverse travels across our screens.

Picha, Paul (State Hist Soc of North Dakota) and Carl Falk (PaleoCultural Research Group)

[230] *Where Rivers Flow: Mandan and Hidatsa Subsistence Economies from an Archaeomalacological Perspective*

Three classes of molluscan data generated from Mandan and Hidatsa villages along Heart and Knife river drainages in North Dakota are reviewed: freshwater bivalve, marine, and fossil gastropod shell. An outline of Mandan and Hidatsa ethnomalacology obtained from native collaborators is found in the writings of anthropologists Gilbert L. Wilson and Alfred W. Bowers and corresponds with the aforementioned molluscan classes. Mandan and Hidatsa subsistence economies are diverse during the longue durée as indicated by the vertebrate and invertebrate faunal records reported to date. Mandan and Hidatsa traditions and ethnomalacology reflect contrasting long-term differences from that of neighboring Arikara villagers.

Picin, Andrea (Friedrich Schiller University of Jena)

[389] *Neanderthal Mobility in the Northeast of the Iberian Peninsula: The Patterns of Chert Exploitation at the Abric Romaní Rockshelter*

Understanding the changes in the technological organization of prehistoric hunter-gatherers is important to research into hominin foraging activities. During the Middle Paleolithic, the coexistence or the replacement between Levallois and discoid technologies has frequently been recorded, but there is still no clear understanding of the reasons for their alternating and fragmented use in the archaeological record. This paper aims to contribute new data to the current debate, by exploring the chert assemblages from Levels O and M of the Abric Romaní rockshelter. The technological analysis reveals a change in the flake production from Levallois in Level O to discoid in Level M. This modification in Neanderthals technical behavior is accompanied by the use of different axes of mobility, a reduction in the foraging radius and a more careful management of raw materials. A cross comparison with other archaeological evidence indicates a similar pattern in the northeast of the Iberian Peninsula during the late Middle Paleolithic.

Pickard, Catriona [40] see Bonsall, Clive

Pierce, Wendy and Gary Scholze (Caltrans)

[41] *Native Irrigation in Owens Valley: The 2000 Year Back-Story*

Owens Valley is unique in that the Native Paiute were recorded as using irrigation to promote growth of certain crops such as taboose, *Cyperus esculentus*. This paper looks at the archaeological occurrence of the taboose tuber and other archaeobotanical remains in Owens Valley to explore the issue of whether Native irrigation would have made sense for this hunter-gatherer group. For roughly the last 2000 years of prehistory the Owens Valley archaeological record shows a cycle of alternating successful subsistence adaptations and population growth with each shift in subsistence denoting more labor input resulting in higher yields or outputs. It is argued based on well documented patterns from the archaeobotanical record, that irrigation would have been a logical step in the intensification cycle prior to disruption by Euroamerican contact.

Pierce, Karen (University of Colorado/Denver), Claude Belanger (Lamanai Archaeology Project) and Elizabeth Graham (University College London, Institute of Archaeology)

[147] *Recent Excavations in the 'Ottawa' Plaza N10[3] Palace Group at Lamanai*

Individual structures of the 'Ottawa' Plaza N10[3] Palace Group at Lamanai have been the focus of excavation at various times since Pendergast's first investigations there in 1981. The time of inception of construction remains unknown, but the group is notable in that its structures were altered, added to, and occupied into the Early Postclassic period. Recent excavations of Str. N10-15 have yielded information on a flurry of activity in the Late and Terminal Classic. Results will be discussed in terms of what we are learning about the kinds of adjustments, adaptations, and changes that occurred at Lamanai from the Classic to the Postclassic period.

Pierce, Daniel (University of Missouri-Columbia)

[189] *Preliminary Results on Regional Postclassic Aztlán Obsidian Usage Patterns*

The usage and trade of obsidian from various sources is well established during the Postclassic in West Mexico. Different qualitatively similar obsidian sources were used in different ways within sites, which suggests preferences for certain sources over others for different types of reduction. No studies, however, have explored this differential usage regionally. Here, I have macroscopically and microscopically analyzed collections from three Aztlán regional centers in Nayarit: Coamiles, San Felipe Aztlán, and Amapa. The results are preliminary, pending further analysis on lithics from broader excavations within these centers. However, the large sample size for each of these sites is sufficient to make broad generalizations despite incomplete excavations. These results are also complimented by the inclusion of selective data from various smaller sites. In this study, I identify differences in how obsidian sources were used within and among sites. Results indicate that while some sites used substantial amounts of distantly traded obsidian, others favored locally produced blades. Further, there are marked differences in how these sources were used within the sites. All artifacts considered in this project were sourced using portable XRF technology in Nayarit, Mexico in

the summer of 2014 and analyzed at the University of Missouri Research Reactor

Pierce, Madison [309] see Ball, Terry

Pierson, Michele [245] see Rakita, Gordon

Pierson, Nancy Kay [10] see Lugo Mendez, Anastasia

Pikirayi, Innocent

[285] *Fortifications in Mukaranga, Northern Zimbabwe (1600-1700 A.D.): A Socio-Political Perspective*

Portuguese written sources mention 'great stone buildings' including state capitals, fortified hilltops and trading centers in their accounts of the Kingdom of 'Monomotapa' (Mutapa State) in northern Zimbabwe in the late 16th and 17th centuries. On the one hand, feiras, the trading centers frequented by the Portuguese, served primarily commercial functions, and only fortified themselves when confronted with external military threats. On the other, the monumental, stone-built structures sited on hills and mountains in the area between the Mazowe and Ruya valleys – a region also referred to in written sources as Mukaranga, the original heartland of the Mutapa State – seem to have been constructed by rebels who disrupted the feira trade. The archaeological evidence from these fortifications suggest these structures served more than defensive purposes, playing critical social and political roles that subsequently replaced a well-established state system in the region.

Pilaar Birch, Suzanne [322] see Hassett, Brenna

Pilaar Birch, Suzanne (University of Georgia)

[377] *Multispecies Archaeology*

This paper discusses ecological novelty in the archaeological record from a multispecies perspective. Pivotal research topics in archaeology have long simplified these novelties into transitions that emphasize the uniqueness of the human species. Though views have evolved from completely anthropocentric perspectives in archaeology and natural history in the 19th and 20th centuries, there is still a pervasive sense of progressivism when we center our points of inquiry on human originality. To some extent, the very debate surrounding the creation of the "Anthropocene" belies a paradigm wherein humanity is gaining importance as a central object of inquiry. In the parallel—but in practice, often separate—field of paleoecology, scientists have worked to understand a "natural" past, often to the point of excluding the role of the human, or viewing it as a disruptive element. These disparate foci create and reinforce an artificial boundary between humans and the natural world of which they are an integral part. A multispecies archaeology can really be viewed as archaeo-ecology, which understands the past through networks and interactions rather than stochastic events and places. As "multispecies ethnography" gains ground in anthropology, this paper questions what a wider consideration of life might play within archaeology.

[377] *Chair*

Pilles, Peter J. [277] see Spurr, Kimberly

Pilles, Peter and Kimberly Spurr (Museum of Northern Arizona)

[277] *The Sinagua and the Western Pueblo Tradition: Perspectives from Material Culture and Burial Practices*

The highland country of central Arizona has historically been interpreted as a region peripheral to the more dominant Hohokam, Kayenta, and Mogollon traditions that surrounded it. However, peripheries are defined by one's perception of where the center is located. Our case in point is the prehistoric Sinagua, which has been the subject of a five-year long study and documentation of more than 1500 human remains and 4000 funerary objects that have been repatriated to the Hopi Tribe by

the Coconino National Forest, as required by the Native American Graves Protection and Repatriation Act. These remains span the entire history of the Sinagua, from about A.D. 600 to 1400, and we believe they demonstrate a developmental trajectory that merges into the Western Pueblo and its ancestral Hopi groups. Ceramic styles, technologies, iconography, unique artifacts, and burial customs suggest the Sinagua were part of a larger cultural pattern, a Central Arizona Tradition, that, although populated by different social groups, maintained a distinctiveness that is reflected by its relationships with surrounding cultural groups through time - relationships that appear to come together with a coalescence that is evident at the sites of Nuvakwewtaqa, in Chavez Pass.

Pinilla, José [187] see Hurtubise, Jenna

Pink, Jeremias (Oregon State University)

[216] *Rural Craft Production and Market Participation in Late Classic Oaxaca: A Case Study from Yaasuchi*

Many models of the Zapotec economy during the Classic Period (A.D. 200 – 850) have relied on an assumption of mutual dependence between rural farmers and urban craft specialists, yet little research has focused explicitly on the economic behavior of rural households. To address this assumption, over 300 archaeological ceramics from the rural site of Yaasuchi - including samples from two domestic structures and a ceramic firing feature - were characterized via INAA to establish provenance. Results of these analyses show that 90% of Yaasuchi ceramics were produced on site and exchanged between households, while 10% were imported from nearby centers. The lower status household relied primarily on domestic production, but also engaged in ceramic production for intra-site and regional exchange. In contrast, the higher status household acquired the majority of ceramics from other households within the community and imported ceramics from fewer sources. Yaasuchi households were thus neither dependent on exchange in urban centers for access to ceramics, nor isolated from the regional economy. Rather, households employed a range of economic strategies to fulfill domestic needs, including craft production for exchange, both within the community and in regional markets.

[216] *Chair*

Pino, Mariela [409] see Parcerio-Oubiña, César

Pintar, Elizabeth (Austin Comm. College), Nora Franco (CONICET- Universidad de Buenos Aires) and Jorge G. Martínez (ISES- Universidad Nacional de Tucumán)

[215] *The Exploration and Colonization of Two Southern Deserts: Case Studies from the Puna and Patagonia*

The peopling of South America is a subject that has been discussed from many angles, including timing, migration routes, genetics, among others, and at various scales of analysis. In this paper we take on a supra-regional scale of analysis and examine stone tool assemblages from a series of Pleistocene/Holocene transition and Early-Middle Holocene sites located in two desert areas on the eastern side of the Andes –Patagonia and the high Puna. Our objective is to assess how these lithic assemblages match up to the expectations of an exploration and colonization model proposed for Patagonia. Information on raw material provenance is used in order to assess changes in human behavior through time. The comparison between both regions allows us to examine how this process might have varied in these two similar but yet different regions of the Southern Cone, and to offer explanations about how the exploration and colonization strategies used by early hunter-gatherers in desert environments varied in relation to their knowledge of the resource structure and the distribution of resources.

Pinto, Lourenco (Rock Art Research Institute, University of Witwatersrand)

[149] *Understanding Variation: Stylistic Ethnographic Analysis of Rock Art from the Makgabeng Plateau, Limpopo Province, South Africa*

The use of style is in its infancy in southern African rock art studies with work on style originating with broad generalizations which linked modes of subsistence, material culture and lifeways to style.

Recent studies have focused on regional art traditions. The author presents a research case study that advocated for the use of style as praxis. Looking at specific depictions of cross-cultural motifs from the Makgabeng plateau, South Africa, this paper explores the intricate spatio-temporal background that foregrounds the art-making process. Much of the interpretation of Makgabeng's rock art has drawn upon the shamanistic explanation. However, the research in this area has provided an array of cross-cultural motifs shared by many different identities and functions, which cannot be explained by the shamanistic explanation alone. This stylistic approach using embodiment theory aims to acquire deeper insight into the intricacies behind rock art variation and the choices taken during the image-making process within Khoekhoe and Bushmen rock art traditions. The concern with choices in the production of art provides important information regarding identity, function, and social context of a particular art object. This coupled with relevant ethnographic analogies could further explain spatial and temporal variation amongst past and present peoples.

Piombino-Mascoli, Dario [299] see Nystrom, Kenneth

Piperno, Dolores [170] see Martin, Juan

Piperno, Dolores (Smithsonian National Museum of Natural History)

[226] *Some Comments on Present and Future Contributions of Paleoethnobotany in the Neotropics*

Paleoethnobotanical research the past two decades from around the world makes it clear that multi-proxy data including from genetic and paleoecological approaches are necessary for understanding plant exploitation, domestication, and spread of agriculture. Recently, bio-archaeologists using such kinds of multidisciplinary endeavors have come to understand that addressing prehistory is also relevant to understanding species adaptation and survival in future environments. This paper discusses these issues and highlights some potentially productive areas of future Neotropical research.

Piqueras, Ricardo [170] see Mendizabal, Tomas

Piscitelli, Matthew (The Field Museum)

[22] *Issues of Function and Scale as Viewed through Possible Ritual Structures at the Late Archaic Site of Huaricanga, Peru*

Throughout the Late Archaic Period (3000-1800 B.C.) communities along the north-central coast of Peru witnessed a dramatic increase in the material manifestations of ritual performance. During this time, the earliest monumental ceremonial architecture in South America was constructed at over 30 sites between the Huaura and Fortaleza River valleys in a region known as the Norte Chico. While considerable archaeological research has been conducted on the large-scale platform mounds and sunken circular plazas, little attention has been given to the small-scale ceremonial buildings distributed among the monumental structures. The emphasis on the impressive monumental buildings has also overshadowed our understanding of household archaeology during this time period. Therefore, some basic anthropological questions are still largely unanswered for the Late Archaic Period in the Norte Chico region: Where did people at these sites live? Did the small-scale structures serve ceremonial or domestic functions, or perhaps a combination of the two? What does the difference in scale between the smaller buildings and the monumental platform mounds and plazas suggest about the role of ritual in the emergence of complex societies? This paper addresses these questions using recent results from innovative, multi-disciplinary research conducted at the Late Archaic site of Huaricanga.

Pitblado, Bonnie (University of Oklahoma)

[223] *Moderator*

[329] *Discussant*

[300] *Chair*

Pitblado, Bonnie L. [300] see Ankele, William

Pitezel, Todd (University of Arizona) and Michael Searcy (Brigham Young University)

[245] *Recent Explorations for Casas Grandes Viejo Period Settlement*

Much is known about political, social, economic, and ritual organization during the Casas Grandes Medio period (ca. A.D. 1200-1450). A looming question is, What are the roots of the Medio period? The preceding Viejo period, assumed to begin around A.D. 500, is poorly understood because so little work has been conducted at Viejo sites, and few sites from this time period are known. We recently conducted reconnaissance and systematic survey north and south of the Medio capital settlement of Paquimé and identified six previously unrecorded sites. We present the characteristics of each site, including a ground stone quarry, and how they fit into our anticipated long-term research program focused on the Viejo period and the roots of the Medio period.

Pitt, Fiona [201] see Hurcombe, Linda

Pittman, Lydia (New Mexico State University)

[274] *A Study of Miniature Pottery Vessels in the Mimbres Region*

What role did miniature vessels play in the lives of pit house and pueblo peoples of the ancient American Southwest? Were they toys? Were they ritual? What is the evidence of their uses? To begin answering these questions I have compiled data to explore the contexts of miniature vessels. This poster explores a case study of Mogollon sites (A.D. 200-1450) from Southwestern New Mexico. In this poster I will discuss traces of the life histories of miniature vessels including where they are found (e.g., floors, burials, fill), their relative frequencies, their associations with other artifacts and differences in their formal properties (surface treatment, shapes, paste).

Plank, Shannon [183] see Welch, Jacob

Plank, Shannon [24] see Kidder, Barry

Plannette, Carol

[27] *It Takes a Village to Curate Burro Flats*

Nestled in the hills of Simi Valley at what is known as the "old" Rocketdyne site and where NASA conducted testing for the Airspace program, is the sacred site of Burro Flats. Considered to be a ceremonial site with evidence of astronomical alignments, Burro Flats carries important meaning for some of the tribes of Southern California, primarily the Chumash and other local communities such as the Fernandeno and the Gabrielino/Tongva. Mainly known for its' painted cave drawings associated with the winter and summer solstices, Burro Flats is also the source of a diverse archaeological assemblage. Originally housed as a complete collection in the mid to late 1950s, this assemblage was later split in the 1980s and only recently reintegrated as a complete collection under the auspice of the Autry National Center of the American West. Through collaboration with public and private sectors, as well as institutional and academic branches, the Autry museum has created opportunities allowing students to assist with the reincorporation of the artifacts while working towards a solution for the curation crisis.

Plaskett, Dave [360] see Kielhofer, Jennifer

Plourde, Aimee (University of Sheffield) and Elizabeth Arkush (University of Pittsburgh)

[14] *The Role of Highland-Lowland Interaction in Political Development: A View from the Hilltop*

Fort Site Ayawiri, in the Andean Highlands of Peru

The florescence of the precolumbian Andean cultural sphere presents a classic, almost trite counter example to the development of highland-lowland relations seen in other areas. Far from marginal, the highlands are where the Inca empire emerged, following the earlier Wari and Tiwanaku states. However, highland-lowland relations were complex and varied; urban societies also developed independently on the Pacific coast, while eastern Amazonian lowlands were often cast as marginal and 'difficult'. Investigation of the pre-Inka site Ayawiri in the South-Central Andean highlands provides some insight into the changing nature of highland-lowland interaction. Ayawiri was a regional center in the northern Lake Titicaca Basin during the Late Intermediate Period (A.D. 1000-1450), a period characterized by conflict and a fragmented, fluid political landscape. Somewhat counter-intuitively, interregional contacts were maintained and continued to play a vital role in political and economic organization. Analyses of excavated assemblages (lithic, metal and faunal) suggest that residents' participation in interregional trade critically contributed to its rise as a regional center. At the same time, they appear to have rejected previously wide-spread ideologies of status and power seen in the Tiwanaku and Upper Formative periods, suggesting that the nature of interregional interaction and trade may have changed substantially.

Pluckhahn, Thomas [26] see Perez Rodriguez, Veronica

Pluckhahn, Thomas (University South Florida) and Victor Thompson (University of Georgia)**[26] *Early Village Societies in the American South and Beyond***

From his early work on social evolution in Mesoamerica to his more recent macrohistory of coalescent societies, Steve Kowalewski has epitomized the big picture approach to anthropological archaeology. Taking a cue from the latter body of work, as well as the recent overview of the topic by Bandy and Fox, we work toward a macrohistory of early village societies. Building from recent work at the Crystal River site (8CI1) on Florida's west central Gulf Coast, we look to commonalities in early village societies elsewhere in the American South and more broadly.

Plumlee, R. Scott [225] see Loendorf, Chris

Plunket, Patricia [303] see Uruñuela, Gabriela

Pluskowski, Aleksander (Department of Archaeology, University of Reading), Alexander Brown (Department of Archaeology, University of Reading), Rowena Banerjee (Department of Archaeology, University of Reading), Krish Seetah (Department of Anthropology, Stanford University) and Daniel Makowiecki (Institute of Archaeology, UMK)**[288] *Transforming Frontiers into Heartlands: The Immediate and Long-Term Environmental Impact of the Crusades in NE Europe***

In the 13th century, crusading armies unleashed a relentless holy war against indigenous non-Christian societies in the eastern Baltic region. Tribal territories were replaced with new Christian states run by the Teutonic Order and individual bishops, who constructed castles, encouraged colonists, developed towns and introduced Christianity. At a time of deteriorating climate, their impact on the local environment, especially plants and animals, would have been profound. Furthermore, since many aspects of the natural world were sacred to the Baltic tribes, this impact would be synonymous with the cultural changes that created a new world - a European world - at this frontier of Christendom. The Ecology of Crusading project has been investigating this impact from diverse perspectives with interdisciplinary objectives. Focusing on a suite of environmental data associated with castles built by the conquering theocratic elite in Prussia and Livonia - the centers of landscape re-organization following the crusades - the project has contextualized the role of the crusades within the ecological history of NE Europe. It has been possible to trace intensities in environmental exploitation associated with multiple waves of colonization, as well as uses of the landscape tailored to the practical and ideological requirements of the conquerors.

Poehler, Eric**[59]** *From Invention to Methodology: The Overlooked "DIY" in Everyday Archaeology*

Archaeology has always been "DIY". It has borrowed nearly all of its physical tools and many of its intellectual instruments as well. In this still new, 21st century realm of digital archaeology our implements look different, but their basic implementation does not. From the shovel to the computer, from the trowel to the database, from the paintbrush to the paint program, archaeology has had to teach itself how to adapt an object - physical or digital - to the needs of the discipline. Using the experience of one deeply digitally invested research project, the Pompeii Quadriporticus Project, this paper explores this overlooked world of DIY in archaeology. At issue are the risks and rewards enmeshed in the many strategies available to any project starting today: the investment in building your own infrastructure, the compromises of cobbling together resources ready-made for other purposes, and the costs in personnel and training. Yet these issues only address one part of ubiquitous DIY in archaeology, the design and creation of a conceptual, if sometime tested, framework. Fieldwork has always been where concept and reality collide, and it offers (requires) yet another moment of DIY adaptation.

[5] *Discussant*

Poehler, Eric [59] see Crowther, Benjamin

Pohl, John (UCLA)**[81]** *Precolumbian Exchange Systems and the Colonization of Northern New Spain*

Traditionally, the colonization of Spain's northern frontier is studied as a uniquely 16th through 18th century enterprise. This paper will describe how this process of expansionism was informed by existing indigenous trade networks that linked bands, tribes, chiefdoms and states into mutual systems of exchange extending from the mouth of the Colorado river to coastal Oaxaca. In so doing, the role of indigenous peoples of southern Mexico as both settlers and mediators between the Spanish Crown and the Pueblo peoples will be examined.

[39] *Discussant*

Pohl, John [259] see Knab, Timothy

Poirier, Marcela (Purdue University) and Kevin Vaughn (Purdue University)**[31]** *Compositional Analysis of Ceramics from the Las Trancas Valley, Nasca, Perú*

In this paper we address the results of an Instrumental Neutron Activation Analysis (INAA) on a sample of sherds from Santa Luisa and Higosñoc, two Las Trancas Valley sites from the Southern Nasca Region (SNR), Perú. By sampling sherds dating from the Early to the Late Horizon, this study adds temporal depth to previous compositional work in the region. While results confirm previous analysis conducted in the SNR suggesting compositional uniformity during Early Nasca, results also reveal compositional uniformity through time beginning in the Early Intermediate period (EIP) as well. We hypothesize this pattern is the result of a technological tradition developed during the beginning of the EIP that correlated with major sociopolitical changes taking place in the SNR.

Pokotylo, David (University of British Columbia)**[188]** *Public Perceptions of Archaeology and Its Impact on Archaeological Resource Preservation: A Case Study from Western Canada*

Although archaeologists acknowledge a legal and ethical responsibility to engage the public, the level of public appreciation and knowledge of archaeology and attitudes toward heritage preservation still remain poorly understood. A handful of past social surveys in North America and Europe give an initial perspective of public opinion on archaeological heritage preservation and its role in contemporary society. Given recent digital advances in public access to information and forums for communication, more research is needed that revisits and extends the scope of these studies to better understand today's public and the challenges of engaging them. Using a case study from

western Canada, this paper analyses individual responses to online news articles on archaeological heritage preservation to monitor public perceptions of the role of archaeological preservation in contemporary society and its economic implications. These results are then compared to the baseline from past surveys to assess current public support of archaeological preservation policies.

Politis, Gustavo (INCUAPA-CONICET, Argentina)

[135] *Myths about the Tropical Rainforest Hunter-Gatherers: A Reappraisal from South America*

Twenty years ago the Foraging Spectrum highlighted the variability in forager behavior around the world and generated several models to reconstruct the lifeways of these kinds of societies in the past. However, contemporary tropical rainforest hunter-gatherers of South America are still underrepresented in the current debate and they are rarely used as a source of analogy to interpret prehistoric foragers. This is partially due to the existence of several myths about them that still persist in the archaeological scenario. These myths are: a) most contemporary hunter-gatherers from the South American tropical rainforest were horticulturists in the past. Therefore, they are the result of a sort of cultural “regression “, b) edible resources in the tropical rainforest are scarce and difficult to obtain, and c) related to this, viable hunter-gatherers populations in tropical rainforests are extremely difficult to maintain without the contribution of domesticated plants. In this presentation these myths will be challenged with the information obtained among contemporary hunter-gatherers from this kind of forest (nukak, hoti, awá, etc.) and their potential for interpreting prehistoric hunter-gatherers will be discussed.

Politis, Gustavo [250] see Gutierrez, Maria

Polk, Michael (Sagebrush Consultants)

[160] *Discussant*

Pollack, Rebecca (Aptos Middle School) and Jules McKnight (Presidio of San Francisco)

[236] *Project Archaeology in the Classroom: Aptos Middle School and the Presidio*

What happens when teachers and students engage with project archaeology curriculum materials in the classroom ? What happens when students investigate archaeological and historical sites using the process archaeological inquiry? Critical thinking, inquiry, and interdisciplinary investigation are the hall marks of Project Archaeology curriculum material. Students at Aptos Middle School in San Francisco learned archaeological inquiry in their classroom and applied it to a real archaeological site. Students and their teacher will report the results in their adventures in archaeology.

Pollard, Mark [49] see Lee, Cheng-Yi

Pollard, Helen (Michigan State University)

[194] *Nahua Merchants in a Tarascan World*

A major enemy of the Aztecs during the Late Postclassic Period, the Tarascan State nevertheless exchanged key commodities within the Mesoamerican world by means of markets, local and long-distance traders, and gift exchange. Sixteenth century documents known since the 19th c have indicated that Nahua merchants exchanged goods with Purepecha merchants at major Tarascan fortified frontier settlements such as Taximaroa. However new research on recently translated documents and new archaeological analysis indicates more direct, complex, and significant economic exchange that affected the political economies of both of these polities.

Polyukhovych, Yuriy [191] see Scholnick, Jonathan

Pompei, Paz [91] see Salgán, Laura

Pontón, Nydia I. [394] see Farnsworth, Paul

Pool, Christopher (University of Kentucky) and Michael Loughlin (University of Kentucky)

[151] *Transisthmian Ties: Epi-Olmec and Izapan Interaction*

Beginning with Matthew Stirling, who in 1943 opined that "Izapa appears to be much more closely related to the earth-mound sites of southern Veracruz ... than it does with sites in the Maya area," scholars have postulated ties of varying strength between Late Formative polities on either side of the Isthmus of Tehuantepec. Ceramic similarities have been noted between southern Chiapas and the Gulf Coast, but discussion of Late Formative transisthmian interaction has focused primarily on sculptural similarities between Izapa and sites of the lower Papaloapan basin, especially including Tres Zapotes. Indeed, Michael Coe suggested that the Izapan art style may have originated on the Gulf Coast rather than on the Pacific slope. In this paper we re-examine Late Formative interaction between Izapa and Epi-Olmec polities with an expanded data set based on recent iconographic studies and archaeological investigations in and around Tres Zapotes.

Pool, Michael (Austin Community College)

[274] *A Chronological and Functional Analysis of Pottery from the HO-Bar Site: A Mogollon Early Pithouse Period Site in West-Central New Mexico*

Pottery is thought to have been introduced into the Mogollon region sometime between A.D. 1 and A.D. 500, probably closer to A.D. 500 than A.D. 1. Dating of the HO-Bar Site and the paucity of ceramics suggest these ceramics are some of the earliest ceramics of the Mogollon Early Pithouse period. A geoarchaeological analysis of the site indicates a main occupation between 200 B.C. and A.D. 200. Typological and functional analyses of 355 sherds and 26 rims from the excavation of approximately 30 cubic meters are used to examine the implications of this set of ceramics for the chronological placement and range of functions of these ceramics.

Pool, Kelly (Metcalf Archaeological Consultants, Inc.)

[282] *Ruins and Restoration on the Colorado Plateau: Earl Morris and the PWA (Public Works Administration)*

In 1934, the Carnegie Institution "loaned" archaeologist Earl Morris to the National Park Service to supervise the repair of ruins in Mesa Verde National Park, Colorado, and Aztec Ruins National Monument, New Mexico. The NPS had received funding in 1933 for long-term development projects through New Deal emergency work relief programs, one of which was the Public Works Administration. The PWA provided money for physical improvements in parks and monuments, including funding for restoration and stabilization of prehistoric ruins. Morris was recommended for the job as an acknowledged expert, with previous reconstruction experience at sites such as Chichen Itza and Canyon de Chelly's Mummy Cave. With the help of unemployed locals, Native Americans, and experienced fieldhands, Morris reconstructed the Great Kiva he had excavated a decade earlier at Aztec and stabilized the Mesa Verde ruins, most notably Cliff Palace. Morris' work served as a model for future projects, and a permanent MVNP stabilization team headed by PWA foreman Al Lancaster grew out of this work. After the PWA, other New Deal programs such as the CCC continued to undertake stabilization projects in these and other Colorado Plateau parks and monuments.

Popa, Alexandru [199] see Davenport, Bryce

Pope, Melody [43] see Reetz, Elizabeth

Popenoe Hatch, Marion (National Archaeological Park Tak'alik Ab'aj) and Matilde Ivic de Monterroso (University del Valle)

[242] *Smoke Signals: Interpretations*

This paper compares expressions of ritualistic concepts that can be found on images on censers and on other artistic creations, including monuments and documents. The research concentrates on Late

Preclassic and Early Classic developments in the Guatemalan South Coast and Highlands but also uses relevant information from other areas. One of the objectives is to trace continuities and changes in forms of rituals and the manner in which individuals participated in them. It is found that contrasting attitudes can be recognized between regional populations. The idea is tested at Takalik Abaj.

Popescu, Gabriel (SHESC, Arizona State University)

[389] *Assemblage Formation and Paleolithic Variability in the Middle Prut Valley Region (Romania)*

The research I will report in my paper has two main goals. The first is to learn something of the behavior of the hominids responsible for the production and accumulation of the Middle and Early Upper Paleolithic assemblages at two multistratified sites in NE Romania, Middle Prut Valley region (Ripiceni-Izvor and Mitoc-Malu Galben). The second goal is methodologically related. Paleolithic assemblages recovered from the archaeological record are mostly interpreted as "typical" expressions of cultural identity. Yet assemblages are also a product of formation processes, they accumulated over varying time spans, with various artifacts combinations and discard rates, and represents therefore the context of complex relationships, as opposed to essentialist view of static types. The excavation methods used at those two sites provide us with the opportunity to examine the assemblage formation by focusing on differential rates of deposition, of the whole assemblages rather than relative frequencies. As shown in several recent studies, this will allow us to understand how the characteristics of the conventionally defined assemblages have evolved during the long occupational histories of those two sites.

Popp, Brian (University of Hawaii), Jarman Jarman (University of Bristol), Hilary Close (University of Hawaii), Thomas Larsen (Christian-Albrechts-University of Kiel) and Terry Hunt (University of Oregon)

[191] *Why Terrestrial Diets in Island Environments? Evolutionary Considerations of Isotopic Results from Rapa Nui*

Archaeology and isotopic studies have demonstrated several examples of initial colonists of Pacific Islands subsisting mainly on terrestrial diets, with exotic domesticates preferred over local seafood. Seemingly a poor adaptation to remote island environments, this appears confusing from a behavioral ecology perspective. From a culture evolutionary viewpoint, however, this could demonstrate how intergenerational transmission of human behavior may preserve dietary traditions in long-distance migration into vastly different environments. Here this hypothesis is explored through high resolution isotopic evidence from Rapa Nui. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ compound specific analysis of individual amino acids from human and faunal remains, and a range of reference food items, confirms that seafood was not a significant component of early Rapa Nui diet. Additionally, rat collagen amino acid isotope values provide a baseline to test the hypothesis of human diets based largely on rats and chickens, and to investigate effects of environmental change on Rapa Nui. Consumption of palm nuts by introduced Pacific rats has been proposed as playing a role in deforestation. Multivariate statistical analysis of amino acid data investigates this, and whether palm nuts may have been a component of human diets too. This presentation situates the updated results within the broader evolutionary questions.

Porter, Samantha [94] see Magnani, Matthew

Porter, Samantha (University of Minnesota)

[121] *A Portable Photogrammetry Rig for the Reliable Creation of High-Quality 3D Artifact Models in the Field*

3D modeling is becoming an increasingly utilized tool in archaeology. Currently, there are three principal ways of obtaining 3D models of objects: laser scanning, white light scanning, and photogrammetry. Photogrammetry is becoming increasingly popular since it is relatively inexpensive, mobile, and requires less equipment that has the possibility of malfunctioning. This poster presents a photogrammetry rig consisting of materials that can be obtained easily in the US. These include a kitchen turntable (lazy susan), 12" x 12" interlocking foam tiles, laminated mm paper to act as a

scale, a black velvet background, and a camera and tripod. In addition, the use of rechargeable battery-powered LED lights means the rig can even be used in areas without direct access to electricity. Tips on taking photos (camera settings, etc.) are provided, along with explanations of ways to streamline and optimize photo and model processing using software including Adobe Photoshop / Gimp, Agisoft PhotoScan, and Meshlab / Geomagic. Limitations of this system, such as object size and raw material, are also discussed in the context of alternative scanning-based systems. Although this system may be used on a wide variety of artifact types, here particular emphasis is given to the modeling of lithic artifacts.

Portillo, Marta (University of Barcelona)

[309] *Chair*

Portillo Ramirez, Marta [309] see Clifton, Breanne

Ports, Kyle [248] see Kieffer, C. L.

Ports, Kyle (Texas Tech University), C.L. Kieffer (University of New Mexico), Marisol Cortes-Rincon (Humboldt State University) and Rissa Trachman (Elon University)

[266] *Small Sacred Spaces: The Results of Investigations into Subterranean Features at N950 and Grupo Agua Lluvia in northwest Belize.*

This paper explores the ways in which the Maya conceptualized subterranean features as sacred landscapes within the Three Rivers Region in northwest Belize. Contemporary archaeological investigations have suggested that large cave systems served as important locations for rituals. The ubiquity of these features to the Maya indicates that these concepts of sacred space may have extended to regions and sites without naturally forming caves. This research focuses on the utilization of small subterranean features located at two sites on the periphery of Dos Hombres. Grupo Agua Lluvia, situated approximately 1.7 km west of Dos Hombres and N950, positioned 1 km north of the site center. This paper will present interpretations using artifact and spatial analysis to determine the role in which these small features were utilized at both sites. Additionally, a comparative analysis of the features that were investigated will provide a greater understanding into how these features were used and incorporated while emphasizing evidence for ritual activity. Investigations into these features will assist in the understanding of the complexity of ancient Maya conception of cultural landscapes.

Posadas Vidales, Lylliam (University of California, Los Angeles)

[311] *We Want In on This: Contemporary Queer Archaeology and the Preservation of Queer Cultural History*

This research will address how contemporary archaeology can be used to explore notions of identity, gender expression and self-determination, community belonging, and the value of queer cultural heritage, with an emphasis on the experiences and engagement of queer and trans youth. Queer and trans youth are organizing in their schools and communities to create change that affects their lives and the lives of their friends and families. They are creating new language for queer and trans identities and gender expressions that better fit them, and are using new technologies in innovative ways to connect with each other and share information about what it means to be queer and trans today. This research uses contemporary archaeology to engage queer young people in exploring and reflecting on cultural heritage as it pertains to queer history and culture and their own place within it. It uses the perspectives of queer and trans youth to address questions on the curation of queer archives and collections and capacity-building for organizations that house and support these collections by emphasizing the needs and interests of queer and trans youth.

Poston, Victoria

[193] *Architecture and the Subjective Experience*

Architecture shapes the subjective experience of those living in it as well as those simply interacting

with it. The Maya continuously changed their environments to fit their needs and desires, thus these spaces mirror their everyday practices. This paper compares the overall architectural arrangement of Xultun to other Classic Period Lowland Maya urban centers, such as Tikal and Palenque, to determine how the reciprocal relationship between urban populations and their built environments reflect cultural interaction and human experience more broadly.

Poteate, Aaron [52] see Thompson, Adam

Poteate, Aaron (University of Oregon)

[105] *Marginalization of the Margins: The Importance of Smaller Islands in Human Prehistory*

Across the world's seas and oceans, archaeological research focused on islands has traditionally privileged those which are larger in size. Myriad reasons can explain this phenomenon, ranging from the (mis)perception by scholars that prehistoric peoples would have been attracted to the greater number and diversity of resources typically available on larger islands, to the ephemeral aspect of archaeological evidence on smaller land areas along with issues that archaeologists face in terms of logistics and infrastructure that limit access to labor, equipment, and transportation to conduct field activities (e.g., remote atolls in the Pacific). An increasing amount of research, however, is demonstrating that peoples in the past readily occupied and/or accessed the smallest of islands for both terrestrial and marine resources. In some instances, evidence shows an earlier occupation on smaller islands within an archipelago versus larger ones, or an attraction to the former given unique or seasonal resource availability and/or defensive capabilities. In this paper, we describe cases from major aquatic regions around the world which highlight the importance that small islands—defined conservatively as those around or under 100 square km in area—have for understanding long-term human adaptations in what many have considered to be the most marginal of environments.

[105] *Chair*

Potrebica, Hrvoje (University of Zagreb, Department of Archaeology)

[177] *Hillforts of the Eastern Hallstatt Circle. Central Places, Fortified Areas or Something Else?*

One of the most prominent landscape features of the Hallstatt Culture that more or less stands for the Early Iron Age of Central Europe are hillforts. They are usually located on prominent spots on the landscape and are surrounded by some kind of fortification. This paper will try to combine geographic and social contextual analysis of these enclosures and create a complex model of their meaning within cultural and physical landscape of Iron Age communities. Usually they are interpreted as central settlements of local communities built in their core, and ramparts and ditches were seen in a purely defensive role. The very idea of central place seems to be coherent in terms of content as well as function within the social structure of local communities. It is possible that an enclosure (rampart or a ditch) does not only function as a fortification but also as a definition of special space. It is probably true that these sites were central places of Iron Age communities. However, it is much more difficult to determine whether they were created in the core of communal activities or if they became central places because of the focus of such activities around them.

Potter, Stephen and John Bedell (The Louis Berger Group)

[29] *Searching for King Opessa's Shawnee Town in the Mountains of Maryland*

In 1688, a band of Shawnee left Fort St. Louis on the Illinois River and headed east. Eventually, some of them settled at King Opessa's Town on the upper Potomac River, circa 1722, in the vicinity of Oldtown, Maryland. In 1975, a National Register Nomination was prepared identifying a 122 x 213 m surface scatter of prehistoric artifacts as the site of King Opessa's Town, which also corresponds to the location of "Shawno Indian Fields Deserted" on Benjamin Winslow's 1736 map. Subsequent test excavations and a magnetometer survey in 2009-2010 by archaeologists of the Louis Berger Group revealed two villages dating 1490-1560 CE. Intensive archaeological survey and testing was also undertaken on the Moore Tract, closer to Oldtown, where land patents mentioned the prior location of a Shawnee town. Despite these efforts, King Opessa's Town remains unidentified. There are at least three explanations for this failure: 1) it is not within the bounds of the C&O Canal NHP; 2)

it is located somewhere that has not been surveyed; or 3) it is in a place that has been searched but has not been recognized. The latter explanation is a distinct possibility that is discussed further.

Potter, James (PaleoWest Archaeology)

[85] *Cowboy Wash Pueblo and Community Organization on the Southern Piedmont of Sleeping Ute Mountain*

Located on the southern piedmont of Sleeping Ute Mountain in southwest Colorado, Cowboy Wash Pueblo (5MT7740) is a large, late Pueblo III site containing thirteen kiva depressions and more than thirty rooms. It is the largest site within what has been termed the Cowboy Wash community, yet it is one of the least well documented of all the habitations composing this community. Recent investigations documented a different configuration for the site than had originally been understood, identified a large D-shape structure previously unidentified, and conclusively placed the construction and occupation after A.D. 1225, when it appears that about half of the small sites in the Cowboy Wash community aggregated in Cowboy Wash Pueblo. This paper discusses the transmogrification of the community from the Basketmaker III period to the end of the occupation sequence at around A.D. 1280 and suggests that, even at its peak in population, this residential-drainage community was too small to be a sustainable community; it is likely that the entire southern piedmont comprised a larger sustainable community. The paper concludes with a comparison of Cowboy Wash Pueblo with other large late settlements in the vicinity.

Potter, Ben (University of Alaska Fairbanks)

[302] *Recent Discoveries in the Tanana Basin, Eastern Beringia*

Recent developments in Western subarctic archaeology have transformed our perspectives on technological, subsistence, and land use strategies implemented during the Pleistocene - Holocene transition and into the later Holocene. This talk encompasses my intersite and intrasite investigations at Upward Sun River, Mead, and other sites in the middle Tanana River basin geared towards explanatory model construction and testing. Athabaskan ethnographic data provide robust frameworks to evaluate the earlier prehistoric record. Results indicate surprising levels of connectivity between ancient and recent lifeways in the subarctic. Significant differences suggest changing responses to risk and the importance of social contexts of site structure and organization and regional land use.

Potter, Ben [360] see Holmes, Charles

Pottier, Christophe (Ecole française d'Extrême-Orient (EFEO))

[36] *Insights from Difference: Text and Archaeology in Angkor*

The study of Angkor was predominantly the domain of epigraphers, art historians and architects for much of the past century of research. To some degree it continues to be. This focus, to its great credit, has reconstituted a millennium of the political history of Khmer society prior to the 16th-17th C CE. The effect has however, been to prioritize a historicist viewpoint, leading to the material record of the monuments being fitted in to the expectations of textual interpretation. Archaeological inquiry has also tended to focus on the monuments rather than their context, the urban landscape and environmental conditions. Since the early 1990s this focus has changed dramatically, initially with the work of the EFEO and then the addition of the Greater Angkor Project. As a result significant differences have become apparent between the textual evidence and the archaeological record in the dating of monuments, the history of urban development, the perspective on Angkor as an urban landscape, and our understanding of the demise of Angkor.

[349] *Discussant*

Potts, Alastair (Nelson Mandela Metropolitan University), Richard Cowling (Nelson Mandela Metropolitan University, Port Eliza), Simon Scheiter (2. Senckenberg Gesellschaft fuer Naturforschung, F), Steven Higgins (Otago University, Dunedin, New Zealand) and Janet Franklin (Arizona State University, Tempe, USA)

[294] *Peering into the Past Cape Vegetation during the Last Glacial Maximum Using Species Distribution Modelling and Dynamic Global Vegetation Modelling*

The Cape has a rich archaeological record that spans the Quaternary. Understanding shifts and changes of vegetation across this landscape will help to contextualize this record and understand the prehistoric resource paleoscape. In order to do this we couple high-resolution regionally downscaled climate simulations of the Last Glacial Maximum, landscape features (e.g. geology, aspect, slope) and two different approaches to modelling vegetation: species distribution modelling (SDM) and dynamic global vegetation modelling (DGVM). In this talk, we cover the reasons for using a multi-pronged approach to vegetation modelling and, more importantly, what vegetation do the models predict for the southern Cape coast during the Last Glacial Maximum. The predictions are compared between approaches and with existing paleoarchives. In addition, we utilize these modelled vegetation changes to test hypotheses regarding the resource paleoscape for early humans; such as the hypothesis that the abundance of heat-treated silcrete in the archaeological record is linked to the availability of fuel-wood.

Potts, Alastair [294] see Atwater, Chloe

Poulmarc'h, Modwene [401] see Herrscher, Estelle

Power, Robert C. [415] see Salazar-García, Domingo Carlos

Powis, Terry [24] see Skaggs, Sheldon

Powis, Terry (Kennesaw State University)

[295] *Vision and Revision in the Use of Residential and Non-Residential Space at Middle Preclassic Maya Sites: A View from Pacbitun, Belize*

Most Maya archaeologists never take advantage of excavating into plazas. The perception might be that there isn't much information other than recovering artifacts to date successive constructive phases associated with the buildings they are investigating along the edges of the plaza. Over the years, some archaeologists have seen the utility of this approach — one that emphasizes locating early Maya buildings, even entire communities — beneath plaza surfaces in site centers. The amount of data can significantly impact one's understanding of site formation and development. Without investigating plaza architecture how does an archaeologist know the complete construction sequence for any site center? For example, temples are a constant feature of ancient Maya societies, yet their origins remain somewhat obscure. Where are the earliest temples located on a Maya site? Are their Classic period counterparts always built directly over top of them? Are temples ever completely buried beneath plaza surfaces? If so, why? Where are early temples found in relation to residences, whether they are elite or commoner? These questions and others are being addressed at Pacbitun where we are investigating why spot X as opposed to spot Y, and comparing our results with other in the Belize Valley and beyond.

Pozorski, Thomas (University of Texas-Pan American)

[66] *Ritual Hearth Structures at the Casma Valley Site of Huerequeque: Making a Case for Highland/Coastal Interaction in Initial Period (2100-1000 B.C.E.) Peru*

Recent excavations at the site of Huerequeque, some 24 km inland at an altitude of 450 m, exposed several large and elaborate hearths, including three ventilated examples. While hearths for cooking and warmth are very common within residential architecture at Huerequeque, these special hearths are consistently associated with non-domestic architecture. One example occupies the center of an intermediate-sized mound structure adjacent to the main platform mound at the site where it served as a likely focal point for congregation, feasting, and ritual by selected individuals. Among the other examples, one is especially reminiscent of highland-style Mito hearths, suggesting that Huerequeque's mid-valley location facilitated communication between the highlands and the lower-valley sites of the Sechin Alto Polity which likely established and controlled Huerequeque as an outpost. Insights gained from the study of special hearths at Huerequeque also help us to

understand the presence and seemingly late occurrence of ventilated hearth structures at down-valley sites and coastal sites during the Initial Period.

Pozorski, Shelia [378] see Nicholson, Daniel

Prado, Marvin, Carlos Morales, Richard Hansen and Douglas Mauricio

[408] *El Mirador Mapping Program 2003-2015: Investigation of an Ancient Maya City with Total Station, Remote Sensing, and Gis*

The ancient city of El Mirador is surrounded by subsidiary centers forming a state level organization indicated by a strong sociopolitical organization developed during the Preclassic period. This paper illustrates the results of Total Station mapping, Remote Sensing, Global Positioning Systems, and GIS applications in archaeological investigations at El Mirador conducted by the Mirador Basin Project over a 12 year period and covering approximately 50 km². This program initiated a comprehensive survey and mapping program designed to document all mounds and features associated with El Mirador, including the causeway network, definition of bajos and vegetation changes. An inductive predictive modeling approach was used to identify areas of high archaeological potential such as residential suburbs, intensive agriculture areas and hydraulic systems, among others, pending LIDAR data from the upcoming year conducted by the Mirador Basin Project. From these data several maps of the region have been derived which is used to identify the relationship of settlement with environmental resources.

Prado, Marvin [408] see Hernandez, Enrique

Praetzellis, Adrian

[416] *Archaeology of San Francisco Jews*

Archaeological collections from San Francisco's South-of-Market area speak to the lives of 19th century Jews. We take the position that archaeology can help us understand the effects of the *haskalah* (the Jewish "enlightenment") on European immigrants' efforts to divest themselves of their sociological ambivalence. In this way, archaeology can help illuminate one of the most enduring and controversial issues in contemporary Jewish studies: the relationship between identity and religious practice.

[45] *Discussant*

Praetzellis, Mary (Anthropological Studies Center)

[117] *Discussant*

Praetzellis, Mary [416] see Praetzellis, Adrian

Pratt, William, David Brown (Texas Archeological Research Laboratory U.T. Austin), Dana Anthony (Texas Archeological Research Laboratory U.T. Austin) and Patricia Mothes (Instituto Geofisico Escuela Politecnica Nacional)

[46] *Laying the Foundations: A Unique Inka Construction Technique in the Northern Ecuadorian Highlands*

While Inka architecture is occasionally discussed as if it were a unified corpus of building styles, regional variation is great, with the Inka frequently adopting local techniques. Recent excavations in northern Ecuador have uncovered examples of a little documented Inka foundation style found at several sites in the region. At Hacienda Guachalá, where local legends maintain that the hacienda chapel, reportedly one of the oldest in Ecuador, was built atop an Inka temple, the early colonial walls are underlain by an earthen platform that is bolstered by rocks. Only present under the oldest part of the Guachalá chapel, this massive earthen foundation matches an unfinished Inka foundation excavated in recent years at San Agustin de Callo where it is thought to be among the last constructions at the site, perhaps abandoned as the Spanish were moving northward towards Quito. Unlike more common Inka wall construction styles, which use finely packed sediments as dry

mortars, the Callo-Guachalá foundation style, which is markedly layered, seems to have utilized wet-lain sediments, unlike other Inka or Spanish colonial foundations. While its origins are vague, the style suggests that the Inka continued to evolve technologically even as their empire was falling apart around them.

Pratt, Suzanna (University of South Florida)

[50] *Land Degradation at Betty's Hope Historical Plantation, Antigua*

The islands of the British West Indies in the eastern Caribbean have been subjected to continuous sugarcane farming since the 17th century. Current land degradation in Antigua has been attributed to centuries of intensive monocropping. However, recent scholarly discussion of the concept of *landesque* capital challenges the idea that long-term cultivation is a main driver of landscape degradation. The Betty's Hope plantation on Antigua operated from 1651-1944 and currently faces problems of land degradation, primarily in the form of soil erosion. This research creates an EPIC (Erosion Potential Impact Calculator) simulation of soil erosion and productivity at the Betty's Hope plantation, and tests the model with ethnohistorical and geoarchaeological data about the plantation's crop yield and landscape degradation. This study evaluates the simulated trajectory of landscape change using ethnohistorical information about the plantation's agricultural yield and a geoarchaeological analysis of the regional landscape. By determining the unique combination of continuous human and environmental changes over the past 300 years, this research contributes to the understanding of how certain practices impact the landscape over time.

Pratt, Jordan (University of Oregon), Isabela Kott (California State University Long Beach), Christopher Lee (California State University Long Beach), Carl P. Lipo (California State University Long Beach) and Terry L. Hunt (University of Oregon)

[52] *Application of Object-based Image Analysis of High Resolution Imagery to Identify Archaeological Features on Rapa Nui (Easter Island, Chile)*

Object-based image analysis provides a powerful tool for using remote sensing data as a means of identifying archaeological features. Object-based image analysis has multiple advantages over pixel and spectral based tools, because it isolates features in image data based on a combination of spatial, spectral, and geometric characteristics. Using high spatial and spectral resolution imagery available for Rapa Nui (Easter Island, Chile) and the Trimble eCognition software package, we explore how object-based image analysis can be used to identify and extract two classes of archaeological features: circular stone walled gardens known as *manavai*, and rectangular stone platforms known as *ahu*. The results of our study demonstrate how remote sensing imagery can improve upon traditional pedestrian surveys and create a systematic and comprehensive survey of archaeological features for Rapa Nui.

Pratt, Darrin (University Press of Colorado)

[68] *Discussant*

Pratt, William [307] see Hechler, Ryan

Pratt, Jordan [150] see Nelson, Amy

Prehal, Brenda

[351] *Missing Bodies and Cat Skeletons: New Perspectives on Ritual in Viking Age Iceland*

The research that has dominated Icelandic burial practices has until very recently been quite narrow. Burials were excavated to extract the skeleton and artifacts within the grave cut itself, leading to a central theory that Icelandic burials are poor in ritual and culture. Recent excavation and theories, however, have led to open area excavations of pagan cemeteries, which reveal much more complicated ritual. Snorri Sturlusson, the author of the famous Icelandic Sagas and Eddas, might give us some clues as to what these newly discovered rituals might have been. How much did Snorri know about his ancestors and what does that mean for Viking Age Icelandic identity?

Premo, Luke [84] see Fisher, Philip

Premo, Luke (Department of Anthropology, Washington State University)

[191] *Mobility and Cultural Diversity in Central-Place Foragers: Implications for the Emergence of Modern Human Behavior*

Although anthropologists have long recognized the importance of mobility to hunter-gatherer subsistence strategies, it remains unclear how mobility affects cultural diversity in subdivided populations. A better understanding of how mobility affects both total diversity and regional differentiation in selectively neutral cultural traits may provide us with an additional line of evidence for explaining the appearance of archaeological indicators of modern human behavior. Here, I introduce a spatially explicit central-place foraging model to investigate how length of the effective foraging radius affects the effective size of a metapopulation composed of central-place foraging groups. Simulation results show emphasizing logistical mobility over residential mobility often inhibits intergroup interaction, which in turn increases the effective size of a subdivided population. Considered within the context of Sewall Wright's work on the effects of isolation by distance, the findings have interesting implications not only for neutral cultural diversity at the level of the metapopulation but also for cultural differentiation between foraging groups. To the extent that we are able to identify shifts in hominin mobility strategies in the Paleolithic archaeological record, the findings of this study may help us better understand and explain the appearance of modern human behavior.

[191] *Chair*

Prendergast, Mary [105] see Faulkner, Patrick

Prentiss, Anna Marie [228] see Scott, Lindsay

Prentiss, Anna (University of Montana)

[312] *The Ancient Floors of Housepit 54, Bridge River Site: Stratigraphy and Dating*

The Bridge River Archaeological Project is a long-term partnership between The University of Montana and X'wisten, the Bridge River Indian Band. The focus of the project is on understanding the historical development of this large housepit village, located near Lillooet, British Columbia. Previous research has emphasized village-wide demographic, technological, and socio-economic and political change during the Bridge River 2 (1600-1300 cal. B.P.), 3 (1300-1000 cal. B.P.), and 4 (post 600 cal. B.P.) periods. With support from the National Endowment for the Humanities, excavations conducted from 2012 to 2014 focused on a remarkable occupation sequence from a single house. Housepit 54 contains an estimated 15 superimposed anthropogenic floors, each with extensive primary evidence for household activities. Dating to the BR 2 through 4 periods, these contexts provide us with abundant opportunities to examine change and continuity in household occupation patterns during these times. In this poster, we introduce the ancient floors (BR 2 and 3 periods) of Housepit 54 with a focus on stratigraphic resolution and radiocarbon dating. The poster also serves as an introduction to the poster symposium.

[330] *Discussant*

[312] *Chair*

Prescott, Christopher (University of Oslo)

[218] *Chair*

Prevost, Marie-Annick (University of Toronto)

[268] *Late Archaic Plant Remains from the Québec City Area (Canada)*

It is more and more recognized that mobile hunter-gatherers can have a significant impact on their environment. In the Northeast, one of the traits of the Late Archaic period is the intense consumption of nuts and acorns and possible management of this key resource to increase its productivity. The botanical macro-remains recovered at the site of côte Rouge, located near Québec City, indicate that butternuts and hazelnuts were indeed consumed but their low densities in the archaeological record cannot support the idea of an intense use. Because these nuts, along with many other species of berries, are shade-intolerant, their presence at côte Rouge indicates some openings in the forest canopy. Repeated seasonal stays could have caused disturbance that favored the growth of these useful plants. However, these observations contrast with the wood charcoal data from the same contexts that revealed mostly trees characteristic of shady climax forests. These results seem to suggest that disturbance was subtle and that prolonged occupation did not limit the access to high quality firewood. Preliminary results of starch and pollen analyses will also be discussed in this paper.

Prevosti, Francisco J. [87] see Borrero, Luis

Price, Neil [57] see Raffield, Ben

Price, Neil (University of Aberdeen)

[57] *Pirates of the North Sea? The Viking Ship as Political Space*

The contextualized meaning of specifically 'Viking' identities, in relation to the general population of early medieval Scandinavia, is a topic of perennial debate. Who were the Viking raiders, how did they see themselves, and how did others see them? How did our artificial construct of 'the Viking Age' actually begin? A key concept in unravelling these problems may be what the Vikings' much later successors, the pirates of the so-called Golden Age, called "the new government of the ship". Over the last two decades, influential work on these pirate communities has recast them as radical actors and social revolutionaries, subverting political norms among state-based societies to create a new and freer maritime identity for themselves and others on the margins. More recent studies have retreated from this vision of political enfranchisement and instead re-emphasized the rational pursuit of self-interest and profit under the cloak of controlled anarchy. All this research can be usefully applied to the Viking Age, not by a direct transfer of paradigms but as a lens through which to view the archaeology of the period afresh, and to shape new models of agency and influence.

[116] *Discussant*

Price, Heather

[62] *Discussant*

Price, Gypsy (University of Florida), Kim Shelton (Department of Classics, University of California,), George Kamenov (Department of Geological Sciences, University of F) and John Krigbaum (Department of Anthropology, University of Florida)

[397] *Following the Herd: Isotopic Access to Faunal Commodity Chains in LBA Mycenae, Greece*

This paper explores variation in the management and distribution of faunal resources recovered from disparate socio-economic spheres of consumption at the palatial settlement of Mycenae, Greece, during the Late Bronze Age (1600-1100 B.C.). It has long been acknowledged that early state economies comprise multiscalar, intertwining spheres of economic activity. Mechanisms driving these spheres of interaction are predicated on the modalities of exchange which connected nodes of production and consumption. Commodity chain analyses of exploited goods offers one effective method to model how socio-political systems of production and consumption and exchange networks were interconnected. Fauna are versatile and ubiquitous, operating at all levels of economic exchange and social hierarchical divisions. As fauna are purposefully managed with their consumption in mind, faunal commodity chains comprise their life history. Management practices, in turn, are recorded in the biological tissues of exploited fauna. Isotope ratios (Pb, Sr, O) allow us to "follow the materials" by tracing individual life histories of exploited fauna. We present new isotopic

faunal and baseline data to demonstrate how isotope ratios can track commodity chains of faunal resources to assist in the identification of distinct faunal economies within a larger socio-political network using management and distribution practices as a proxy.

Price Steinbrecher, Barry (University of Arizona) and Paul Tosa (Pueblo of Jemez)

[239] *Jemez Oral Traditions and Ancestral Landscapes*

Ethnographic research with cultural advisors and research partners from the Pueblo of Jemez on fire ecology, use of plant resources, and landscape within the Jemez Mountains in northern New Mexico reveals significant ongoing connections to Jemez ancestral places. The ancestral places within the Jemez Province that archaeologists define primarily through the distribution of Jemez Black-on-white ceramics, which dates between approximately A.D. 1250 to A.D. 1750, reflect an intensively occupied locus within a vast cultural landscape. The oral traditions among the community at the Pueblo of Jemez encode historical information, commemorate significant events, and provide geographical context for historic land use from time immemorial. The network of Jemez ancestral places, which can be conceived of as a “footprint”, illustrates a high degree of mobility among Jemez ancestors. We examine defining elements of a Jemez ancestral landscape, draw comparisons with archaeologically defined cultural areas, and consider the continued role of cultural landscapes within contemporary tribal society and traditions.

Prieto, Gabriel

[404] *La Poza de Huanchaco: A Late Early Horizon – Early Intermediate Period Fishing Community: Social and Material Culture Interactions between Salinar and Gallinazo*

La Poza has been excavated since 1965. Today is one of the most intensive sites that have been studied in the Moche valley but at the same time is perhaps the most damaged by modern urban growth. The recent excavations carried out at the site, using the test pitting technique have uncovered principally a Salinar and Gallinazo occupations. Human burials and domestic contexts with complete ceramic vessels are the most common findings in this site. The dense deposits provided a great collection of ceramic sherds, plants and abundant faunal remains. More important, six radiocarbon dates taken from secure contexts are available and allowed to place these materials in an absolute sequence, linking these occupations with the rest of the Prehispanic occupations in the Moche Valley. In this paper I will present preliminary results and some thoughts about the Salinar and Gallinazo interactions during the end of the Late Early Horizon and the beginnings of the Early Intermediate Period.

[404] *Chair*

Pritchard, Erin (Tennessee Valley Authority), Johannes Loubser (Stratum Unlimited, LLC), Jan Simek (University of Tennessee, Knoxville) and L Mashburn (University of Alabama, Tuscaloosa)

[353] *Tennessee Valley Authority Conservation and Management Initiatives at Painted Bluff, Alabama*

Located in northeastern Alabama, Painted Bluff contains motifs similar to ones found on Mississippian ceremonial objects, and an associated charred river cane dating to between A.D. 1300 and 1440. Approximately 80 images were recorded on the limestone cliffs of the bluff, most of which are red ocher paintings, a few with yellow pigment, one containing white, and at least three separate thinly-plastered surfaces with fine-line incisions. Following initial recording of the site by Simek, Cressler, and Hermann, Pritchard from the TVA decided to pro-actively conserve and manage the painted site with public visitation in mind. In consultation with relevant Native American Indian groups, Pritchard launched a condition assessment, graffiti removal and camouflage session, and thorough graphic recording of the site with the aim of opening and interpreting a selected portion to the public, with the aid of a boardwalk and interpretive infrastructure.

Prociuk, Nadya (University of Texas at Austin)

[417] *Marking Your Place: Exploring the Symbolic Communication of Identity in the Castro Culture of North-Western Portugal during the Bronze and Iron Ages*

How did the people of the Castro Culture of north-western Iberia use symbols to convey meaning and identity during the Late Bronze and Iron Ages? The repeated inscription of symbolic motifs on a variety of material mediums suggests that the role of symbols was more than merely decorative for the Castro people, and the literature is curiously silent regarding the social implications of these motifs. In this paper I will present the results of this research, and argue that the people of the Castro Culture utilized repetitive and recognizable symbolic motifs to assert facets of their identities by inscribing the everyday materials of their lives with symbols that communicated to themselves and others who they were, and their place in the world. The research is based on a newly developed motif typology and database recording the context, frequency, association and presence/absence of each motif as it appears in the ceramic collections from six Castro sites. I have also surveyed museum collections and the published literature for instances of motifs appearing on domestic and communal architecture, and on items of personal adornment.

[417] *Chair*

Proctor, Alison [192] see Mackie, Quentin

Prout, Michael (Anthropology Master of Arts)

[355] *Subadult human sacrifices in Midnight Terror Cave*

Children throughout Mesoamerica were preferred sacrificial victims, especially to water deities. Because caves were associated with rain, ethnohistoric sources mention the sacrifice of children in caves. The importance of children in sacrifice was documented early on by Edward Thompson's dredging of the Cenote of Sacrifice at Chichen Itza. More recently archaeological investigations of caves have recovered have recorded the skeletal remains of children that have been interpreted as sacrificial victims. This paper reports on the juvenile skeletal assemblage from Midnight Terror Cave with an eye toward refining our understanding of the age at death with this large sample. Attempts will also be made to determine method of sacrifice.

Prufer, Keith [155] see Thompson, Jessica

Prufer, Keith (University of New Mexico)

[288] *IHOPE Maya: Linking Lessons of the Past to Our Present and Future*

Since 2007 the IHOPE Maya team has focused on synthesizing dynamic human-environmental interactions of the ancient Maya of southeastern Mexico and upper Central America (400B.C.-900 A.D.). A series of great tropical societies, the Maya occupied a diverse range of tropical environments, adapting local strategies to meet varied subsistence, economic, political, and ecosystem service needs at large and small urban centers. Cycles of expanding populations, increasing despotism, and reliance on long-distance trade to support statecraft and domestic life characterize a millennium of development. By the 9th century A.D., downward pressures on fragile tropical resources combined with increasing climate variability introduced uncertainties at a time of maximum populations, intensifying warfare, and multi-decadal droughts. Though differing responses across the geopolitical landscape reflect the resilience and rigidity of highly networked polities, within 150 years the political and economic systems of the Classic Maya had disintegrated. IHOPE Maya recognizes the stark similarities to the challenges confronting our current global developmental trajectories, and the applicability of these data to modern issues. Linking the past to the present allows us to explore human decision-making and its consequences for the future of our humanity that is now facing similar challenges to those of the past.

Pryce, Thomas Oliver [140] see Dussubieux, Laure

Przadka Giersz, Patrycja [227] see Giersz, Milosz

Przelomska, Natalia (University of Cambridge), Harriet Hunt (University of Cambridge), James Cockram (National Institute of Agricultural Botany), Frances Bligh (Unilever UK) and Martin

Jones (University of Cambridge)**[345]** *Human Dispersal or Environmental Selection? Using Genetics to Decode Diversity in Millet Landraces across Eurasia*

Eurasian millets (genera *Panicum* and *Setaria*) are amongst the world's oldest cereal crops, with evidence of cultivation in China from 10,000 years cal BP. Archaeobotanical evidence also indicates the presence of domesticated millet in Europe as early as 7,000 years cal BP. New archaeological evidence coming to light suggests that these important staple food crops were part of a 'Trans-Eurasian exchange' during prehistory. Traditional cultivars, or 'landraces,' of millet have been preserved in living seed collections from across their past cultivation ranges. Phenotypic analyses of these landraces have demonstrated high diversity in traits pertaining to plant architecture, grain quality and flowering time. Applying several different genetic techniques to DNA obtained from these landraces, we have been able to paint a picture of molecular diversity and population structuring across the millets' geographic ranges. Diversity in the environmentally significant adaptive trait of flowering time has a particularly interesting genetic basis in *Setaria*. This will be discussed in the context of human routes of migration and the effect that new climatic conditions would have exerted on the crop plant as it was transferred to different environments.

Przystupa, Paulina**[7]** *Idyllic Childhood or Practical Placement: Examining Children's Homes Using GIS, Remote Sensing, and Landscape Archaeology*

The late 19th century represents a turning point in Western beliefs about childhood. These new cultural beliefs redefined childhood as an innocent stage in the human life cycle and encouraged particular environments for raising children. Rural areas encouraged learning and exercise, sheltering children from the dangers of the polluted urban environment. However, this ideology contradicted the economic realities of the late 19th century. Other archaeologists have examined this tension between the ideology and reality of childhood during this time by examining artifacts excavated from household contexts. Interestingly, children's homes, which increased in use during this time and cared for children whose parents could not, have rarely been investigated. This poster examines how closely children's homes were able to adhere to this new concept of childhood by using landscape archaeology theory, GIS, and remote sensing to investigate America's historical children's homes within their environmental and anthropogenic context. Since humans alter their landscape to reflect their culture, I hypothesize that institutions built earlier will be placed in environments that embodied the practical nature of children's homes, while later children's homes will choose landscapes that reflect this new ideology of childhood.

Puckett, Neil (Texas A&M CSFA)**[243]** *Underwater Geoarchaeology of Perennial Lakes in the Great Basin*

Underwater archaeology in the Great Basin has been generally ignored because underwater researchers often do not associate this desert with inundated environments. Despite this misconception, many large lakes, marshlands, and rivers are found throughout the region. For instance, northern Nevada includes 168 sizable man-made perennial reservoirs that partially or completely cover 188 known sites. In addition, during the late Pleistocene large lakes of fluctuating size covered many of the valleys across the Great Basin. Though most are now dry, a select number of natural lakes remain that have been neglected with respect to underwater archaeology. Research in and around three of these, Malheur Lake, Eagle Lake, and Walker Lake, began in the summer of 2014. Terrestrial and underwater survey, cores, and cutbank stratigraphy reveal the potential for buried site preservation within and around these lakes. These data also allow for predictive modeling of site locations and thus a controlled subsurface testing program. Since most open air sites in the Great Basin are found in surface context, identifying buried sites around these lakes has the potential to vastly improve our understanding of temporal changes in adaptive land use around Great Basin lakes.

Pugh, Tim [219] see Freiwald, Carolyn

Pugh, Timothy, Prudence Rice (Southern Illinois University at Carbondale) and Evelyn Chan (CUDEP)

[219] *An Orthogonal Grid at Nixtun-Ch'ich', Petén, Guatemala*

Nixtun-Ch'ich' is a large archaeological site on the western edge of Lake Petén Itza in Petén, Guatemala. Recent remapping of the site revealed that its architecture was largely organized by an orthogonal grid. While most Maya sites exhibit some degree of urban planning, the organization of sakbes (roads) into an orthogonal grid has not been described elsewhere in the Maya world. The grid seems to have developed at Nixtun-Ch'ich' in the Late Preclassic period. It is not yet known whether it developed independently or whether its designers were influenced by interactions with Central Mexico. It is likely that that planning and construction of the grid were centrally organized, which would have required a great deal of political power.

Pugliese, Francisco [326] see Zimpel, Carlos

Pugliese, Francisco Antonio (MAE/USP BRAZIL), Carlos Augusto Zimpel Neto (Museu de Arqueologia e Etnologia, MAE/USP, Brazil), Thiago Berlanga Trindade (Museu de Arqueologia e Etnologia, MAE/USP, Brazil), Tiago Hermenegildo (Museu de Arqueologia e Etnologia, MAE/USP, Brazil) and Laura Pereira Furquim (Museu de Arqueologia e Etnologia, MAE/USP, Brazil)

[326] *Sol de Campinas Site and the Cultural Variability in Southwestern Amazon: Moundbuilders and Archaeological Earthworks in Acre State – Brazil*

The central area of Sol de Campinas site is composed of fifteen mounds, dispersed in an elliptic arch surrounding a plaza with an area of almost 15 m². The site is geographically related to other earthworks of southwestern Amazon known as geoglyphs in the Brazilian states of Acre, Rondonia and Amazonas. Although it shows similar attributes to other places in the region, such as its geometrical forms and "roads" structured from the peripheral portions of the site, its main structures are composed of 3 meters high mounds and not of ditches and embankments as frequently seen in other sites. At this presentation we intend to show how the excavation of sites like Sol the Campinas can be used to study the function of the archaeological earthworks in the region. Showing a well preserved stratigraphy the excavation of the mounds contributed to the understanding of the formation of the earthworks and the results brought a new light to the emergence of cultural complexity at southwestern Amazon river basin.

Pullen, Alexander [31] see Lane, Kevin

Pulsifer, Peter [288] see Strawhacker, Colleen

Punzo, Jose Luis (Instituto Nacional de Antropologia e Historia) and Lissandra Gonzalez (INAH-Michoacan)

[189] *Ring the Bell: A Spatial Comparative Analysis of Copper Bells between the Greater Southwest and Michoacán*

Recent studies about metal work in the Proyecto Arqueologia y Paisaje del Area Centro Sur de Michoacan gave us the possibility of analyze a wide sample of copper bells from different collections and in museums along this western state in Mexico. In this paper we will present a comparative analysis between our database of Michoacan's copper bells with the ones found in the USA southwest and specially in Paquime, Chihuahua, focusing on the Period 2 (A.D. 1200-1300 to Spanish invasion) like the most productive time for metal items in west Mexico. With this work we will try to establish different possibilities for interaction between Michoacan as a producing zone of copper items and the Greater Southwest where for the moment many researchers accept that there's no evidence of production of metal.

Punzo, José Luis [231] see Andrade, Israel

Punzo Díaz, José Luis [156] see Ortiz Barrera, Rosa

Purcell, David (WestLand Resources, Inc.), Danny Sorrell (EcoPlan Associates, Inc.), Pete Taylor (Apache-Sitgreaves National Forests), Kye Miller (PaleoWest Archaeological Solutions) and Lynn Neal (EnviroSystems Management, Inc.)

[48] *Revealed by Flames: Modeling Site Distribution in Arizona's White Mountains after the Wallow Fire*

EcoPlan Associates developed a site spatial density model for, and in partnership with, the Apache-Sitgreaves National Forests (ASNF). In 2011, the Wallow Fire started in the Bear Wallow Wilderness in the White Mountains of East Central Arizona, eventually burning over 538,000 acres within 840 square miles of Arizona and New Mexico. Four contractors and ASNF inventoried 63,424 acres in various portions of the burned area after the fire, much of it at high elevation. Unexpectedly, the surveys identified 136 sites concentrated within a few small areas; yet, most of the post-fire survey areas were devoid of any cultural resources, including isolated occurrences. The unusual bimodal site distribution was not accounted for in the model, particularly the presence of communities of Reserve/Tularosa phase Mogollon habitations above 8,000 feet elevation. Analysis of the model in light of the Wallow Fire findings suggests that Douglas Fir forest does not provide an appropriate proxy for high elevations, and that high elevation projects were underrepresented in building the model. Larger block surveys more closely approximated the modeled site distribution than did smaller and linear projects.

[48] *Chair*

Purdue, Louise [84] see Murphy, John

Purdy, Barbara (University of Florida), Kathryn Rohlwing (University of Florida) and Bruce MacFadden (University of Florida)

[220] *Devil's Den (8LV84), Florida: Rare Earth Element (REE) Analysis Suggests Contemporaneity Between Late Pleistocene Fauna and Human Skeletal Material*

In the early 1960s, human remains of several individuals were found in association with late Pleistocene mammals during an excavation at Devil's Den sinkhole in Levy County, Florida. The rarity of this occurrence in Florida and across the Americas is well-known. Very little has been published about the Devil's Den site, and the human remains were not available for study until 2003. Neither the human or animals bones can be dated by the radiocarbon method due to a lack of sufficient surviving collagen. In this paper, the concentration levels and patterns of rare earth elements (REEs) in the bones are used to determine the relative antiquity of the remains.

Purser, Margaret [392] see Dowdall, Katherine

Purtzer, LeAnn [276] see Holtkamp, David

Puseman, Kathryn (Paleoscapes Archaeobotanical Services Team (PAST), LLC) and Craig Lee (Metcalf Archaeological Consultants and Institute o)

[300] *Out of Ice: A Review of Greater Yellowstone Area Ice Patch Hunting Technology*

While the unique plant and animal communities of the alpine are of clear ethnohistorical and modern significance to the indigenous communities of the Greater Yellowstone Area (GYA), no histories regarding the use of ice patches have been identified. Information sharing with tribal groups and the public regarding the nature of ice patches, including the technical analysis of recovered materials, fosters understanding of and appreciation for these endangered features. This paper focuses on the technical analysis of wooden shafts recovered at five ice patch sites in the GYA relative to other organic hunting implements from the region. Foreshafts and darts are primarily made of birch (*Betula* sp.), but willow (*Salix* sp.) and spruce (*Picea* sp.) were also used. One presumed arrow shaft is made of pine (*Pinus* sp.). Structural and physical characteristics of birch, spruce, and pine wood make them excellent choices for this type of use.

Putt, Shelby [122] see Dellopoulos, Emma

Putt, Shelby (University of Iowa)**[122]** *The Origins of Stone Tool Reduction and the Transition to Knapping: An Experimental Approach*

There is now a general consensus that the earliest Oldowan artifacts were made by skilled toolmakers with a clear understanding of the fracturing mechanics of different toolstone materials, thus leading several researchers to propose a simpler lithic reduction stage that occurred prior to 2.6 Ma. Three reduction techniques that are within the behavioral repertoire of the genus *Pan* are proposed as potential intermediate stages between the percussion behaviors of the LCA of chimpanzees and humans and the skilled knapping of the Oldowan toolmakers. These include direct and indirect projectile percussion and bipolar flaking techniques. To better understand some of the factors that influenced how early hominins obtained sharp flake tools, measures of productivity, expediency, and efficiency were obtained and compared between these three reduction techniques and novice knapping. The results of this experiment indicate that dropping or throwing a large hammerstone on a brittle core is the most efficient way to exploit a core, while bipolar flaking is the most expedient method; however, novice knapping creates the most productive flakes with large, sharp cutting edges. Thus, the transition to knapping in the late Pliocene may have been due to a shifting emphasis on productive toolmaking over expediency or efficiency.

Puzachenko, Andrey Y. [74] see Van Kolfshoten, Thijs

Pyburn, Anne (Indiana University)**[147]** *The Same, but Different*

Variations in the architecture, settlement patterns, local environmental context, and occupational history of Maya archaeological sites are difficult to assess. Which differences are culturally meaningful? Which similarities indicate social relationships, and if so, what sort of relationships? Which differences are simply a result of local climate and available building materials? In this paper I will examine some of the similarities and differences among the three Maya sites in North-Central Belize where I have done research: Chau Hiix, Albion Island, and Nohmul. This comparison will shed light on the value of regional analysis.

[236] *Discussant***Pye, Jeremy (Cultural Resource Analysts, Inc.)****[204]** *Laboratory Techniques for the Detection of Human Parasites in Archaeological Samples.*

Parasites have had a significant impact on the course of human history. Activities of a variety of parasites throughout the world can lead to lethargy, dementia, malabsorption of nutrients, bowel obstruction, internal bleeding, blindness, physical disability and deformation, and many other symptoms of disease. Furthermore, parasites have caused the deaths of countless individuals, have resulted in the abandonment of settlements, and have even affected the outcome of wars. The effect that parasitic illness has had on people worldwide is a hot topic in fields like medical anthropology. It is curious, therefore, that archaeologists have paid relatively little attention to looking for evidence of parasites in archaeological samples. This poster explores a variety of laboratory techniques that can be used to identify evidence of parasites in samples that can be collected from archaeological contexts. Perhaps once more archaeologists are aware of the importance of archaeoparasitological testing, we can make more informed interpretations of past population health, as it relates to parasitic disease.

Qin, XiaoLi**[37]** *Turquoise Ornaments and Inlays Technology in Qijia Culture -- A Comparative Study of Qijia Culture and Erlitou Culture*

Most turquoise ornaments from early Neolithic sites are pendants with a single material. However, from the later Neolithic period such as Qijia culture, people started to use ornaments which were inlaid with turquoise and other materials by unique techniques. In early Bronze Age, turquoise

production process, especially the inlays technology, reached its peak. From a Qijia culture site, we found a bone hairpin. On its tail part, small white bone rings were sticking on black jelly. From Majiayao culture site, we found 12 bracelets bone plates of the same length, which were stuck on black jelly. From later Qijia culture site, ceramic inlayed with turquoise have been found. Meanwhile from Erlitou site, archaeologists found a large dragon-shaped turquoise painting, variety animal-shaped turquoise decorations, and turquoise workshops. In this paper, I will compare the turquoise products in Qijia culture and Erlitou culture, then try to understand the importance of turquoise products in early dynastic formation process by analyzing the following topics: the technological evolution, the combination of composite materials, the usage of adhesive, and the production process of this type of ornament.

Qin, Ling [186] see Weisskopf, Alison

Qin, Zhen (Washington University in St. Louis)

[283] *A Geoarchaeological Investigation of Ancient Agricultural Fields at Sanyangzhuang Site, Henan Province, China*

Over the last 10,000 years, agriculture has gradually replaced hunting and gathering, and become the dominant food resource. Because of their extreme importance agricultural issues have attracted much academic attention; a wide variety of new perspectives and understandings, especially concerning agricultural origins, have been gained in the past few decades. However, there is a huge intellectual gap between the extensive agriculture soon after the earliest domestication and intensive agriculture practiced by early states. How was the gap bridged? What resources were invested to intensify food production? Questions concerning agricultural intensification have been attracting but also puzzling anthropologists and archaeologists for a long time. Field management technique is one of the most significant aspects of agricultural intensification. This paper presents the result of the geoarchaeological surveys at the Sanyangzhuang site in recent years, and explores the development of the field management techniques on the basis of micromorphological and geochemical analyses of soil samples from the site. Plowing, manuring, and irrigation are focused. By doing that, the outline of the trajectory of agricultural intensification from the late Neolithic Age to the early Iron Age in the local scale will be depicted.

Quackenbush, William (Ho-Chunk Nation)

[195] *Discussant*

Qualls, Catherine and Leslie Drane (Glenn A. Black Laboratory Of Archaeology- Indiana)

[359] *The Creation of a Comparative Resource for 1000 B.C.E. – 1600 C.E. Indiana Ceramics*

This poster explains the work being conducted for the creation of a booklet about Indiana (and likely surrounding states) ceramic types and varieties from approximately 1000 B.C.E. – 1600 C.E. We anticipate this booklet being utilized as a field guide and a comparative resource for those studying precolumbian people in the area. Because archaeologists so often encounter unfamiliar types and hybrid ceramic formations, this resource could be extremely beneficial for any researchers studying Midwestern people. Using the collections at the Glenn A. Black Laboratory at Indiana University, Bloomington, we are producing a guide that will contain photographs of each ceramic type with a detailed report on variety of the type, as well as a list of examples located at the lab. Ultimately, this project will end in the production of a comparative resource on Indiana ceramics, as well as a revision and inventory of the ceramic type collections held at the Glenn A. Black Laboratory. Our poster explores the process of creating this guide, the benefits it will provide researchers, and the future, collaborative advances we hope to accomplish.

Quates, Duane [43] see Schulz, Margaret

Quesada, Marcos [180] see Korstanje, Maria Alejandra

Quezada, Osiris (Arqueóloga) and Camila Pascal (Instituto de Investigaciones Estéticas UNAM)

[198] *Vocablos nahuas aplicados al proceso constructivo de los edificios prehispánicos del Altiplano Central*

Este trabajo presenta los términos constructivos que se aplicaron en época prehispánica para nombrar elementos arquitectónicos, algunas técnicas constructivas, así como a los individuos que colaboraron en las actividades relacionadas con la edificación, particularmente en edificios del Posclásico en el Altiplano Central.

Quicksall, Andrew [230] see Hollenback, Kacy

Quilter, Jeffrey (Peabody Museum, Harvard University)

[404] *Linking Chronology, Culture History, and Culture Process in Moche Studies.*

Revised chronologies affect our interpretations of cultural phenomena more than vice versa. This paper explores these issues in relation to the Moche. New dates suggest that the Moche phenomenon occurred later and ended later than previously thought and this is linked to a number of key issues in Andean culture history. The collapse of the Larco ceramic sequence is linked to the undermining of the concept of the Moche state and affects our concept of "Moche," in general. Particular attention will be focused on the relations between the dual temples at Huacas de Moche and El Brujo, a case study that provides some of the most detailed information currently available for examining chronology, culture history, and culture processes.

Quinlan, Angus (Nevada Rock Art Foundation)

[352] *Exploring Nevada Rock Art as a Social Landscape*

Approximately 1,500 rock art sites that broadly span the Archaic have been identified in Nevada. Regional and temporal differences in site structure, rock art styles, landscape settings, and associated archaeological contexts are discernible in these data, offering insights into Great Basin culture history and the categorization of the environment as a social landscape by prehistoric populations. Traditional approaches to Nevada rock art have often emphasized interpretation at the expense of explanation, seeking rock art's cultural significance or "meaning" in subjective considerations of its imagery. As Nevada rock art marks only a small percentage of the landscapes prehistoric populations are known to have used, I argue that understanding what made these locations appropriate places to be marked by rock art is a research theme that can address mainstream archaeological interests in describing the structure of past landscape use. Relating Nevada's rock art to the physical environment and settlement patterns provides information about the structure and properties of special places in the landscape, and illustrates that the use of culturally significant places was a consideration in residential mobility strategies.

Quinn, Colin [54] see Dalton, Jordan

Quinn, Colin (University of Michigan)

[54] *Decoupling Decoration and Dates: A New Absolute Chronology for the Transylvanian Middle Bronze Age*

Metal from southwest Transylvania fueled the development of inequality and regional polities across Eastern Europe during the Bronze Age. However, little is known about the communities in the resource-rich region. Through regional survey, test excavation, and digitization of existing collections, the Bronze Age Transylvania Survey (BATS) Project seeks to understand the long-term dynamics of social organization throughout the Middle Bronze Age in southwest Transylvania (2000-1400 B.C.). A robust chronology is critical to monitoring contemporaneous variability across the region and change through time in social, political, and economic organization. However, current models for the structure and dynamics of Bronze Age communities in Transylvania are based on a previously untested relative dating system based on ceramic seriation. In this poster, I present a new radiocarbon-based chronology for the Middle Bronze Age. These new dates challenge our understanding of the social significance of ceramic decoration as well as the long-term dynamics of

social complexity in Bronze Age societies.

[54] *Chair*

Quinn, James

[195] *Discussant*

Quintana, Patricia (Cinvestav Unidad Merida IPN), Vera Tiesler (Laboratorio de Bioarqueología, Facultad de Ciencia), Diana Arano (Sección de Restauración, Centro INAH Campeche, Ins), Dominique Rissolo (Waitt Institute for Discovery, San Diego, Cal) and James Chatters (Applied Paleoscience and Direct AMS, Bothell, Wa.)

[370] *General Taphonomy and Diagenesis of a Submerged Pleistocene Skeleton from the Cenote of Hoyo Negro, Tulum, Quintana Roo, Mexico: Preliminary Results*

This paper examines the macroscopic taphonomy and the diagenesis of a partially lifted preceramic skeleton of a female juvenile (called "Naia"), dated approximately between 13,000 and 12,000 yrs. AP. Naia was recovered at 41 meters below sea level in a submerged karstic cave. Despite the good general preservation of Naia's remains, the bone segments are brittle, showing changes attributable to time, weathering, changing salinity and micro-organisms. The external bone layer is only loosely attached to the subjacent bony core. Our present research aims to understand the fluctuating postmortem conditions of Naia, to prospect the analytical possibilities for conducting molecular research, and assisting mid and long term stabilization measures of the dental and bony remains. The study combines macroscopic taphonomy with X-Ray Diffraction Raman Spectroscopy, SEM, histology of undecalcified bone, and ICP analyses of associated water and sediments. Our results show diagenetic substitution of the inorganic substrate with exogenous calcareous minerals and moderate preservation of histological structure. This study was financed by the Subdirección de Arqueología Subacuática of the Instituto Nacional de Antropología e Historia, CONACYT-152105 (2012-2015), the Laboratorio Nacional de Nano y Biotecnología (FOMIX LAB-108160, CONACyT-123913).

Quintana Morales, Erendira (Muséum national d'Histoire naturelle, Paris)

[154] *A Social Topography of Fishing: Exploring the Spatial Variability of Fish Consumption Practices at Songo Mnara*

In the Swahili towns of the East African coast, fish have contributed a major source of protein consumed by coastal inhabitants, but the role of fish consumption in the construction of social meaning is rarely discussed. This paper addresses this gap by exploring spatial differences in fish consumption strategies around Songo Mnara, a fifteenth -sixteenth century Swahili town in the Kilwa Archipelago, and links them to social patterns visible in the organization of the town. The spatial distribution of discarded fish and other animal remains shows variability in the relative frequency, taxonomical composition, and estimated size of fish, indicating that food consumption practices varied across different socially-defined spaces around Songo Mnara. Inhabitants in a non-elite area of the town relied more heavily than their elite counterparts on the consumption of fish rather than domesticated animals; the elite also consumed larger fish and more outer reef fish compared to their non-elite neighbors. More than reflections of the socio-economic status of their consumers, these differences in fish consumption could indicate processes through which people constructed and reinforced social status, such as through access to particular tools and forms of consumption that connected them to the Indian Ocean trading network.

Quintus, Seth (University of Auckland) and Jeffrey Clark (North Dakota State University)

[233] *Examining The Temporal Scale of Human-Environmental Relationships on Ofu Island, Manu'a Group, American Samoa*

Pacific Islands have long been considered natural laboratories or model systems for the examination of human-environmental relationships. The impact of temporally variable environments on human populations is now well-documented throughout the Pacific, though questions remain on how the variable temporal scale of environmental change can modify the human response to these changes. An opportunity to address this question is presented by the cultural sequence of Ofu Island, a small

island in the Manu'a Group of the Samoan archipelago, in which the impact of both short-term environmental hazards and long-term landscape evolution is apparent. The reconfiguration of the coastline through the 1st millennium A.D. led to a transition in human settlement and subsistence patterns, eventually leading to permanent settlement in the island's interior uplands. The recurrence of quasi-predictable hurricanes, on the other hand, led to investment in infrastructure to mitigate the effects of hazards on the terrestrial food production system. The differential response to these environmental factors can be understood in terms of risk and uncertainty. Furthermore, the influence of coastal reconfiguration is significant on small islands such as Ofu, where marine regression modifies the ratio of shallow marine environments to terrestrial lowlands.

Raczek, Teresa (Kennesaw State University)

[292] *A Plethora of Possibilities: Evaluating Debitage from Large Habitation Mounds*

For the past few decades, the analysis of lithic production has incorporated an extensive consideration ofdebitage. While this work has been fruitful, the social and economic context of early habitation mounds presents a number of challenges todebitage analysis. Debitage can result from a number of activities beyond chipped tool production; as a result, researchers must carefully analyze broader economic and social activities in order to offset these challenges. This paper will present the analysis of lithics,debitage, and other related artifacts from a variety of sites in third millennium B.C. southeast Rajasthan in order to demonstrate how our analytical methods must be modified for early complex societies.

Radde, Hugh (California State University Northridge)

[27] *Understanding Island Tongva Villages: Results from the Catalina Island Museum's Toyon Collection*

The Catalina Island Museum (CIM) cares for the largest collection of Island Tongva (Gabrielino) artifacts in the world, the results of early expeditions, modern excavations as well as objects donated by Catalina Islanders. Opened in 1953, the Catalina Island Museum boasts a wealth of historic, archaeological, and archival materials that document life from the first islanders 8000 years ago to the present day, and strives to provide awareness and appreciation of the island's rich heritage through the use of research, exhibition and educational programs. However, most of the collection remains unstudied and unanalyzed and in some instances in the same paper bags that they were put in over 50 years ago. This presentation will discuss the importance of using legacy collections to understand Island Tongva lifeways and provide the results of one such collection from Toyon Bay, on Catalina Island, California.

Radermacher, Matthew (North Dakota State University), Stephanie Day (North Dakota State University), Anne Denton (North Dakota State University), Jeffrey Clark (North Dakota State University) and Donald Schwert (North Dakota State University)

[260] *Pattern Recognition and Automatic Feature Extraction in GIS*

Archaeological applications of geographic information systems and remote sensing technologies are becoming increasingly popular, especially in regard to site prospection and the geospatial analysis of cultural features. Utilizing aerial LiDAR and high-resolution satellite imagery of North Dakota, a training data set was used to define the boundaries and characteristics for certain morphological features of anthropogenic origin, which include mounds, earth lodge depressions, and fortification ditches. From this, a data mining algorithm was developed to adapt machine learning into an automated extraction program. This system was then tested on other data sets aimed at detecting similar, unrecorded features in the landscape, and verified in the field through ground truthing to determine accuracy. Implications for the successful development of this technology will allow archaeological investigators to review topography and locate specific anthropogenic features on the surface that can otherwise be difficult to distinguish in the field due to vegetation cover, terrain, or landowner permissions. Additionally, it could reduce the amount of time ground crews spend in the field and provide the researcher with site leads and an accurate model of feature distribution within a project area.

Radivojevic, Miljana (UCL Institute of Archaeology)**[89]** *Paint It Black: The Rise of Metallurgy in the Balkans*

This study integrates archaeological, microstructural and compositional data of c. 7000 years old metallurgical production evidence with an aim to address the how and why of the world's earliest metallurgy. The main focus is set on copper ores and metal production debris coming from four Vinča culture settlements in Serbia and Bosnia and Herzegovina, all dated between c. 5400 – 4400 B.C. Chemical study of copper minerals throughout all sites points at striking uniformity in selecting black and green minerals for metal extraction, some of which predate smelting events at c. 5000 B.C. Microstructural examination of metal production debris showed convincing technological similarity throughout c. six centuries of copper making in studied sites. It is argued that black and green ores were intentionally selected as ingredients for the metal smelting 'recipe' in the early stages of Balkan metallurgy based on the knowledge related to their appealing visual aspects. This finding demonstrates a unique technological trajectory for the evolution of metallurgy in this part of the world and illustrates the capacity that materials science carries in addressing the how and why of the emergence of metallurgy, and outlines methodology for future studies of early metallurgies worldwide.

[89] *Chair*

Radivojevic, Miljana [89] see Amicone, Silvia

Radovanovic, Ivana (University of Kansas)**[74]** *Correlating Climate Change and Archaeological Record in the Iron Gates Mesolithic*

Material culture record from the Danube Iron Gates Mesolithic reflects a variety of hunter-gatherer adaptive strategies, including shifts in foraging methods, changes in preferential choices for the raw material extraction, and a variable use of the same locations for residential and/or aggregation camps covering over five millennia. Archaeological debates however remained focused mainly on a few hundred years of the local hunter-gatherers' interaction with the incoming food producers during the Final Mesolithic. Recent geoarchaeological and archaeological survey of Mesolithic sites beyond the Danube Gorges in tandem with building a finer resolution record of the climate oscillations on the local and regional scale (AMS dating and stable isotope analyses), provides a possibility to explore a fuller context of the Iron Gates Mesolithic settlement and establish if there is a chronological correspondence between the late Pleistocene and early Holocene climate oscillations and the archaeological record.

[40] *Chair***Radovic, Marija (University of Belgrade) and Kevan Edinborough (University College London)****[89]** *Teeth As Tools: Paramasticatory Dental Modifications Reflecting Habitual Behavior in the Danube Gorges, Serbia (9500 - 5500 B.C.)*

Technological knowledge and task-related activities of past populations are known mostly by analyses of material culture remains. Here we use a new line of evidence for reconstructing habitual behavior by investigating paramasticatory use of human teeth. Paramasticatory dental modifications (chipping, notching, occlusal and interproximal grooving) are examined on 89 individuals' dentitions (1308 teeth) from three sites of the Lepenski Vir culture: Vlasac, Lepenski Vir and Padina in the Danube Gorges, eastern Serbia (9500 - 5500 B.C.). Both macro- and micro-scopic (scanning electron microscope - SEM) lesions were analyzed. Paramasticatory use of teeth was detected in 43% (38/89) of individuals. Variations in sex/age categories and diachronic changes in teeth use-wear patterns were quantified. SEM surface imaging and micro-residue analyses of lesions enabled comprehensive investigation of their etiology. Specific task-related activities involving teeth-as-tools (e.g. cordage/basketry, bow-drilling) were only detectable using SEM analyses.

Our SEM results show that teeth formed an integral part of tool kits for prehistoric inhabitants of the Danube Gorges. Ethnographic and material culture comparisons indicate patterns of tooth-wear found in our study have significant implications for understanding technological evolution in other case-study areas. Thus, archaeometry can provide an essential insight into human behavior.

Radu, Valentin [401] see Herrscher, Estelle

Rae, Brianna [281] see Jones, Brian

Rafferty, Kevin

[352] *The Rock Art of Valley of Fire, Clark County, Nevada*

Valley of Fire is one of the gems of Nevada archaeology known as an area rich in archaeological resources. Yet little work had been undertaken in the area. Since 2003 the College of Southern Nevada (CSN) has conducted five survey field schools in Valley of Fire designed to teach students survey and site recording. The results so far demonstrate that Valley of Fire is an area rich in rock art and other cultural resources, with new rock art sites being recorded and data from earlier recorded sites being updated. These sites range in age from the Archaic period (ca. 5500 B.P.-2000 B.P.) to the proto-historic Numic period (ca. 800 B.P.-150 B.P.). The data also suggests that in the late prehistoric period, several different cultural traditions occupied or used Valley of Fire as a resource procurement zone. This succession of occupations and cultural traditions will be examined through a discussion of the rock art resources of the locality. In the end the results demonstrate that Valley of Fire is an important archaeological zone that holds the potential to enhance or change many of southern Nevada's archaeological community's ideas about the prehistoric occupation and use of the southern Great Basin.

Raffield, Ben [57] see Greenlow, Claire

Raffield, Ben (Simon Fraser University)

[57] *The 'Bare Branches' of Scandinavian Society and the Origins of Viking Raiding*

The surge of violent raiding that traditionally marks the beginning of the Viking Age at the end of the 8th century ushered in a period of turmoil and change across much of Europe. Though the factors that might have triggered this have been repeatedly debated, no hypothesis has thus far provided a convincing explanation for this important historical phenomenon. One of the oldest arguments, discussed in this paper, was that proposed during the 11th century by Dudo of St. Quentin in *Gesta Normannorum*, who suggested that an excess of young males amongst Scandinavian societies forced many to embark on raiding in search of wealth and reputation. This paper will propose a hypothetical social model for the conditions that might have prompted this violent behavior. The mutually reinforcing social practices of polygyny and selective female infanticide will be considered in light of their potential to generate a pool of low-status males who were required to seek wealth and status in order to enter an elite-dominated marriage market. Relevant archaeological, historical and anthropological data will be consulted in order to identify the possible social mechanisms underpinning Iron Age Scandinavian societies, as well as the extent to which these precipitated socio-political change.

[57] *Chair*

Rafuse, Daniel [250] see Gutierrez, Maria

Raghavan, Maanasa (Center for GeoGenetics, University of Copenhagen) and Eske Willerslev (Center for GeoGenetics, University of Copenhagen)

[337] *The Genetic Prehistory of the New World Arctic*

The New World Arctic, the last region of the Americas to be populated by humans, has a relatively well-researched archaeology. However, there is no consensus on how the different Arctic traditions were genetically related to one another. We present genome-wide sequence data from ancient and present-day humans from Greenland, Arctic Canada, Alaska, Aleutian Islands, and Siberia, contributing new perspectives to the debate of cultural versus genetic replacement in the New World Arctic. We show that Paleo-Eskimos (~3000 B.C.E. to 1300 C.E.) represent a migration pulse into the Americas independent of both Native American and Inuit expansions. Furthermore, the genetic

continuity characterizing the Paleo-Eskimo period was interrupted by the arrival of a new population from western Arctic, representing the ancestors of present-day Inuit, with evidence of past gene flow between these lineages. Despite periodic abandonment of major Arctic regions, a single Paleo-Eskimo metapopulation likely survived in near-isolation for more than 4000 years, only to vanish around 700 years ago.

Ragsdale, Corey (University of New Mexico) and Heather JH Edgar (Department of Anthropology, University of New Mexico)

[217] *Biological Distance among Huastec, Veracruz, and Maya Groups*

The people of the Huasteca region have a shared language history with the Maya region. This connection has long been of interest to Mesoamerican archaeologists and linguists. They also traded with other populations along the Gulf Coast, such as those in Veracruz. To date, biological evidence for these connections remains limited. We compared Huastec (n= 62), Veracruz (n= 47), highland (n= 29) and lowland Maya (n= 63) groups to evaluate the effects of shared language and economic exchange on biological similarities using dental morphological observations. We also conducted non-metric multidimensional scaling to evaluate within-group variation among samples from each region. Our results show a high similarity between Huastec and Maya groups compared with Veracruz groups. The highland Maya is similar to both the Huastec and lowland Maya groups. Additionally, non-metric multidimensional scaling results suggest high variation among individuals from the Huastec sample from Tamtoc, indicating high immigration related to cultural processes. Our results are consistent with archaeological and linguistic evidence for similarities between Huastec and Maya groups. We further conclude that shared migration histories between Huastec, Veracruz, and Maya groups affect population structure based on morphological (phenotypic) data.

Ragsdale, Corey [346] see Edgar, Heather

Raharijaona, Victor [20] see Kus, Susan

Raharijaona, Victor (U of Fianarantsoa) and Susan Kus (Rhodes College, Memphis, TN)

[142] *"My Only Equal [as Sovereign of This Land] Is Rice": The "Technology" of Rice Production Politically Deployed and Ideologically Appropriated in Early Merina "States" of Central Madagascar*

Over past centuries the landscape of the central highlands of Madagascar has been dramatically transformed. Draining, diking and terracing have created vast expanses of irrigated rice fields where forests once stood. The employ of this transformative technology depended on collective social labor; unsurprisingly the dikes that rendered the land productive also served in the political organization and unification of territory and populations. Yet, the destruction of these dikes was also a ploy and consequence of political warfare. Under the rule of Andrianampoinimerina, credited with creating a unified and expansionist Merina "state" in the 18th century, the additional vast marshland expanses that were drained and diked were not only put into standard rice production, but also allowed a second "counter-seasonal" crop of rice. The crediting of this innovative "technological" move to this sovereign was put to extensive ideological use: (1) construction of dikes and rice fields was confounded with the construction of polity; (2) food security served as an "index" of legitimacy of rule; (3) the counter-seasonal second crop of rice was understood as a "true" product of the "state"; and (4) the ruler, as innovator/creator, beyond the constraints of ordinary mortals, was portrayed as a "god seen with the eyes."

Railey, Jim (SWCA - Albuquerque)

[67] *Bell-Shaped Storage Pits and Social Evolution in the Yuanqu Basin, North China*

Control and manipulation of stored food was an important force driving human social evolution. Among the more distinctive forms of storage facilities are bell-shaped pits, which have a global distribution and were common in ancient north-central China. In this paper, size variation of 86 bell-shaped pits, spanning the Neolithic to Early Bronze Age in China's Yuanqu Basin, are examined in relation to other evidence of sociopolitical complexity and change. The data show a significant

increase in the average size, and size range, of bell-shaped pits between the Yangshao and subsequent Late Neolithic and Early Bronze age periods. This may be evidence for increasing inequality, and possibly intensified competition and variable success at control over food production and storage. Moreover, given that concealment was an important function of bell-shaped pits, their presence throughout this sequence may signal household-level management of food stores, resistance to economic control by elites, and perhaps conditions of intense warfare and a desire to hide stores from enemies. These trends are considered in relation to evidence and arguments that the development of sociopolitical complexity, inequality, and state-level societies in China was rooted more in the ceremonial and ideological realm, and less in control over subsistence economics.

Raimond, Christine [350] see McKey, Doyle

Rains Clauss, Lee

[224] *Discussant*

Raja, Mussa [53] see Goncalves, Celia

Rakita, Gordon (University of North Florida)

[245] *Plainware Ceramics from the Surface of the 76 Draw Site, Luna County, New Mexico*

The 76 Draw archaeological site (LA 156980) is located in southwestern New Mexico. This Medio period (A.D. 1200-1400) site is situated within the northern edge of the Casas Grandes interaction sphere just south of Deming, New Mexico. It includes the remains of pueblo-like adobe structures overlain with a scatter of thousands of artifacts including lithic and mixed ceramics. In the summer of 2013, the University of Missouri and University of North Florida surface sampled the site. One purpose of this sampling was to assess the cultural connections between the Casas Grandes, Salado, Black Mountain, and El Paso Phase, Jornada in the Animas region. In this paper we report our analysis of the plainware ceramics retrieved from the site. We explore four questions. First, to what extent do the 76 Draw Plainware ceramics conform to the original Di Peso type descriptions for Casas Grandes plainwares? Second, we assess whether or not plainware ceramics provide meaningful information about the regional connections of those living at the site. Third, our data allows us to investigate how plainwares were used at the site. Fourth, and finally, we assess whether or not the plainware ceramics provide clues to the chronological placement of the site's occupation.

[161] *Discussant*

Rakita, Gordon [245] see Waller, Kyle

Ramirez, Alfredo

[232] *The Comparison of Central and Peripheral Household Compounds at the Site of Panquilma, Peruvian Central Coast*

This paper explores the hierarchical differences between households at the site of Panquilma. Previous studies at the site have identified two types of household compounds: central and peripheral. Despite the fact that central compounds are bigger and located closer to the public buildings of the site, no other difference has been identified that can point towards the presence and the nature of any type of hierarchical distinction between both types of domestic compounds. Using 3-D reconstruction, recorded at a domestic and central compound respectively, this paper will be based in the assessment of differences between both types of households in terms of the household developmental cycle. To this end, I will identify remodeling events associated with the different activities that took place at these domestic spaces.

Ramírez, Felipe [141] see Ibarra, Georgina

Ramirez Muñoz, Favio William (Favio Ramirez Muñoz)**[134]** *Aprovechamiento de Recursos Renovables Durante el Horizonte Tardío en la Cuenca Hidrográfica del Río Cañete*

La presente investigación tiene por propósito aproximarnos al conocimiento tecnológico alcanzado por las sociedades prehispánicas durante el Horizonte Tardío en los distintos espacios geográficos que abarca la cuenca hidrográfica del río Cañete, enfatizando en el aprovechamiento de los recursos naturales renovables, acontecido por una constante interacción entre el hombre y su medio ambiente, siendo un factor importante en los cambios ecológicos la necesidad de adaptación al entorno en el que se desarrolla. Se ha elegido como marco temporal el Horizonte Tardío por ser la última etapa de producción de conocimientos autónomos y por abarcar los conocimientos tecnológicos alcanzados en los anteriores periodos. Su estudio se realizará tomando en cuenta la geografía, los sitios arqueológicos, los rasgos arqueológicos en el paisaje, los artefactos, los ecofactos y los actuales saberes locales. El cruce de variables para su análisis toma indicadores arquitectónicos, etnobotánicos, ecosistémicos, etnohistóricos y antropológicos que al congregarse nos permitirán llegar a inferencias arqueológicas sobre los conocimientos alcanzados tanto por las élites de prestigio como por el grueso de la población que conforman las sociedades anexadas al aparato estatal incaico en la cuenca hidrográfica del río Cañete.

Ramirez-Sánchez, Felipe [409] see Pacheco Gonzalez, Marco

Ramirez-Urrea De Swartz, Susana (Universidad de Guadalajara), Catherine Liot (Universidad de Guadalajara) and Javier Reveles (Universidad de Guadalajara)**[189]** *The Transition between Epiclassic to Early Postclassic in Western Mexico. Processes Involved in the Sayula Basin (Jalisco)*

The transition between the Epiclassic and Postclassic in Western Mexico has been linked to the Aztatlán tradition. The Sayula basin offers a great opportunity to explore the processes involved in the cultural assimilation and interaction between two contemporary major cultural components: one with strong local identity related to a major component of social structure at Epiclassic sites, such as Ixtépete, La Higuerita, Los Altos de Jalisco and La Quemada (Zac). The other is part of the Aztatlán Tradition.

Ramon Celis, Pedro**[111]** *Registros gráfico-rupestres en Yagul, pintura rupestre en contextos urbanos*

El sitio arqueológico zapoteco de Yagul, Oaxaca, es conocido por su carácter de ciudad-fortaleza, contando con una gran cantidad de edificios monumentales, una traza urbana definida, y un área habitacional que se extiende más allá del macizo rocoso donde se enclavan los edificios más importantes. Empero poca información se ha referido en cuanto a un elemento que ante su pequeño tamaño, palidece frente a estos contextos mencionados, nos referimos a las pinturas rupestres y petrograbados que se encuentran a lo ancho de la ciudad. En esta exposición mostraremos cómo es que estas pinturas se relacionaban y formaban parte integral de la ciudad.

[111] *Chair*

Ramos, Martha [11] see Carini, Claudio

Ramos, Jorge**[366]** *A Sacred and Defensible Hill and the Memory of Ruler 12 in Late Classic Copan, Honduras*

Inscribed monuments, iconography and archaeological correlates point out the pivotal role the founder of Copan's dynasty, K'inich Yax K'uk' Mo' played in the religious and political ideology of the local community. Moreover, several lines of evidence in the archaeology of Copan show the importance of the long-lived Ruler 12, K'ahk' Uti' Witz' K'awiil (ruling from 628 to 695 CE) in the Maya kingdom of Copan during the Late Classic period (600-820 CE). Recent research in the Copan Valley at the outlying Group 6N-1, in the area traditionally known as Rastrojon, has revealed an ornately decorated residential complex devoted to the memory of Ruler 12, his sacred mountain and

defensive system. This paper explores the motives behind the construction and use of this architectural complex at a very strategic place within the Copan Valley and seeks to add to our understanding of the local ideology in connection with the figure of Ruler 12 in Late Classic Copan's multi-ethnic community.

Ramos Madrigal, Jazmín [229] see Wales, Nathan

Randall, Lindsay (Robert S. Peabody Museum of Archaeology), Ryan Wheeler (Robert S. Peabody Museum of Archaeology) and Joel Jacob (Phillips Academy)

[93] *Statistics: It's a Sherd Thing: Archaeology in a High School Math Class*

Entire books have been dedicated to the subject of math applied to archaeology, both in the field and in analysis. Archaeology educators have recognized that the excitement of archaeology can be used to share elements of trigonometry, statistics, geometry, and more. Educators at the Robert S. Peabody of Archaeology and Phillips Academy have collaborated to use existing collections of pottery sherds from sites in New Mexico to introduce statistics to high school students. In the "It's a Sherd Thing" exercise students analyze sherds and then test hypotheses about chronology, all the while contending with issues of collections bias and other challenges often absent from textbook problems. A writing assignment asks that the students concisely describe their results, providing an opportunity to assess the learning goals of the project. Like other learning opportunities offer by the Peabody Museum, "It's a Sherd Thing" supports existing curricula, using the concept of "teaching with" archaeology, rather than adding archaeology to the already burgeoning curriculum. Problem and project oriented learning, like "It's a Sherd Thing," fosters deeper knowledge and contribute to greater self-esteem, and provides a new way to use older museum collections.

Randall, Asa [348] see Gilmore, Zackary

Ranere, Anthony (Temple University) and Richard Cooke (Smithsonian Tropical Research Institute)

[186] *Contributions of Archaeological Research in Panama to the Early Human History of the American Tropics*

There has been a sea change in our understanding of the early human occupation in the tropical lowlands of the Americas over the last four decades. Research carried out in Panama has contributed to this change in a number of ways. First, evidence of Terminal Pleistocene hunter-gatherer populations using both Clovis technology and presumably later fluted fishtail projectile point technology was recovered in tropical forest as well as open woodland habitats. Importantly, the pioneering analyses of phytoliths and starch grains by Dolores Piperno documented the early domestication and dispersal of tropical lowland plant species in the Americas. In addition, by establishing a massive comparative collection of terrestrial and aquatic faunas, a detailed assessment of faunal use over the last 8000 years has been established in the region. Finally, a probabilistic site survey of a tropical watershed documented changing settlement patterns and occupational densities from 13,000 years ago until European contact. This research implies that New World tropical forests were occupied by hunter-gatherers as early as other non-forested tropical habitats and that tropical forest populations were key participants in the early domestication and widespread distribution of New World crops.

Ranere, Anthony [186] see Dickau, Ruth

Ranhorn, Kathryn (The George Washington University), Francys Subiaul (The George Washington University), David Braun (The George Washington University), Alison Brooks (The George Washington University) and Robert Kaplan (The George Washington University)

[122] *Detecting Signatures of Cultural Transmission: An Actualistic Study*

The potential to detect signatures of cultural transmission in stone tool technology is quickly gaining traction in Paleolithic archaeology (e.g. Tostevin 2012). These methods, rooted in middle range theory, remain to be tested through controlled experiment. This project uses experimental flint

knapping and a social learning framework to test the hypothesis that signatures of direct cultural transmission can be detected in core reduction strategies. The participant pool included experienced North American flint knappers. The experiment consisted of three isolated sessions simulating different degrees of information transfer ranging from Baseline (low fidelity) to Imitation (high fidelity). Preliminary results suggest that variation in core form is driven primarily by shape of the original cobble and skill level. Skill was determined by both post-experiment questionnaire and by pre-experiment observation. Variation in flake morphology was correlated to different stages of reduction intensity. This study attempted to empirically elucidate signatures of cultural transmission and demonstrates the importance of analyzing these markers across the reduction sequence. The lithic variables measured in this study can be applied to various spatial and temporal contexts.

Ranhorn, Kathryn L. [356] see Wilkins, Jayne

Rankin, Caitlin (Washington University in St. Louis), John Kelly (Washington University in St. Louis) and T.R. Kidder (Washington University in St. Louis)

[359] *Geochemical and Physical Characteristics of Anthropogenic Sediments from Cahokia*

The 110 mounds that characterize Cahokia's landscape represent the most visible aspect of anthropogenic transformation of landscape. Recent ongoing efforts on the northern edge of the east plaza at Cahokia are uncovering a hidden landscape of earthmoving, illustrating the social complexity of this urban center. Traditionally, mound building has been perceived as a simple process of moving and reshaping earthen material. Because of this simplified model of mound construction, studies of mound building have primarily focused on identifying and dating construction stages, as well as studying the structures supported by these various construction stages. Recent interpretations suggest mound construction required a planned effort to organize labor, prepare the original ground surface for construction, and select specific building materials. We apply geochemical and physical soil analyses to anthropogenic sediments from the northern edge of the east plaza at Cahokia that are associated with a planned effort to transform the landscape. We treat the sediments as artifacts that can contribute to our knowledge of social complexity, as well as show how precolumbian North Americans were actively engaged in transforming their environment.

Rankin, Amanda (University of Nevada, Reno)

[386] *High Altitude Residence in the Great Basin and the Rocky Mountains*

It has been suggested that high elevations are highly demanding environments, poor in resources, and only heavily used to procure high ranked animal prey. Steward's work in the Great Basin with the Shoshone and Piute showed that valley and foothill resources dominated subsistence patterns, with high altitude resources playing only a minor role for hunting. However, evidence exists for high altitude residential sites in both the White Mountains of eastern California (Great Basin) and the Wind River Range of western Wyoming (Rocky Mountains). These sites appear to be anomalous in that they contradict previously held ideas about hunter-gatherer adaptive choices, specifically intensive plant processing in lieu of hunting, evidenced by large quantities of groundstone. Ongoing research seeks to define the use of grinding implements through starch residue and use-wear analysis to better understand hunter-gatherer adaptive choices at high altitude.

Ranoli Oñasojle, Ishiba [409] see Silverstein, Jay

Ranzi, Alceu [157] see Watling, Jennifer

Rao, K.P. [101] see Abraham, Shinu

Rareshide, Elisabeth (California State University, Northridge)

[27] *Legacy Collections in Public Education*

Not all legacy collections are forgotten in dusty boxes. Some find new life in public education, offering non-archaeologists tangible connections to the past. Integrating legacy artifact and

document collections with effective education techniques provides the opportunity to engage children and adults in archaeology. Through the case study of developing an interactive educational tour about pre-Contact Chumash at the Leonis Adobe Museum in Calabasas, this paper explores practical concerns regarding communicating educational material to the public, working with multiple stakeholders, and ethically representing native voices.

Raschkow, Wanda

[29] *Mystery in Grapevine Canyon: Gender and Ethnicity in a Historic Period Site*

The Grapevine Archeological District in Death Valley National Park contains evidence of prehistoric and historic occupations. The district also overlaps with the Death Valley Scotty Historic District. A road realignment project in 2014 led to the discovery of a historic period site that appeared to be a mining camp with features and artifacts typically associated with tasks performed by men. Surface features and artifacts included a forge and hand-forged axes; a mining claim cairn marked the eastern boundary of the site. Excavation conducted for mitigation of adverse effect revealed artifacts that hint at the presence of women and children and also raise issues of ethnicity. These artifacts include a thimble, doll's leg, metate fragments, and knapped glassware.

Rasic, Jeffrey [8] see Urban, Thomas

Raslich, Nicole (Michigan State University)

[95] *Indigenous Perspectives On Cultural Heritage Management And Preservation*

Cultural Heritage Management has various perceptions when utilized by indigenous communities and archaeologists. Heritage management professionals advocate preserving sites from looters, limiting access to curb erosion and protecting historical places from the degradation of time. Preservation methods may include stopping traditional uses of these locations unless otherwise specified through legislation. Most often, sites are located and archived through historical and archaeological research. Various Sami and Ojibwa groups along with other indigenous communities use cultural heritage management to preserve sites or buildings while allowing for the continued traditional utilization of the place. Often, indigenous perspectives on cultural heritage preservation refer to the passing of cultural knowledge to future generations through the continued traditional use of sites. Many times these places are located through oral history surveys and visual surface surveys with archaeologists and elders. Both of these often contested perspectives speak to the same principle that is at the core of archaeological practice; stewardship. By aligning these methods along the common principle of stewardship, mutually constructive and meaningful partnerships can be achieved.

Raslich, Frank [365] see Bengtson, Jennifer

Raslich, Frank (Michigan State University), Jodie O'Gorman (Michigan State University) and Michael Conner (Dickson Mounds Museum)

[365] *Coming Together: Evidence of Ritual and Public Space as a Mechanism of Social Integration*

Structure 16 at the Morton Village site (11F2) provides a unique opportunity to examine social interactions between Oneota and Mississippian populations situated within the Central Illinois River Valley. Prior to our work, the nature of these interactions at this site was poorly understood. Burgeoning data supports our interpretation of a cohabitation at Morton Village between these populations following Oneota in-migration. A method of this integration is demonstrated through ritualistic activity expressed extensively at structure 16. This structure is a unique public space illuminating various forms of ritual. Our archaeological investigations at structure 16 provide strong evidence of cultural admixture within an exclusively integrated public domain. Our data suggests a negotiation of identity occurs, after the Oneota in-migration, through the active adaptation of select traits, activities, and behaviors between these populations. We explore the nature of integration that existed between the Oneota and Mississippian populations identified through the material remains and architecture found at structure 16.

Rasmussen, Amanda**[120]** *An Analysis of the Archaeological Remains at Fort Halifax Park*

Fort Halifax, located in Halifax Township, Pennsylvania, was occupied from 1756 to 1757 during the French and Indian War. Fort Halifax Township Park, where the fort is believed to be located, contains rich expanses of prehistoric and historic archaeological data. Since the Fort Halifax Park contains information regarding several occupations, the collected archaeological data has been useful in identifying the spatial relationships between occupations. This data, when further analyzed through the implementation of Bayesian Statistics, could assist in identifying which locations are most likely to yield remnants of fort activity. The use of Bayesian Statistics assists in assessing a group of test criteria through the incorporation of archaeological evidence. The probability is influenced not only through geophysical data and historic artifact densities and distributions, but also other factors such as landscape data, soil stratigraphy, and levels of disturbance. This investigation implements these attributes into a statistical analysis, increasing the likelihood of recovering Fort Halifax.

Rasmussen, Josephine (University of Oslo)**[218]** *Heroes of Heritage: Detrimental Situations as Commendable Motivation for Hobbyist Metal Detecting*

Within the contemporary European heritage discourse, agriculture and forestry are increasingly identified as threats to archaeological remains. At ploughed-over archaeological sites, objects that were once associated with primary depositional contexts become mixed into the top soil, and this enhances their destruction. This paper explores the discourse that revolves around hobbyist metal detecting as a large scale means of rescuing archaeological material from destruction. Based on a case study from Norway, I address the rhetorical dichotomy between commendable and dubious motivations that permeate debates concerning hobbyist metal detecting, archaeology, the antiquities trade, and artifact collecting.

Rassman, Knut [47] see Davis, Stephen

Rath, Will [362] see Vernon, Kenneth

Rath, Pip (University of Sydney, Australia)**[412]** *Negotiating Social Identity through Practices with Stone*

Dazzling, large, highly retouched obsidian objects comprised part of the material world of prehistoric people from West New Britain, Papua New Guinea from sometime between ca 6300- to 3300 years ago BP. Beyond their role as valuables, the seemingly mundane practices of choosing and acquiring raw material together with the application of a sequence of actions on the material and knowledge used in making them were fundamental for creating and structuring social relations. A case study, identifying and comparing the routine practices at three sites where various mixes of obsidian sources were exploited to make the stemmed tools, illustrates how people used these practices to negotiate social identity and ownership of the sources.

Raubenheimer, David (The University of Sydney)**[415]** *The Nutritional Ecology of Human Obesity*

Nutrition has exerted a powerful influence on human evolution and history, and continues to play a central role in global challenges such as food security and obesity. However, the complexity of nutrition presents considerable challenges for researchers to unravel its grip on human affairs. In this talk I will introduce an approach called nutritional geometry that has been developed to aid this process. Nutritional geometry differs from conventional nutritional models in acknowledging that nutrients do not act alone, but interact extensively in their influence on humans. I illustrate this in the context of human obesity, showing how nutritional geometry has provided new insight into the ways

that recent changes in human nutritional ecology have interacted with evolved human traits to generate this major global problem.

Raviele, Maria (Institute of Museum and Library Services)

[5] *Discussant*

Ray, Erin (University of California, Merced)

[10] *Geochemical Analysis of Construction Materials in the Cave at Las Cuevas, Belize: An Intrasite Analysis*

The entrance chamber of the Cave at Las Cuevas, Belize prominently features many platforms, staircases, and terraces. To date 72 platforms, seven staircases, and two sets of terraces have been mapped and recorded. Geochemical analyses of the plastered surfaces were conducted in situ and in the lab in order to understand the technology used to create the platforms within the cave. Geochemical analyses were conducted in situ using portable XRF (pXRF) and additional samples were collected for portable XRF analysis in the lab. Platforms from different areas of the cave entrance, different light quality, and different sizes were considered for this study. I hypothesize that differences in chemical composition may represent differences in function or may represent a construction chronology. I will present the results of the pXRF analysis and discuss the range of variation and possible reasons for the variation.

Razeto, Jorge [318] see Vidal Elgueta, Alejandra

Reagan, Andrew [15] see Riggs, Erin

Reardon, Jim [90] see Kneifel, Rebekah

Reber, Eleanora (UNC Wilmington)

[417] *Wine or Wax? Organic Residue Analysis on Pottery from the Early Bronze I at Nahal Tillah*

Nahal Tillah is an Early Bronze I site in the Southern Levant with evidence for a strong Egyptian trade presence. Twenty-eight sherds from four different vessel types underwent absorbed pottery residue analysis to identify possible traded resources and to confirm vessel functions. Although wine and olive oil are believed to be the major trade resources in the region, wax was an unexpectedly important resource in the pottery sampled, particularly among the Southern Levantine styled jars.

Reddy, Seetha (Reddy Anthropology Consulting)

[41] *Changes Palates and Resources: Modeling Diachronic Plant Use in Prehistoric California*

Despite considerable diversity in plant communities across coastal and inland California, the region's hunter-gatherers often have been viewed as having broadly similar plant resource orientation. This paper reassesses this perspective by explicitly examining spatial and temporal variation in plant use west of the Sierra Nevada. In doing so, the study capitalized on a growing body of paleoethnobotanical data to explore similarities and differences in plant food resource emphasis across six main regions in western California. Initially, the talk will highlight regional patterning in potential plant resource distribution and density. Then analysis will emphasize trends in the relative reliance on exploited resources, focusing on three main plant food groups - seeds, nuts and geophytes. The results provide a baseline to explore to what degree observed spatio-temporal patterns in plant use are primarily a function of resource distribution, and in what contexts do social factors (such as investment in labor, risk assessment, population density, settlement organization, and cultural preference) play a more prominent role. The talk concludes with a consideration of the underlying causal factors driving the pace and scale of change in plant usage, and the social context in which certain plants became keystone resources.

[41] *Chair*

Reddy, Seetha [175] see Hull, Kathleen

Redmount, Carol (UC Berkeley)

[240] *Mortuary Practices through Time at El Hibeh, Egypt*

El Hibeh is an isolated urban site some three hours south of Cairo. The walled town was founded at the beginning of Egypt's Third Intermediate Period, when it reached its greatest importance, and was occupied for approximately a millennia and a half--at least into Coptic/Early Islamic times. Hibeh was an important provincial town during Egypt's Third Intermediate Period (early first millennium B.C.E.) after which it lost much of its regional significance. The town mound is surrounded by burials cut into the natural limestone; the mound itself was also used for burials at various times. This paper provides an overview, based on available evidence, of shifting mortuary practices at the site through time and seeks to correlate these shifts with developments in contemporaneous political, religious, economic, landscape, site usage and other patterns as relevant.

Reed, Lori (Aztec Ruins National Monument) and Mary Ownby (Desert Archaeology, Inc.)

[79] *In the Land of Lava: Petrographic and Chemical Analysis of Pottery from El Malpais National Monument*

Pottery found at four sites located in the eastern half of El Malpais National Monument offers significant clues into the importance of this area for the southern Chaco cultural extension. Further, the movement of pottery within the area is also significant as is information on local or non-local production. In order to begin to understand these issues, chemical and petrographic analysis was carried out on pottery mostly from the great house site of Las Ventanas. The Cibola White Ware, Socorro White Ware and White Mountain Red Ware are dominated by sherd temper that can cause difficulties for analysis. This may have resulted in the many chemical groups identified, for which petrography indicated some connections. We suggest that Cibola White Ware from the monument was made at many sites, while Socorro White Ware and White Mountain Red Ware may have had more limited production. Examination of the NAA data within a larger database also indicated such a pattern. These results have provided a preliminary hypothesis on pottery exchange in this area which further analyses will test.

Reed, Denne (University of Texas at Austin)

[161] *Discussant*

Reed, William (USDA - Forest Service)

[329] *Discussant*

Reed, Paul (Archaeology Southwest)

[382] *Life and Ritual at the Edge of the Lava: The Ancient Chacoan Community at Las Ventanas*

The ancient Chacoan-affiliated community at Las Ventanas, New Mexico, on the El Malpais National Monument, has been known to the southwestern archaeological community since Adolph Bandelier's time in the late 19th century. Knowledge has accrued over nearly 140 years with visits by various archaeologists. Archaeology Southwest's recent Las Ventanas Community Landscape Project has continued this work and produced some astounding findings. Seven extensive trails were documented in the lava west of the Las Ventanas Pueblo Community and the Sandstone Bluffs area. Hints of trails were apparent before, in this area and across the entire Monument. But, new research has shown the construction and use of trails to have been much more intensive and extensive than previously suspected. Furthermore, these trails were not built primarily or exclusively as utilitarian transportation corridors. Rather, most were built as ceremonial byways to access a variety of rituals features in and around the lava flow.

[382] *Chair*

Reeder-Myers, Leslie [105] see Rick, Torben

Reeder-Myers, Leslie (Smithsonian Institution)**[120]** *Modeling Sea Level Rise and Shoreline Change in a Complex Sedimentary Environment: Case Study from Chesapeake Bay*

Accurate estimates of past shoreline locations are important for archaeologists interested in the complex relationships between sea level rise and human ecology. However, shoreline reconstructions require careful consideration of highly variable eustatic, isostatic, tectonic, and sedimentary processes. In the Chesapeake Bay, records from marsh cores have produced high resolution models of relative sea level rise since the Bay first emerged between 8000-7000 BP, influenced by both global sea level rise and local subsidence. Shoreline reconstructions within Chesapeake Bay, however, are complicated by significant and highly variable sediment deposition during the Colonial, Historic, and Modern periods, which has obscured the original bathymetry. This study explores different methods for measuring and compensating for that sedimentation to model shoreline change across the entire Bay. Results suggest that even the relatively slow sea level rise during the Late Holocene produced shifts in shoreline locations that would have affected estuarine ecosystems and the people who depended on them. Modeling, in this case, is an important starting point, but variability in sedimentation rates requires more localized studies to produce accurate reconstructions to contextualize archaeological studies.

Reedy, Chelsea (University of Oklahoma) and Leland Bement (University of Oklahoma & Oklahoma Archaeological S)**[122]** *Tool Production, Subsistence, or Practice: An Investigation of Human Modified Bison Phalanges Present at the Bull Creek and Clary Ranch Sites*

The Clary Ranch site in Southwestern Nebraska and the Bull Creek site in Northwestern Oklahoma are Late-Paleoindian camps that were used for processing the meat and bones from bison hunts. This is an experimental archaeological investigation involving Clary Ranch and Bull Creek, both of which contain evidence of spiral fracturing on bison phalanges resulting from the butchering and preparation process. This archaeological experiment investigates possible motives Paleoindian hunters would have for breaking the small, dense, and low-yield marrow bison phalanges at these two sites. The hypothesized reasoning behind this anomalous butchering practice is threefold; perhaps the use of the broken phalanges for bone tool production, a possible addition to the Paleoindian subsistence strategy, or the practicing of spiral fractures for the later butchering of higher yield areas. The results are consistent with the idea of marrow extraction over spiral fracture practice and bone tool production.

Reedy, Chandra (University of Delaware)**[284]** *Incorporating Image Analysis into Ceramic Thin-section Petrography*

In 2002, our laboratory received a grant from NCPTT to research digital image analysis of petrographic thin sections. Two years previously we published our first paper on the application of image analysis to thin-section studies; the enormous potential of this line of research was apparent, but to fully pursue it would require a period of dedicated time and effort. The NCPTT grant gave us this time, and allowed us to purchase new software packages and upgrade our computer and microscope digital camera capabilities. That original grant resulted in a document comparing two comprehensive commercial software packages and one free shareware package, taking each through a series of typical operations important for image analysis of archaeological thin sections. Twelve years later, image analysis is a routine part of thin-section petrography research in our laboratory. We currently focus on ceramic studies, which now incorporate both traditional qualitative thin-section petrography (such as identification of minerals and other aplastics, geological comparisons, and inferring fabrication and production methods) and collection of quantitative data through image analysis. Examples illustrating these new routines will focus mainly on low- and high-fired ceramics (particles, pores, and decorative layers) from a variety of sites in China, especially within Sichuan Province.

Reents-Budet, Dorie (Smithsonian Institution)

[344] *Ideology and Power at Copán, Honduras*

The ideology of place was central to the structures of power that directed the socio-political trajectories of the myriad polities that comprised the Classic Maya landscape. Nowhere was this more vital than at Copán, Honduras. In their book *Forest of Kings*, Linda Schele and David Freidel highlighted the ideological underpinnings of Copán's dramatic architecture and sculpture. They defined an interpretive history based on the inter-weaving of archaeological, art historical, and epigraphic data to craft a socio-historical narrative from both an academic and anecdotal perspective.

Reese, Kelsey (Washington State University) and Timothy Kohler (Washington State University)**[287]** *Agency of Access: Public Architecture in Mesa Verde National Park*

There are many architectural features in the Mesa Verde region that have been defined as "community centers," or rather, specific areas of cultural and social significance. Community centers may contain several public features, including a: Great Kiva, Reservoir, Great House, Plaza, Tower, and others. Although these features are assumed to have served a large surrounding population, the placement of these structures on the landscape can help us understand the ease with which the surrounding population may have accessed these public features—either visually or physically. The production of public architecture suggests forethought into the level of visibility and accessibility to each public feature—and this paper hopes to extrapolate and quantify that thought process by examining the placement of both habitation sites and public features. This paper combines least-cost and viewshed analyses to produce an accessibility metric that represents the ease of travel and participation from habitation sites to contemporaneous public architecture. By running these analyses across the Mesa Verde landscape and through time, changes in accessibility can be observed to suggest how communities may have responded to social, cultural, and environmental changes from A.D. 600-1280.

[330] *Discussant*

Reese, Elena [416] see Ballard, Hannah

Reese-Taylor, Kathryn and Julia Guernsey (The University of Texas at Austin)**[306]** *Situating the Narrative Style and Legacy of A Forest of Kings*

In this paper, we situate *A Forest of Kings*, which combined archaeological and art historical data, within the genre of ethnographic fiction. We consider its waxing and waning throughout time as a popular narrative form and its legacy that continues to this day. *A Forest of Kings* was conceived and written at a significant moment within the history of ethnographic fiction. While it is strongly grounded in the reflexive and representational practices of the late 1980s and early 90s, *A Forest of Kings* simultaneously presents an interesting departure. One that, we believe, was "before its time" in its effort to present archaeological data and also people the past with individual actors and agendas through "story-telling." This style of writing and its goals of imaginatively populating long abandoned archaeological sites provided a vehicle through which innovative ideas concerning performance and the built environment were presented that have been pursued and criticized by many scholars in the field since then. The goals of this paper, therefore, are both to provide a long overdue historical context for *A Forest of Kings*, as well as to assess its influence within the field of Maya studies.

Reetz, Elizabeth, Cynthia L. Peterson (University of Iowa Office of the State Archaeologist) and Melody Pope (University of Iowa Office of the State Archaeologist)**[43]** *Bridging the Professional-Public Divide through Flood Recovery Compliance Archaeology at the University of Iowa*

Recent federally-funded flood relief compliance projects on the University of Iowa campus provided the University of Iowa Office of the State Archaeologist with an opportunity to involve various publics in our work. It also provided us with an opportunity to reflect critically on how we represent our work and archaeology more broadly to the public and how our work is presented to even wider publics by the media. We first present an overview of the various approaches we took to engage the public in

learning about on-going compliance archaeology resulting from a major flood that impacted the university and city through active learning, lectures, discussion forums, and media interaction. We then offer some critical reflections on the successes, failures, challenges, and responsibilities of representing archaeology and the past to various publics in what are often politically-contentious settings.

Reetz, Elizabeth [98] see Alex, Lynn

Reeves, Daniel

[143] *Signs of Authority? Symbolic Media and Items of Personal Adornment from Cache Cave*

Along with a remarkable utilitarian perishable assemblage, a number of objects recovered from Cache Cave can be considered from ideological or symbolic perspectives. These include a number of ornamental and personal items that clearly indicate something other than the storage of everyday objects within the cave. This assemblage contains a variety of beads, a coyote femur tube, an exquisite chert knife, and several other enigmatic objects made of animal bone, skin, wood, and shell, including the rarest of items known of in South-Central California: a decorated bald eagle beak pendant. While some of these items may have functioned in everyday roles, the presence of rare artifact types presents the opportunity to explore dynamics of status or authority that may have been conveyed through the possession and/or display of such items. This paper describes these objects along with their contexts and considers competing explanations for their usage as well as for their caching at Cache Cave

Reeves, Daniel [143] see Brown, Gloria

Reeves Flores, Jodi [123] see Rivers Cofield, Sara

Reeves Flores, Jodi (Center for Digital Antiquity, Arizona State University) and M. Scott Thompson (Center for Digital Antiquity)

[353] *Managing 'A Mountain' of Rock Art Digital Data*

Currently, rock art research generates large amounts of digital data, both un-structured and structured. This paper discusses the significant role that digital data management systems and repositories such as the Digital Archaeological Record (tDAR) can play in the examination, management, and long-term curation of these data. tDAR is a dynamic digital platform that allows archaeologists to conduct research with and manage their data. The paper describes how rock art researchers can use tDAR to study, organize, and share vast amounts of unstructured data; such as images, reports, and field notes; and large structured data sets. It also presents a case study from the American Southwest as well as other examples from current collections in tDAR to illustrate tDAR's utility in managing rock art data. The case study focuses on legacy rock art data from A Mountain (Tempe or Hayden Butte) in Tempe, Arizona.

Reff, Daniel (Comparative Studies, Ohio State University)

[257] *Warfare, Invasion, and Ethnogenesis during the Protohistoric Period in Sonora*

When examined separately, the archaeological record and early Spanish accounts of Sonora are seemingly insufficient or ambiguous with respect to culture continuity and change. However, critical juxtaposition of the two "data sets" suggests that the late prehistoric period in Sonora was a time when competing chiefdoms or "statelets" embraced slavery and territorial expansion, contributing to processes of ethnogenesis that have confounded previous interpretations of the archaeological and historical records.

Regnier, Amanda [173] see Hammerstedt, Scott

Rehren, Thilo [89] see Amicone, Silvia

Rehren, Thilo (UCL Qatar), Maninder Gill (UCL Qatar) and Ian Freestone (UCL Institute of Archaeology)

[411] *Cultural transmissions and indigenous influences: Glazed tiles from Mughal India*

The use of glazed tiles for architectural embellishment in the Islamic world was widely patronized by the Timurids in Central Asia in the fourteenth and fifteenth century, influencing in times to come the decorative traditions of neighboring lands. In northern India, glazed tiles began to be used in substantial numbers by the Mughals on their buildings in the sixteenth and seventeenth century, in the province of Punjab near the north-west border, and further inland at Delhi. Samples representative of tile-work on buildings in these two regions were subject to laboratory investigations using electron microscopy. The tiles from the Punjab region are similar in character and composition to tile-work from nearby Central Asia, their manufacture thus seemingly in the hands of itinerant craftspeople. In contrast, tiles from Delhi were found to be technological hybrids, exhibiting an interesting amalgamation of imported and indigenous technologies, in the bodies and glaze layers respectively. Our findings provide firm evidence of the incorporation of traditional Indian glass technologies in the manufacture of a product of essentially foreign Central Asian character. Overall, the paper aims to present the efficacy of archaeometric investigations in studying such cultural interactions, through an assessment of technologies manifest in the archaeological record.

Reich, David [396] see Krause, Johannes

Reichardt, Stephen (Arizona State University)

[7] *Development and Integration of Cultural Resource Data in a Geographic Information System from Nuvakwewtaqa, Chavez Pass, Arizona: A Model for Spatial Data Management*

The six year Chavez Pass Archaeological Project (Arizona State University - Chavez Pass Project 1976-1982) consisted of survey and excavation at the large Puebloan site of Nuvakwewtaqa. The burial assemblages that resulted from this project were recently reanalyzed in cooperation with the Coconino National Forest, as part of ASU's Forest Service sponsored NAGPRA Documentation project. The initial project recorded and documented all features identified across the site. However, a comprehensive site map tied to a non-arbitrary coordinate system was not generated. Archaeological relationships within and between features at Chavez Pass are complex and as such, necessitated a visual mode of spatial data interaction. Recent improvements in mapping technology including Geographic Information Systems (GIS) greatly facilitated georeferencing the digitized site maps. Once georeferenced and projected (Arizona NA.D.83 UTM Zone 12), the non-arbitrary site coordinates were applied across all subsequent feature maps. These new georeferenced data layers served as foundations to build a comprehensive geodatabase and map of the Chavez Pass site that will provide researchers, and students with a visual mode of spatial data interaction.

Reid, David (University of Illinois at Chicago)

[149] *Rock Art and Prehistoric Roads: The Connection in Southern Peru*

The site Toro Muerto, located in the Majes Valley of southern Peru, constitutes one of the largest and better studied rock art sites in South America. Approaching Toro Muerto through a 'landscapes perspective,' we can situate the site within a changing ideological, socio-economic, and political landscape beginning in the Middle Horizon (A.D. 600-1000) to the 18th century Colonial-period. This paper goes beyond the typical site-level analysis to place Toro Muerto at the center of a southern Andean rock art tradition that extended beyond the Majes Valley. Utilizing geographic information systems (GIS), a least-cost path analysis was conducted between Toro Muerto and other known Middle Horizon sites of southern Peru. Remote sensing and archaeological survey of the modeled path show that Toro Muerto was a major node on a road and caravan system that linked other prehistoric settlements and rock art sites. Petroglyphs depicting camelid caravans, the presence of stone cairns or apachetas, fresh water wells, and geoglyphs at Toro Muerto also require us to reexamine previous interpretations of rock art sites in the southern Andes.

Reid, Kenneth (Idaho State Historical Society) and Ethan Morton (Idaho State Historical Society)**[300]** *Idaho's Radiocarbon Record and the Challenges of Chronometric Hygiene*

Idaho's position as a hub adjoining several culture areas gives its radiocarbon chronology more than local interest. The record of late Pleistocene and Holocene radiometric dates extends back more than fifty years and includes at least 800 known or reported assays, not all of which are on file at the Archaeological Survey of Idaho. As of mid-2014 more than 650 dates were available from 184 sites distributed across all ten of the Level 3 ecoregions intercepted by the state's border. Not surprisingly, here as elsewhere, issues of chronometric hygiene haunt interpretation and contribute to debates and uncertainties concerning initial colonization, the emergence of the storage-anchored "winter village pattern," the arrival of bow-and-arrow technology, the appearance and spread of pottery, and, more generally, the accurate establishment of occupation timing throughout the state. This paper reviews the sample, and offers a preliminary scoring system combining sample type, measurement method, and the age and precision of the measurement to gauge the relevance of the dates to events of interest in Idaho prehistory.

Reid, Connie (Connie Reid)**[308]** *Discussant*

Reider, Kevin [30] see Hoffman, Brian

Reilly, Kent [182] see Stauffer, John

Reilly, Frank (Texas State University) and David Freidel (Washington University St. Louis)**[306]** *Middle Formative Origins of the Early Classic Period Stela Cult*

Stela are standing stones, incised or carved with iconographic or hieroglyphic information. Stelae vary in size from the portable to monumental stones. Some of the earliest examples of stelae were erected at the Middle Formative period site of La Venta. Undoubtedly, these La Venta stela, like their Maya counterparts, are linked to concepts of rulership and sacred cycles of time. A close iconographic analysis supports an interpretation that finds the origin of these early stela firmly rooted in the caches of polished green stone celts and or figurines and statues that carry incised symbols and motifs as secondary information.

Reindel, Markus [31] see Isla, Johnny

Reindel, Markus (German Archaeological Institute, Bonn, Germany)**[100]** *Overview: MayaArch3D - A Web-based 3D-GIS for the Analysis of the Archaeology of Copan, Honduras*

The documentation and analysis of complex archaeological sites constitutes a challenge for modern research. Large amounts of data have to be stored and accessed, normally by different research teams, based on places all over the world. Funded by the German Ministry for Education and Research (BMBF), and in cooperation with partners from Germany, Italy, USA and Honduras, the MayaArch3D project is using data from the Maya site Copan, Honduras, to develop a state-of-the-art, open source, online system for the documentation and analysis of complex archaeological sites. The data, different in kind and resolution, include text and numerical information, raster data, vector data, 2.5D surface models, and 3D models of objects, architecture and landscape. The system combines the database functions with the analytical functions of Geographical Information Systems (GIS) into one single platform. On the back-end of our system, a Filemaker Pro database contains the archaeological attributes for each digital object and two PostGreSql databases that hold the geometries for 3D objects and 2D shapefiles. On the front end, the public sees a 2D geobrowser, a 3D geobrowser, and a Single Object Viewer. A user management system offers different security levels, with both a public and password log-in.

[100] *Chair*

Reinhard, Karl (University of Nebraska - Lincoln) and Isabel Teixeira-Santos (Escola Nacional de Saúde Pública, FIOCRUZ)

[127] *Dietary Reconstruction Based on Coprolites from Antelope Cave*

Results of 20 Antelope Cave coprolites show both consistencies and inconsistencies with other Ancestral Pueblo coprolite analyses. Most of the human coprolites appear to be late summer and early fall depositions. Four principal plant foods were ground to a fine flour: maize kernels, dropseed caryopses, sunflower achenes, and cheno-am seeds. Maize and dropseed were found in six coprolites each and they did not co-occur. Microscopically, maize starch occurred in seven coprolites. Thus, maize was slightly more important than dropseed. Sunflower occurred in four coprolites and dominated three of these. Ground sunflower flour, in our experience, is unique to Antelope Cave. Flour was also made of cheno-am seeds and was found in three coprolites but dominant in only one. Following maize and wild grass, prickly pear pads were an important food source. Four coprolites included macroscopic remains of prickly pear while eleven contain microscopic remains. Prickly pear tended to co-occur with other foods. Therefore, prickly pear was an important stand-alone food and also supplemented other foods. Nutritionally, there was a high reliance on fiber-rich plant foods with low glycemic indices. The relevance of this diet to the development of NIDDM in descendent populations will be presented.

Reinhard, Karl [127] see Araujo, Adauto

Reinhard, Andrew (American Numismatic Society) and Shawn Graham (Carleton University)

[235] *Playing Pedagogy: Videogaming as Site and Vehicle for Digital Public Archaeology*

While there is an extensive literature on the pedagogical uses of video games in STEM education, and a comparatively smaller literature for languages, literature, and history, there is a serious dearth of scholarship surrounding videogames in their role as vectors for public archaeology. Moreover, video games work as 'digital public archaeology' in the ways their imagined pasts within the games deal with monuments, monumentality, and their own 'lore'. In this presentation, we play the past to illustrate twin poles of 'public' archaeology, as both worlds in which archaeology is constructed and worlds wherein archaeological knowledge may be communicated.

Reinhardt, Eduard [112] see Brown, Alyson

Reinhart, Katrinka (Stanford University)

[67] *Of Kings and Artisans: Comparing Household and Palace-Temple Rituals at Yanshi Shangcheng*

Elite ritual has been a primary focus in Chinese archaeology. Well known studies of the oracle bones from Anyang and bronze ritual vessels have shed light on elite ritual practices but have also generated a bias linking ritual with elites. Indeed there is strong evidence of elite ritual activity in palace temples of the early Bronze Age site of Yanshi Shangcheng (the Shang city at Yanshi), located in the Central Plain area of northern China. However, there is also evidence of similar rituals in domestic contexts of an artisan's neighborhood. This calls into question the idea that elites monopolized access to ritual power. In this paper, I will compare these two contexts, explore the relationship between ritual and power, and raise questions about ritual, social status, and agency.

Reinhold, Alexander [385] see Chaterji, Katia

Reinicke, Kris (Centro de Estudios Avanzados de Puerto Rico y el Caribe)

[118] *GIS Illuminates Site Formation Processes: Archaeology of the Fortín de la Perla*

This is the first archaeological investigation into a 17th century Spanish fortification whose remnants lie within a dynamic urban slum setting in La Perla, San Juan, Puerto Rico. The Fortín de la Perla does not enjoy protection by any government or cultural agency and its condition has substantially deteriorated due to natural and cultural processes. During the first quarter of the 20th century, parts

of the Fortín's structure and immediate surroundings were settled by poor workers and country folk from all over the island. These first La Perla community members reincorporated what remained of the dilapidated structure as a foundation for dwellings and reutilized building materials. This process is evident in aerial photographs starting in the 1930s. By digitizing and georeferencing historical maps, Spanish Military Engineering plans, and aerial photographs, we are able to distinguish the cultural site formations processes. Armed with this information, we can enter into the discussion of what should be done with the Fortín as it stands today.

Reitz, Elizabeth (University of Georgia)

[178] *The Transect Survey at 30-Something*

In 1977, an American Museum of Natural History team lead by David Hurst Thomas began an ambitious survey of St. Catherines Island, Georgia. The intent was to systematically survey 10% of the island following a series of transect lines using a research design from plant ecology. The survey collected hundreds of small vertebrate samples, none of which met zooarchaeological standards for adequate sample sizes and analysis. These hundreds of small samples, however, proved invaluable because they were used to develop hypotheses about change and stability in animal use that have guided all subsequent zooarchaeological studies of both prehispanic and Hispanic sites on St. Catherines Island and elsewhere in the Georgia Bight. These systematically recovered survey data provided a broad perspective of people's lives on the island, snapshots of how they used each habitat available to them from the very earliest known sites through the Mission period. Many of the hypotheses developed from the transect survey samples have been supported by larger samples recovered by subsequent work, others need revision, and new hypotheses have emerged. Starting a long-term zooarchaeological study with a survey program, even with very small samples, is more than worth the effort when long-term research is anticipated.

Reitze, William (University of Arizona)

[148] *Folsom on the Edge of the Plains: Occupation of the Estancia Basin, Central New Mexico*

At the end of the Pleistocene, during Folsom occupation, the Estancia Basin contained the eastern-most pluvial lake in the American Southwest. The basin has a long history of archaeological research and the story of changing lake levels has played an important part in understand the Paleoindian occupation of the New World. Within the basin, geoarchaeological assessment at the Martin site can be used as a baseline for understanding environmental change during the late Pleistocene. The large well documented Martin and Lucy Folsom artifact assemblages provide a window into lithic technological organization. Combining these data within a broader basin-wide analysis provides a glimpse at Folsom occupation and land use between the well-studied Southern High Plains and the Middle Rio Grande. By combining the stories of environmental change, fluctuating lake levels, lithic variability, and human mobility a better picture of life at the Pleistocene/Holocene transition emerges.

[364] *Chair*

Reitze, William [364] see Erickson, Katrina

Remondino, Fabio (Bruno Kessler Foundation (FBK)) and Belen Jiménez Fenández-Palacios (Bruno Kessler Foundation (FBK))

[100] *Virtual Copan - From 3D Data Collection to Analysis Inside a Web Visualization Tool*

3D modelling technology is increasingly used for research, preservation, reconstruction, documentation, and communication of cultural assets. Heritage 3D models, accessible on the web, are the most powerful solution to disseminate culture and, at the same time, a great source for tourism, research, and education. While the use of 3D technologies in CH have been around for many years there are still some blocking factors that slow down a wider approach. On the technological side we still lack robust and easy to use technologies that allow the practical use of complex 3D models. On the other hand, the authoring tools for developing 3D applications are mostly borrowed from the entertainment industry and oriented to the creation of dedicated applications. The creation and management of 3D applications oriented to remotely study, visualize, analyze, query, and interact with 3D digital copies of heritage is still partly missing. This presentation

presents on the reality-based, multi-resolution and multi-source 3D documentation and digital reconstruction of architectures at the ancient Maya kingdom of Copan, Honduras. We discuss our strategies for 3D surveying and modeling as well as optimization of the 3D models for use in 3DWebGIS.

Ren, Minghua [294] see Smith, Eugene

Renard, Delphine (McGill University), Anne Zangerle (Université de Montpellier, Center d'Ecologie Fonct) and Doyle McKey (Institut Universitaire de France & Université de M)
[350] *Ecological Legacies of Precolumbian Raised Fields and Their Implications for Agroecosystems Today*

Some South American lowland environments bear impressive legacies of precolumbian agriculture: vestiges of raised fields that have persisted since their abandonment centuries or millennia ago. In an interdisciplinary approach, we aim at understanding how the construction and use of raised fields in the past influence the functioning of these ecosystems today. In a raised-field landscape in a seasonally flooded coastal savanna of French Guiana, we characterized the distribution of soil macroinvertebrates (ants, termites, earthworms) and plant roots within the landscape and quantified their influence on soil physical properties. Our results showed that landscape modification by precolumbian farmers has long-lasting effects on the distribution of soil organisms in this wetland. Since their abandonment, and perhaps before, raised fields have attracted a diverse and abundant community of soil engineers that enhance the stability of mound soils, allowing their maintenance against erosion. We compare similarities and differences in the ecological functioning of ancient raised fields in this study site with those in the Beni savannas of Bolivia, where raised fields have a different history and show very different spatial organization in the landscape. Finally, we examine the applications of our results in the framework of ecological engineering to conceptualize new durable agroecosystems.

Rendell, Luke [33] see Morgan, Thomas

Rennaker, Patrick (Portland State University) and Virginia Butler (Portland State University)
[168] *Conservation Biology and Archaeology: Using faunal remains of Pacific cod from the Tse-whit-zen village*

In 2010, the Salish Sea stock of Pacific cod (*Gadus macrocephalus*) was listed as a species of concern, which resulted from declining commercial and recreational catches that have not increased despite harvest reductions. Fishery managers typically use historical data from the past 40 to 50 years to create baselines to manage reduced fisheries; archaeological data can extend these baselines much further back in time. The Tse-whit-zen village site, located on the southern shore of the Strait of Juan de Fuca in Port Angeles, WA, provides a ~ 2000 yr history of indigenous fisheries for one part of the Salish Sea and thus presents a unique opportunity to study Pacific cod history in the area. Through measurements of skeletal elements and faunal frequency estimates it is possible to reconstruct data that fisheries biologists collect, such as length, age, fecundity, and relative abundance compared to other species. This would extend the data available to fisheries biologists back 2000 years, and, along with site-scale and other regional paleoenvironmental records, enable us to study ways Pacific cod are affected by climate change and other processes.

Renteria, Rebecca (University of Arizona Tree-Ring Lab), Ronald Towner (University of Arizona Tree-Ring Lab), Anastasia Steffen (Valles Caldera National Preserve) and Galen McCloskey (University of Arizona Tree-Ring Lab)

[128] *Dendroarchaeology of the Otero Cabin, Valles Caldera National Preserve, New Mexico*
 The Valles Caldera National Preserve (VCNP) in northern New Mexico has been the site of many culture group activities from prehistoric to present times due to its exceptionally resource-rich environment. During the early 20th century, profit-driven ventures left the landscape that we see today. A few families during this period were critical participants in the development of the VCNP

environment. The earliest of these families was the Oteros who used land in the VCNP primarily for grazing horses, cattle, and sheep. As part of this land use, the Oteros built cabins to serve as housing for family and workers, corrals, and other outbuildings. One such structure, the Otero Cabin, is said to have been constructed in 1908, and based on historical records, is one of the oldest Euroamerican structures in the VCNP. Dendroarchaeological samples from the Otero Cabin were collected during our 2014 field season and the results are presented here. These data and resulting interpretations will provide the VCNP staff with the most recent and accurate data to be presented through interpretative tours while also informing the public about dendroarchaeological methods.

Renteria, Rebecca [354] see Towner, Ronald

Reuther, Josh [360] see Holmes, Charles

Reveles, Javier [189] see Ramirez-Urrea De Swartz, Susana

Reyes, Omar [2] see Méndez, César

Rhode, David (Desert Research Institute)

[341] *Plant Resources in Great Basin High Altitude Foraging*

Prehistoric high altitude occupation sites in the White Mountains and Toquima Range contain archaeobotanical assemblages that inform on the use of plant resources both alpine in origin and imported from lower altitudes. Plant assemblages from the two areas show many similarities in the range of plant resources represented, as well as evident differences that reflect variable modes of high altitude living across the Great Basin. This presentation compares the plant materials from the White Mountains and Toquima Range and considers how plant resources fit into high-altitude foraging patterns.

Rhodes, Sara (Eberhard-Karls-Universitat Tübingen), Antonio López-Jiménez (Departamento de Zoología y Antropología Física, Univ), Mariano López-Martínez (Murcia, Spain), Maria Haber-Uriarte (Departamento de Zoología y Antropología Física, Univ) and Michael J. Walker (Departamento de Zoología y Antropología Física, Univ)

[397] *Opportunistic Fire in the Early Paleolithic: Evidence of Small Mammal Incidental Burning at Cueva Negra del Estrecho del Río Quípar (Murcia, Spain)*

Cueva Negra, an upland rockshelter in southeastern Spain, has revealed a delineated ash feature containing burnt macrofauna and chert within Early Pleistocene deposits (>0.78 Ma). This paper details a novel methodology utilizing heat-altered micromammal remains to identify opportunistic fire-use by the inhabitants of this site. We hypothesize that micromammal bones deposited in the by non-human predators were unintentionally modified by anthropogenic fire, and may be used as proxy evidence of human behavior in the past. Taphonomic analysis of 2290 rodent remains identified discoloration indicating exposure to temperatures exceeding those common in natural fires (>600°C). SEM – EDS confirms this modification is not due to post-depositional mineral staining. Charred/calcined micromammal remains constitute 32% of specimens within the ash feature, or 97% of all heavily burnt bone examined. This is a statistically significant pattern in the distribution of burnt bone ($\chi^2 = 169.7$, $p < 0.001$). Digestive corrosion and skeletal representation suggest the assemblage was deposited by non-human predators. As such, the thermal alteration of these remains represents unintentional anthropogenic modification. This represents another type of taphonomic bias rarely considered in small mammal studies, as well as a novel line of evidence in identifying hominin pyrotechnological capabilities at early Pleistocene sites.

[397] *Chair*

Rice, Prudence [158] see Duncan, William

Rice, Glen (Rio Salado Archaeology)

[304] *The Interaction of Hohokam Ideology and Religious Beliefs in the Hohokam Practice of Dual Cemeteries*

From A.D. 900 to 1400 Hohokam populations frequently used both corporate and household cemeteries within the same village. The practice became more visible following A.D. 1200, when burial was by inhumation in household cemeteries and by cremation in corporate cemeteries. The choice of cemeteries gave households flexibility in dealing with the tension between Hohokam sociopolitical ideology and religious beliefs. Burial in the privacy of household cemeteries served their egalitarian ideology while burial in public corporate cemeteries served their religious beliefs. Faced with a death, households chose the strategy best suited at that moment for maintaining or advancing their social standing.

Rice, Prudence (Southern Illinois University) and Don Rice (Southern Illinois University)

[413] *Ixlú: A Postclassic Entrepôt on Lake Petén Itzá*

Ixlú, occupied from pre-Mamom times through the late seventeenth century, is a relatively small site on the isthmus between Lakes Petén Itzá and Salpetén. This siting conferred a strategic advantage for monitoring movements of goods and people. Just southwest of Ixlú, pairs of raised jetties or wharfs modified the lower courses of the Ríos Ixlú and Ixpop and extended into the eastern end of the main body of Lake Petén Itzá. These large, wide channels likely served as port facilities and could handle canoe traffic of different drafts; Itza canoes could hold up to 40 persons. We propose that in the Postclassic through Colonial periods Ixlú was an entrepôt: an intermediate transshipment point in long-distance trade. Ixlú and its facilities were controlled by the powerful Itzas, but at some point their eastern enemies, the Kowojs, allied with the Chak'an Itza faction to the west, challenged that control. With a substantial settlement at nearby Zacpetén, the Kowojs built a characteristic temple assemblage at Ixlú and established settlements on the northeastern shore of Lake Petén. The Ixlú port facilities were contested in the conflicts between the Kowojs/Chak'an Itzas and the Petén Itzas over Spanish demands for submission.

Rich, Fredrick [178] see Bishop, Gale

Rich, Michelle (Far Western Anthropological Research Group, Inc.)

[306] *From A Forest of Kings to the Forests of Petén: The Mirador Group at El Perú-Waka'*

More than 10 years of research at El Perú-Waka', carried out under the co-direction of David Freidel and several Guatemalan collaborators, has resulted in a wealth of information about this ancient city and the role its rulers and residents played in the Classic Maya world. Enhanced through his work with Linda Schele, Freidel's persistent focus on the interplay between ancient history and archaeology—on stelae, buildings, and people—has shaped research at Waka', located in Guatemala's Laguna del Tigre National Park. The Mirador Group, one of the site's principal civic-ceremonial settings, was an initial focus for the El Perú-Waka' Regional Archaeological Project. While the Mirador Group's stelae are either blank or largely eroded, archaeological investigation of the monumental architecture has shed light on topics explored in *A Forest of Kings*, including the role of Teotihuacan, Tikal, and Calakmul in Classic period interactions. This paper will explore Waka's involvement in these relationships, particularly as evidenced by the Mirador Group's royal interments and the narrative figurine scene depicting an elaborate courtly ritual.

[255] *Discussant*

Richard, Francois (University of Chicago)

[305] *What's an (Archaeological) Peasant? Notes on Rural Subjectivities in Atlantic Africa*

This paper explores rural communities' historical relationships to state authority in the Siin province (Senegal). I engage with classic literature to examine how the concept of 'peasant' might be relevant to archaeological realities in Senegal's countryside during the Atlantic era, and how it might help to think about political identity among social actors chronically understudied (and under-documented) in the African past. I am interested in the term as one way to conceptualize the relations tying rural people with the various formation of power – pre-colonial, colonial and postcolonial – that governed

the Siin over the past 300 years. I lend special attention to the material worlds that peasants made and that mediated their experiences of centralized government. The landscapes fashioned over the centuries by collective labor and organization provide both a record of political relations in the past and a medium for their construction and negotiation. Specifically, I argue that peasant landscapes were a key vector of subjectification, through which people constructed themselves as members of communities of political feeling and crafted their relationship to the state. Historically, peasant landscapes appear to have worked less as avenues of subjugation than as conflicted spaces that frequently collided with state rule.

Richard, François [398] see Pacyga, Johanna

Richards, Michael [80] see Grier, Colin

Richards, Julian (University of York Archaeology Data Service)

[221] *Encouraging Open Methods via Data Repositories*

In order to make our research results reproducible we must first of all make our research data available, so that others can re-use them, and test our results. In turn this requires long term digital data preservation and open access to data. Data sets must also be citable via permanent digital identifiers. This paper will discuss the experience of the UK's Archaeology Data Service in making data available for re-use, and our evidence for such re-use. It will highlight, in particular, the use of Digital Object Identifiers to reference specific data sets, and data items, but also the reluctance of researchers to properly cite the digital data resources which underpin their research.

[297] *Discussant*

Richards, John (University of Wisconsin - Milwaukee) and Catherine Jones

[301] *Using PXRF Technology to Aid in the Recovery and Analysis of Human Remains*

Excavation and analysis of human remains from the Milwaukee County Institution Grounds Poor Farm Cemetery (MCIG) provided an opportunity to test the effectiveness of portable X-ray fluorescence (pXRF) as both a field and laboratory tool. During the fieldwork portion of the project, excavations exposed soils that visual inspection suggested might harbor a concentration of toxic materials. PXRF was used on site to determine the nature of the potential toxins and determine the risk factor associated with continued excavation. Subsequent laboratory analysis used the pXRF analyzer in two separate instances. First, elemental composition of excavated soil samples was identified to determine background levels of soil constituents that might produce diagenetic changes in human skeletal remains. Second, the MCIG excavations recovered 77 instances of commingled human remains representing multiple individuals. This paper reports the results of a pilot study to use pXRF as an aid in identifying commingled bones from MCIG interments as belonging to specific individuals.

Richards, Nicholas (University of Wisconsin-Milwaukee)

[301] *MCIG according to MCIG: historic document research*

The Milwaukee County Institutional Grounds Cemetery in Wauwatosa, WI, operated under the administration of the Milwaukee County Institutions, which prepared official reports for submission to the Milwaukee County Board of Supervisors. These primary documents survive in varying degrees of completeness at repositories across Milwaukee and include evidence of the mortuary activities of County institutions that may have buried individuals under institutional care at the MCIG cemetery. Submitted annually by law, the reports offer an 'official' picture of institutional operations and the population therein to compare with the archaeological understanding of the cemetery. Statistical and prose reports evidence the institutional process by which the cemetery was created. Intake and outtake statistics record age, nationality, occupation, and religious affiliation, drawing a demographic portrait of aid-seekers at various institutions over time. Tallies of coffins built, burials conducted, County-related post-mortems, Hospital and Home for Dependent Children deaths, and fulfillment of the religious needs of those served by the County can be accounted for in the County's official

documents. Taken together, these documents give a contemporary picture to compare with the archaeological evidence.

Richards, Patricia (University of Wisconsin-Milwaukee)

[301] *Here Lies.... You Know, Weaver, I've Forgotten Who We Just Buried: The Milwaukee County Poor Farm Cemetery Project*

The Milwaukee County Poor Farm Cemetery Project was initiated in 2008 and is a collaborative effort of the UW-Milwaukee Archaeological Research Laboratory, UW-Milwaukee Anthropology Department graduate students, UW-Milwaukee Undergraduate Research Opportunity Students, and the staff of Historic Resource Management Services (now UWM-CRM). In 2008 UWM Archaeological Research Laboratory applied for and was granted by the Wisconsin Historical Society final disposition of all human remains, personal artifacts, burial hardware, field notes and field images associated with 1991 and 1992 excavations of human remains at the Milwaukee County Institutions Grounds-Froedtert Tract (site # 47 MI 527). In 2013, Historic Resource Management Services of the University of Wisconsin-Milwaukee recovered an additional 640 individual coffin burials representing over 700 individuals from the Milwaukee County Institution Grounds (Froedtert Tract) Poor Farm Cemetery. This paper provides a summary of the overall progress of the project as well as the preliminary results of analyses of human remains and material culture recovered as a result of the 2013 excavations.

[301] *Chair*

Richardson, Karimah [27] see Villarreal, Margarita

Richardson, Lorna-Jane (UCL Center for Digital Humanities)

[235] *Public Archaeology in a Digital Age: An Overview of My Research*

This paper examines the impact of the democratic promises of Internet communication technologies, and social and participatory media on the practice of public archaeology in the UK. This work is based on my doctoral research undertaken from 2010-2014 and addresses the following issues: the provision of authoritative archaeological information online; barriers to participation; policy and organizational approaches to evaluating success and archiving; community formation and activism, and the impact of digital inequalities and literacies. This research was the first overarching study into the use of participatory media in archaeology. It is an important exploration of where and how the profession is creating and managing digital platforms, and the expanding opportunities for networking and sharing information within the discipline, against a backdrop of rapid advancement in the use of Internet technologies within society. It demonstrates that archaeologists do not yet fully understand the complexities of Internet use and issues of digital literacy, the impact of audience demographics or disposition towards participation in online projects. While recognition of democratic participation is not, on the whole, undertaken through a process of actively acknowledging responses to archaeological information, there remains potential for participatory media to support and accommodate these ideals.

[200] *Discussant*

Richardson, Leesha (University of South Africa)

[294] *Environmental Implications of Marine Bird Remains in the Late Holocene of Pinnacle Point*

Marine bird remains are common in late Holocene coastal sites in South Africa. The Pinnacle Point Shell Midden Complex (PPSMC) is such a site. Marine bird remains from the PPSMC were studied to better understand their role in the foraging and mobility patterns of late Holocene stone age people on the Mossel Bay coast. The PPSMC has four separate excavation areas and marine bird remains are present and were studied in each. Microscopic analyses for signs of surface modification proved to be difficult as root damage was extensive. However some signs of cutting and tool manufacture were found. Research of modern bird wash-ups by Avery have shown that certain marine bird species are more commonly found washed out along the South African coast during

certain times of the year. A comparison of the PPSMC analyses to these modern data shows that the four excavated areas were exploited on a seasonal basis. The strong seasonality of marine birds provided a predictable food and raw material resource for hunter-gatherers.

Richards-Rissetto, Heather (University of Nebraska-Lincoln)

[100] *A 3D Landscape Analysis of Stelae Visibility at Copan, Honduras*

From the early 5th to early 9th centuries, a dynasty of sixteen kings ruled at the ancient Maya site of Copan, Honduras. In the mid-7th century, Chan Imix K'awiil, or Ruler 12, is believed to be the first of Copan's rulers to erect stelae outside the city's main civic-ceremonial group. Why did he do this? Did these stelae exist as solar markers? Did they serve as territorial markers? Or, were they part of a communication system? Scholars have set forth these and other hypotheses, to explain the purpose of the valley stelae. In this paper, we use traditional Geographic Information Systems (GIS) and the MayaArch3D WebGIS to perform visibility studies using GNSS GPS data of the stelae and terrain modeled from airborne LiDAR data. We then evaluate our results using additional archaeological and iconographic data in relation to existing hypotheses and explore new potential interpretations for the placement of these stelae in the Copan Valley.

[5] *Discussant*

[100] *Chair*

Richards-Rissetto, Heather [289] see King, Justin

Richerson, Peter (UC Davis)

[191] *Cultural Evolution in Archaeology*

Models of cultural evolution aim at a process level understanding of cultural change and gene-culture coevolution. The micro level foundations of these models can be tested in the lab and field on living populations and, in favorable circumstances, with fine-grained archaeological data. Macro scale problems can only be studied by fitting models to historical and archaeological data that can resolve patterns on time scales of a century or more. Progress in two areas in particular is contributing to making this project feasible. First, improvements in dating resolution and increases in the spatial and temporal resolution of the archaeological record are making it possible to generate high quality quantitative databases that resolve the longer time scales. Second, increased computing power and improvements in statistical methods allow us to fit competing evolutionary models directly to this data.

[1] *Discussant*

Richter, Tobias [210] see Maher, Lisa

Rick, Torben [32] see Erlandson, Jon

Rick, Torben (Smithsonian Institution), Leslie Reeder-Myers (Smithsonian Institution), Kenneth Gobalet (California State University Bakersfield), Nicholas Jew (University of Oregon) and Thomas Wake (University of California Los Angeles)

[105] *Small, But Not Insignificant: Human Subsistence, Ecology, and Land Use on Anacapa Island, California*

Anacapa Island (2.9 km²) is the second smallest of California's Channel Islands and has limited freshwater and terrestrial biodiversity. Called 'Anayapax, a word meaning deception or mirage, by the Chumash, archaeologists have long speculated that the island was occupied seasonally or as a stopover by people based on the mainland or other islands. Here, we focus on our recent archaeological research at CA-ANI-2 and other Anacapa sites. Occupied between about 3130 and 2750 cal BP, CA-ANI-2 contains diverse faunal and artifact assemblages, including the remains of whales, pinnipeds, deer from the mainland, a variety of marine fishes, and unique chipped stone and bone tools. Stable oxygen isotope data suggest that mussels deposited at CA-ANI-2 were harvested during all seasons of the year. When placed in the context of other archaeological sites on Anacapa

and Santa Barbara islands (2.6 km²), these data suggest that, despite their small size and perceived marginality, both of these islands played an important role in larger Native America interaction spheres and settlement/subsistence systems.

Riebe, Danielle (University of Illinois at Chicago)

[391] *Exploiting, Exchanging, and Establishing Boundaries: Lithic Trade during the Neolithic on the Great Hungarian Plain*

There has already been extensive analysis of Late Neolithic material culture on the Great Hungarian Plain. Much of that research, however, typically has been restricted to one site as opposed to multiple sites within a region. This paper explores assemblage variation in lithic materials from multiple sites across the Plain. By identifying differences in lithic materials, one can assess the extent to which lithics either reflect or even potentially reinforce social boundaries. In addition, building off of a study assessing ceramic stylistic and compositional variability from this period, this paper addresses how patterns of lithic long-distance trade and exchange relate to short-distance trade and exchange of ceramics in order to discern socio-cultural boundaries in the past.

Riel-Salvatore, Julien [53] see Docchio, Rebecca

Riel-Salvatore, Julien (Université de Montréal), Ingrid Ludeke (University of Colorado Denver) and Fabio Negrino (Università degli Studi di Genova)

[181] *Upper Paleolithic Use of Space at Riparo Bombrini (Balzi Rossi, Italy)*

We present an analysis of the spatial distribution of various features (hearths, dripline, etc.) and of four broad artifact classes (lithics, fauna, ochre, shell) in the proto-Aurignacian levels of Riparo Bombrini. The site is a collapsed rockshelter in the Balzi Rossi site complex and is interesting in part for having yielded very late Mousterian and very early proto-Aurignacian levels. The site thus offers an ideal setting in which to study behavioral differences between late Neanderthals and early Homo sapiens in this part of the world. Our analysis comprises complementary multiple levels of resolution: visual; density; and unconstrained cluster analyses are performed to tease out 1) whether evidence of spatial segregation of activities is visible; 2) whether these activity areas are recurrent over time; and 3) what may cause this variability. We conclude with a discussion of what the patterns seen at Bombrini mean for our construal of Upper Paleolithic behavioral strategies and of how to best integrate spatial analysis with other lines of evidence to do so.

Rieth, Christina (New York State Museum)

[43] *Public Engagement and Compliance Archaeology in a Museum Setting*

Public engagement in compliance archaeology is inherent in Section 106 of the National Historic Preservation Act as well as many state historic preservation ordinances. Engagement in publically funded projects allows those who pay for the research to share in the project results but also provide information as stakeholders of the past. Although such regulations provide for public engagement, the process and type of involvement varies by project, geographic area, and archaeological resource. This paper provides an overview of the benefits and challenges of public engagement and the need to diversify engagement strategies to serve the various publics encountered by compliance archaeologists. The importance of including a plan for engagement into scientific research designs is discussed along with the need to consider engagement both during and after the completion of fieldwork. Examples of public engagement from state and federally funded compliance projects in New York are provided.

[43] *Chair*

Rieth, Timothy [77] see Cochrane, Ethan

Rieth, Timothy (IARIL) and Ethan Cochrane (University of Auckland)

[191] *The Origins and Distribution of Oceanic Agricultural Techniques Revealed through Comparative Phylogenetic Analysis*

Agricultural innovation fueled the development of Oceanic societies. Techniques such as pond-fields and lithic mulching increased yields and made marginal landscapes habitable. Unfortunately, our knowledge of the evolution of techniques, including ancestral states, homologies, and independent inventions has been largely speculative. Here we present a phylogenetic analysis of ethnohistorically and archaeologically documented agricultural techniques across Oceanic societies. The analysis combines linguistic trees as models of population history with agricultural technique data to explain the evolution of techniques across Oceania. Results have implications for explaining prehistoric interaction, variation in social complexity, and the concept of Polynesia as a monophyletic cultural unit.

Rigano, Aryel [85] see Diederichs, Shanna

Riggs, Erin (SUNY Binghamton), Andrew Reagan (GIS Data Resources, Inc.) and Matt Riggs (California State University, San Bernardino)

[15] *Innovative Applications of Archaeological Perspectives: An Analysis of Home Front Material Culture within the Context of Individual vs. Municipal Investments in Oakland, CA*

Through the growth and development of satellite imagery and panoramic street photography championed by Google Earth, a mass archive of accessible imagery has been created documenting intimate material worlds frozen in space and time. Utilizing these newly available forms of public data, our team (built of one historical archaeologist, one GIS technician, and one statistician) conducted a virtual pedestrian survey of 1000 randomly selected home fronts in Oakland, California, implementing a five-facet rating scale to document evidence of resident investment. Personal investment was compared to city investment to test for bias in use of replacement strategies within negatively characterized neighborhoods as opposed to refinement within positively characterized neighborhoods. We argue that through innovative selection of subject material, interdisciplinary collaborations, and the utilization of all available tools, historical archaeology will continue to expand in scope and relevance.

Riggs, Matt [15] see Riggs, Erin

Riggs, Casey (Texas A&M University) and Suzanne Eckert (Arizona State Museum-University of Arizona)

[272] *Plants in a Day: A Cost Distance Analysis of Single Day Distance to Floral Resources of the Ancestral Puebloans at Goat Springs Pueblo (LA 285)*

The way in which groups interact with their surrounding environment can provide insight into the importance of natural resources for a social group, despite having a large reliance upon cultivation for subsistence. For this study the landscape around Goat Springs Pueblo (LA 285) was analyzed to identify accessible botanical resources for the pueblo's inhabitants. Current research has indicated that abiotic natural resources were not frequently accessed, therefore site use may have been related to biotic resource availability. Through cost distance analysis in a geographic information system, in tandem with data from the Ecological Site Description System and the Terrestrial Ecological Unit Inventory, a single day foraging area was digitally replicated around the pueblo. Results indicate that Goat Springs Pueblo's unique location allowed access to elevation-based environmental gradients, both north and south of the pueblo, in addition to grassland and shrubland plant communities that bisect the foraging area. More specifically the cost catchment indicates access to large stands of an ethnographically important winter food staple: piñon pine (*Pinus edulis*) nuts. Finally, results indicate that ease of access to stands of Douglas fir (*Pseudotsuga menziesii*), an important construction material, may have further predicated the site's positioning.

Riley, Jenny (Indiana University) and Kevin Hunt (Indiana University)

[164] *Preservation of Faunal Remains from an Underwater Cavern, Padre Nuestro, Dominican Republic*

Between 2005 and 2010, Indiana University dive teams performed surface collections at the entrance chamber to Padre Nuestro Cavern, a submerged limestone cavern located in the East National Park in the southeastern peninsula of the Dominican Republic, where they recovered Taino

ceramics, Casimiroid lithics, and many faunal remains including two extinct sloth species (*Acrotocnus* ye and *Parocnus* serus), an extinct platyrrhine monkey (*Antillothris bernensis*), and other commingled bones including sloth, bird, bat, fish, rodent, and insectivore. The faunal remains were sent to the Human Origins and Primate Evolution Laboratory at Indiana University for preservation. Water can have a negative impact on the preservation of bone, sometimes causing cracking and flaking. This poster details the preservation process applied to the monkey specimen along with the commingled remains. The specimens were immersed in distilled water for 30 days, changing the water every 10 days, in order to dissolve impurities within the bones. The next stage involved submerging the bones in increasingly concentrated solutions (10%, 20%, and 50%) of polyethylene glycol (PEG) 4000 over a period of 30 days. They were then allowed to dry. Overall, the process proved successful in stopping or slowing down the deterioration of the bone.

Riley, Tim (Prehistoric Museum @ USU Eastern)

[352] *Revisiting the Stylistic Similarities of Utah's Barrier Canyon and Texas' Pecos River Murals*
 Polly Schaafsma was among the first to recognize the many stylistic elements shared between Utah's Barrier Canyon rock art and the Pecos River style along the Lower Pecos Canyonlands in Texas. While the Barrier Canyon murals are markedly simpler in execution, common elements include anthropomorph shape and torso decoration, composed sets of zoomorphs, and the depiction of wild plants. During this initial study, Schaafsma (1971) defined the Barrier Canyon style based on nineteen sites located in the San Rafael Swell and the associated Green River desert. Since that time, many more Barrier Canyon panels have been located in this region of the Colorado Plateau. This paper reevaluates the argument of stylistic similarity between these two styles in light of this broader data set. The recently published optically stimulated luminescence (OSL) dates of the type site in Horse Canyon will also be incorporated into a discussion of the cultural association of the Barrier Canyon style and possible temporal variation within the style.

Rinck, Brandy [10] see Hodges, Charles

Rinck, Brandy (Northwest Archaeological Associates)

[190] *Recent Applications of Micromorphology to Cultural Resources Management in the Pacific Northwest*

Solving geoarchaeological questions in a cultural resources management (CRM) context can be difficult due to time and budget constraints. In the Pacific Northwest, however, recent projects have fortunately allowed for some micromorphological analyses. Paul Goldberg has championed micromorphology as a valuable geoarchaeological method over the past three decades. The micromorphological analysis of shell middens, peat deposits, and alluvial sediment in and around the Seattle, WA area has elevated the resulting cultural resources assessments and data recovery reports. The conclusions drawn from these micromorphological analyses can be applied to both academic research and the private sector. If time and money for geoarchaeological analysis, such as micromorphology, can be built into CRM schedules and budgets, then CRM archaeologists can continue to produce useful and sophisticated scientific reports while conducting business. This presentation provides examples of the successful application of micromorphology to specific geoarchaeological research questions asked in CRM. Examples come from the Paleoindian Bear Creek site in Redmond, the Cattail Lake midden on the Bangor Naval Base, and Foster Island in Lake Washington. This talk also includes special thanks to Paul for teaching me how to collect and process micromorphology samples and for sharing his knowledge and mentoring me along the way.

Rincon Mautner, Carlos

[193] *Ritual Constructions of the Mesoamerican Underworld View in the Caves and Cavates of the Southern Mexican Highlands: An Exploration of Changing Functions and Meanings*

This presentation explores the diachronic significance and variety of ritual uses assigned to caves and cavates by the peoples who lived in what is now southern Puebla and northern Oaxaca, Mexico from the Archaic through the Early Colonial Periods. The existence of distinct ritual complexes for different time periods suggests changing functions and meanings, which are inferred from

archaeological artifacts, parietal pictograms and petroglyphs for different caves, and documentary sources. These cave ritual complexes focused principally on cosmogonic, fertility/generative, propitiatory, mortuary and socio-political foundational themes. Caves also served to introduce Christianity to the native peoples.

Ringberg, Jennifer (California State University - Stanislaus)

[404] *Ceramic Petrography and Early Intermediate Period Interaction in the Moche Valley, Peru: Current Understanding and Future Research*

Understanding the spatial distribution of pottery styles in combination with pottery composition and raw materials availability can help illuminate networks of interaction among groups at a regional scale. My research focuses on distinct pottery styles of the middle and upper Moche Valley that had wide distribution during the Gallinazo and Early Moche phases. The pottery assemblage from three large, high status households at Cerro León (A.D. 60 to 350, 2 sigma cal.) in the middle Moche Valley demonstrated that imported highland pottery was integral to particular activities, especially feasting, spinning, and certain daily food processing and storage activities. However Cerro León's relationship to contemporary sites in the valley during this dynamic period remains unexplored. The data presented in this paper represent initial efforts to understand the composition of stylistically similar pottery assemblages from eight sites in the upper middle Moche Valley. Context and contemporaneity must be confirmed, but preliminary results indicate broad technological similarities with possible differences in paste composition that may indicate local variation in manufacture.

Ringelstein, Austin

[27] *Turning "Crisis" into Opportunity: Rediscovering and Reconnecting with a Colonial Era California Collection*

In the late 19th century museum collectors recovered an abundance of cultural materials from the Channel Islands and dispersed them to national museums. Although they recorded important ethnological observations, their practices were often not in the best interests of native peoples or even academics. Many of the artifacts were stored without provenience information and in many ways disregarded. However, the unique preservation of legacy collections provides an excellent opportunity to recover valuable information without filling more valuable space on repository shelves. Institutions such as the Peabody Museum of Archaeology and Ethnology are supporting research of such collections. Current research on the Schumacher Collection aims to rediscover the material practices of the Tongva people on Catalina Island. Many of the artifacts embody how the Tongva were integrating local and non-local materials as new people were arriving on California shores. Although these artifacts were originally removed from their community, they now offer a fresh chance for archaeologists to help reconnect native peoples with the brilliant traditions of their ancestors.

Rios, Jorge (Centro INAH Oaxaca) and Juan Carlos Diaz Vazquez (INAH- Zona Arqueologica de Mitla)

[111] *Las manifestaciones grafico-rupestres en las Cuevas Prehistoricas de Yagul y Mitla (WH-UNESCO)*

El arte rupestre, dentro de los contexto arqueológicos, es una herramienta capaz de proveernos información privilegiada acerca de fauna, flora y de comportamiento humano, en el caso de las Cuevas Prehistóricas de Yagul y Mitla en los Valles Centrales de Oaxaca, es uno de los atributos por los cuales, además de la evidencia de domesticación temprana de plantas, se ha documentado en una diversidad de motivos que denotan un paso constante humano y su conocimiento del medio que le rodeaba. Las Cuevas Prehistóricas de Yagul y Mitla incluye un área de cinco mil trescientas hectáreas en donde se incluyeron elementos culturales que exaltan los valores científicos, arqueológicos, naturales, estéticos, económicos, sociales e identitarios del área que comparten los municipios de Tlacolula de Matamoros, Villa de Díaz Ordaz y San Pablo Villa de Mitla junto con la agencia municipal de Unión Zapata en el estado de Oaxaca.

Ríos Allier, Jorge Luis [111] see Jimenez Roman, Karina

Ripley, Jessa [204] see New, Briana

Riris, Phil (University College London)

[157] *Precolumbian Monumentalism and Social Structuration: Geospatial Modelling of Relative Accessibility as a Proxy for Emergent Territoriality among the Southern Proto-Jê*

How did southern proto-Jê mound and enclosure complexes (MECs) in the eastern La Plata basin structure their social landscapes? MECs possess a broad geographical distribution from the banks of the Rio Paraná to the Atlantic mountains of southern Brazil, as well as a variety of configurations, relative densities, and sizes. Discussions of their functions have emphasized their implications for the perception of social inclusion/exclusion among the groups that constructed them. Archaeological evidence from them has been linked to the emergence of kin-based socio-political hierarchies, based on commensal relations established through feasting practices.

To date, however, the effect and presence of MECs in their broader environmental settings has not been studied through formal and statistically robust spatial analytical techniques. This research employs simulation and modelling in order to enable the analysis of the relative accessibility of MECs, and, describe their relationship to their social environment in clearer terms. Ultimately, the goal will be to establish a framework within which competing hypotheses on the interpretation of the material record may be tested. The findings of the simulations are placed within the context of our archaeological understanding of precolumbian complexification and anthropological explorations of territoriality. Correlations with settlement data are also proposed.

Rissetto, John (Department of Anthropology, University of New Mexico), Giancarlo Pepponi (Micro Nano Facility, Fondazione Bruno Kessler), Igor Gutiérrez-Zugasti (Inst. Int. de Invest. Prehistóricas de Cantabria), Rossana Dell'Anna (Micro Nano Facility, Fondazione Bruno Kessler) and David Cuenca-Solana (Chercheur Postdoc Fyssen FNDN, Uni. Rennes)

[185] *Multi-Tiered Proveniencing Analysis of Early Holocene Radiolarite Artifacts from Northern Spain*

Radiolarite is a fossil-rich derivative of biogenic chert found in isolated geologic formations across northern Spain. This inconsistent presence on the landscape has often led archaeologists to misidentify it with other siliceous rock types. However, as the proveniencing of lithic raw materials increase in Spain, archaeologists are becoming more aware of radiolarite and its possible unique technological, typological, and social significance in prehistoric cultures.

This paper will present the results of a multi-tiered analytical program that combines the results of macroscopic, petrographic, and geochemical analyses to characterize and compare natural and human altered radiolarite samples from the northern coast of Asturias, Spain. Natural radiolarite source areas were identified, sampled, and analyzed from the montane and coastal region of eastern Asturias. Using the same analytical techniques, these results were compared to radiolarite artifacts originating from the Early Holocene assemblages in the El Mazo rockshelter site located in proximity to the identified source areas.

By establishing the geographic presence and geologic characterization of radiolarite, archaeologist will have new empirical data in which to help define how hunter-gatherer-fisher cultures: 1) organized stone procurement strategies, 2) moved and settled across the landscape, and 3) utilized stone material in a sociocultural context.

Rissolo, Dominique [38] see Glover, Jeffrey

Rissolo, Dominique (University of California, San Diego)

[413] *Shifting Tides along the North Coast of Quintana Roo: Recent Research at Conil and Vista Alegre*

In the northern lowlands, there is strong evidence for a coastal Maya presence since at least the

Middle Preclassic, and scholars have long discussed how inland-coastal connections served as a catalyst for the development of social complexity. The scope and scale, however, of maritime commerce and interaction was closely linked to the ever-changing political and economic landscape. The work of the Proyecto Costa Escondida at the neighboring port sites of Conil and Vista Alegre highlight the shifting nature of coastal-inland relations over millennia. During the Terminal Preclassic and Early Classic periods, both Vista Alegre and Conil appear to have been involved in robust trade with regional inland polities, which may have been facilitated by seasonally navigable interior waterways as well as overland routes. The parallel occupational histories of these sites, however, diverge in the Terminal Classic. The Terminal Classic period at Vista Alegre was characterized by participation in larger peninsular networks of exchange, controlled or influenced by more distant polities, like Chichen Itza. In the Late Postclassic period, while Vista Alegre was largely abandoned, the coast remained a dynamic locale as evidenced by the reoccupation and growth of Conil into a large center at the time of Contact.

[370] *Chair*

Rittenour, Tammy [6] see Jones, Hillary

Ritterbush, Lauren and Virginia A. Wulfkuhle (Kansas Historical Society)

[98] *The Power of National and State Engagement for Archaeology Education in Kansas*
 Kansas has played a synergistic role in Project Archaeology for more than a decade. Archaeologists in the state linked with educators as early as 1992, disseminating curriculum materials as part of Kansas Archeology Week. An early focus on shelter played a key role in the development of national Project Archaeology's first Investigating Shelter unit, drawing on a Kansas example. Since then, the Kansas Historical Society has adopted the national themes of shelter, food and culture, and migration to create state-specific units. The relevance of these units to current educational goals (Kansas College and Career Ready Standards/Common Core) makes them flexible and attractive to both educators and students. Today, Project Archaeology is spreading in the state through a variety of partnerships and teacher contacts in workshops, in-service trainings, and university courses, resulting in the adoption of Project Archaeology materials in K-12 districts, classrooms, virtual schools, home schools, and informal educational settings.

Ritz, Crilly [358] see Sparks, Shane

Rivera, Angel (INAH)

[410] *Un estudio sobre la iconografía de los huesos grabados de la Mixteca Baja*
 Los huesos humanos grabados, encontrados como ofrenda en depósitos funerarios, representan un marcador especial del gremio sacerdotal de la sociedad del Oaxaca antiguo. Por un lado, al ser huesos humanos, establecen un lazo con los ancestros del grupo; por otro, la imaginería que muestran permiten establecer el tipo de rituales y oblaciones a los que estaban dedicados. Más aún, estos objetos eran considerados como reliquias y en algunos casos se les ilustra en la imaginería de los códices posclásicos. En este trabajo se analizan unos ejemplares procedentes del sitio clásico de Cerro de las Minas, en Huajuapán y de Tonalá; en ellos es representativa la iconografía ñuiñe y por el contexto de las piezas es posible determinar el rol y papel que sus poseedores tuvieron en la estructura social mixteca.

[111] *Discussant*

Rivera, Iran (Posgrado en Estudios Mesoamericanos) and Sergey Sedov (Instituto de Geología-UNAM)

[141] *Paleosols and Human Activities in the Lakebed Area of the Basin of Mexico during the Middle Holocene*

During 2013-2014, archaeological research was undertaken in San Gregorio (Xochimilco) and Tepexpan, Basin of Mexico, to recover evidence for human activity associated to the preceramic period in the lakebed area of Chalco-Xochimilco and Texcoco. One of the specific objectives of this

research is to characterize soil conditions north and south of modern Mexico City during the early agriculture period (6500-4000 BP) by means of paleopedological analysis, and evaluate environmental and anthropogenic processes involved in site formation using micromorphology, pollen, phytoliths, and stable isotope analysis. These data will be correlated with human activities in both sites, the introduction of domesticated plants and the effects of management by human groups on the lacustrine environments before the first villages in the region were established.

Rivera, Mario [333] see Olson, Elizabeth

Rivera Guzmán, Ángel Iván [88] see Helmke, Christophe

Rivera-Claudio, Hector (Para la Naturaleza)

[290] *Una experiencia personal en el descubrimiento de la arqueología: mi voz como ciudadano*
Un interés personal por la historia me llevó a buscar cómo entender mejor mi presente, aprendiendo sobre los errores y los éxitos de nuestro pasado. La creación de las investigaciones de Ciudadano Científico coordinadas por Para la Naturaleza da oportunidades al público para obtener experiencia en varias áreas de la naturaleza y personalmente me abrió las puertas hacia el mundo de la arqueología. Mi experiencia en la investigación Descubriendo Nuestras Raíces y en proyectos anteriores del programa de Ciudadano Científico inspiró a enfocarme en la arqueología como campo de investigación y así poder re-descubrir un pasado poco conocido. Esta perspectiva multidisciplinaria me ha dado la oportunidad para estudiar y presentar mi perspectiva dada por las experiencias personales en otras actividades tales como estudio de cuevas y cavernas, flora y fauna, viéndolo todo no solo como actividades recreativas, sino como una posibilidad de contribuir a la ciencia, uniendo disciplinas que antes yo no relacionaba. Esta experiencia me ha permitido comprender la relación entre la naturaleza y la arqueología. Esta ponencia presenta mi perspectiva sobre el conocimiento adquirido a través de la investigación e interacción con las personas me dieron la inspiración y vías necesarias para aprender y compartir sabiduría.

Rivera-Collazo, Isabel (University of Puerto Rico, Rio Piedras)

[290] *Codes of Ethics and Archaeology in Practice: "Communal Archaeology" and Citizen Science towards the Advancement of the Discipline*

Adherence to codes of ethics is central to successful and respected practice of archaeology. The SAA's Code of Ethics includes eight principles that address critical broad issues, including the importance of in-situ long-term conservation and protection of archaeological sites (Principle 1), establishing beneficial working relationships with all parties (Principle 2) and the importance of public outreach (Principle 4). Even though, as members of the SAA, we agree that these principles are the best standard to which we should all aspire, in practice it is not that simple. In this presentation I argue that the practice of community archaeology, from the Latin American perspective of "communal archaeology", and the opportunity of informal education provided by citizen science, can help us comply with all the Principles. While practicing communal archaeology, the archaeologist as expert can demonstrate ethical behavior to the public without restricting access to the archaeological heritage or the production of knowledge. I propose that this approach can help reduce destruction of sites by shifting public perception of archaeology from a selfish endeavor (go, excavate and disappear) to a communal work for the recovery of lost pieces of history that belong to the community, and they are part of the process.

[290] *Chair*

Rivers Cofield, Sara (Maryland Archaeological Conservation Laboratory) and Jodi Reeves Flores (Center for Digital Antiquity)

[123] *Evaluating a Cooperative Approach to the Management of Digital Archaeological Records (ECAMDAR): A Defense Legacy Project Assessing tDAR for the Department of Defense*

The Maryland Archaeological Conservation Laboratory (MAC Lab) and the Regional Archaeological Curation Laboratory (RACF) in Ft. Lee, Virginia are archaeological repositories that meet high professional standards for the care of artifacts and paper records. Unfortunately, neither facility has

the expert technical staff and specialized infrastructure necessary to qualify as permanent repositories for digital records, despite the exponential rise in site documentation that exists in digital form only. This project is designed to test tDAR as an alternate repository for digital records held by the MAC Lab and RACF on behalf of 25 different military installations in Maryland, D.C., and Virginia. Of paramount importance is determining whether tDAR can strike a balance between accessibility and the stringent security that many DoD installations require in a way that is cost-effective and applicable to many different kinds of installations. The project results are positive, and the procedures developed to address the 25 installations included in this project have therefore been converted into standards and recommendations for the DoD as a whole. Ultimately, the project participants hope to impact DoD policy so that their irreplaceable archaeological data will be protected regardless of its form.

Rizvi, Uzma (Pratt Institute)

[142] *Harappan Urbanites: Standardization, Ratios and Subjectivity*

Hallmarks of the third millennium B.C.E. Harappan civilization include baked bricks, weights and measures, and water wells, which index centralized control, civic management and urban planning. In this study, I aim to locate the Harappan in a Harappan urban environment. I will consider the ways in which the use of space, design, and architecture may inform the constructions of self. Furthermore, I will interrogate the ancient urban form by considering ratios and standardization as a means to construct an ideal ancient urban subject. The co-production of politics and technology in relation to the construction of self will be of central concern. These urban subjectivities should not be read as passive constructions of the self, rather as active decisions to maintain a cosmopolitan and urban sensibility. Through an investigation of how the self may be constructed, and the ideals linked to that self that are being encouraged by the production of space, questions related to Harappan political structures will be addressed.

[104] *Discussant*

Roberts, Charlotte (Durham University)

[299] *The Potential and Challenges of Constructing a Bioarchaeology of Care for a Person with Leprosy in the Late Medieval Period*

Everybody suffered ill health at some point during their lives in the past. In late medieval England (12th-16th centuries A.D.) historical data suggest the availability of care and treatment of disease, but it is unknown how many, and which, people got access to care. There is also little direct evidence of specific care seen in skeletal remains beyond trepanation, amputation, and dentistry. Using the 'Index of Care' (IoC; Tilley and Cameron 2014), this paper describes bone changes of leprosy in a middle aged man from a late medieval leprosy hospital that functioned in Chichester, Sussex, England. Potential 'disability' (life experience) is assessed through applying signs and symptoms to the man, based on the bone changes, and attempting to construct a model of care. Likely and uncertain interpretations of the data are provided, along with the type of care that would have been needed for the 'patient'. It is emphasized that the IoC is a more objective method to use for inferring care, yet every person experiences even the same diseases in different ways and would not necessarily have required the same kind of care. 'One size cannot fit all'; a personalized approach through an osteobiography is recommended.

Robertshaw, Peter (CSU San Bernardino), Laure Dussubieux (Field Museum, Chicago) and Freda Nkirote (National Museums of Kenya)

[194] *The Explanation of Ceramic Variation in East African Prehistory: New LA-ICP-MS Results from Gogo Falls, Kenya*

Two of Frannie Berdan's abiding research interests are the concept of ethnic identity and the application of scientific analyses to archaeological problems. These two topics intersect in research on pottery in East Africa. Pioneering work in the 1970s by Simiyu Wandibba led to the recognition of several ceramic 'wares' represented among Neolithic and later assemblages from Kenya and northern Tanzania. The occurrence on some sites of more than one ware in the same occupation horizon challenged conventional culture-historic frameworks and prompted a long-lasting debate with

opinions ranging from claims that the initial analyses were flawed and that a traditional culture-historic framework could be constructed to a view that the ceramic variation found in East Africa was unique. While theoretical advances in our understanding of both ethnicity and ceramic variability has led to more mature discussion, there has been little progress in understanding East African ceramic variation, perhaps because no new analytical tools have been used. We report here results of chemical analysis of 94 sherds of three different Neolithic and two different 'Iron Age' wares from Gogo Falls in Kenya. The compositional analyses of these ceramics represent a first step in opening new avenues of inquiry.

Robertson, James [280] see Hambacher, Michael

Robertson, Robin (University of Texas, San Antonio) and Debra Walker (University of Florida)

[413] *Prospering in Place: Cerro Maya and the Late Preclassic Exchange Networks*

Cerro Maya, located on Lowry's Point at the southern edge of Chetumal Bay in northern Belize, sits at a strategic intersection between riverine and coastal transportation routes used by the Maya from Preclassic times onward. Evidence suggests a major dock facility was the first monumental construction undertaken during the initial Late Preclassic occupation, indicating the site was intentionally founded to mediate access to interior sites on the two principal river drainages in the region for purposes of exchange with coastal traders transporting goods from all over the Maya Lowlands. During the 100-150 years of Late Preclassic occupation, the diversity of the ceramic inventory and comparative richness of the material remains evinces interactions with sites on the Northern Plains of Yucatan, as well as central Peten and the Central Karstic Uplands. Cerro Maya flourished during this era, developing from a small village of perishable structures next to a monumental dock into an important center with monumental architecture remembered well into the Postclassic era.

Robinson, David [3] see Bedford, Clare

Robinson, David (University of Central Lancashire, UK)

[143] *Cache Cave: Site Structure and Chronology*

This paper presents an overview of the site structure within the confines of Cache Cave with a particular focus on excavated crevices, deposits, and features. We also present the results of 25 AMS dates so far submitted from the site. These dates include a range of material from basketry, cordage, matting, reeds, bone objects, and charcoal. In total, this program represents the most comprehensively dated Chumash cache cave assemblage yet achieved and yields important data regarding site usage and chronology. This paper concludes by considering the site chronology within a wider regional diachronic context, with particular attention to environmental variables that may aid in our interpretation of the site's history of use and abandonment.

[143] *Chair*

Robinson, Eugenia

[196] *The Antigua Valley, Guatemala: Dating and Contexts of the Middle Preclassic Period*

Evidence of sedentism in the Antigua Valley begins in the Middle Preclassic Period at the archaeological sites of Urias and Rucal, located at the head of a corridor to the Pacific coast. This area has evidence of mobile Early Preclassic peoples as early as 1400 B.C. Middle Preclassic finds at Urias and Rucal include middens, bottle-shaped pits, stone markers, platforms, a burial, and pottery similar to Charcas types from Kaminaljuyu and Naranjo. Radiocarbon dating and stratigraphy could support interpretation of settlement beginning at 800 B.C., rather than 1,000. B.C. This later date would suggest discontinuity with the Early Preclassic remains.

Robinson, David (URI-GSO), Doug Harris (NITHPO) and John King (URI-GSO)

[243] *Identifying Submerged Paleocultural Landscapes: A Collaborative Archaeological Approach*

Narragansett Indian Tribal oral history relates to us that “More than 15,000 years ago, the ancient villages of the Narragansett were out where the ocean is now. The waters began to rise overnight and the people had to abandon their homes.” This Tribal oral history echoes the regional geological record indicating that at the time of the last glacial maximum, ca. 24,000 years ago, what are now the Atlantic waters of Rhode Island and Block Island sounds were part of a subaerially-exposed continental shelf that was an open vegetated plain available for ancient human habitation. Since 2012, a research team from the University of Rhode Island's Graduate School of Oceanography and the Narragansett Indian Tribal Historic Preservation Office has been working collaboratively in the Atlantic Ocean off Rhode Island's coast on a 4-year BOEM-funded study designed to assist with the development of protocols for identifying submerged paleocultural landscapes and the ancient Native American archaeological sites they may contain. This paper will present our initial methodological approach and preliminary results from these ongoing investigations, as well as provide some insights about what has been learned along the way regarding the integration of marine geoarchaeological research with Tribal knowledge, perspectives and concerns.

Robinson, Jess (Vermont State Archaeologist)

[255] *Discussant*

Robles, Fernando [413] see Andrews, Anthony

Robles Cortés, Erika (Proyecto Templo Mayor), Ximena Chávez Balderas (Proyecto Templo Mayor), Alejandra Aguirre Molina (Proyecto Templo Mayor) and Michelle De Anda Rogel (Proyecto Templo Mayor)

[298] *Images of Death in Offering 141 of Tenochtitlan's Great Temple: Human Sacrifice and the Symbolism of Effigy Skulls*

Offering 141 is one of the numerous deposits found at the Great Temple of Tenochtitlan that contain the remains of decapitated individuals associated with the Mexica practice of human sacrifice. After the immolation of men, women, and children, their heads underwent various cultural treatments in order to be utilized by the city's priests in specific rituals. Although some of these severed heads were buried shortly after death to consecrate the building, others were transformed into effigies of defleshed beings that represented earth and death deities. This paper presents the results of osteological and symbolic analyses of the seven skulls found in Offering 141, which are characterized by their magnificent conservation and for preserving sufficient polychromy to generate a graphic register and pictorial reconstruction of their facial decoration. The skulls also were adorned with insignia of shell, pyrite, and wood, and were found associated in the context of skeletal sculptures, marine material, and animal pelts—ritual objects that help us understand the symbolism of the effigies represented.

Robles Garcia, Nelly (Instituto Nacional de Antropología e Historia)

[26] *Athens-Oaxaca y puntos intermedios: Steve Kowalewski's Influence in Local Archaeologists*

One of the major contributions of Dr. Kowalewski has been a dual impact in the development of Oaxacan archaeologists, and his model of engagement with communities where he has studied. Undoubtedly, Steve has been an example to follow in academia, as his Valley of Oaxaca survey expanded on Ignacio Bernal's pioneer study. He and his associates used the full-coverage strategy for the central valleys and replicated it in the Mixteca Alta. Steve has always been open to including Mexican archaeologists in his projects; and shares and discusses Oaxaca's archaeology with all interested colleagues. Ethics permeates his work and he teaches his assistants how to perform good social archaeology. His international students received from him a great contribution; he made us feel at home, attended to, and supervised. Finally, our time there will be among our best memories and we have learned what it means to be a good teacher and a best friend.

[111] *Discussant*

Rocek, Thomas (University of Delaware)

[82] *Which Neolithic House? Pithouses and Pueblos in the U.S. Southwest*

The archaeology of the United States Southwest permits examination of the process of Neolithization with chronological precision in a wide range of contexts. In broadest outline, Southwestern data parallel social, economic and technological patterns documented worldwide. The recency, large sample, and fine resolution of Southwestern data allow recognition of multiple divergent and convergent patterns shaped by local environments and cultural traditions that are difficult to observe in other areas.

A major dimension of change in the Southwest is the architectural shift from semi-subterranean pit structures to individual, or more often conjoined surface pueblo buildings, the "pithouse to pueblo transition." While this shift is widespread in the Southwest, its timing, specific form, correlation with other aspects of Neolithization, and the degree to which the transition occurs all vary. I suggest that the pithouse-pueblo contrast helps to disaggregate some of the closely linked variables that are often thought of as part of a single Neolithic "package." At the same time, variation within the pithouse to pueblo transition demonstrates how, despite the seemingly straightforward contrast between pithouses and pueblos, use of these architectural forms as proxies for other variables over-simplifies the interplay of processes that together constitute Neolithization.

[82] *Chair*

Rockman, Marcy (U.S. National Park Service)**[83]** *A National Strategic Vision for Climate Change and Archaeology*

The US National Park Service (NPS) recognizes a two-fold relationship between cultural resources and climate change: climate change affects cultural resources, while in turn cultural resources contain invaluable information about long-term human capacity to adapt to changing climates. The NPS Climate Change Response Strategy (2010) set out four pillars of climate change response: science, adaptation, mitigation, and communication. Work is now underway to merge these two approaches, integrating the two-fold perspective of cultural resources with each climate change response pillar. The result is a full complex strategic vision for a national climate change and cultural heritage program. This paper walks out roles and examples of NPS archaeology in this program.

[106] *Discussant*

Roddick, Andrew (McMaster University)**[252]** *Chijipata Alta: Tracing A Genealogy of Potting Practice in the Lake Titicaca Basin*

Andeanists have produced rich ethnoarchaeological studies of specialized potting villages, yet up until now scholars have ignored contemporary ceramic production in the Southern Lake Titicaca Basin. This poster reports on recent work of the Proyecto Olleros Titicaca Sur (P.O.T.S.), a recently initiated project in the village of Chijipata Alta exploring the relationship of learning, identity, and social boundaries using both ethnographic approaches (participant observation, oral history, and videography) and archaeological methods (excavation, petrography, and radiography). This community of specialized "olleros" produces standardized forms and exchanges them throughout the altiplano. Three particular material traces associated with the life of these vessels resonate with ongoing archaeological research in the region: (1) The paste recipes, which are excavated from a long utilized and important clay quarry to manufacture the utilitarian pots. (2) The ash mounds that grow over many generations of pottery firings within and across the boundaries of this specialized community. (3) The fragments of Chijipata Alta produced cooking pots that are distributed across the larger South-Central Andes. I argue that the social dynamics behind these three variables provide valuable insights to ongoing archaeological research into issues of identity and social boundaries in the deeper past.

[104] *Discussant*

Rodgers, Kendra (Penn State)**[149]** *Using GIS in Archaeological Research: A New Look at Hunting Rock Art Sites*

Place, space, and movement are core concepts for analyzing how cultural behaviors of traditional

hunting societies shape a landscape. Sites mark the use of a landscape and connect people to particular events, movements, or places on this landscape. Analysis of rock art must consider who created and used this art and the roles it played in shaping landscape use. Panels depicting hunting scenes have been recorded at communal hunting sites, in rockshelters that served as habitation areas, and as isolated panels. Common archaeological evidence of hunting includes faunal remains, stone tools, architectural features, and topographic features that provide favorable vantage points. Notably, the presence of hunting images may be interpreted as overall evidence for hunting behavior, but unlike other artifacts are not individually interpreted as a sign of hunting.

Assuming these images played a role in hunting behaviors whether in the form of actual subsistence practices or hunting like rituals, I use spatial analysis and traditional archaeological methods to take a new look at the potential relationships between hunting-themed rock art locales and surrounding archaeological sites in the landscape at the Pinon Canyon Maneuver Site to gain insight into the placement of images and the land use of the area.

Rodning, Christopher (Tulane University), Robin Beck (University of Michigan) and David Moore (Warren Wilson College)

[81] *Conquistadores, Colonists, and Chiefdoms in Northern La Florida: Artifacts and Architecture at the Berry Site in Western North Carolina*

From 1566 to 1568, the northern frontier of the Spanish colonial province of La Florida was situated in western North Carolina. Members of the Hernando de Soto expedition traversed the province of "Xuala," in the upper Catawba Valley, in 1540, en route to towns on the other side of the Appalachians, in eastern Tennessee. Expeditions led by Juan Pardo between 1566 and 1568 visited many of the same places and provinces in the Carolinas and eastern Tennessee as the Soto expedition, including "Joara." Pardo established six outposts along what was intended to become an overland route connecting Santa Elena, the capital of La Florida in what is now coastal South Carolina, with New Spain and the Spanish silver mines of Zacatecas, Mexico. That overland route never materialized, but Pardo chose the Native American town of Joara as the location of his principal outpost (Cuenca) in the interior of La Florida, where he established Fort San Juan. Investigations at the Berry site—the location of Joara, Cuenca, and Fort San Juan—shed light on the sixteenth-century Spanish colonial presence in western North Carolina and responses by the people of Joara and other Native American towns to Spanish contact and colonialism.

[104] *Discussant*

Rodning, Christopher [188] see Moore, David

Rodrigues, Antonia [163] see Wellman, Hannah

Rodrigues, Teresa (Gila River Indian Community), Frances Landreth (Gila River Indian Community, Cultural Resource Man), Lorrie Lincoln-Babb (Bioarch, LLC) and Chris Loendorf (Gila River Indian Community, Cultural Resource Man)

[225] *Rock Art Heritage Conservation and Management*

The Gila River Indian Community is actively engaged in the inventory and documentation of petroglyphs located within the Community. These recording efforts also include oral history interviews with tribal members who have knowledge of the areas where the art occurs. Rock art sites include prehistoric and historic period figures, and they are found throughout the buttes and mountains surrounding the Middle Gila River. This art often occurs along trails, and in prominent locations such as mountain ridges or passes. Petroglyphs are associated with many areas that are sacred to the modern members of the Community, and most rock art sites are considered to be Traditional Cultural Properties (TCPs). Other goals of our work are to prevent rock art site damage, as well as to mitigate and restore damaged sites. Public outreach within the Community maintains and strengthens ties to the landscape. These efforts are also designed to facilitate access to sacred sites for elders as well as young people learning O'odham traditions. Heritage awareness fosters preservation and protection of these important locations. The Community is committed to a holistic

approach for the appropriate sharing of knowledge, while also safeguarding sacred and important places on the landscape.

Rodrigues, Antonia (Simon Fraser University), Camilla Speller (University of York), Anna Prentiss (University of Montana) and Dongya Yang (Simon Fraser University)

[312] *Dog Coprolites as a Source of Dietary and Genetic Information at the Bridge River Site, B.C.*

DNA recovered from ancient coprolites can provide an important source of dietary and host information. In this study, ancient DNA techniques were applied to dog coprolites recovered from two pithouses at Bridge River, a complex hunter-gatherer village on the Fraser River, British Columbia. Dog mitochondrial DNA was targeted to assess the genetic relationship between the domestic dogs of Bridge River and other ancient and modern dog populations both locally and worldwide. Multiple *Canis familiaris* mitochondrial DNA sequences were recovered from the ancient remains, some of which matched sequences recovered from ancient dogs at other Pacific Northwest Interior Plateau sites. Mitochondrial sequences matching *Oncorhynchus nerka* were recovered from salmon bones within the canid coprolites, and from the coprolites themselves, indicating that domestic dogs at Bridge River had access to sockeye salmon. Whole genome analysis, followed by next-generation-sequencing on an Illumina MiSeq platform was also applied to investigate other dietary components, as well as the potential for obtaining host nuclear DNA from coprolites.

Rodriguez, Erin (University of California, Berkeley)

[15] *Microscale Geoarchaeology in a Historic Context: Soil Micromorphology Analysis with the Fort Davis Archaeological Project*

Microscale geoarchaeology, specifically soil micromorphology, has incredible potential for enriching archaeological understandings of the materiality of past experience through detailed information on the events, actions, and processes which create archaeological sites. Soil micromorphological analysis can parallel the strict time scales available through historic documentation with material evidence of specific human, non-human, and natural events. This paper shows how micromorphological approaches can be integrated into a historical archaeology project through examples from the Fort Davis Archaeological Project in Fort Davis, Texas. Micromorphological sampling during field season 2014 was crucial in understanding the development of archaeological sites excavated by the project, particularly in terms of deposition and the effects of water action on archaeological features. Furthermore, micromorphological analysis was incorporated into the analysis of living spaces and depositional practices at several sites analyzed by the project. Using these examples this paper shows how integrating microscale geoarchaeology within a historical archaeological framework provides a material and temporal correlate to historical and artifactual modes of analysis which are standard practice within historical archaeology.

[15] *Chair*

Rodriguez, Carol

[134] *Characterization of the Cerro de Oro Pottery Style*

This study focuses on the analysis of the ceramic material from the archaeological site Cerro de Oro, located in the Cañete Valley. While the Cerro de Oro pottery style has been defined previously in a generic way (Menzel 1964), this study seeks to reopen the investigation and conduct a deeper analysis with recently excavated material, which allows us to characterize it in itself. The aim is to define an iconographic program that allows us to compare and contrast it with popular styles from a defined time and space. Evidence from literature and preliminary studies show that styles from the Nasca, Wari and Lima societies are present in the ceramic of Cerro de Oro and would play an important role in the dynamics of defining the cultural identity of these societies during the late Early Intermediate and early Middle Horizon (550-750 A.D.)

Rodriguez, Iraida [300] see Smith, Lisa

Rodriguez, Enrique (University of Texas)

[393] *Postconquest Figurines from Central Mexico: Aspects of Phenotype and Artifice*

This analysis focuses on figurines made after the Spanish conquest (1521 CE) of Mexico, based on the collections from three museums: the Hearst Museum, the American Museum of Natural History, and the Field Museum. The central questions address figurines as media that could potentially negotiate issues of racial (or casta) categorization, phenotype, and artifice. The figurines were collected and accessioned in the early 20th century, before the development of archaeological methodologies that pay close attention to context and stratigraphy. Therefore, they present serious challenges to chronology-building, to our knowledge of the sites where the figurines were collected, and to any determination of use of the figurines. Still, it is possible to address three basic questions regarding the figurines: 1) Do they portray what we would recognize as phenotypes or any other aspects of racial categorization? 2) Do they focus instead on what we would associate with ethnicity, including aspects of dress, hairstyles, and other material culture? 3) Were figurines media for conveying ideas about race or casta, ethnicity, class, or other social distinctions in postconquest Mexico? The figurines offer us a unique opportunity to understand how indigenous people portrayed aspects of ethnicity and casta in colonial and republican Mexico.

[393] *Chair*

Rodríguez, Agustín [78] see Guillen, Sonia

Rodríguez Mota, Francisco [21] see Esparza Lopez, Rodrigo

Rodriguez Suarez, Roberto [313] see Buhay, Bill

Rodríguez Zariñán, Nora (Universidad Nacional Autónoma de México)**[21]** *Parallels between Pseudo-Cloisonné and Huichol Votive Gourds: Iconography, Processing, and Disposal*

Pseudo cloisonné is a characteristic ceramic type of West Mexico. It has generally drawn the attention of researchers because of its complex iconography and elaborate manufacture, which have led many to regard it as a prestige/exchange good. The study of this ceramic type, supported by ethnographic analogy with votive gourd bowls produced by the Huichol of northern Jalisco, suggests the possibility that many pseudo-cloisonné pieces may not have been considered as prestige/exchange goods. The Huichol do not even conceptualize the votive gourd bowls as vessels for deities, but as the deities themselves. And then, the ethnography also supports the possibility that this pottery was manufactured in situ. This study shows how pseudo-cloisonné vessels and Huichol gourds share patterns of manufacture (with respect to both iconography and ceramic forms) and disposal (sherds in fill or whole vessels in ceremonial contexts), thus justifying the possibility that not only are these patterns shared between the vessels, but also the cosmogenic value that they possess. It is important to mention that these analogies are not trying to indicate a direct relationship between the groups involved. However, properly argued, this analogy provides an enlightening and clearer understanding of pseudo-cloisonné pottery.

[21] *Chair*

Rodriguez-Rellán, Carlos**[137]** *Watch out for Rocks: a GIS and Agent-Based Modeling Approach to the Rock Art of Northwestern Iberia*

Geographic Information Systems and high-resolution cartography (LIDAR), together with Agent-Based Modeling, are used for assessing the traditional view of open-air rock art as an active element in the shaping of the prehistoric landscape. Petroglyphs have usually been thought to play a major role in the configuration of different significations of prehistoric landscapes, their location repeatedly analyzed in terms of spatial proximity with paths and resource-rich areas that would have been key for the local Neolithic and Bronze Age communities. Nevertheless, such considerations were often based on relatively shallow spatial analyses, which the importance of perceptibility of the engravings as a main element in determining their agency. The use of new GIS approaches to mobility and

perception, such as the density of potential pathways and the reverse viewshed analyses, together with the simulation of the processes of perception of rock art sites by applying Agent-Based Models, shall allow us to check the accuracy of the notion of rock art acting as a landscape marker linked to the so-called "geography of movement."

[137] *Chair*

Rodriguez-Rellán, Carlos [353] see Valcarce, Ramon

Rogers, Michael (Ithaca College) and Scott Stull (State University of New York at Cortland)

[124] *Using Archaeogeophysical and 3D Laser Surveying to Visualize an Integrated Landscape*
Archaeogeophysical and 3D laser scanning at the Old Fort Johnson National Landmark site in Fort Johnson, New York provides a case study for creation of an integrated landscape. The ability to digitally image above and below ground features creates a new way of visualizing an integrated landscape. Above ground remains of historic structures often appear out of their original context. Defensive elements, outbuildings, agricultural areas, ceremonial areas, walkways, and shape of the ground surface may be modified or removed. Evidence for these former features on the original landscape may appear in historic documents, artwork, photographs, collective memory, and beneath the subsurface. Archaeogeophysical survey, historic document research, and other archaeological methods have the ability to help us visualize the landscape in its original state, and address anthropological questions.

Rogers, Thatcher (University of Wisconsin - La Crosse)

[245] *Paquimé and Diablo Phases at Paquimé: An Examination of Architectural Validity of Phase Declarations*

This paper will present on the results of statistically-based analyses of architectural data relating to the Paquimé and Diablo Phases at the site of Paquimé collected and published by Charles Di Peso et al. in 1974. A re-examination of the architectural data is necessitated as, in a methodology dissimilar to standard procedure, Di Peso utilized architectural attributes as a basis for phase differentiation. While prior statistical analysis (Frost 2000) has been applied successfully to architectural remains correlating to the Buena Fe and Paquimé Phases, no known successful statistical analysis of the Paquimé and Diablo Phases, nor division therebetween exists. The analyses undertaken have the dual objective of determining the validity of Di Peso's declaration of structures sans secure dating to either phase, and whether a phase distinction can be supported using architectural attributes. The results to be presented will assist in future understanding of the diachronic constructive history of structures at Paquimé, as well as that of individual architectural attributes and the frequency of their presence.

Rogers, Jason [360] see Kielhofer, Jennifer

Rogge, A. E. [273] see Herr, Sarah

Rogoff, David (University of Pennsylvania)

[307] *Combating Researcher Bias in Archaeological Investigations of Identity*

There is extensive evidence that people are self-serving in the interpretation of data and are very likely to reach their desired conclusions. Archaeologists have grappled with this issue as it pertains to the construction of meaningful analogs, but there has been little effort to follow through with an evaluation of archaeological analogies. I propose a methodology for combating researcher bias in archaeological analysis and apply it at El Coyote, a Classic Period center in western Honduras.

Rohlwing, Kathryn [220] see Purdy, Barbara

Rojas, Alexis [107] see Garcia, Jorge

Rojas Pelayo, Lisbeth [208] see Archebelle-Smith, Aric

Roksandic, Ivan (University of Winnipeg)

[313] *The Nicaraguan Rise and the Problem of Early Peopling of the Greater Antilles*

This presentation examines the patterns of interaction in the Greater Antilles at the time of early migrations, the sources of those population movements and the reasons behind them, with a special focus on the probable links between Lower Central America and the Western Caribbean, in light of recent research results from several academic fields, such as archaeology; aDNA studies; physical anthropology; toponomastics. It investigates developments that made possible such long distance maritime links and population movements. The Nicaraguan Rise – extending from Honduras and Nicaragua as far as Jamaica – with its numerous low-lying islands, provides both an ideal situation for island-hopping, and an extremely rich environment for economies based on fishing. If the sea level, as recent bathymetric studies have suggested, was just two meters lower than it is today in the period between 8 and 4 ka. years BP, many more islands would be exposed, providing early fishing communities with an easy island-hopping route towards the Greater Antilles. This hypothesis is in agreement with recent views, which analyze the process of island colonization as consisting of the phases of discovery, exploration, visitation, and year-round utilization, followed by seasonal settlement, and finally establishment, or permanent settlement.

[313] *Chair*

Roksandic, Mirjana (University of Winnipeg), Sagrario Balladares (Universidad Nacional Autónoma de Nicaragua), Leonardo Lechado (Universidad Nacional Autónoma de Nicaragua) and Donald Byers (Bluefields Indian Caribbean University (BICU-CIDCA))

[313] *The Earliest Dated Skeletal Remains from the Atlantic Coast of Nicaragua*

A recent discovery of a female skeleton from Monkey Point – a shell matrix site on the Atlantic coast of Nicaragua – represents the earliest confirmed evidence of the occupation of the region. In 2014, the skeleton eroded from the profile (left unprotected after the excavations in the 1970s) prompting rescue excavations. The skeleton was not disturbed, and the excavations could follow proper archaeological procedures, allowing us to reconstruct the burial position and to attempt chronometric ¹⁴C dating. Here we present the skeletal and burial data in their archaeological and chronological context. Situated in Bluefields, Atlantico Sur Province, Nicaragua, (11° 36' 0" North, 83° 40' 0" West), the site is a large shell-matrix site in the Duck Creek region, considered to be very important in the subsistence of the local indigenous Kriol and Rama communities. This particular region, because of its geographic position on the coastal area of the Nicaraguan rise, plays a potentially critical and yet poorly known role in our understanding of the early peopling of the Greater Antilles. The discovery of human remains at the site offers us material evidence of the early population and the opportunity to examine population affiliations and movement.

Roksandic, Mirjana [313] see Buhay, Bill

Rolbiecki, David [363] see Mt. Joy, Kristen

Rolett, Barry (University of Hawaii)

[77] *Marquesan Voyaging during the East Polynesian Archaic Era*

Early East Polynesian chiefdoms are remarkable for their voyaging spheres, as evidenced by archaeologically-documented interisland contact. One of the most prominent examples of interisland contact derives from a 1974 study by Bill Dickinson in which it was found that a handful of pottery sherds discovered in the Marquesas can be sourced to Fiji, an archipelago lying more than 4000 km to the west. Various interpretations of this discovery continue to fuel debate surrounding the context and intentionality of early East Polynesian voyaging. An emerging consensus suggests that the imported pottery is linked to an early period of systematic long-distance voyaging, prior to a later

breakdown in interaction. Recent research, including new excavations at the Archaic era Hanamiai site (southern Marquesas), highlights the value of stone adzes and phonolite (a distinctive green-colored rock) for reconstructing early voyaging and refining the chronology of the ca. A.D. 1450 breakdown in interaction spheres.

Romanowska, Iza (University of Southampton)

[84] *Testing the Variability Selection Hypothesis on Hominin Dispersals - A Multi-Agent Model Approach*

The Variability Selection Hypothesis proposed by Potts (1996; 1998) postulates the evolution of behavioral plasticity among early hominins arising during periods of strong environmental fluctuations in the last 6 million years. It argues that the inconsistency in selection regimes caused by the rapid environmental fluctuations produced particularly strong selection pressure on adapting to change rather than any particular set of conditions (termed 'adaptive complexity', 'adaptive flexibility', 'adaptive versatility', or simply 'versatilist organisms'). The work by Potts was further formalized by Grove (2011) in a single locus model and tested on the temperature curve spanning the last five million years. The current implementation aims to assess the implications of the Variability Selection Hypothesis on the agent's ability to disperse, a process that is visible in the archaeological record. The model was translated into a stochastic multi-agent simulation to investigate the dynamics between individuals with different positions and range on the adaptive spectrum (including the 'versatilist' individuals) within a non-homogenous population. The initial results shows that using heterogeneous multi-agent simulation can successfully replicate Grove's formal implementation but also sheds new light on how the pattern of dispersal unravels under different environmental regimes.

[84] *Chair*

Romero, Freddie (SYB.C.I Cultural Resources Coordinator)

[106] *Discussant*

Romero, Sergio (University of Texas at Austin)

[242] *"Just the leftovers!" Pre-Christian Ritual in Highland Maya Colonial Documents*

In this paper I will present an analysis of colonial texts in indigenous languages that describe or paraphrase prehispanic ritual. I will present comparisons between the structure and poetics of such texts and those of contemporary Christian sacramental practice as attested in sixteenth and seventeenth century doctrines and catechisms. Based on the analysis of intertextuality, I will show that prehispanic ritual genres became a template for the Spanish mendicant friars and their native collaborators charged with the translation of Catholic ritual and prayer into highland Maya languages. Eventually, this led to two opposed Christian ritual traditions. The first, represented by the Dominican Domingo de Vico's *Theologia Indorum*, closely followed prehispanic poetic and lexical templates. The second, represented by the diocesan Antonio del Saz' sermons, sought to distance itself from any discursive repertoire with potential "pagan" associations. These two incarnations of Christian language were solutions to tensions among Spanish clergy resulting from different views of the Maya and of evangelization. However, they also reflected tensions among Maya elites torn between continuity and adaptation to Spanish colonial rule. Christian language underwent constant changes and readjustments but Spanish clergy never really succeeded in exorcizing the linguistic traces of prehispanic ritual.

Rondeau, Michael [35] see O'Grady, Patrick

Rondelli, Bernardo [73] see Angourakis, Andreas

Roney, John (Colinas Cultural Resource Consulting), Robert J. Hard, A.C. MacWilliams and Mary E. Whisenhunt

[262] *Recent Test Excavations at an Early Agricultural Period Cerro de Trincheras Site on the Upper Gila River, Arizona*

Investigations on a cerro de trincheras site overlooking the Gila River were conducted in 2014. The Round Mountain site tentatively dates to the Early Agricultural period (2100 B.C.-A.D. 100). The 6 ha expanse of the site includes 1.9 km of constructed walls and terraces. The remains of 16 houses are defined by a constellation of rock rings in the central part of the site. Projectile points include five Tularosa corner-notched points. This style of point is associated with both Early Agricultural period and Pithouse period occupations. Other surface artifacts include 63 metates, and are largely basin and slab forms, as well as 14 complete one-hand manos. In addition two stone pipes and a rectangular stone mortar or tray were also found on the surface. This ground stone assemblage is consistent with that seen in other Early Agricultural period contexts. Early Agricultural period cerro de trincheras sites have been documented in the Rio Casas Grandes in northwestern Chihuahua and along the San Pedro River in the Tucson Basin where they are associated with the spread and adoption of maize agriculture. The Round Mountain site on the Upper Gila extends this phenomenon to a third major river valley in the Greater Southwest.

Ronsairo, Karleen (California State University, Northridge)

[323] *Postclassic Chen Mul Fragments from the Cochuah Region, Quintana Roo, Mexico*

Postclassic Chen Muls are known as effigy censers, or incensarios. Thompson (1957) suggested that these objects were placed at the feet of altars and used in ceremonial shrines during rituals of renewal. During the 2014 Cochuah Regional Archaeological Survey, we recovered a collection of Postclassic Chen Mul fragments from excavations at four sites in the project area: San Felipe, San Francisco, Venadito, and the Fortín de Yo'okop. While we did not recover whole incensarios, visual analysis of the Chen Mul fragments we found from the Cochuah region suggests that the deities portrayed in this assemblage are comparable to those of other Postclassic Chen Mul collections from sites throughout the Yucatan Peninsula, such as Mayapan (Smith 1971) and Tulum (Sanders 1960). Analysis of our sample of Chen Mul fragments not only provides insight into the ritual practices associated with these Postclassic incensarios, but also the changes in Maya power and ideology in the Cochuah region during the transition from the Terminal Classic to the Postclassic, as Maya ideology and religion centered on kingly power was replaced by folk religion that glorified deities (Johnstone 2008).

Rooney, Clete (National Park Service), David Morgan (National Park Service) and Kevin MacDonald (University College London)

[44] *Archaeology of the 18th-Century French Colonial Metoyer Land Grant Site, Natchitoches, Louisiana*

Recent plans to develop a tract of land on Cane River prompted examination of a locality pivotal to understanding the colonial creole experience in northwest Louisiana. Survey work in 2011 and 2012 identified a large river front site, part of which was home to the plantations of Narcisse Prud'homme, John Plauché, and Pierre Metoyer—the latter an economically prominent colonial known for his relationship with the celebrated Marie-Thérèse Coincoin. Subsequent archival research, geophysical survey, and excavations have identified the possible residences of the plantation owners and those they enslaved.

Roos, Christopher [52] see Hernandez, Nicole

Roos, Christopher (Southern Methodist University)

[239] *Multi-Millennial Fire Histories from Sedimentary Archives: Human and Climate Impacts*

Sedimentary archives offer the opportunity to build millennial length fire history reconstructions with which to evaluate hypotheses of anthropogenic and climatic impacts on fire prone forests. Particularly when calibrated with centennial length fire history records from tree-rings, sedimentary paleofire proxies can be used to build spatially explicit records of fire regime changes. As part of the Jemez Fire & Humans in Resilient Ecosystems Project, this paper presents the results of multiple, spatially distributed paleofire records that span more than 6000 years. This research contextualizes the historic fire-climate dynamics on these landscapes and provides evidence of human impacts on the vulnerability of fire-prone ponderosa pine forests to low-frequency climate changes.

[159] *Discussant*

[239] *Chair*

Roosevelt, Christopher [167] see Gauthier, Nicolas

Roosevelt, Anna (Univ. Illinois, Chicago) and Christopher Davis (UIC Anthropology)

[353] *Doing It the Old-fashioned Way: Dating Paleoindian Rock Art in Eastern South America*

Rock painting flourished in several parts of the world, including eastern South America. Traditions that can be important evidence not only of development of art, society, and religion but also of science and technology. Techniques for direct dating are in active development these days, but archaeological stratigraphy and radiometric dating can give an important baseline to compare with other methods. We present an example of this strategy and its results at Monte Alegre, Brazil and briefly summarize evidence from sites in the larger region. At Cavern of the Painted Rock, people dropped paint and prepared pigment on the ground below art panels, and sediment subsequently covered them. We radiocarbon dated charcoal and carbonized plants with the paint, thermoluminescence-dated burned lithics, and OSL dated sediment. At the open site of Panel of the Painted Rock of the Pestle, paint stone and carbonized wood were left on the ground next to the painted walls and these became buried in sediment. The sediment was shaded, so could not be OSL dated, but the charcoal was radiocarbon dated. Both sites paint-bearing layers dates averaged c. 13,150 cal years BP., making the art and its archaeoastronomical alignments among some of the oldest yet dated.

Roper, Donna (Kansas State University)

[79] *Characterizing Eighteenth Century Technological Changes in Pawnee Pottery*

The pottery produced by the Pawnee of the central Great Plains of North America underwent extensive modification in the eighteenth century. Although twentieth-century archaeologists described the "early" and "late" materials, they did not adequately characterize how Pawnee potters modified their craft in terms of vessel morphology or technological practice, nor did they consider pottery function. Thus, we have no satisfactory account of this change. Situated in the context of technological changes during the contact era, this study uses petrography, vessel morphometrics, pXRF, and FTIR to address how the pottery changed. The analysis reveals that the introduction of metal vessels did not lead to a phase-out of native pottery, but rather that the functions formerly performed by pottery alone were divided between metal and earthenware. The appearance of the material was so markedly different because manufacturing technology and form were modified to facilitate pottery's revised role in foodways.

Rorabaugh, Adam [92] see Fulkerson, Tiffany

Rorabaugh, Adam (Washington State University)

[114] *Restricted Forms of Knowledge in Pre-contact Coast Salish Lithic Craft Traditions*

Recently anthropologists have increasingly recognized the role that the control of knowledge has in the production and reproduction of social inequality in small scale societies. In the case of the pre-contact Coast Salish of the Pacific Northwest, ethnographic data emphasizes the role that the control of elite prerogatives had in the maintenance of their status. Drawing upon cultural transmission models, these social relationships would be reflected not only in the prestige goods often discussed by archaeologists but in a shift towards more restricted household learning in a wide range of technologies during the Marpole period (2400-1000 BP) when large winter plank house villages and hereditary forms of social inequality are argued to have emerged. High resolution analyses of formed lithic tools from previously excavated archaeological collections were conducted to examine fine scale stylistic and metric variation in assemblages in sites throughout the Salish Sea. The impacts of material quality, tool curation, and time-averaging effects were also assessed and did not appear to be factors significantly patterning this sample. Overall these data suggest that the learning of these technologies may have been restricted by gender and kin lines, and became increasingly influenced

by prestige over the past 3,000 years.

Rosales-Tham, Teresa [347] see Duke, Guy

Roscoe, Paul (University of Maine)

[285] *Beyond Defense: The Political Implications of Defense in Contact-era New Guinea*

At contact, New Guinea polities were uniformly at war, either episodically or permanently, with at least one of their neighbors. As a result, they all adopted significant defensive measures, commonly some mix of advanced warning systems, settlement nucleation, and natural or artificial fortifications. These measures were crucial to survival but they had numerous social and cultural implications. In this paper, I outline some of the more important of these consequences, before focusing on the political implications. In communities where people perforce interacted on foot through face-to-face communication, the distribution of population across a landscape had significant political consequences. I trace some of these outcomes drawing on data from about a hundred contact-era New Guinea polities.

[228] *Discussant*

Rose, John [6] see Canaday, Timothy

Rose, Chelsea (Southern Oregon University)

[45] *Getting Burned: Fire, Politics, and Cultural Landscapes in the American West*

The National Historic Landmark town of Jacksonville, Oregon is celebrated for its nineteenth century past. While saloons, hotels, and shops survive as testament to the days of the Oregon gold rush, the selective preservation of the built environment has created a romanticized frontier landscape. A sleepy park now covers the once bustling Chinese Quarter, which burned to the ground in 1888. Recent public archaeology excavations revealed the remains of a burned building and led to a fruitful collaboration with the local fire department, which helped illustrate the taphonomic processes of the historic fire. While fires often lead to the recovery of well-preserved archaeological deposits, the context of the fire itself as a socio-political artifact has been underexplored. Used as both a deliberate and opportunistic means of controlling and creating social and political landscapes, fire was effective at displacing, marginalizing, or even erasing populations like the Overseas Chinese from historic communities.

[45] *Chair*

Rosen, Steven (Ben-Gurion University) and Francesca Manclossi (Universite Paris Ouest Nanterre and Ben-Gurion Uni)

[292] *The Importance of Being Ad Hoc: Patterns and Implications of Expedient Lithic Production in the Bronze Age in Israel*

Analysis of the ad hoc component of lithic assemblages from three Bronze Age sites in Israel shows common technological patterns without significant chronological and geographical differences. Like more formal components of lithic industries, expedient and opportunistic production of tools can be characterized using technological criteria and parameters which discern recurrent patterns in lithic manufacture. Irregular flakes, variable in shape, size, and raw material, and with only minimal retouch, constitute coherent assemblages, resulting from basic knapping strategies based on a few rules and simple flaking schemes. Specifically, the absence of standardized morphologies should not be misconstrued as random production. A general uniformity and stability in the ad hoc production system through the Early, Middle, and Late Bronze Ages indicates the maintenance of common technical behaviors that did not change in parallel to other technological transformations, either within the flint system or outside it, and nor in response to significant socio-political changes. This diachronic continuity, attested through the early Iron Age, reflects a stable technological substrate. Low technical investment and elementary production/consumption systems represent domestic contexts, widespread within the society, which for millennia played a leading role the daily life of ancient people.

Rosen, Arlene (University of Texas at Austin)**[334]** *Climates of History in Ancient China: Lessons from Deep-Time and Cross-Cultural Perspectives*

In recent decades, studies of climate change and its impact on past societies have been colored by a veneer of political agenda and oversimplification of how ancient societies might have actually responded to changes in their environments. Although many of these climatic changes would have profoundly impacted economic systems of past societies, these social and economic systems have often demonstrated remarkable resilience in the face of such changes. Other times, abrupt environmental changes initiated profound transformations in past societies. The scholarship and published works of Brian Fagan have provided us with an invaluable compilation of case studies which help to illuminate the complex responses of societies to environmental change in both the distant past and within historical periods. In the spirit of honoring this contribution, this paper relates a sequence of environmental changes and human responses in northern China beginning with the Neolithic Holocene Climatic Optimum that encouraged rice farmers to spread to the moist valleys of the Loess Plateau, the abrupt onset of drier conditions which coincided with the first state society in the Early Bronze Age Erlitou Period, and the impact of droughts on the expanding Han Empire at the beginning of the Iron Age in China.

Rosenberg, Danny [91] see Campeau, Kathryn

Rosenberg, Michael**[228]** *That Complex Whole: Hierarchies, Sorts, and Punctuation*

Implicit in most approaches to the evolution of culture is both the view that cultural evolution is always incremental and that cultures are structurally simple entities, making individual cultures seem entirely as capable of evolving in one direction as another, based solely on phenotypic plasticity and/or selective forces. However, as noted 140+ years ago by Tylor, culture is a complex whole. Structurally, it can best be viewed as multiple reflexive social, behavioral and informational hierarchies, each subject to a different mode of selection. Selection within each hierarchy produces a sort that feeds into each of the other hierarchies to be reflexively acted on there by the specific selective forces in operation within each of the destination hierarchies. The sort sent by one hierarchy to another given hierarchy and the selective forces operating within that destination hierarchy are not of necessity always compatible. When such incompatibility occurs, punctuational change is sometimes produced.

Rosenberg, Danny (Zinman Institute of Archaeology, University of Haifa)**[342]** *Bedrock Features and Cupmarks-Bearing Boulders: An overview of a Natufian and PPNA Phenomenon*

The Natufian–Pre-Pottery Neolithic A transition (ca. 11,500 Cal BP years ago) in the southern Levant is evident in many aspects of the material remains, and reflects pronounced socio-economic changes. One of the most fundamental changes is documented for bedrock features such as mortars, basins and cupmarks. While during the Natufian we find bedrock features mainly in 'public' contexts near or within sites, it seems that during the following PPNA period these were also introduced into the domestic arena. The documented transition includes a notable shift from natural outcrops/cave floors to large boulders, slabs and querns, on which cupmarks were now made; the latter were found for the first time on many floors of dwelling structures. Also, it appears that while Natufian bedrock features reflect a typologically rich and diverse assemblage (from tiny holes to deep narrow shafts) the PPNA remains reflect a dramatic reduction in the variety of types (shapes, depths, diameters and morphologies). In our talk we offer an overview of this intriguing change and suggest possible explanations, linked to other contemporaneous shifts documented in the archaeological record.

[342] *Chair***Rosenfeld, Silvana (University of South Dakota)**

[406] *Zooarchaeological Inferences and Analogical Reasoning at Chavin de Huantar (Peru)*

Chavín de Huantar (1000-500 B.C. Peru) has long been considered a major center in the central Andes given its complex architecture and art. Mostly based on art depiction, ritual at Chavín has long been associated with psychoactive plant ingestion. Stone sculptures show the hallucinogenic San Pedro cactus, as well as the representation of monstrous animals and supernatural beings interpreted as priests transforming into animals during hallucinogen consumption. Inspired by Diane Gifford-Gonzalez's epistemological work on zooarchaeological inferences, analogical reasoning, and actualism, I analyze and interpret the manufacture and use of bone artifacts at Chavín in its ritual context.

Rosenstein, Dana Drake (University of Arizona) and Christopher I. Roos (Southern Methodist University)**[239] *Luminescence Dating of Surface Ceramics from Naturally Burned Archaeological Contexts***

Luminescence dating of surface ceramics at archaeological sites is problematic for many reasons, including estimation of environmental dose rate, likelihood that an artifact is in situ and weathering. Until now, there has not been systematic research on the effect of natural fires on luminescence dating of pottery. This is an important consideration, because while the temperature of a typical fire is well above the threshold for resetting the luminescence signal in a sherd, the length of time exposed to that heat is relatively short. At Wabakwa village in the Jemez Mountains (LA 478), we developed a robust sampling strategy for collecting surface ceramics around the pueblo from specific areas of differential heating and smoldering during the San Juan Prescribed forest fire in 2012. At this level of specificity, we can compare the luminescence signals of sherds exposed to varying temperatures and duration of heat at the same time. This study is a guide for archaeologists dating sites where surface collection of artifacts is the only sampling method permitted.

Rosenswig, Robert (University at Albany)**[151] *Defining the Izapa Polity with Lidar and Pedestrian Survey***

This paper reports the results of the first systematically collected Formative period settlement data from the area around Izapa. Three environmental zones (coastal plain, low hills and piedmont) were documented by the Izapa Regional Settlement Project combining lidar and pedestrian survey methods. Results indicate population was highest on the coastal plain from 1700-850B.C. as a series of four sequential political centers rose and fell, each lasting for a century or two. After 850B.C. collapse of the La Blanca polity (the fourth and final coastal plain center), occupation shifted to the piedmont as the Izapa polity coalesced. Between 750-350B.C. (the Escalon and Frontera phases) population peaked in both the low hills and piedmont survey zones while there was almost no one documented in the coast plain survey zone. At this time, eight lower-tier monumental centers are documented in the low hills zone — all arranged with the same orientation and architectural features as Izapa. During the Guillen phase (350-100B.C.) the quantity of occupation decreased in both the low hills and piedmont zones and population was relatively more concentrated in and around existing monumental centers. These data begin to illuminate regional demographic changes as the Izapa state was established.

[151] *Chair*

Rosenswig, Robert [151] see Blake, Michael

Rosenthal, Jeff [293] see Brink, Laura

Rosenzweig, Melissa (Miami University)**[305] *The Negotiation of Political Subjectivity in the Neo-Assyrian Empire***

Thinking of political subjectification as the processes by which individuals recognize themselves as subjects to authority, this paper pursues the negotiation of this subjectivity for people living within the purview of the ancient Neo-Assyrian empire. Negotiation resides between the poles of subjugation

and resistance to authority, and constitutes the ways in which people participate in defining the contours of their socio-political positions. In the provinces of Upper Mesopotamia in the early first millennium B.C.E., Neo-Assyrian authorities put conquered peoples to work farming the land, and this program of agricultural colonization instituted human-environment practices that established ties between agriculturalist and empire. But, importantly, subject agriculturalists cultivated agro-pastoral practices that circulated outside Neo-Assyria's large-scale, surplus economy. These divergent forms of land-use nuance subjects' relationship to the empire. Neither wholly assenting to nor rebelling against the Assyrianization wrought on them through imposed resettlement and taxation, subject agriculturalists preserved and/or created avenues (both material and performative) for fostering non-imperial subjectivities. Archaeobotanical data from the provincial capital of Ziyaret Tepe (ancient Tushan) in southeastern Turkey demonstrate the archaeological imprint of this negotiation of political identity and agency.

Rosero, Paulina [367] see Cordero, Maria-Auxiliadora

Rosiles Hernandez, Sara and Philip J. Arnold III

[144] *Surface Ceramic Distributions at Matacanela, Southern Veracruz, Mexico*

Prior archaeological research in the Sierra de los Tuxtlas, southern Veracruz, Mexico demonstrates significant sociopolitical transformations spanning the Formative through the Postclassic periods. Ongoing fieldwork at the site of Matacanela, located within the central portion of the Tuxtla Mountains, is contributing to this understanding. This paper discusses the results of the first season of fieldwork at Matacanela with a focus on patterning in the distribution of surface ceramic material. These systematic survey data allow us to identify both temporal and spatial trends in the site's material record and provide additional insight into the internal development of Matacanela as well as its position within the regional cultural sequence.

Roskin, Joel [368] see Bar-Yosef Mayer, Daniella

Ross, Wendy [29] see Sturdevant, Jay

Ross, Ann [384] see Sugimoto, Kassie

Rossen, Jack (Ithaca College)

[109] *Agriculture and Inter-village Space in the Ancient Haudenosaunee (Iroquois) World*

Ancient Haudenosaunee (Iroquois) settlement patterns have been commonly presented as a series of well-spaced two acre defended agglutinated villages. Inter-village space was generally viewed as dangerous within a landscape of endemic warfare. Surveys and excavations in the Cayuga heartland (east side of Cayuga Lake) of the Finger Lakes region, central New York, are altering that vision. By at least the 15th century, agricultural complexes and stations were established between villages. These locales, possibly hosted by a particular clan, served as nodes of contact and communication between both local and distant groups. Based on recent excavations at the Myers Farm site, they do not contain the size, organization, or longhouse architecture of villages, but do contain small middens, unusually small ceramic bowls, and high frequencies of ground stone, farming implements and smoking pipes. As evidenced by large-scale food production at small sites, communal feasts were held to host visiting work parties.

Rossi, Franco (Boston University)

[303] *Sabios in Situ: Art-making and Representing Authority at Classic Period Xultun*

The study of mural art has moved beyond analytical approaches that isolate these highly meaningful works from the anthropological contexts that produced them, toward approaches that underscore their inseparability from the complex circumstances surrounding their production. However, such contexts in the ancient world are not directly observable and therefore cannot be studied using ethnographic methods. Instead, sociological dimensions of ancient art must be reconstructed

through careful analysis of the archaeological context in which it occurs—situating specific works in place, time, and socio-cultural setting. This paper attempts one such reconstruction, focusing on the eighth century Maya mural at the Los Sabios group within the site of Xultun, Guatemala. I discuss the social and political implications of the Xultun mural in light of the archaeological record on site, to shed light on the ways residents shaped this living work of art and were themselves shaped by what anthropologist Stephen Houston calls the mural's "moral narrative." Together, the images, texts, and archaeological materials found in and around the chamber enable us to contextualize acts of art-making and their authorship, as well as engage larger questions regarding the cultural constructs and systems of authority shaping artistic literacy and its pedagogy in Maya society.

Rostain, Stéphen

[180] *What's That Mound? Answers from Interdisciplinary Approach*

Modern archaeology must diversify its scientific approaches. First, it is essential to get various viewpoints and different scales to understand better the artifact. Moreover, the interdisciplinary methodology improves considerably the interpretation. The Amazonian raised fields study is a good example of such multiple scientific approaches. While raised field agriculture is no longer widely practiced today, it was quite widespread in the past. These structures are frequently found on the coast of the Guianas, the remnants of a technique widely used during the precolumbian period. The interdisciplinary research recently conducted on these structures revealed many surprising aspects of such intensive agriculture. Only the multiplicity of expertise completed successfully to a general understanding of these ecofacts. The Guianas coast has a long history of human impact and the actual landscape partially results of a millenary cultural action.

Roth, Barbara [138] see Woods, Aaron

Roth, Barbara (UNLV), Aaron Woods (UNLV) and Forrest Jarvi (UNLV)

[276] *Lithic Technology and Households at the Harris Site, Southwestern New Mexico*

Recent excavations at the Harris Site in the Mimbres River Valley of southwestern New Mexico have documented differences between Three Circle phase (A.D. 750-1000) pithouses and associated features that suggest differences in social organization. In this poster we use data from cores and chipped stone tools recovered from house floors, extramural work areas, and extramural storage areas to examine core reduction technology and raw material use associated with these households. Our main goal is to determine if a consistent pattern in core reduction technology, raw material access, and raw material preference exists across the community or if differences exist between households. Factors influencing the similarities and differences in lithic technology will be explored.

Rouse, Lynne (Washington University in St. Louis)

[291] *In-Visible Periphery of Old World "Collapse": Recognizing Choice and Circumstance in the Archaeological Record of Mobile Pastoralists*

As in many regions of the Old World, the end of the Bronze Age in southern Central Asia is marked by a prolonged period of social "collapse" toward the end of the 2nd millennium B.C., during which the size, arrangement, and apparent sphere of influence of agriculturally-based population centers changed. Discussions of this period focus primarily on the loss of visible markers of social hierarchy and inter-regional trade networks, but as our collective knowledge of mobile pastoralists in Eurasian prehistory grows, previously 'invisible' practices operating outside the direct control of agricultural centers can be recognized as stabilizing and even driving forces in Old World history. In re-framing pervasive binaries such as Center/Periphery, State/Non-state, and Sedentary/Nomad in terms of social networks and alignments of practices, "collapse" becomes a matter of perspective, and might productively be analyzed for the arenas of daily behavior, relationships, and social institutions that endured across it.

Rowe, Matthew (William R Adams Zooarchaeology, Indiana University)

[35] *Rockshelters in the Bighorn Basin, Wyoming; Environment, Ecology, and Landuse Patterns*

Archaeologists have investigated many aspects of rockshelters in the Bighorn Basin, Wyoming, but questions remain about the role of these sites within regional settlement patterns. It is clear that the Bighorn Basin is a moisture-controlled ecosystem and that variability in environmental moisture levels produces dramatic changes in both animal and plant populations. Changes in environmental moisture also appear to affect human population levels, and past settlement and subsistence patterns. This research combines geoarchaeology and zooarchaeology to interpret environmental conditions and cultural responses to changes in environmental conditions preserved in four Bighorn Basin rockshelters. This study incorporates faunal material from BA Cave (46BH1065), Eagle Shelter (48BH657), Alm Shelter and Paintrock V (48BH349). Results of this research suggest that well-established geographic features contribute to predictable patterns of resource distribution through the preservation and maintenance of productive microclimates at high elevations and in deeply cut riverine canyon systems. This suggests that settlement and subsistence patterns observed ethnographically reflect a long-term adaptation to these recurrent patterns. By combining environmental data derived from rockshelter sediments and cultural information based on faunal remains, this research clarifies our understanding of the role these sites played during different environmental conditions in the Bighorn Basin.

[35] *Chair*

Rowe, Matthew [35] see Finley, Judson

Rowe, Robert and Collin Rucker

[155] *Archaeology in a Cretaceous Swamp*

During the Late Paleocene and Early Eocene, a tropic/sub-tropic forest located in a large swamp was located in present day east-central Colorado. Over time the swamp was enveloped by subsequent volcanic eruptions which resulted in the creation of the Paleosol-Dawson Arkose formation. The primary area of this geological formation is located in Elbert County, between Colorado Springs and the small town of Agate on the plains of Colorado. Large stands of tropical wood, including sycamore, walnut, ginkgo, sequoia, and palm became silicified as a result of the deposition of the volcanic ejecta. Due to uplifts of the area and subsequent erosion of the formation, large areas of petrified wood have become exposed creating a readily accessible source of stone tool material for native populations to exploit. The presence of this material allowed the native populations to occupy the area with a moderate population. Archaeological surveys in support for the installation of a natural gas pipeline across the study area allowed a unique opportunity for archaeologists to map the area of the silicified wood deposits and determine how much exploitation was taking place and if there was preference for type of wood to another.

Rowe, Marvin (Texas A&M University), Eric Blinman (Office of Archaeological Studies, Museum of NM), Jeffrey Cox (Office of Archaeological Studies, Museum of NM), John Martin (Office of Archaeological Studies, Museum of NM) and Mark MacKenzie (Conservation Laboratory, Museum of NM)

[284] *Cold Plasma Oxidation and "Nondestructive" Radiocarbon Dating*

A decade ago, with partial funding from the National Center for Preservation Technology and Training, Marvin Rowe and his students at Texas A&M University developed a cold plasma oxidation method for "nondestructive" radiocarbon sampling of organic materials. This sampling approach is applied to the whole artifact, is carried out under vacuum, plasma temperatures can be maintained below 100°C, only organic carbon is oxidized (carbonate and oxalate are not sampled), and sampling leaves the artifact virtually unaffected. This approach takes advantage of the AMS direct dating potential of samples as small as 100 micrograms, and since the sample is in the form of carbon dioxide, no further treatment is required at select AMS labs. A new and improved cold plasma device has been constructed at the Office of Archaeological Studies, resulting in a more efficient procedure with even lower temperatures. We report on the design innovations and on additional experiments in sampling.

Rowe, Sarah (UNC Chapel Hill)

[367] *Local Communities, Ceramic Use, and the Uneven Development of Social Complexity in the Late Valdivia Period of Coastal Ecuador*

The Late Valdivia period of the coast of Ecuador is often portrayed as one of movement, as sites in the former "heartland" adjacent to the Santa Elena Peninsula were abandoned and new, larger sites were founded at the former peripheries to the north and south. These new sites are implicated in the development of incipient social hierarchy within Valdivia society. However, recent research at the site of Buen Suceso in the Manglaralto Valley suggests that this process of developing social complexity was highly varied and mediated by local social dispositions. Comparative analysis of ceramic assemblages from several Late Valdivia sites highlights differences in ceramic use and assemblage composition that indicate diverging ways of fomenting community through participation in communal eating. These differences point to the negotiated character of communities and highlight the contingent nature of increasing social complexity within Valdivia society. This variation further emphasizes the need for locally-developed and historicized examinations of social practices to understand changes in the Valdivia period.

[367] *Chair*

Rowley, Charlotte [17] see Little, Aimee

Rozo, Jennifer (University of Chicago)

[110] *Home on the Range: An Environmental History of Land Use Changes at Paa-ko, New Mexico*

By using multiple lines of evidence from the archaeological material record, as well as from the environmental pollen record, this paper will explore the history of anthropogenic landscape changes at one particular site in the Galisteo Basin of New Mexico. Located on the margins of the Spanish mission system, the ancestral Pueblo site of Paa-ko and its surrounding field systems present an ideal opportunity to tease out the thread of colonial influences on local communities, particularly with the introduction of livestock into the region. The impacts of grazing continue to be felt into the present, as the eastern field systems are currently a privately owned ranch with small herds of cattle and horses. The transition from an exclusively agrarian landscape to an agropastoral landscape had dramatic and long-lasting social and physical consequences, and these dynamics will be the focus of this study. This project will explore the details of this physical transformation and examine these ecological shifts within the context of changing economics, politics, and aesthetics.

[110] *Chair*

Ruane, Jonathan

[193] *The Development and Modification of a Hydraulic Urban Space at the Classic Maya Site of Xultun, Guatemala*

In order to better understand the use history of the central reservoir at Xultun an investigation was performed during the 2012 and 2014 field seasons. ArcGIS 10.1 was used to model the site's hydrology and excavations were performed both within the reservoir and on architecture within the catchment area to the north. The reservoir was built from a modified quarry and in use since the Late Preclassic. The larger architecture associated with collection and management of this resource was not added until the Early Classic. A series of depressions within the catchment area led to the discovery of a large sub-plaza drainage canal. This feature and the sacbe to the east of the reservoir were used to divert water from Plaza B into the reservoir. An elite administrative neighborhood was positioned between these two collection points. The reservoir was modified over time being dredged and expanded in the Late Classic. The use of the canal also changed through time having surface collection points added and eventually being filled in and abandoned. Hydrological strategies employed by the Maya were adaptive, changing with population pressure.

Rubin de Rubin, Julio Cezar [155] see Silva, Rosicler

Rubinson, Samantha

[390] *Moderator*

Rubinstein, Emily (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College), David Bailey (Hamilton College) and Bruce Wegter (Hamilton College)

[10] *Geochemical Characterization of Anthropogenic Sediments through EA-IRMS from Slocan Narrows Pithouse Village*

Elemental Analysis-Isotope Ratio Mass Spectroscopy (EA-IRMS) has been used to analyze the elemental compositions of materials from archaeological settings, but work done specifically on culturally modified sediments is limited. In this study, we explored EA-IRMS as a technique for characterizing anthropogenic sediments to establish spatial organizations of past living spaces as well as possible changes in environmental conditions over the past 2,700 years. Using EA-IRMS techniques, we examined $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ levels in floor sediments from the Slocan Narrows Pithouse Village in the interior Pacific Northwest of North America. Samples for this study include floor sediments systematically collected from Housepit 6 (n=118), samples associated with specific features in Housepit 9 (n=23), and control samples collected from local (but off-site) non-culturally modified sediments (n=11).

Rubio, Xavier [73] see Frances, Guillem

Rubio-Campillo, Xavier [73] see Lancelotti, Carla

Rubio-Campillo, Xavier (Barcelona Supercomputing Center) and Enrico Crema (University College London)

[73] *Modelling Group Formation in Small Scale Societies*

Several human activities require an optimal number of individuals to maximize their utility, often leading to the coexistence of positive and negative frequency dependence. This generates unstable equilibria, as group close to the optimal size will be invaded by joiners who will increase their fitness by becoming new members, leading either beneficial or detrimental effects to the incumbent members. If a group is optimally sized, incumbent member will experience a decline in fitness, while joiners will increase its fitness by joining the group. This leads to an Evolutionary Stable Strategy (ESS) where group sizes are greater than the optimal size in the case of ideal free individuals. This outcome will be different if the acceptance of a new member can be blocked by the receiving group. The group members will face a volunteer's dilemma, as any cost of rejecting incoming individuals will be benefited by the entire group. This paper examines the role of this ESS in group formation dynamics. The decision-making process of individuals is explored, focusing on situations where members of a group can choose to reject new members for a given cost. Different scenarios are considered, including individual and shared costs, and macro scale implications are discussed.

Ruck, Lana

[33] *Determining Hominid Handedness in Lithic Debitage: A Review of Current Methodologies*

Lithic analysis is of great value for understanding hominid biological, cognitive, and cultural evolution, but analyses of handedness in lithics are rare, despite their potential to elucidate the evolution of human lateralities in the body and the brain. This paper will present results of an experiment to determine handedness in lithic materials. In a blind study on debitage (n=631) from Acheulean handaxes created by right- and left-handed flintknappers, several flake characteristics significantly indicated handedness, with a binary logistic regression correctly predicting handedness for 71.7% of the flakes. However, some characteristics were indistinguishable for handedness, and regressions account for little variability in the data overall. This is likely a result of personal knapping styles, as additional analyses show that individual knappers associate to discrete features better than handedness does. These results are congruent with general issues in analyzing evidence of handedness, but are more conclusive than many of the previous studies. Continued improvement of these methodologies will enable analysis of Paleolithic assemblages in the future, with the ultimate goal of tracking population-level hominid handedness rates through time and using them as a proxy for cognitive development and language evolution.

[33] *Chair*

Ruck, Lana [246] see Colón, Justin

Rucker, Collin [155] see Rowe, Robert

Ruebens, Karen [389] see Dogandzic, Tamara

Ruhl, Donna [166] see Walker, Karen

Ruhl, Donna (Florida Museum of Natural History)**[201]** *Exposed Again: Current Environmental Impact on Dugout Canoes---Their Research and Care!*

Across Florida, severe drought in recent years lowered water levels, especially in 2000 and then again a decade later. Both times this resulted in the exposure of dozens and dozens of ancient dugout canoes. This trend occurred not only in Florida, but also the greater southeastern U.S. This paper discusses the concerted efforts of state and local agencies as well as private stewards to document the environmental impact on these canoe finds, as exposure to sun and elements accelerated their degradation. This destructive process nevertheless provided an opportunity to again record, map, photo, sample, identify, analyze and even preserve a few of these remains. Results of this analysis include many new C-14 dates that reveal insights about paleoenvironmental impacts, waterscapes, settlement change, economies, and overall significance of these typically overlooked yet unique artifacts. In addition, initiatives to exhibit and preserve selected dugout canoes has given way to innovative, green methods for their stabilization and care.

Rühli, Frank [264] see Bouwman, Abigail

Ruiz Y Costello, Donna (Arizona State University) and Sarah Striker (Arizona State University)**[277]** *Color and Technology: A Legacy of Painted Burial Objects at Nuvakwewtaqa (Chavez Pass, Northern Arizona)*

Known to the Hopi as Nuvakwewtaqa, the Chavez Pass pueblo complex (13th-15th CA.D.) was excavated in part by researchers from Arizona State University from 1976 through 1982. Before these excavations, the site had been subjected to decades of looting, especially in burial contexts. A recently completed Forest Service sponsored NAGPRA project provided the opportunity to photograph and analyze the exceptional artifacts found in burial contexts prior to repatriation. This poster discusses new insights gained from examining a clay-lined, painted basket as well as painted wood artifacts which demonstrate specialized craftsmanship and knowledge. As part of the repatriation process, we present our research and documentation of these items as a legacy for future research. The clay-lined, painted basket found at Chavez Pass is one of less than fifty known examples of these types of baskets, arm bands, and hats from archaeological contexts in the American Southwest. When considered with the painted prayer sticks, wands, and staffs from the same assemblage, a vibrant image of social life at Nuvakwewtaqa emerges. Through their use of color and technology, it is evident the people of Nuvakwewtaqa were engaged with regional stylistic traditions and, at the same time, creators of their own local style.

Ruíz-Correa, Salvador [346] see Jimenez, Diego

Ruiz-Perez, Javier [176] see Madella, Marco

Rumold, Claudia (USFS)**[162]** *Insights into the Context, Mode, and Timing of Potato Domestication through Microfossil and Ground Stone Analyses at Jiskairumoko in the Western Titicaca Basin*

The data presented in this poster provide novel and direct microfossil evidence for the exploitation of potato (*Solanum tuberosum*) approximately 5000 years ago at Jiskairumoko, an early village site in the south-central Andes. In the Andes, elucidating the trajectory of potato domestication is central to an overall understanding of the development of agriculture, as this crop was perhaps one of the most important of the autochthonous highland Andean suite. Nevertheless, efforts to elucidate the timing, mode, and context of its domestication have been hindered by the paucity of direct macrobotanical evidence. The results of this study demonstrate the combined effectiveness of starch grain and grinding tool analyses in addressing questions relating to the chronology and context of domestication for the potato. Forty-one starch grains derived from 14 grinding tools are identified as consistent with domesticated potato. Some archaeological *Solanum* starches may reflect the role of grinding in detoxifying potatoes and catalyzing the domesticatory process. Additionally, use-wear analysis of 98 grinding tools indicates women's intensive use of this technology throughout the Late Archaic-Early Formative Period occupation of Jiskairumoko. These results are taken as indicating plant resource intensification reflecting low-level food production.

Runggaldier, Astrid [244] see Brouwer Burg, Mariëka

Runken, Zhou [179] see Lina, Zhuang

Rupp, Elizabeth

[29] *The Promise and Pitfalls of Geophysical Survey at Valley Forge NHP*

The use of geophysical survey techniques to identify potential archaeological deposits has a long history at Valley Forge NHP (VFNHP). As early as 1974, while it was still a state park, Dr. Bruce Bevan conducted magnetometer and GPR surveys of some of the brigade areas. Since 2011, archaeologists at VFNHP have undertaken a series of geophysical surveys aimed at identifying possible encampment related features. The surveys produced a series of promising anomalies, many of which have been tested through excavation. Although no definitive encampment-era remains have been identified as a result of these recent surveys, the anomalies did correspond to deposits from other cultural periods. The results of these surveys have demonstrated that, when combined with historical research, geophysical techniques are useful tools to identify areas likely to contain archaeological features at VFNHP.

Rush, Laurie [43] see Schulz, Margaret

Rusk, Mark [311] see Margaris, Amy

Russell, Will [324] see Starr, Isabel

Russell, Bradley (College of Saint Rose)

[338] *Of Cenotes and Serpents: Modern and Ancient Cave Ritual at Mayapán, Yucatán, Mexico*

The pairing of ritual architecture with sacred underground spaces is common throughout Mesoamerica and makes clear the importance that ancient inhabitants of the culture area placed on caves and cenotes. These spaces were home to powerful forces. The Late Postclassic Maya center of Mayapán (1150-1450 A.D.) is known for its clear spatial associations between temples and cenotes. These temple/cenote complexes have been found both within and outside of the large defensive city wall. Cenote Sac Uayum, located south of the city wall is still believed to be guarded by an enormous feathered serpent with the head of a horse, an easily angered chimera. Underwater exploration of the feature has revealed at least 17 ancient skeletons within. Cenote San Jose, also located south of the wall contains dozens more burials. Several cenotes in the area currently serve as the focus of rain or other rituals. Some cenotes are said to be "alive". They are considered the source of winds, both good and bad, that can bring disaster or prosperity to individuals and the community. This paper will examine several examples of archaeologically known cave ritual at the site and compare those to modern practices still evident at the nearby village of Telchaquillo.

Russell , Will [278] see Zanotto, Hannah

Russo, Michael (National Park Service SE Archeological Center)

[284] *The Archaeological Dynamic Friction Cone Penetrometer*

Archaeologists have used metal probes for centuries, and, more recently, their digitized descendant, the penetrometer, to locate artifacts and features that yield greater resistance in the soil. Most recently, geological miners and agricultural technologists have added additional instrumentality to the penetrometer to measure both resistance and friction. To determine if archaeological soils and other midden features could be distinguished using a penetrometer employing both resistance and friction metrics, a prototype archaeological friction cone penetrometer was constructed and tested on a known archaeological midden in northwest Florida. The results of those tests are presented here.

Rutecki, Dawn (Indiana University South Bend)

[269] *Ambiguous Iconography: Queering the Shell Game*

This paper queers archaeological interpretation by unpacking and destabilizing underlying assumptions in Southeastern iconography. While not focusing expressly on sexuality or gender in these representations, this research discusses the ways ambiguities in engraved shell iconography, more broadly, have been dismissed, glossed, and deemphasized. In part, this exclusion is unintentional and results from the amount of research that remains to be conducted on the vast body of images, but we need to more fully consider the implications of these monolithic interpretations. Using iconography from Spiro Mounds, Oklahoma, this paper begins to bridge the gap through feminist and queer readings of these images, providing alternative possibilities for their interpretation and a better understanding of their use in Spiro society.

[330] *Discussant*

Rutherford, Allen (Tulane University)

[227] *Forming Bonds in the Late Intermediate Period Huaura Valley and Central Coast of Peru*

This paper will examine the ceramic forms from excavated contexts at Cerro Colorado de Huacho, Huaura Valley, Peru in order to address conflict, cooperation, and exchange on the central coast of Peru in the Late Intermediate Period (LIP) (A.D. 1000-1450). Though dominated by Chancay black-on-white and Lauri impressed ceramic styles, the range of diversity in forms from Cerro Colorado is sizable. The diversity of these forms will be compared and contrasted to ceramics from contemporaneous central coast and highland sites as a means of identifying potential interregional exchange networks and sociopolitical affiliations and how they were developed.

Rutz, Matthew (Brown University)

[14] *Mental Topographies of Ancient Mesopotamia: Textual Perspectives on Learned and Lived Highland-Lowland Interactions*

Textual sources from southern Iraq's early historical periods constitute a surprisingly rich body of material for exploring highland-lowland interactions in ancient southwest Asia. Cuneiform inscriptions typically convey only one perspective on these interactions, namely, that of the elite inhabitants of city-states and territorial polities of the southern Mesopotamian alluvium. However, these decidedly one-sided representations were hardly monolithic, and in this paper I explore the various views found in the written record by attending to the archaeological and historical contexts in which the texts were produced. First, focusing in particular on the third and early second millennia B.C.E., I briefly survey the prominent literary topoi, historical episodes, and epigraphic/iconographic landscapes that shed light on long-term trends in how mountainous regions and their populations were imagined by Babylonian states and their scribes. I then look in specific at the ways in which early second-millennium educational practices at sites such as Nippur and Ur created geographic knowledge. By treating textual remains as material culture it is possible to ground the ancient production of literature in practices of cognitive socialization.

Ruvalcaba, Jose Luis [399] see Alonso-Olvera, Alejandra

Ruvalcaba, Jose (Instituto de Fisica UNAM)

[399] *Discussant*

Ruvalcaba Sil, José Luis [194] see López Luján, Leonardo

Ryan, Susan (Crow Canyon Archaeological Center)

[22] *Rooting the Kiva: The Placement of Coal in Ancestral Pueblo Construction Rituals*

Architectural construction is the process by which material and non-material elements and overall spatial setting are made fixed. Consideration of the ways in which physical space-defining elements function can provide insights to the ways in which space was used and understood by the occupants or builders. This study illuminates how ancestral Pueblo kiva construction rituals were integrated within Pueblo worldview concepts in the northern Southwest during the Pueblo II (A.D. 1050-1150) and Pueblo III (A.D. 1150-1280) periods. The placement of coal, or lignite, below kiva features and floors followed strict principles of spatial composition referencing axes that ordered space and served as symbolic representations of the layered cosmos. Moreover, the placement of coal during construction rituals ensured the strength of the house, long life, fertility, and good health of its occupants, the fertility of crops, abundant rain, and provided for the general welfare of occupants in the larger village.

Ryan, Susan [85] see Coffey, Grant

Ryan, Joseph (Osaka University)

[145] *The Role of Iron Weaponry and Martial Ideology in the Political Consolidation of Early Japan*

In addition to their functional role as military implements, weapons can also serve as material representations of martial ideology. Research on weapons burials must therefore take into consideration the multifaceted nature of weaponry within a society. During the majority of Japan's Kofun period (mid-3rd century to early-7th century), the archipelago relied on the importation of finished iron products and raw iron materials from the Korean Peninsula. This formed an intimate connection between elite power, which was capable of conducting long-distance trade, and iron products (weapons, tools, and agricultural implements). Iron weapons, which facilitated elite control, also functioned domestically as symbols of sociopolitical legitimation. While weapons burials are a defining feature of the Kofun period, there are almost no other archaeological correlates of widespread warfare or conquest. This apparent contradiction can be resolved by interpreting the archipelago-wide spread of weapons burials as representing the formation of a confederacy of elites bound by a common martial ideology. A diachronic analysis of the changing nature of weapons and weapons burials reveals the conditions behind the formation and spread of these authority symbols among the elite.

Ryan, Stacy (Desert Archaeology, Inc.)

[278] *Technology and Typology in the Upper Gila: Flaked Stone from the 3-Up and Fornholt Sites, Mule Creek, New Mexico*

Several seasons of field school excavations at the late Pueblo period 3-Up and Fornholt sites in Mule Creek, New Mexico, have produced a substantial number of flaked stone artifacts. Because these sites are located adjacent to the extensive Mule Creek obsidian source, and were occupied at a time when Mule Creek obsidian was widely distributed, the collections provide information about lithic technology at sites with immediate access to the material. Obsidian composes a large proportion of the artifacts, and projectile points are almost exclusively made from this material. Although occupations at these sites may have overlapped, the Tularosa phase (A.D. 1200-1325) Fornholt site produced a more diverse set of projectile point types than those recovered from 3-Up, where a late 13th to 14th century probable Kayenta migrant enclave and a later Salado occupation have been identified. This poster summarizes the obsidian core reduction and tool production patterns at 3-Up

and Fornholt, and illustrates the stylistic variability of the projectile point types from these sites. The points are compared with late pre-contact typologies from southwestern New Mexico and southern Arizona to make inferences regarding their temporal and cultural affiliations.

Ryan, Ethan, Thomas A. Foor (The University of Montana), Kristen D. Barnett (The University of Montana), Pei-Lin Yu (Boise State University) and Matthew Schmader (The City of Albuquerque)

[312] *Household Hearth-Centered Activity Areas at the Bridge River Site, British Columbia: Formation Processes and Site Structure*

Archaeological investigations at Housepit 54 within the Bridge River site have identified approximately 15 discrete floors dating between 1500 and 100 years ago. In this poster we draw data from a Bridge River 3 (ca. 1300-1000 cal. B.P.) period floor to examine the formation of activity areas with a larger goal of reconstructing "site structure" in a constrained space. We address questions specifically directed at formation processes as well as potential relationships between at least two hearth-centered activity areas by examining variability in artifacts, faunal remains, and features. More specifically, we examine feature form and function, lithic tool production and maintenance, animal and plant processing, taphonomic processes, and potentially, ritualistic practices to reconstruct the means by which the items in each activity area came to be co-associated. From these studies, we draw conclusions regarding the roles of these spaces on the house floor. We then seek to address potential relationships between activity areas by application of re-fitting analysis and examination of inter-assemblage variability. Results of this research permit us to develop a range of implications regarding household occupational history and sociality.

Sablin, Mikhail V. [28] see Germonpré, Mietje

Sabloff, Jeremy (Santa Fe Institute)

[344] *Discussant*

Sabol, Donald [8] see Buck, Paul

Sacks, Ben [28] see Brown, Sarah

Safi, Kristin [8] see Simon, Katie

Safi, Kristin (Washington State University), Adam Wiewel (University of Arkansas), Katie Simon (Center for Advanced Spatial Technologies) and Andrew Duff (Washington State University)

[287] *Mapping the Monumental Architecture of the Largo Gap Great House*

This study combines spatial technology with traditional field methods to accurately identify and map the monumental architecture of the late Pueblo II Largo Gap great house. Although previous visits by early researchers to the site identified monumental architectural characteristics typically associated with Chaco-style great houses (primarily the presence of a great kiva), the surface expression of such features is currently lacking. Rubble present along the steep slopes of the knoll upon which Largo Gap is situated suggests not only a lack of major external architectural features but also an atypically small overall architectural footprint. We present a case study utilizing multiple data lines (aerial thermography, ground penetrating radar, surface mapping, and limited excavation) to obtain surface and subsurface architectural signatures for the great house. We use these data to counteract the impacts erosion, significant historic stone borrowing, and modern ranching have had on understanding the structure's surface expression, and to identify monumental architecture through minimally invasive means. Our approach is balanced between obtaining specific architectural signatures relevant to determining identity and participation in the Chaco Regional System while also broadening our spatial and analytical scope to expand beyond using surface wall alignments to form socially contextualized interpretations for the site.

Safronov, Alexander [86] see Belyaev, Dmitry

Sagebiel, Kerry

[147] *Dragons through a Ceramic Lens: Evidence for a North-Central Belize Ceramic (Sub)Sphere*
As viewed through a ceramic lens, it is becoming evident that North-Central Belize was distinct from surrounding areas. Starting in the Middle Preclassic, the ceramics of the Swasey/Bladen Sphere of North-Central Belize are notably different than those of adjacent areas of the Belize Valley, Peten, and Yucatan. The extent of the Middle Preclassic Swasey/Bladen Sphere is becoming clearer with work at Ka'Kabish and the surrounding area. Similarly, the Terminal Classic/Early Postclassic ceramics of Lamanai and Ka'Kabish have unique attributes when compared to those of adjacent areas. The time periods in between — the Early Classic and Late Classic — still need further investigation in order to determine if they are also ceramically outstanding. Possible implications of a coherent North-Central Belize ceramic sphere or sub-sphere for political and cultural interaction/entanglement and shared identity will be explored.

[147] *Chair*

Sagebiel, Kerry [147] see Lockett-Harris, Joshua

Sahle, Yonatan (Human Evolution Research Center, University of California, Berkeley)

[174] *Assessment of Projectile Use at Aduma (Middle Awash, Ethiopia)*

There is not yet clear evidence for the beginning of complex projectile technologies (propulsion via mechanical aid). Morphological attributes and miniaturization of stone points at Aduma have been used to suggest early complex projectile use ~100,000-80,000 years ago. Hafting traces on stone segments and geometric pieces were presented as better indications of early complex projectile use at Sibudu Cave, South Africa, ca. 64,000 years ago. However, neither point shape/size nor evidence for hafting unequivocally imply the existence of complex projectile technologies. With only the lithic component of complex projectile technologies so far recovered from the African Middle Stone Age, confident reconstruction of the entire armature system (based on ethnographic analogues) requires unambiguous evidence, such as fracture propagation velocity on stone points damaged from impact. Unfortunately, this method has extremely limited applicability. Given these facts, the use of multiple lines of circumstantial evidence is the best approach to a sound assessment of complex projectile use. This study examines morphological attributes and macrofracture damage patterns on the Aduma assemblages. In so doing, it re-assesses previous suggestions for the points' use as tips of early complex projectiles.

Sahlen, Daniel (Stockholm University)

[89] *Non-Ferrous Casting Molds and Technical Logic: What Can the Technical Differences between the Bronze Age and Iron Age Molds Tell Us about the Technological Development of Metalworking?*

Studies of technological changes in non-ferrous casting during the shift between the Bronze and the Iron Age in Europe have particularly looked at changes of crucible manufacture or the use of different alloys, while technology of the casting mold has not been studied to the same extent. Mainly three types of molds were used during the prehistoric period – single piece, two-piece, and investment. The first two types were made in clay, stone and occasionally metal, while investment molds were only made from clay. These differences are often discussed as a chronological evolution of technical complexity. However, all three types were used at least during the Iron Age and would have been part of the skill set of the caster; the choice of mold would rather relate to the object to be cast. The purpose of this presentation is to use microscopic and elemental analyses to examine the technological changes of the manufacture of casting molds from the Bronze Age to the Iron Age. This makes it possible to highlight technological choices and to recreate craft practice on macro- and micro-levels. Material from Scotland will be in focus, though assemblages from other parts of northern Europe will also be discussed.

Sailors, Damion**[233] *Ring Graph Analyses of Early Communities on Rapa Nui Measuring the Distribution of Stone-lined Earth Ovens (umu)***

Agricultural societies are commonly thought to have begun as small, kinship-based groups of people that eventually extended their social interaction beyond the household level and intensified their adaptive efforts through a variety of means. Most of these early, sedentary communities began to demonstrate aspects of social inequality and had cooperative, centralized settlements that have left a detectable pattern in the archaeological record. For this paper, stone-lined earth ovens from the remote Pacific island of Rapa Nui were chosen for a spatial analysis of settlement patterns using a ring graph technique developed by Drennan and Peterson (2008). Ring graphs are derived from the more traditional approaches of rank-size graphs and histograms which have been used for the last several decades to study settlement distributions and to determine the nature of stratification and interaction in sedentary, agriculturally based societies. The results of this analysis were used to investigate the possible centralization of early Rapa Nui communities. An emphasis on the intra-regional variation in settlement dynamics exhibited by the colonizers of this isolated island were discussed within a behavioral ecological framework.

Sajantila, Antti [78] see Guevara, Evelyn

Sakai, Masato (Yamagata University), Jorge Olano (Yamagata University), Yoichi Watanabe (Yamagata University) and Kaoru Honda (Yamagata University)**[31] *Nasca Lines, Ceramic Sherds, and Social Changes: Recent Investigation at the Nasca Pampas, Southern Coast of Peru***

The objective of this study is to discuss the social changes of the societies in the Nasca region, the south coast of Peru through the analysis of ceramic sherds distributed near the lines and line centers. In 1926 the Nasca lines had been discovered by Alfred Kroeber and was investigated archaeo-astronomically by Paul Kosok and María Reich. At the 1980's Anthony Aveni and his colleagues carried out investigation at the pampas and contributed to reveal the details of the Nasca lines and centers. Since the year 2010 Yamagata University have conducted field research at the pampas. We have tried to investigate thoroughly the archaeological remains at the pampas, which Dr. Clarkson had carried out a preliminary study in the 1980's. In our research, more than ten thousand sherds were recognized in association with lines and centers. Interestingly, their chronological position varies from Late Ocucaje to Ica Period and they were intentionally smashed at the lines and centers. In this presentation we will not only report a result of these ceramic analyses, but also discuss the diachronic social changes around the Nasca pampas for two thousand years.

Sakai, Sachiko [133] see Garfin, Timothy

Sakai, Sachiko (California State University Long Beach), William Krill (California State University Long Beach), Hector Neff (California State University Long Beach), Hazwan Faizul (California State University Long Beach) and Desiree Shahbazkhani (California State University Long Beach)**[358] *Optically Stimulated Luminescence (OSL) Dating of Little Springs Lava Flow: Impact of Lava Flows to Human Adaptation in Mt. Trumbull, Arizona***

Recently, optically stimulated luminescence (OSL) dating of sediment has been used increasingly in the study of human occupation history in archaeology. This paper employs OSL to date the Little Springs Lava Flow, a lava flow near Mt. Trumbull, northern Arizona, thought to have erupted about 1000 years ago. The accepted dates are based on cosmogenic helium dating. This lava flow covers some of the most productive agricultural land in the Mt. Trumbull area. Previous archaeological surveys revealed multiple structures built on the top of this lava flow and potentially suggested that their construction was for defensive purposes. In this paper, we re-evaluate the timing of the eruption of the Little Springs Lava flow using OSL dating of sediments from just beneath the lava. One goal of this study is to compare OSL dating of the sediment vs cosmogenic helium dating for determining the age of lava flows. Second, understanding the timing of the eruption or eruptions will contribute to a

better understanding of their impact on the Ancestral Puebloan people who inhabited this marginal agricultural environment.

Sala, Nohemi and Juan Luis Arsuaga (Centro Mixto UCM-ISCIII Evolución y Comportamiento)

[87] *Taphonomy and Actualistic Studies of Carnivores: Applications to Understanding Sima de los Huesos (Atapuerca) and other Pleistocene Sites in Spain*

The study of carnivore activity on bones is crucial to understand the role of the carnivores in site formation since some carnivores are able to accumulate bones in cave dens. The studies of Professor Haynes reveal that actualism is a very useful tool for taphonomic studies, as it allows understanding the behavior of the fauna in the past. In Spain there are several Pleistocene sites with evidence of carnivore activity. The Sima de los Huesos (SH) is the site with the largest accumulation of human remains from the Middle Pleistocene. Studies in the last two decades have proposed different hypotheses to explain the origin of the SH hominin accumulation, carnivores being one of them. We have approached the taphonomic study of SH through actualistic research with living carnivores (ursids, canids, and large felids). The comparison of bone modification patterns at SH to actualistic data allows us to suggest that bears were likely to have been the carnivore responsible for the modification observed on human fossils but we discard the carnivores as the accumulation agents. The research developed by G. Haynes was decisive in this study since it was the framework of our actualistic experiments.

Salazar, Diego (Universidad de Chile), carola flores, laura olguin (Universidad de Tarapacá), Cesar Borie (Universidad de Tarapacá) and Valentina Figueroa (Universidad Católica del Norte)

[2] *Environment, History and Resilience of Archaic Coastal Hunter-Gatherer-Fishers from the Atacama Desert, Northern Chile*

The coast of the Atacama Desert in northern Chile is one of the most extreme environments of the Andean area. However, the high productivity of the Pacific Ocean facilitated the peopling of this territory as early as 12,000 years cal BP and also a continual occupation of hunting-gathering-fishing communities throughout the Holocene. In this paper we discuss significant environmental changes during the Middle Holocene, as well as the systematic interaction of local communities with inland agropastoral groups during the Late Holocene. We are especially interested in exploring the resilience of local economy in the face of these important external conditions and transformations, making them one of the few cases in the coastal Andes where a hunter-gatherer-fisher economy was maintained until at least the 19th Century.

[180] *Chair*

Salazar, Julian (Universidad Nacional de Cordoba - CEH Segreti - CONICET) and Jordi A. López Lillo (Área d'Arqueologia, Universitat d'Alacant (Spain))

[82] *Early Village Dwellings and the Reproduction of South Andean Formative Communities*

Agriculture was adopted by in northwestern Argentina around 3500 BP as part of a complex process of macroregional population reorganization, economic intensification and increase of territoriality. This transition was followed by a rapid introduction of large and solid buildings that became the major and most visible features in the village arrangements after 2500 BP. Thousands of multi round-room compounds were built and inhabited by several generations all over several high valleys, like Taffí, Anfama, Yocavil and Cajón, creating continuous and centrifugal village landscapes. This particular spatial configuration has been interpreted as the material traces of fluid and heterogeneous communities built up by largely autonomous extended households. Taking some remarks from "symmetric archaeology" we address the relations between humans and the material settings of daily life, considering how these relations allowed the emergence and reproduction of household and communities within the conflictive medium of early village societies. We include GIS landscape and space syntax analyses for both outdoor village space and indoor inhabited place, and a study of quotidian practices carried out within house occupation.

Salazar, Diego [152] see Figueroa Larre, Valentina

Salazar-García, Domingo Carlos (MPI-EVA Plant Foods Research Group), Chelsea A. Leonard (Plant Foods in Hominin Dietary Ecology Research Gr), Robert C. Power (Plant Foods in Hominin Dietary Ecology Research Gr), Stephanie L. Schnorr (Plant Foods in Hominin Dietary Ecology Research Gr) and Amanda G. Henry (Plant Foods in Hominin Dietary Ecology Research Gr)

[415] *Plant Food Consumption among Modern Foragers Informs Paleolithic Dietary Ecology*
Reconstructing hominin diets is hindered by biases in the methods used to recover dietary information, and by our narrow interpretations of modern forager behavior. A better understanding of these limitations necessitates re-examination of dietary evidence in the archaeological record. Zooarchaeological and stable isotope data suggest that medium and large game dominated the diets of Middle and Upper Paleolithic foragers, and environmental reconstructions indicate that energetic returns from large game far exceeded returns from plants and smaller animals. Yet our studies of dental calculus from several Paleolithic populations demonstrate consumption of starchy plant foods. Furthermore, our data on plant food consumption among Hadza foragers of Tanzania and Twa foragers-horticulturalists of Namibia demonstrate that 1) caloric and biological value (digestibility) of plant foods are not always predictive of foraging strategy, and 2) microfossils in dental calculus present an incomplete record of plant consumption. These results indicate that we continue to underestimate the importance and presence of plants in ancient diets. We suggest that calories must have come from both plant and animal origin in Paleolithic Eurasia, not only to enable macronutrient balance, but also to ensure acquisition of essential micronutrients in the diet despite the lower energetic returns of plant food resources.

Saldaña, Julio (Pontificia Universidad Catolica del Peru) and Luis Jaime Castillo Butters (Pontificia Universidad Catolica del Peru)

[60] *Is It a Priestess? Preliminary Analysis of the Excavations of a Late Moche Chamber Tomb from San Jose de Moro, North Coast of Peru*

San Jose de Moro, located in the North Coast of Peru, is a well-known ceremonial site where ritual practices were held over a span of 1000 years. This, in relation with the burial of high rank individuals whom are believed to have performed important roles within Moche society, especially during the Late Moche Period, places this site as one of high importance for the understanding of the Moche society along with its region. This paper will present the results of excavations held in 2013, when we uncovered a Late Moche Chamber Tomb in which we found the main individual within a coffin covered by copper plaques with maritime designs. This individual was surrounded by 7 other individuals as well as an astonishing quantity of funerary offerings like raw architectural models, beads from semiprecious rocks, spondylus and over 102 ceramic vessels. The aim is not only to show the excavation process and its findings, but also to try to figure out through osteological and material analysis whether this main individual was buried as an actual priestess, as the tradition at the site indicates, or whether we can identify a new type of high ranking individual from Moche society.

Saldaña, Melanie [355] see Bueno, Marilyn

Salesse, Kevin [207] see Bruzek, Jaroslav

Saletta, Maria José [251] see Nuevo Delaunay, Amalia

Salgán, Laura (CONICET/ IANIGLIA Museo de Historia Natural de San Rafael), Paz Pompei (IANIGLIA Museo de Historia Natural de San Rafael), Adolfo Gil (CONICET / IANIGLIA Museo de Historia Natural de Sa) and Gustavo Neme (CONICET / IANIGLIA Museo de Historia Natural de Sa)

[91] *Technological Approach of Obsidian Sources in North Patagonian: Comparative Studies between Plain and Highlands Sources*

Obsidian sources in northern Patagonian reflect early use (ca. 8000 years BP). Provenance studies

conducted so far realize that obsidian sources located in the Andes even with limited access (only during the summer) are those that reflect a wider spatial dispersion and more continuous use than those located in the plains. In this way, the sources located in the plains reflect local use for the last 1000 years BP. This presentation compares the results of the technological studies that have been sampled in the mountainous source "Las Cargas" and in the plain source called "El Peceño". The results obtained from both sources show differences in procurement activities carried out and allow discuss models proposed for southern Mendoza.

Salinas Acero, Jennifer (UC Berkeley)

[107] *Paleoethnobotanical Analysis of Preceramic Sites in the Sabana de Bogotá*

The Sabana de Bogotá is one of the most extensively studied regions of preceramic archaeology in Colombia. Many of these projects were carried out by or in conjunction with Dr. Gonzalo Correal (UNAL) and contributed a wealth of information on the period including paleoenvironmental data, tool use, and faunal data. However, few botanical remains have been recovered which resulted from the sieving of a few small samples or were found in-situ. Recent excavations conducted at rockshelters and open-air sites revisited several sites in the in the region that had yielded macrobotanical evidence when excavated by Dr. Correal. These excavations resulted in the systematic collection of column samples for flotation and microbotanical analysis affording the first opportunity to fully examine the use of plants in the preceramic period of this region. This presentation provides a preliminary summary of the paleoethnobotanical analysis of this preceramic assemblage. An assemblage that will eventually serve as a baseline for understanding diachronic changes in foodways and contribute to an understanding of human-environmental interactions in the preceramic period of the Sabana de Bogotá.

[107] *Chair*

Salmon Schreck, Kelsey (College of Wooster) and P. Nick Kardulias (College of Wooster)

[162] *The Domestication and Migration of Zea mays L. in Association with Holocene Climatic Variance*

Maize is known to have originated in Mesoamerica from which it spread north and south adapting to many varied climatic and environmental conditions. This study details the origin of the species *Zea mays* L. The teosinte hypothesis and the concepts of seasonality and scheduling are used to discuss the domestication of maize by means of human selection. This information is used to highlight the basic circumstances necessary within a human population for maize agriculture to be adopted. Furthermore, climate is examined through the minimum and ideal environmental conditions needed for the successful growth of maize. Environmental cues play a profound role in the phenotypic characteristics a species exhibits; therefore, Holocene climatic events are examined in areas with extensive evidence of maize domestication. The minimum requirements for maize growth are compared against the actual conditions during periods of significant climatic change (Little Ice Age, Medieval Warm Period, etc.). By comparing the ideal versus realized conditions over time, a model for the diffusion of maize from Mesoamerica into North America, with a particular focus on the Southwest and Ohio Valley, is developed.

Salomon, Hélène [181] see Bon, François

Salpeteur, Matthieu [73] see Lancelotti, Carla

Saltonstall, Patrick [311] see Margaris, Amy

Saltzman, Teresa

[30] *Issues Involved in the Recording and Protection of a Previously Unknown Rock Art Site in Northern California*

This paper will discuss the interaction between an archaeologist, a Native American who is a most likely descendent from the archaeological site, and a municipal government agency in the

rediscovery, documentation and eventual repatriation of indigenous knowledge of a previously unrecorded rock art site. The rock is located in Northern California, on the lake bottom of a municipal water district water property. How should the rock be recorded? Does anyone really “own” that information? Who determines whether it could be sacred or the meaning of the symbols in the context of a cultural tradition? Only through the accumulated data base of site reports and studies can more possible cultural patterns be uncovered and help in the continued search for the more of these little known or understood early rock art sites. By working with the all three interested parties, protocols could be developed for future rock art site discoveries that would establish a consistent documentation and protection plan for these cultural resources.

Salyers, Kimberly (University of California, Santa Cruz)

[24] *Resource Procurement at the Local Level in Classic Maya Chinikihá (A.D. 600-900)*

Resource procurement is a topic traditionally approached from a geographic macro scale. In the Maya area, this refers to the scale of settlement patterns or the landscape, involving the territory inhabited by a large number of people living in different settlements. What this scale often misses is the role that commoner households play in these processes. This presentation will discuss how geographic setting and access to resources not only shaped the daily lives of Maya commoners but the role households play in local polities, like those at the Classic period site of Chinikihá, Mexico. Through the use of GIS analysis and analysis of material recovered from household excavations, this presentation demonstrates changes in understanding of the procurement of local resources. Possible applications such as fauna, ceramics and lithics will be considered.

Samei, Siavash and Karim Alizadeh (Department of Anthropology, Harvard University)

[402] *Craft Production and Specialization in the Transcaucasian Early Bronze Age: A View from Köhne Shahar, NW Iran*

A common image of the Kura Araxes Cultural Community (KACC) of Transcaucasia is one of egalitarian and mobile groups of pastoralists. While mobility and pastoralism are important aspects of KACC, this generalization dampens what in reality is a more complicated picture of the Early Bronze Age of Transcaucasia. Recent investigations in Transcaucasia, including the site of Köhne Shahar (KSH) in northwestern Iran, present a much more nuanced image of social and economic interactions in this time period. In this paper we contend that KSH served as a locus of craft specialization in the region, focusing on the large-scale production of such goods as metal and antler tools and ornaments. Finally, we discuss the importance of KSH and its economic and productive activities within a broader regional framework, including the relationship between the Caucasian highlands and the steppe communities to its north and Mesopotamia to its south.

Samillán Torres, César [371] see Szumilewicz, Amy

Samiratedu, Mehmet [178] see Bishop, Gale

Samolczyk, Mary [155] see Grooms, Michael

Sampson, Christina (University of Michigan)

[275] *Lines and Legacies: Ceramic Assemblages from the Weeden Island Site (8PI1)*

The Weeden Island site (8PI1) is perhaps best known for its connection to the eponymous Woodland period culture, found in Alabama, Georgia, and Florida, and characterized in part by the use of a specialized class of decorated mortuary wares. In the Tampa Bay area, both the regional movement and local production of pottery contributed to the adoption of new ceremonial practices in the late Woodland period. I present here a study of ceramic collections from early 20th century work at the Weeden Island burial mound in the context of archival materials and new excavations of off-mound portions of the site.

Samson, Alice [288] see Cooper, Jago

San Roman, Manuel (Universidad de Magallanes), Jimena Torres (University of Paris I Panthéon-Sorbonne, UMR 7041-) and Flavia Morello (Universidad de Magallanes, Instituto de la Patagon)

[251] *Offing 2 Locus 2 Archaeological Site (Dawson Island, Patagonia, Chile), Marine Hunter-Gatherers and Interaction during the Late Holocene*

The results from Offing 2 Locus 2 archaeological site are presented and used to discuss broader implications for Patagonia hunter-gatherer contexts during Late Holocene. The site is located near Dawson Island, in a strategic geographical position between Fueguian-Patagonian archipelagos and the South America mainland. Radiocarbon dating suggests occupation around 800 BP. Evidence is characteristic of shell midden deposits and chronological evidence indicates a short occupational sequence. Lithic technology includes the use and transport of green obsidian with predominant use of local rocks, and a wide typology of instruments such as end-scrapers, side-scrapers and knives, common along the macro-region. As for projectile points they are predominantly stemmed but varied in typology and small size points are identified with bow-arrow weapons similar to those described for ethnographic collections. Bone instruments consider wedges, retouchers and awls, among others, but the key characteristic instruments are harpoon points of one barb and simple-tenon base that are detachable, also described in historic-ethnographic times. Other fauna elements include guanaco bone remains (*Lama guanicoe*) and scallop shells (*Chlamys* sp.) (both of exotic origin) and decorated bird bone pendants. Subsistence strategies are dominated by pinniped exploitation, sea birds and fishing. Results are discussed in relation to cultural traits and interaction evidence.

San Roman, Manuel [251] see Morello Repetto, Flavia

Sanchez, Gabriel (Department of Anthropology, University of California Berkeley)

[103] *Testing the Association of Chipped Stone Crescents with Wetlands and Paleo-Shorelines of Western North America: A GIS-based Spatial Analysis*

We use ArcGIS and spatial analysis to quantitatively test a proposed association between chipped stone crescents and wetland environments in western North America. Dating between ~12,000 and 8,000 cal BP, crescents are often found in association with stemmed points of the Western Pluvial Lakes or Western Stemmed traditions. Many scholars have suggested that crescents served as transverse projectile points for hunting waterfowl, others have viewed them as more generalized and multi-purpose tools, possibly associated with wetland resource processing. In this paper we provide the first quantitative analysis of the proposed association between crescents and wetland habitats—testing their proximity to ancient pluvial lakes, marshes, rivers, estuaries, and islands using a GIS-based model. During the Terminal Pleistocene and Early Holocene, coastal habitats were highly dynamic and the Great Basin was cooler and moister than today, with numerous lakes and much more abundant marsh habitat. 8,000 years ago, environmental changes led to significantly drier conditions in the Great Basin, reducing lake and marsh habitat. Our results will help evaluate previous theories about the ecological association of crescents, as well as their function.

Sanchez Miranda, Guadalupe (INSTITUTO DE GEOLOGIA-UNAM) and John Philip Carpenter (Centro INAH Sonora)

[189] *Funerary Practices in Prehispanic Sinaloa: Assessing Aztatlán Mortuary Behavior*

Funerary traditions reflect social behaviors that contain important information about the integration of several social groups. Funerary practices seem to persist over time because they comprise an integral aspect of group identity. In this paper we discuss the funerary practices known for the identified late prehispanic Sinaloan archaeological traditions. Specific locations to bury the dead appear to be the usual practice for the Aztatlán and Huatabampo traditions. Funerary mounds with extended burials appear to be associated with the Huatabampo/Guasave tradition and are present on the Pacific coastal plain of northern Sinaloa and southern Sonora. During the northern expansion of the Aztatlán tradition (between 900-1400 C.E.) urn burials, along with several commodities, expanded into northern Sinaloa; the northernmost urn burial known is located on the Bahía Agiabampo adjacent to the Sonoran border. Additionally, we discuss the evidence for interaction and integration of the Sinaloan archaeological groups based upon funerary practices, trade goods and

social identity.

Sand, Christophe (Institute of Archaeology of New Caledonia and the Pacific (IANCP)), Jacques Bolé (Institute of Archaeology of New Caledonia and the), David Baret (Institute of Archaeology of New Caledonia and the), André-John Ouetcho (Institute of Archaeology of New Caledonia and the) and Tautala Asaua (Center for Samoan Studies, National University of)

[77] *Geological Subsidence and Sinking Islands: The Case of Manono (Samoa)*

W. Dickinson, as part of his wide study of the geological history of Pacific islands, has proposed in a series of papers to explain the unique case of the deeply submerged Lapita site of Mulifanua in Western Upolu (Samoa) as linked to the slow subsidence of Upolu Island. Recent archaeological research on the neighboring small island of Manono has brought new and detailed data on this geological process. A series of dates aid in chronologically defining the speed of the subsidence as well as the massive environmental changes to which the local population had to adapt over the past 2500 years.

Sand, Christophe [77] see Chiu, Scarlett

Sandberg, Paul [410] see Hepp, Guy

Sanders, Thomas

[30] *The Hindquarters of God, Seeing the Sacred in a Landscape*

As the needs of our expanding society increasingly refashion our natural environment, we struggle to maintain healthy habitats and our sacred places. Archaeologists, land developers, lawmakers, theologians, and indigenous practitioners of traditional spirituality all struggle with conflicting views of what do we mean when we declare that something is sacred and how do we recognize and preserve sacred places. The burning questions at the heart of this struggle are seemingly unanswerable: "What is sacred and what is not sacred." If something is sacred, can we interact, alter or develop it? If everything is sacred what can we develop, consume or even study in an academic setting? Dakota Elder Tom Ross taught that the sacred cannot be defined. He believed that the more we defined the sacred, the further we got from understanding it. Tom was taught by elders how to think about the sacred. He was taught how to recognize what could not be defined. This paper briefly outlines the teachings on the sacred and sacred places of some Dakota, Cheyenne, Arapaho and Shoshoni elders.

[30] *Chair*

Sanders, Mariana (University of Guam), Stephen Acabado (Adviser) and John Peterson (Adviser)

[119] *Climate Change and Subsistence Shifts: Wet-Rice Agriculture in Ifugao, Philippines*

The Little Ice Age was a global phenomenon beginning in the late 13th century A.D. that impacted the northern Philippines by creating more arid conditions. This was more evident in the eastern lowlands of Luzon where northeastern trade winds were typically dry. Conversely, the central highlands of Ifugao and the Cordilleras were relatively more humid due to orographic relief. These conditions, caused by periodic volcanism cooling the northern hemisphere, forced the Inter-Tropical Convergence Zone south to 0-5° north latitude, exposing the northern Philippines to 5-15° north latitude to drier conditions. This may have sent lowland farmers in search of humid highland terrain, documented around 3,200 years before present in the Cagayan lowlands of Luzon, allowing for the rise of wet-rice farming after its introduction into the Philippines ca. 1400-1500 A.D. As recent research shows, the rice terraces were not 2,000 years old but date to 1400 A.D., corollary to Spanish settlement in the lowlands and emergence of mountain settlement by Ifugao and other farmers. Spanish colonialism in the 16th-17th centuries A.D. led to the rise of extensive wet-rice farming in regions peripheral to Spanish governance.

Sandgathe, Dennis [35] see Goldberg, Paul

Sandgathe, Dennis (Dept. of Archaeology, Simon Fraser University), Vera Aldeias (Department of Human Evolution, Max Planck Institut), Harold Dibble (Department of Anthropology, University of Pennsylvania) and Shannon McPherron (Department of Human Evolution, Max Planck Institute)

[190] *A Most Interesting Career: Paul Goldberg's Other Contributions to Life and Science*

Many people are familiar with Paul Goldberg's contributions to archaeological research around the world through micromorphological analysis. Many are also familiar with his innovations in this area of analysis. However, few may know of his many other contributions. Applying his notable skills and talents to a wide range of practical applications, scientific and otherwise, Paul has made major contributions to life as we know it. His has been, and continues to be, a most interesting career.

Sandor, Shana [12] see Crebbin, Kyle

Sandor, Jonathan (Iowa State University, Agronomy Department) and Jeffrey Homburg (Statistical Research, Inc.)

[180] *Approaches to Assessing Anthropogenic Soil-Landscape Change in Ancient Agricultural Systems*

Farming alters and can wholly transform landscapes and soil properties, through both deliberate management and unintentional trajectories. The archaeological record of agriculture holds important long-term evidence about land management and change relevant to archaeology and current agriculture. Quantitative assessments of soil change in ancient fields are relatively few because of methodological challenges, soil's dynamic nature, and post-agricultural imprints of environmental change and land use. This paper discusses approaches to measuring and interpreting soil change through examples, identifies potentials and pitfalls, and considers new methods. Evaluating soil change requires baseline reference data. Inferring soil change is commonly based on a "space-for-time substitution" method in which agricultural soils are compared with uncultivated reference soils in similar geomorphic and pedogenic settings. Because soils are dynamic, reference soils do not represent original soils, but rather what cultivated soils would be like now had they not been farmed. Another way to detect soil change is to identify anthropogenic properties outside the range found in natural soils. Most comparative studies involve soils farmed during one period in the past, but there are examples involving multiple periods that allow studies of soil change pathways. Soil change outcomes range from degradation to enhancement of soil productivity.

Sandoval, Cindy (Arqlga. Cindy Sandoval), José Luis Punzo (Dr. en Arqueología) and Héctor Víctor Cabadas (Dr. en Geología)

[231] *Petrographic Analysis of Ceramics and Construction Materials: The Dwellers of Cueva del Maguey in the Sierra Madre Occidental and the Ferreria site of the Guadiana Valley in Durango, Mexico*

The archaeological site of the Ferrería (550-1350 d.C.) is undoubtedly the most important prehispanic settlement of Chalchihuites Culture in the Guadiana valley in Durango. The work done was based on a chronology made for Charles Kelley who divides into two main branches (Súchil and Guadiana). The presence of archaeological materials allowed reconsider the provenance of ceramics Madero Fluted type in the Guadiana valley and the Sierra Madre Occidental, activities and tasks has been important in the travel of materials, objects and ideas. The operational chains are the join of operations that were made to transform some materials in a product and that chains interfere jointly in the traditional knowledge lapsed socially and the experimentation. The ability of the constructors in the sierra allowed the use of constructive strategies for the edification of masonry. The traditional methods include itself the transmission of knowledge and the concept of learning (Castrellon, 2009:79). At the same time the presence of materials associated with the phase Tunal and Calera (1000-1350 d.C.) in Durango and the exchange with the dwellers of the sierra, reveal the deep cultural continuity that exist in the groups of La Ferreria and the Cueva del Maguey site.

Sandoval Mora, Cindy Cristina [156] see Ortiz Barrera, Rosa

Sands, Robert [199] see Megarry, Will

Sandstrom, Alan (Indiana University-Purdue University Fort Wayne (IPFW))

[194] *Why Pilgrimage? The Ethnography and Archaeology of Journeys to the Center*

Pilgrimage is a "dynamic concrete isolate" found throughout the world at all levels of socio-cultural integration. Pilgrimage involves a journey to a significant geographic location and a return to the place of origin. Pilgrimage shades into tourism and a pilgrim's destination may range from the site of a miraculous appearance of a deity to Graceland. In Mesoamerica, pilgrimage has become a major focus of archaeological research. Sites with ritual associations and little evidence of habitation are routinely interpreted as pilgrimage centers. Pilgrimage and the meanings attached to it are also a recent focus of our own ethnographic research among Nahua people of the Huasteca. Contemporary indigenous and as well as non-indigenous participants continue the ancient pilgrimage tradition throughout Mesoamerica. We see pilgrimage as a means for people to escape the confines of a rigid social structure, introduce innovation into the system, and reset social relations without threatening the overall system. Pilgrimage has the potential to allow people to escape a social straitjacket while at the same time demonstrating commitment to cultural values embodied in a significant site. We dedicate this presentation to the ethnographic researches of Frannie Berdan, and especially her work among Nahuas in the Sierra Norte de Puebla.

Sandweiss, Daniel (University of Maine)

[334] *Floods, Famines, and Fagan: Recent Research on El Niño in the Age of Andean States and Empires*

In 1997-98, the first mega-Niño of the internet age devastated vast regions of the equatorial Pacific basin and altered weather throughout the globe; El Niño became a household term. Within two years, Brian Fagan had published "Floods, Famines, and Emperors: El Niño and the Fate of Civilizations", calling global attention to potential impacts of the phenomenon in prehistory. The Peruvian coast is ground-zero for El Niño, and Fagan included a chapter on Peru in his book. Over the last 15 years, new research has increased our understanding of the timing, frequency, and potential impacts of this climatic perturbation in coastal Peru. In this paper, I review the most salient new results on climate and civilization over the last two millennia, when complex states and empires controlled the Central Andes. Niño-related topics include landscape alteration and monument location, cycles of temple abandonment, population displacements, and the effects of the Spanish Conquest on coastal change, among others.

Sanger, Matthew C. [178] see Napolitano, Matthew

Sanger, Matthew (American Museum of Natural History)

[400] *Animate Landscapes and the Transference of Authority: Resistance to hierarchy among Hunter-Gatherers of the Eastern Woodlands*

Traditional conceptions of power, hierarchy, and inequity focus on the relations between and among human communities. To a certain extent, objects and places are considered important aspects of human relations, but they are largely framed as inanimate tools wielded by human actors. This prevalent view is threatened by a rich body of research among non-Western societies that shows non-human things, places, and animals are often considered to be powerful beings imbued with agency and efficacy. Drawing from this research, this paper investigates the societal structure of hunter-gatherer groups who inhabited the Southeastern American coastline during the Late Archaic (5000-3000 B.P.). Several of these groups had all of the components thought to lead to social inequality, including sedentism, amassed resources, and long-distance trade, yet there is no evidence of entrenched status differentiation. Considering the likelihood that non-human actors were important members of this past community, it is suggested that certain aspects of emergent elitism, including ownership over material goods, were transferred out of human hands and instead emplaced within particular places on the landscape thereby reducing the threat of intra-human

dominance and inequity.

[400] *Chair*

Santana Cabrera, Jonathan (Prometeo Researcher. State University of Santa Elena. La Libertad, Ecuador.), Jo Appleby (School of Archaeology and Ancient History. Univers) and Krish Seetah (Anthropology. University of Stanford. Stanford, Un)

[116] *The Price of Freedom: Health Status in a Freed Slave Community in Le Morne (18-19th Centuries, Mauritius)*

This contribution presents the preliminary results of an osteobiographical approach to the life conditions of a slave/ex-slave population from Le Morne cemetery (18-19th centuries, Mauritius Island). We evaluate the incidence of several stress indicators/pathologies on the human remains that are the result of environmental conditions during life. Dental health, infectious diseases and physical activity markers were analyzed to address the daily life of this population. Our results indicate high incidences of caries, periodontal disease, dental calculus, antemortem losses and dental enamel hypoplasia. In addition, a nonspecific infectious disease in form of osteomyelitis was recorded on bones from four of the individuals. Evidence of stress from physical activity was also observed in the sample. These markers are enthesopathies, Schmorl's nodes, herniated disks, osteoarthritis in the spine and appendicular skeleton, bilateral spondylolyses and fractures of the secondary ossification centers in some ulnae and calcaneus. The osteobiographical profiles documented in the population from Le Morne suggest poor health conditions, consistent with historical data. In this regard, osteobiographical research on this population contributes to recovering the historical memory of this community.

Santana Sagredo, Francisca (Research Laboratory for Archaeology and the History of Art, University of Oxford), Julia Lee-Thorp (Research Laboratory for Archaeology and the History), Rick Schulting (Research Laboratory for Archaeology and the History) and Mauricio Uribe (Departamento de Antropología, Universidad de Chile)

[378] *"Diet and Connections among Cultural Groups in the Atacama Desert during the Late Intermediate Period (A.D. 950-1450)*

The Pica-Tarapacá and the Atacama cultures appeared in northern Chile during the Late Intermediate Period, after the decline of the Tiwanaku state. Archaeological data suggests that both groups practiced maize agriculture and pastoralism to variable degrees, but their trade and exchange links differed significantly. Interaction with coastal groups, in the form of fish and other marine resources is common in the Pica-Tarapacá sites. The Atacama groups, who occupied the Atacama oases and pre-cordilleran area, seemed to have directed their networks towards the highlands instead. Here we applied stable isotope ratio analysis of carbon, nitrogen and oxygen to test the archaeological reconstructions of their dietary patterns and residential mobility. Our results show that diet amongst Tarapacá and Atacama cultures differed significantly: the Atacama group was mainly based on the consumption of terrestrial resources, while values for the Tarapacá group indicate consumption of both marine resources and maize. Oxygen isotope values from at least five individuals strongly suggest the presence of foreigners in the cemetery associated with the Pica-Tarapacá culture, consistent with evidence for high mobility patterns during this period. This evidence for human mobility accompanies the high levels of trade and interaction observed in the archaeological record.

Santarone, Paul [361] see Cannon, Kenneth

Santasilia, Catharina (PhD student, University of California, Riverside) and Jaime Awe (University of Arizona, Flagstaff)

[24] *Placing Cahal Pech on the Map: Implications of Burial Goods Recovered in the Site's Eastern Triadic Shrine*

Between 2011 and 2014, the BVAR Project focused considerable attention on the excavation and preservation of the site's Eastern Triadic Shrine (a.k.a. E-Group). In addition to revealing important information on the evolution of the architectural complex, our investigations also uncovered a series of burials that span from the Preclassic to the Terminal Classic periods. The burials, particularly

those discovered in Structure B1, the central structure of the eastern triadic complex, reflect considerable wealth and an astonishing assemblage of unique artifacts that has contributed to a better understanding of the elite Maya who lived at Cahal Pech. The grave goods in the elite burials within Structure B1 also provide evidence for interregional trade and interaction, and serve to position Cahal Pech as one of the most important socio-political centers in the upper Belize River Valley.

Santasillia, Catharina [338] see Novotny, Anna

Santiago, Rey [238] see Bolunia, Mary Jane Louise

Santini, Lauren (Harvard University)

[193] *Preliminary Results of Wood Charcoal Analysis for Household Groups in San Bartolo*

This paper presents preliminary results of analysis of charcoal remains recovered from well stratified household middens at the Maya archaeological site of San Bartolo located in the Department of the Peten, Guatemala. It presents reconstructed use patterns of local trees for typical San Bartolo residential households, as well as a discussion of how these patterns changed over time, and what factors, cultural and environmental, may have influenced these changes using secondary evidence.

Santos Ramírez, Víctor Joel [156] see De La Torre Vázquez, Jesús

Santy, Jenna

[41] *Ancient Starch Research In California: Results from CA-SBA-53*

Acorns were an essential foodstuff across prehistoric California; the transition to acorn use is currently being investigated. CA-SBA-53, a single-component Middle Holocene site on the mainland coast near Santa Barbara, contains an assemblage fairly evenly split between mortars and pestles, traditionally associated with acorn processing, and manos and metates, generally associated with seeds; furthermore, these mortars and pestles are some of the oldest known in California. By extracting and analyzing ancient starch grain extracted from ground stone tools, we can study subsistence shifts and associated shifts in technology. Such analyses can further illuminate issues of technological transitions and resource intensification during this period. Final results, presented here, suggest that this method could be very useful in reconstructing ancient foodways in prehistoric California, even though there remains much work to be done, particularly in regards to identification.

Sarich, Steven (Michigan Technological University) and Timothy James Scarlett (Michigan Technological University)

[126] *Physical Characterization of Stoneware Ceramic Materials*

The Davenport Pottery manufactured earthenware and stoneware in Utah, between 1853 and 1888. This poster uses data from a broad range of analyses, including XRF, INAA, petrography, and mechanical stress testing to develop profiles of the outcomes of technical processes at the pottery shop. These characteristics then provide insight into various key research topics in archaeology, including pottery systematics, life-expectancy and depositional time lag, experimental archaeology, and the applicability of RHX dating techniques on high-fired ceramic samples.

Sartin, Sunnie (New Mexico State University), Winona Patterson (New Mexico State University), Kristen Corl (New Mexico State University), Todd Scarbrough (New Mexico State University) and Angel Pena (New Mexico State University)

[273] *Twin Pines: Looking Beyond Mimbres Valley*

The Twin Pines site, located in the Gila National Forest, New Mexico, is a large Mimbres site that shows signs of multiple occupational periods spanning the Late Pithouse Phase (A.D. 550-1000) through the Mimbres Classic phase (A.D. 1000-1130). On the basis of recent mapping and reconnaissance, the Twin Pines site can provide crucial information about the Mimbres culture. First, it is a large Mimbres site which lies farther north of the extensively studied Mimbres Valley and most

other sites of the same period. Investigating the site allows us to understand the interaction and affiliation between the people from Chaco Canyon and the Mimbres areas. Second, the site is a source of several interesting artifacts, including copper bells, a copper effigy, an abundance of turquoise, and obsidian flakes. Tracing these artifacts to their source allows us to understand and reconstruct trade between people in the Upper Gila and other areas in the American Southwest. Finally, the site is of interest because it features rock art panels, which include several mortar holes. Understanding these features allows us to better understand the social landscapes and how people interacted in the Mimbres region.

Sartin, Sunnie [273] see Scarbrough, Todd

Sasaki, Ken-ichi (Meiji University)

[145] *Adoption of Horse-Riding Practices in Fifth-Century Japan and Its Political Significance*

A practice of horse-riding was introduced to Japan from the late fourth century and after. Since horses were not native to Japan, Korean specialists of raising and breeding horses were invited. Recently, fifth century evidence for raising horses has been excavated at various places in Japan. In the central Osaka Prefecture near where the central polity was located, horses were carefully buried at the foot of small fifth- and sixth-century circular burial mounds, and Korean ceramics were discovered at nearby settlement sites, along with pottery specially used for salt production. A situation is very different in the central highlands of Japan. There, we found numerous fifth-century cairns, which is very unusual in Japan and suggests that descendants of Korean immigrants were buried. A few ceramic figurines of horses were offered, but no horse burials at the foot of burial mounds and nor Korean ceramics. It seems likely that local elites who might be descendants of Korean immigrants introduced methods of producing and raising horses quite independently from the central polity. It might be the case that the central polity in the fifth century did not fully monopolize the diplomatic rights.

[145] *Chair*

Sassaman, Kenneth [348] see Gilmore, Zackary

Sassaman, Kenneth (Univ of FL - Anthropology)

[400] *Discussant*

Satterlee, Ashton (University of Idaho) and Andrew Duff (Washington State University)

[274] *Further Analysis on Vessel Size and Feasting in Three Chacoan Great House Communities*

Examining rim sherds and identifying ceramic vessels size is one method of investigating feasting practices. Larger vessels may indicate larger scale food preparation and consumption than found at normal households. Chacoan Great Houses are thought to have been used as gathering places for local communities to serve as the locus of ritual and feasting activities. The temporal element is expanding the research by using general ware types as temporal indicators on the ceramics recovered from Pueblo II sites in New Mexico's southern Cibolan communities of Cox Ranch Pueblo, Cerro Pomo, and Largo Gap.

Saturno, William

[303] *Presenting Order: Painting as Mythic Past and Mathematical Future in the Murals of San Bartolo and Xultun, Guatemala*

Though the murals of San Bartolo and Xultun are located only 8km apart in the lowland forests of Guatemala, they are separated by more than 800 years of Maya history and reflect very different relationships between society and the cosmos as well as between the artworks and their intended audiences. Where one publicly recounts episodes of Maya mythology and the idealized roles of both gods and kings in the creation and maintenance of cosmic order, the other, painted within a private household, illustrates the king and members of the court as the background for the scholarly calculations of cosmic cycles themselves. This paper uses the excavation, conservation, and

interpretation of these two remarkable examples of Maya mural painting as a point of departure for discussing the evolving role of Maya muralists and the continued use and alteration of these paintings long after their initial renderings.

[193] *Discussant*

Saturno, William [350] see Griffin, Robert

Saucedo, Ricardo [151] see Macias, Jose Luis

Sauza, Maximiliano and David Gárate (Universidad Veracruzana)

[144] *Perceptions of the Matacanela Archaeological Site by the People of Zapoapan de Cabañas*

The town of Zapoapan de Cabañas, located south of Lake Catemaco, Veracruz is adjacent to the archaeological site of Matacanela. Even though little historical continuity exists between the archaeological site and the contemporary settlement, perceptions that Zapoapan's inhabitants have about the site are informative because they suggest how the site is internalized and integrated into daily life. The historical memory of the inhabitants of Zapoapan de Cabañas, through oral tradition and the reuse of space, is a cultural phenomenon that links the daily landscape with the past. Archaeologists play an important role in how the community's perceptions of the past are shaped. We present some findings from preliminary ethnographic research into their ideas of the past and how they relate to it on a daily basis.

Savage, Dan [48] see Cheong, Kong

Savage, Daniel (Trent University), Gyles Iannone (Trent University), James Conolly (Trent University) and Jack Barry (Trent University)

[316] *Keep your Boots on: LiDAR as a Reconnaissance and Survey Tool on the Vaca Plateau, Belize*

Recent studies have demonstrated the revolutionary potential of LiDAR as a means of mapping archaeological features within densely forested and/or inaccessible landscapes. In a matter of days, aerial LiDAR scans can survey swaths of forest which would take decades to map on foot. However, in order to effectively exploit the analytical potential of LiDAR datasets, we must understand how the spatial information captured by these systems compares with those produced by traditional ground survey. To this end, we employ a blind-test to examine our ability to identify and classify known archaeological settlement features on a LiDAR map. The results of this blind test expose a number of limitations which may bias LiDAR based settlement surveys. Nevertheless, we emphasize the value of this technology as a means of targeting high potential areas for further exploration, as well as reconnaissance of isolated regions

Sawyer, Alicia (Department of Archaeology, Boston University) and Justin Holcomb (Department of Archaeology, Boston University)

[9] *Interpretation of Midden Formation Processes at Three Farms in Skagafjörður, Northern Iceland Using Thin Section Micromorphology and pXRF Chemostratigraphy*

Skagafjörður, northern Iceland is a fertile valley bottom where farms established during the Landnám in the late 9th century are still occupied today. In this study, we examine middens from three farms: Reynistaður, Syðra-Skördugil, and Stóra Seyla. The middens show deposition from the Landnám through the Medieval Period. This research answers four questions: What is the sediment composition of the midden fill? What are the main modes of deposition? How do these deposits contribute to the chemostratigraphy of the site? Given these data, what assessments can be made as to the formation of these middens? To answer these questions, we applied a combination of thin-section micromorphology and portable x-ray fluorescence spectrometry (pXRF) to sediments from three sites in the local area. By generating a chemostratigraphic framework targeted on sampled areas, a predictive in-field approach via pXRF can be obtained for future application throughout the study areas.

Sayre, Matthew (University of South Dakota) and Daniel Contreras (Kiel University)**[186]** *Lessons from the Tello Obelisk- Domestication and Plant Use at Chavin de Huantar, Peru*

The work of Dolores Piperno has significantly advanced our understanding of the rise of agriculture in the tropical Americas. Her work has been fundamental in the development of microbotanical techniques used to understand the use of plants in the past. This paper builds off of Dolores' analysis of plants depicted on the Tello Obelisk, at the site of Chavin de Huantar in Peru, in order to consider the role that plants from distinct ecological zones across the Andes played at the temple site. This analysis is presented in conjunction with a discussion of how the agricultural community at Chavin managed the landscape that surrounds the temple site. New phytolith data will be presented in conjunction with macrobotanical data in order to reach a more nuanced understanding of how the inhabitants of Chavin varied their plant use across the different sectors of the site. Data will be presented from a hearth in the West Field, from the Wacheqsa area near the monumental center, and from the La Banda domestic sector.

Sayre, Matthew [347] see Mayer, Aaron

Scales, Mary**[8]** *Learning from Disturbance: A Late Woodland-Early Mississippian Site in the Georgia Piedmont*

Between 2012 and 2014, the University of Georgia field school in archaeology undertook investigations at Raccoon Ridge, a highly disturbed Late Woodland-Early Mississippian site in the Georgia Piedmont. Systematic surface collections and shovel tests were used extensively to define the site's geographical footprint. Geophysical survey, including shallow magnetic gradiometry and susceptibility, together with phosphate analysis were also utilized. Anomalies detected with these methods were investigated by test excavation, with mixed results. Following the 2014 season, our findings have revealed a more intricate picture, as the site is more highly disturbed than anticipated. Ultimately, what we thought was a single large site was determined to consist of two separate occupations. The importance of disturbed sites, whether existent on private or public lands, is discussed here. Conclusions regarding this site and the findings of each season are compiled briefly to address how the investigation of sites that may be overlooked or written-off because of extensive destruction, intentional or otherwise, can contribute to the archaeological record.

Scaramelli, Franz [371] see Navas, Ana

Scarborough, Vernon [295] see Dunning, Nicholas

Scarborough, Vernon (University of Cincinnati)**[334]** *Crosscultural Archaeology and the Role of the Tropics in Informing the Present*

The ancient Maya and Khmer developed in semitropical environmental settings, both having not dissimilar chronologies. Tropical ecological rhythms dictated their respective dispersed land-use patterning. To cope with seasonal abundant precipitation followed by 4-5 months of drought-like conditions, the Maya accepted cropping designs based on the limitations of extended ground storage while the Khmer located resources to elevated reaches of stilted housing; approaches conditioned by accelerated organic decomposition and pest infestation. To accommodate rapidly grown and harvested food, though subject to the vagaries of regional rainfall, extensive roadways and canoe transport connected groups and polities into elaborate exchange networks coordinated by sizable centers and their calendrical scheduling. The effects of climate, both at the nuanced seasonal level and at more coarse decadal levels, resulted in environmental adaptations which provide a potential picture of our own. Internet connectivity to resource-specialized communities located in hinterlands away from urban aggregates and physically linked by light-rail would mimic the successes of past tropical socioenvironmental systems. Urban hubs would continue to prosper as coordinating centers for global socioeconomic supply/demand, but rural communities would be prized and elevated in their importance and influence. Community-based cooperatives today would have a global reach not

apparent in antiquity.

Scarborough, Todd [273] see Sartin, Sunnie

Scarborough, Todd (New Mexico State University), Kristin Corl (New Mexico State University), Dylan Clark (New Mexico State University) and Sunnie Sartin (New Mexico State University)
[273] *Burning as Ritual in the Jornada Mogollon*

What is the significance of multiple burning events at Cottonwood Spring Pueblo (LA 175) an El Paso Phase (A.D. 1300-1450) Mogollon village in Southwest New Mexico? What do these burning events tell us about the life history of the pueblo? When did they occur? How do they compare to burning events at contemporary sites in the American Southwest? Contextual evidence suggests they are separate ritual events. What purposes did these events serve? How do they differ from other purposeful pueblo burning? This poster explores these questions through a case study of one of the largest villages in the region. We employ multiple chronological methods (stratigraphic superposition, dendrochronology, radiocarbon and archaeomagnetism) to contextualize burning within the site for our comparison. This pueblo straddles a cultural boundary between the Jornada and Mimbres branches of the Mogollon offering a good case study in this understudied region and phase. We found burning events in 16 of the 18 rooms and at least two areas with evidence of superimposed burning events. Our poster argues that the burning appears to have resulted from a combination of retiring particularly important ritual rooms, remodeling phases, and the final abandonment of the site.

Scarlett, Timothy James [126] see Zhao, Shan

Scarlett, TimothyJames (Michigan Tech University)

[126] *Multi-Lab Collaborative Experiments with RHX Dating*

Michigan Technological University, California State University-Long Beach, and Arizona State University scientists have been collaborating on a critical assessment of the novel RHX Dating technique, pioneered by Wilson et al. (2009). This chronometric technique, if proven reliable, will transform archaeological dating practices. We have conducted multiple trials with a wide range of ceramic types from Neolithic through Early Modern, using varied set ups of instrumentation and thoughtful lab protocols. We continue to refine models of the rehydration and rehydroxylation processes; explore the relationship between relative humidity and RHX behaviors and other water crystallization systems; examine different lab practices and protocols; and assess other mechanisms of mass loss and gain, such as decarbonation, carbonization or organic contaminants, and decomposition of sulfates and salts. At this time, analytical trials of 50% of our samples yield dates close to expected dates of manufacture while the other 50% remain inaccurate. We are cautiously optimistic for the ongoing development of this dating technique, but many very important questions remain to be answered.

[126] *Chair*

Scarre, Chris

[334] *The Comparative Archaeology of the Channel Islands*

Brian Fagan's long fascination with the sea and sailing gives special resonance to his studies of coastal communities and human adaptation. In Before California he studied the Chumash peoples and the prehistoric settlement of the Channel Islands of the Santa Barbara Channel. In recognition of Brian's evocation of broad-scale cross-cultural comparisons, the postglacial communities of the Californian Channel Islands are here contrasted with patterns of settlement and social change in the Channel Islands of the English Channel. Despite many differences in technology and social organization, both sets of communities were dependent on maritime connectivity and both subject to the vulnerability imposed by their coastal environments. This study will demonstrate the value of cross-cultural comparison in throwing new light on even such disparate prehistoric settings as the

islands of western North America and those of northwest Europe.

Scattolin, María (Museo Etnográfico, Buenos Aires)

[371] *Before Calchaquí. The Formative Period and Middle Horizon ceramics in Northwest Argentina*

This paper gives a characterization of the ceramic styles as well as the forms and functions of vessels and, broadly, the production of pottery in the village societies that inhabited the southern Calchaquí Valleys (Northwestern Argentina) during Formative period and Middle Horizon (first millennium A.D.). The study of ceramics in Northwestern Argentina has traditionally been centered on descriptions, taking decorative motives as fundamental evidence in the definition of styles and periodization. From this perspective, style is generally understood more from the point of view of an observer than from the perspective of the potter. Following an examination of the main settlements of these periods, the extent of styles recognized until now is considered. Then, results of new chronological-stylistic analysis based on the study of museum collections are offered. Changes in the main traditions are discussed as well as correlation and disjuncture from previous classifications. Morpho-functional and petrographic studies recently performed on fragments and vessels found at excavations in Cajón and Santa María Valleys are then provided. Pottery manufactures are compared with those from other sites in the region to display an overview of ceramic production of prehispanic agro-pastoral societies that inhabited the Southern Andean Area previous to the Calchaquí populations.

Schaafsma, Curtis and Polly Schaafsma (Museum of New Mexico)

[137] *How Values, Prejudice, and Social Issues Shape Rock Art Research in North America*

We present a brief history of rock art research in North America, identifying some of the social forces and schools of thought that have shaped these studies within and outside of the confines of traditional archaeology. Among relevant issues within academia are prevailing paradigms that aspire to specific goals and interests that orient archaeological research. Even when these interests and concerns would benefit from the analysis of prehistoric images made by the socio/cultural groups under investigation, rock art is often ignored or left up to the purview of active amateur rock art groups, who have enthusiastically embraced these endeavors, thereby creating a social division in the field of rock art research in North America. Also because rock art is an artifact of worldviews and social practices, in cases where there are living descendants, issues regarding interpretation and preservation have arisen. Problems encountered in these areas are considered.

Schaafsma, Polly (Research Associate, MIAC\LOA)

[189] *Some Observations on Hohokam Figurines: Implications for Early American Southwest Connections with West Mexico*

Hohokam anthropomorphic figurines differ in style, mode of manufacture, and meaning with most, if not all, other figurine traditions in the American Southwest which appear to be regional in their derivation. In contrast, clay Hohokam figurines have often been cited as evidence of early cultural relationships between southern Arizona and Nayarit and adjacent regions. Between the Formative/Pioneer Period and prior to ca. 800 C.E., simple Hohokam figurines display distinctive stylistic norms that nevertheless link them to the slightly earlier and much more elaborate and sophisticated clay shaft tomb sculptures of West Mexico. Many scholars have postulated that early Hohokam figurines had roles in household rituals pertaining to fertility and the ancestors, the latter further supporting a West Mexican connection. These early parallels with West Mexico presage events between 800 and 950 C.E. when rapid changes in Hohokam ritual and socio-political organization included the appearance of ball courts and trade items manufactured in the West Mexican highlands. Simultaneously new stylistic developments of the figurine complex with strong Mexican affinities are found associated with formalized and public mortuary rituals seemingly adding a political role to ancestor veneration among the Hohokam.

Schaafsma, Polly [137] see Schaafsma, Curtis

Schaan, Denise [157] see Watling, Jennifer

Schach, Emily (Arizona State University) and Jane Buikstra (Arizona State University)

[378] *"Feeding the Dead" at Chiribaya Alta*

The inclusion of foods and eating utensils within graves at Chiribaya Alta, a Late Intermediate site ~5 km from the mouth of the Osmore river, suggests that "feeding the dead" during funerary rites was a common practice within the Chiribaya polity. Thus far, however, these foods have not been systematically considered in relation to funerary practices. This study examines food items placed within tombs at Chiribaya Alta (n=307) and considers their potential symbolic meanings within funerary practices, as informed by documented ethnographic and ethnohistoric cases. We compare the foods included within graves to the aggregate diets of skeletal individuals as determined through previously published carbon and nitrogen isotopic analyses. This study will allow for a consideration of the importance of symbolic foods within the daily diet of Chiribaya individuals.

Schachner, Gregson (UCLA)

[335] *Seeking New Metaphors for Communities and Households in the Ancestral Pueblo Southwest*

Investigations of households and communities have long been strengths of archaeological research in the American Southwest. As the spatial breadth and temporal resolution of these studies has improved, the archaeological record has raised key challenges to our preconceptions of the scale, stability, and structure of Ancestral Pueblo communities and households. Newer models must reconcile evidence for the frequent movement of individuals and households with contrasting data attesting to long-term use of residential and non-residential locations and the complexity of local economies. These new models must also directly confront the fact that the archaeological record has a temporal and spatial depth that is rarely present in models of community and household derived from ethnology. In this paper, I explore multiple examples of community organization and household strategies in the Western Pueblo region in order to illustrate the benefit of shifting the spatial scales of our analyses and argue for the adoption of models that more fully embrace the temporal rhythms of the archaeological record.

Schaeffer, Bryan (Florida State University)

[259] *Interaction as Movement, Movement as Interaction: The Tripod Vessel in the Maya Region*

Interaction between the central Mexican city of Teotihuacan and the Maya region, and the subsequent influence of Teotihuacan on Maya material culture, has been much discussed. Although many scholars have noted the tripod cylindrical vessel as a diagnostic trait of Teotihuacan and as evidence of interaction and/or influence in other areas of Mesoamerica, further examinations of the tripod ceramic vessels and their imagery found in the Maya area have not been fully developed. The tripod vessel has even been questioned as a characteristic solely of Teotihuacan. A few scholars postulate that the tripod form originated in the Gulf Coast cultures of Veracruz. Previous examinations of these vessels have not adequately explained their presence in various Maya cities, from the highlands of Guatemala, to the southern lowlands of the Petén region, to the southern-most Maya city of Copán. This paper examines the movement of a stylistic form closely associated with Teotihuacan and the interactional dynamics of a culturally appropriated artistic form. Several ceramic tripod vessels from the Maya region demonstrate a fusion of Maya and "Teotihuacanoid" elements, underscoring an artistic exchange that traversed divergent Mesoamerican regions.

[259] *Chair*

Schaepe, David M. [162] see Kasper, Kimberly

Schaetzl, Randall [280] see Hambacher, Michael

Scharf, Elizabeth (University of North Dakota)

[162] *Weediness: Modern, Historic, and Prehistoric Plants at Poverty Point, LA*

With construction beginning about 3,700 years ago, Poverty Point (16WC5) in northeast Louisiana is one of the earliest and largest sites of its kind in the United States. What were conditions like when people began constructing the mounds? What kind of environment did they live in? How did this change (or not change) over time? This poster presents lithological and palynological evidence covering the period before, during, and after prehistoric occupation at this site. Comparing and contrasting prehistoric with historic and modern vegetation in the area reveals how vegetation has changed over the last half of the Holocene, putting both past and present environmental conditions into perspective.

Scharlotta, Ian**[391] *Trade Routes and Contradictory Spheres of Influence: Movement of Rhyolite through the Heart of the Western Mojave Desert***

Provenance analysis of obsidian and rhyolite artifacts from four Late Prehistoric sites located on the edges of the western Mojave Desert suggest direct procurement practices and the presence of a trade network through the Antelope Valley. Less clear is whether evidence for the movement of materials can effectively be used to infer particular cultural territories or specific cultural interactions. Ethnographic work in the Antelope Valley suggests that areas surrounding rhyolitic formations may have been controlled by different groups. The boundaries described by ethnographers may not have accurately reflected the prehistoric territories of groups in the area, as Mission contact likely altered regional populations prior to recording. Notes from early missionaries and explorers provide conflicting information regarding the location of villages, native groups, and associated territories within the Antelope Valley. Furthermore, reports suggest that enmity/amity relationships varied between regional groups over time, and that open conflict occurred near Santa Clarita, California during the 1770s. These actions likely inhibited trade networks between the western Mojave and coastal Chumash populations. The movement of lithic artifacts is examined in light of the different lines of evidence to infer modification of previous trade networks and territorial boundaries in the Antelope Valley.

Scheder Black, Ash (University of Arizona)**[396] *Applied Archaeological Visualization: Technical Advances and Research Insights from the Effort to Visualize Neanderthal/AMH Interactions at Deep Time Depth***

Geospatial and temporal mapping technologies continue to rapidly evolve, making possible archaeological visualizations capable of revealing patterns in the past from new and potentially dramatic perspectives. The TemporalMapping.org project, now in collaboration with the University of Oxford's PalaeoChron.org, will share techniques and research results from data visualization efforts including a global 30-arc second resolution model of sea level change from 475,000 BP to Present and a high resolution animation of Neanderthal/Anatomically Modern Human interactions based on research published in August, 2014. Details of current modelling processes and programming methods will be discussed along with a brief introduction to using similar techniques and freely available tools to craft bespoke visualizations, and the potential for archaeological applications of emergent technologies originally designed for Business Intelligence.

[5] *Discussant*

Scheffran, Jürgen [73] see Balbo, Andrea

Scheiber, Laura [361] see Burt, Amanda

Scheiber, Laura (Indiana University)**[406] *The Future of Zooarchaeological Collections in Twenty-First-Century Scholarship***

Zooarchaeological research is nearly impossible without comprehensive comparative collections that aid in the identification and analysis of archaeofauna. Throughout her career, Diane Gifford Gonzalez has been a strong proponent of developing and maintaining comparative research

collections of modern and ancient vertebrate specimens. In this paper, I discuss the current state of zooarchaeological collections in twenty-first century scholarship. I highlight the William R. Adams Zooarchaeological Laboratory at Indiana University, which contains over 10,000 modern specimens from all over the world. The lab recently completed a massive overhaul of its curation facilities, with the help of a large award for capital improvements from the National Science Foundation. The investment in comparative collections by the National Science Foundation demonstrates the fundamental importance of these resources. Quality comparative collections are the foundation of zooarchaeological research, and the strength of the research is directly limited by the types of comparative resources available. Efforts have now turned to three-dimensional scanning of the comparative collection in order to help overcome a major hurdle in zooarchaeological research. These bring irreplaceable research collections and comparative collections together from disparate geographic locations. I will also discuss digitization results within the context of broader anthropological and ecological research goals.

Scheiter, Simon [294] see Potts, Alastair

Schelberg, John and Carla Van West (SRI Foundation)

[282] *The Civilian Conservation Corps in Chaco Canyon, New Mexico*

In 1937, a unique Civilian Conservation Corps (CCC) sponsored "Indian Mobil Unit" was established in Chaco Canyon. The camp was located east of Pueblo Bonito and the goal was to train Navajo men and a woman in stone masonry, ruins stabilization, drainage control, archaeological excavation, and associated administrative tasks. In 1939, under the direction of National Park Service (NPS) archaeologist Gordon Vivian, men from the Indian Mobile Unit excavated a small village site in advance of the construction of CCC camp NP-2-N, designed to house a regular 200 man unit. Camp NP-2-N was closed in 1941 and the Indian Mobile Unit was closed in 1942. The success of the Mobile Unit program resulted in the establishment of permanent Ruins Stabilization Units at parks in the Southwest. The 1939 excavation of the archaeological site, the CCC Site, exposed nine rooms and associated sheet trash. In 1949, two deeply buried kivas were excavated by the NPS. In the mid 1970s, the Chaco Project re-excavated portions of the two kivas and Room B in order to obtain archaeomagnetic dates.

Schelberg, John [354] see Akins, Nancy

Scher, Sarah (Upper Iowa University)

[187] *High and Low: Highland and Coastal Dress in the Andean Region, 100-800*

Dress can be a key aspect of stating a cultural or ethnic identity. Garment shapes, textile techniques, and accessories all contribute to creating a particular ensemble that can define a group identity. This effect can be heightened in the representation of dress, as the artist and patrons decide what are the essential elements that are worth depicting, and as the medium of representation dictates what can and cannot be conveyed visually. This paper examines the similarities and differences in the representation of dress in ceramic effigy vessels among the Moche, Nasca, and Recuay cultures of Peru. These cultures overlap in time, providing a chance to understand what were considered important elements of the cultures themselves, and whether commonalities in coastal dress styles noted by A. Rowe (1990) and others (Frame 2003, Horié 1991) persisted in the representation of costume in ceramic. Similarities and differences in garment forms, decorative motifs, and accessories are all used to analyze the statement of identity and difference made by these pieces.

[187] *Chair*

Scherer, Andrew K. [86] see Schroder, Whittaker

Scherer, Andrew (Brown University)

[158] *To Burn like the Sun: Rituals of Fire and Death among the Classic Maya*

The dichotomies of hot and cold, light and darkness were essential to Classic Maya cosmology. The celestial and underworld journey of solar deities offered a fundamental mythic charter, and fire was the ultimate transformative force, providing a bridge between earthly and otherworldly realms. Such ideology is especially patent in rites of death, sacrifice, and veneration. Monuments from western kingdoms describe censuring rituals performed months, years, and even decades after the death of important personages. Work at Piedras Negras demonstrates that even the long cold remains of the kings were activated by exposure to flame. In other kingdoms, fire was used to transform the most precious of mortuary offerings: the corporal remains of mourners and the bodies of sacrificed youths.

[158] *Chair*

Schick, Kathy [215] see Zipkin, Andrew

Schieber de Lavarreda, Christa [242] see Vázquez De Ágredos Pascual, Marisa

Schieber de Lavarreda, Christa (National Archaeological Park Takalik Abaj)

[242] *The Universe of Ritual Manifestations at Tak'alik Ab'aj*

The archaeological record of 27 years of research at the ancient site of Tak'alik Ab'aj at the southwestern pacific piedmont of Guatemala has summed up evidence of a wide range of different ritual activities and patterns, which are represented through a huge diversity of materials and artistic or handicraft skills. The pivotal role of Tak'alik Ab'aj as a long distance trade center and precocious cultural and religious "mecca" with "international flair" is reflected in the materials and artifacts employed in its rich ritual tradition. With a rapid overview of its ritual manifestations, it will come apparent that these are present at Tak'alik Ab'aj in almost every aspect of common life and rulership, and repeatedly employ powerful messages, as well as ritual protocols, which trespass time, space and materiality.

[242] *Chair*

Schieppati, Frank [352] see Hayward, Michele

Schier, Wolfram [348] see Whittle, Alasdair

Schiffer, Michael (School of Anthropology, University of Arizona)

[241] *Social Processes and Technological Change*

Archaeologists are much concerned with, and often have evidence for studying, the effects of technological change on social processes. In this paper, I reverse the causal arrow and examine social processes that can initiate technological change. Among these varied social processes, I discuss here peer competitions; social role expectations; new social groups, social roles, and activities; and maintaining a system of status differentiation. Each of these processes can serve as fillips to invention and, perhaps, initiate processes of development, manufacture, and adoption.

[343] *Discussant*

Schilling, Tim [29] see Vawser, Anne

Schilling, Timothy (Midwest Archeological Center)

[29] *Challenges and Opportunities of Archaeology in Urban Parks: an example from the Arch*

Jefferson National Expansion Memorial is an anomaly in the National Park Service. The park was designated in 1935 as the first national historic site, memorializing America's westward expansion, yet it is best known for the Gateway Arch, a modernist monument that towers over the city. Archaeological information from the St. Louis riverfront is sparse, but the park is located in an area that was densely settled from prehistory to the beginning of the twentieth century. In the late 1930s, NPS razed the historic city and then for the next half century completely recontoured the grounds in

a series of cut and fill stages as the monument was built. In the past, archaeologists have documented a few historical items encountered during construction, but intact features are rare. The CityArchRiver 2015 project along the riverfront will involve deep and extensive excavations potentially exposing early undisturbed landscapes and features. Other aspects of the project may expose historically sensitive deposits within the Old Courthouse. The scale and extent of this project are atypical for the NPS. In this paper, I discuss how the Midwest Archeological Center is partnering in innovative ways with multiple stake holders to preserve archaeological resources during this project.

Schilt, Flora (University of Tübingen, Germany), Susan Mentzer (University of Tübingen, Germany), David Wright (Seoul National University, South Korea), Jessica Thompson (Emory University, USA) and Elizabeth Gomani-Chindebvu (Malawi Ministry of Tourism, Wildlife, and Culture)

[155] *Micromorphology of Middle to Later Stone Age Sites at Mwanganda's Village, Northern Malawi*

The Mwanganda's Village site, northern Malawi, was first excavated in 1965-1966 under the direction of J. D. Clark, who reported the recovery of early Middle Stone Age (MSA) stone tools in possible association with the remains of an elephant. New work in 2009-2012 revealed that the elephant and the artifacts were not likely to have been behaviorally associated. The site lies within a series of river terraces dating from the Middle Pleistocene to the Holocene. Near the top of the sequence an in situ Middle to Later Stone Age deposit dates to before and during the Last Glacial Maximum, providing an opportunity to examine human behavior in light of changing paleoenvironmental conditions.

Micromorphological analysis is employed to reconstruct a detailed site formation history of the sequence at Mwanganda's Village. Post-depositional features observed in thin section are especially informative about the paleoenvironment, as they are associated with ancient water tables and soil formation. Data from sediment cores collected in Lake Malawi indicate a series of mega-droughts during the Late Pleistocene. The association of terminal MSA artifacts with depositional and post-depositional features linked with riparian environments shows an emerging pattern of wetland adaptation during the MSA in central Africa.

Schjellerup, Inge

[78] *Landscapes under Chachapoya and Inca Presence in the Chachapoya Region*

The Chachapoya and the Incas had different perceptions of the landscape concerning settlement, agriculture, and communication and each of them transformed the original landscape into a cultural landscape with the construction of monumental architecture and enormous investment in agricultural intensification in the form of various types of terraces. The objective is to illustrate how historical sources and archaeological investigations together contribute to the understanding of the nature and impacts of Chachapoya and Inca control on the eastern slopes of the northern Andes of Peru.

Schlagheck, John, Dave Casebolt (National Park Service) and Eloise Warren (National Park Service)

[416] *A Mid-19th Century Lighter from San Francisco Bay's Yerba Buena Cove: Context, Documentation, and Conservation*

In 2013, WSA recovered a well-preserved Gold Rush Era lighter from the original shore of Yerba Buena Cove. This class of boat, used to load and unload ships where there is no adequate harbor, was used extensively in San Francisco prior to the completion of sufficient deep-water wharfs in the 1860s. This paper contextualizes the use of lighters in frontier San Francisco and presents new insights into the construction of the recovered lighter gained from the creation of a 1:12 scale model. The authors also describe the methods and results of the conservation effort undertaken by the National Park Service to stabilize the lighter for future study and possible public display

Schleher, Kari (Crow Canyon Archaeological Center), Jamie Merewether (Crow Canyon Archaeological Center) and Grant Coffey (Crow Canyon Archaeological Center)

[85] *Material Culture of Communities: Temporal and Spatial Patterns in the Material Culture of the Goodman Point Community*

In this paper, we explore temporal and spatial patterns present in the material culture of the Goodman Point Community. The Goodman Point area of southwestern Colorado was home to ancestral Pueblo peoples from the A.D. 600s until depopulation of the broader region around A.D. 1280. Recent laboratory analyses by the Crow Canyon Archaeological Center have produced a large data set of the material culture within the later Goodman Point Community, including data on over 95,000 sherds and 75,000 lithic artifacts primarily dating from the A.D. 1000s through A.D. 1280. In this paper, we discuss this robust assemblage focusing on types of artifacts, including pottery, pottery tempering materials, stone tools, and exotics, to evaluate both contemporaneous and diachronic artifact patterns to assess social connections within the community and to other peoples further afield. These patterns are compared to other material signatures recorded for contemporary communities in the region, including the Sand Canyon Community.

Schlerer, Kari [121] see Barker, Andrew

Schmader, Matthew (University of New Mexico)

[81] *"They Had So Many Stones to Hurl": Evidence of Inter-Indigenous Conflict on the Vázquez de Coronado Expedition, 1540-1542*

In 1540, Francisco Vázquez de Coronado led one of the largest expeditions ever assembled by the Spanish crown into the present-day American southwest. The expedition had 375 European men and was supported by a large contingent of at least 1,300 native Mexican soldiers from various ethnic groups. The native Mexican soldiers likely did much of the advance work, hand-to-hand fighting, guarding, and other military detail. The whole expedition was not well-equipped with European military technology and had to rely on native weaponry to a great extent. Upon its arrival in the Rio Grande valley of central New Mexico, the expedition took over native villages for shelter and engaged in several battles with indigenous pueblo people. In so doing, the fighting that broke out between native Mexican soldiers and pueblo people is a rarity in the cultural history of the American southwest. Physical evidence of this conflict from a pueblo site in New Mexico is examined. Slingstones, projectile points, and obsidian flakes are possible links to the Mexican soldiers. These artifacts are intermixed with European items such as crossbow points, musket balls, horse shoe nails, and personal gear. The pattern of artifacts and apparent puebloan defense of their village is described.

[81] *Discussant*

[81] *Chair*

Schmader, Matthew [312] see Ryan, Ethan

Schmaus, Tekla (Indiana University)

[397] *Home Is Where the Herd Is: Social Factors and Mobility Patterns in Prehistoric Kazakhstan*

Our understanding of the structure of pastoralist societies in prehistoric Eurasia is currently being reevaluated in light of new data from a range of sources. I present the results of a cementum annulation study done on domestic sheep teeth from prehistoric pastoralist communities in Semirech'ye, Kazakhstan. These data provide evidence that past mobility patterns were not necessarily rigidly dictated by seasonal climate conditions. Rather, although the environment was certainly a major factor in people's decisions about when and where to move, there was a good deal of flexibility in migration patterns. Even in a difficult environment, a range of social and cultural factors influenced people's decisions about what was best for their herds. On the other hand, some of these factors also seem to have been resilient in the face of larger social influences. Flexibility in the timing and location of migrations pertained throughout the Bronze Age and the Iron Age, even during a transition to a more stratified society. The social changes that took place during this time do not seem to have influenced herding practices. I consider possible explanations for this continued flexibility that take into account both social and environmental factors.

Schmid, Magdalena (University of Iceland)**[321]** *Colonization Models of Iceland: New Archaeological and Environmental Data*

This study aims to improve the dating resolution of archaeological and environmental data from the earliest sites of human occupation in Iceland in order to understand better the timing, scale and rate of the colonization of Iceland. This can be achieved through critical examination of the whole corpus of approximately 650 sites which is now accessible; through cross-referencing of different dating methods – primarily tephrochronology, radiocarbon dating and typology – and through application of new statistical methods of analysis, such as Bayesian statistics which in turn allow testing of specific colonization models. A key motivation for this research is the idea that Iceland is located in the deep ocean, where in the ninth century neither indigenous people nor land-mammals lived, and agriculture had not yet been practiced making this volcanic island the most extreme case study to test colonization models.

Schmidheiny, Martin (MIT)**[327]** *Seeing Red: Characterizing Historic Bricks at Sylvester Manor, Shelter Island, New York 1652-1735*

This project develops a basic material characterization of pre-mechanized, handmade bricks excavated at the site of Sylvester Manor on Shelter Island, New York. In the early Manor period of 1650-1690, this early Northern provisioning plantation supplied Barbadian sugar operations and pursued mercantile interests independent of state control. The technology and processing of pre-mechanized brick and other architectural ceramics have received comparatively little attention in historical archaeology. Here, qualitative visual analysis on different scales as well as petrographic thin-sections were used to characterize the internal composition, variation, and production evidence in the bricks. Accounting for the range of production defects and fabric properties of the bricks demonstrates an unappreciated diversity of the brick material, and further suggests on-site or local manufacture as a regional ceramic industry developed in Long Island Sound in the 17th and 18th centuries. Interpreting the results of this analysis offers alternatives to the assumptions about building materials on the site. Moreover, it identifies different material experiences of regulated, municipal brick-making versus home-grown industries utilizing expedient resources. Thus, the project advocates an active role of material science to assess the complex contribution of building materials to a changing landscape and urban development.

Schmidt, Mary [94] see Heller, Abigail

Schmidt, Caroline and Ryan Parish (University of Memphis)**[292]** *Determining Implications of Lithic Selectivity in the Early Historic European Trade of the Central Mississippi Valley*

Exchange between Protohistoric Period Native American and European traders in the Central Mississippi Valley reorganized the lithic industry to focus on hide processing. The most distinctive markers of this industry, thumbnail scrapers, increased as participation in the regional trade intensified and gradually led European-made goods replacing traditional tools. Although several avenues concerning the implications of thumbnail scrapers have been investigated, their raw material source remains inconclusive across the region. Verifying material source will shed light on possible shifts in lithic procurement strategies, mobility patterns, and interregional relationships following participation in the skin trade economy. Additionally, variations in lithic selectivity may be a factor in certain groups' success or failure in the trade. Using reflectance spectroscopy, the chert type and source will be non-invasively determined for a collection of thumbnail scrapers from various protohistoric sites in the Central Mississippi Valley.

Schmidt, Peter (University of Florida)**[340]** *Co-practice amongst Non-Western Peoples: Abandoning Theory at Center Stage*

Theory as Western performance in archaeology has hogged center stage so long that other actors standing in the wings ready to play their roles are not included in the drama. Indigenous theories of knowledge have been relegated to permanent off-stage status. Yet those who have had the privilege

to work with and collaborate with historically-minded counterparts in other cultures have incrementally accumulated local beliefs and have, both consciously and unconsciously, woven local epistemologies into interpretation. These new interpretative tapestries are not ethnographic uses of best inference, but constructions drawing on meanings arising out of mutual co-practice that lead us in new theoretical directions. Discourses arising out of co-practice in heritage work in NW Tanzania capture how heritage is theorized today. Embodied experiences, such as building shrines, bring multiple meanings to the surface—including human rights claims and religiously informed ethical principles pertaining to sacred places—that differ significantly from how indigenous heritage was previously theorized and how the West theorizes heritage today. Acceptance of indigenous theories of heritage requires moving off center stage, embracing local practice, and discovering how co-practice may enrich Western theory.

[340] *Chair*

Schmitt, Dave (Desert Research Institute) and Karen Lupo (Southern Methodist University)

[296] *Is Bigger Always Better? Body-Size, Prey Rank, and Hunting Technology*

Zooarchaeological applications of rationale derived from the Prey Choice Model (PCM) are based on the assumption that prey body-size is a robust proxy for prey rank and post-encounter return rate. The PCM predicts dietary expansion and contraction in response to the encounter rates with large-sized and highly ranked game. In zooarchaeological assemblages, co-variation in the abundances of large and small-sized prey are often viewed as reflecting changes in foraging efficiency and are usually attributed to resource depression or other processes that influence the encounter rates with large-sized, high ranked prey. However, changes in hunting technology and techniques can greatly alter the efficiency of hunting different prey. Using empirical data from ethnographic sources we show how snaring and other techniques used to procure smaller-sized prey can be more reliable and productive than hunting certain large game. We then use archaeological data from Holocene sites in the Bonneville basin of western North America to show that leporids were more frequently targeted than larger-sized and presumably high ranked game, even when the latter were abundant on the landscape.

Schneider, Tsim (University of California, Santa Barbara)

[175] *Making Community in the Colonial Hinterland of Coastal Marin County, California*

From the first baptism in 1783 to the last recorded baptism in 1832, at least 2,800 Coast Miwoks from the Marin Peninsula entered Spanish missions in the San Francisco Bay area. Understandably, and like most accounts of Indian entanglements with Spanish missions, the story of Coast Miwok missionization and assumed cultural loss is told through the documents and trowel work at Spanish missions. Comparably less is known of the world beyond the mission walls and in the hinterlands that took shape during the mission-era and afterward. After discussing the hinterland landscapes of Spanish missions in the San Francisco Bay—including the places where Coast Miwok fled to escape missions and other places where some kept to themselves—I borrow the concept of a “littoral borderland” to showcase community-making at shoreline zones away from the eyes of missionaries. In doing so, I present archaeological and historical research underway examining Coast Miwok communities of the Tomales Bay region forged in the wake of consecutive waves of colonization.

Schneider, Anna (University of Colorado, Boulder)

[273] *A Preliminary Analysis of Chipped and Ground Stone Artifacts from Garden Canyon Village*

Garden Canyon Village is a large multi-component site located in southeastern Arizona. The main occupation dates to the Classic Period, but the rich resources of the Huachuca Mountains drew ancient people to the site from Preceramic times through the end of the Prehistoric Period (A.D. 1450). Located 10 miles north of the U.S.-Mexico Border and 65 miles southeast of the Tucson Basin, Garden Canyon Village was located on the frontier of the Hohokam, Mogollon, Mimbres, and Trincheras culture areas. This poster presents an overview of Garden Canyon Village as well as a preliminary analysis of chipped and ground stone artifacts from the site. The sample consists of chipped stone tools and ground stone from two excavation areas: the E75 complex, a residential area with two adobe-walled structures, and the E100 complex, a courtyard with two adobe-walled

rooms. In addition to providing insight into raw materials, lithic technology, subsistence strategies, and regional trade, this project addresses Garden Canyon Village's position in the larger Southwest and the cultural affiliation of its residents.

Schnell, Joshua (Department of Anthropology, Michigan State University)

[204] *Three-dimensional Osteometry: A Comparative Study of 3D Model Generation Techniques for Cranial Osteometry*

The recent proliferation of three-dimensional scanning devices and model generation techniques has made the use of 3D models in bioarchaeological research a reality. Despite the numerous applications of 3D modeling both in the field and in the lab, the existing body of research and published literature about constructing, analyzing, and sharing these models within archaeology is slim. The primary goal of this study is to test the accuracy of two of the most popular techniques for digital osteometry. A sample of crania was digitized using a NextEngine 3D Laser Scanner and 3D models were created with the accompanying ScanStudio HD software. The same crania were then modeled with a photo capture/photo stitching technique using Agisoft PhotoScan Professional software. Standard measurements were taken from each of the models after generation according to major osteometric cranial measurements and subsequently compared to results taken from the original crania using traditional osteometric instruments. We present the results of these comparisons and discuss the relative utility and efficiency of each technique.

Schnieder, Joan [418] see Hadel, Patrick

Schnorr, Stephanie L. [415] see Salazar-García, Domingo Carlos

Schober, Theresa (University of Florida)

[372] *Perishable Disparity: Mortuary Treatment in Baja California Sur*

Missionary and explorer accounts document status differences in adornment, possession of ceremonial items, and body proportions in the marine foraging populations of the Cape Region, Baja California Sur, Mexico. The antecedent and concurrent Las Palmas Culture (ca. A.D. 1200 to 1700) was originally defined by William Massey based on excavation of small exclusive-use mortuary caves. Each cave held one or two primary interments and several secondary bundle burials representing both sexes and all ages. Skeletal elements in bundle burials were typically painted with ochre before being bound in sewn palm fiber mats or less frequently, animal hides. Both burial types have produced a diversity of largely perishable grave offerings, particularly in child burials and adult primary interments. Other mortuary programs occur in some coastal sites with interments directly in sand dunes with more frequent association of utilitarian objects. Previous research has demonstrated mortuary patterning does not correlate with differential access to food resources based on stable isotope analysis of bone collagen and apatite carbonate. Formal disposal areas with excellent preservation of burial items, in conjunction with bone chemistry data permit an investigation of differing interpretations of social identity and equality when perishable objects are included and removed from analysis.

Schoeman, Maria (University of the Witwatersrand)

[177] *History Runs Through It: A Biography of Gorges in Bokoni, South Africa*

Stonewalled enclosures and associated terraces embody the intersection of Bokoni gorge biographies and broader social history. The complex biographies of the gorges include being ritual spaces marked by rock art, iron smelting sites, refugia and strongholds. Many of the uses did not substantially alter the gorges, but in the troubled times of the eighteenth and nineteenth centuries in southern Africa, pre-colonial farmers used stonewalling to reconfigure several gorges in Bokoni. The stonewalled enclosures and associated terraces, however, materialized ideas about 'home' that had developed at earlier sites configured around ideas about livestock and farming. While the older ideals and ways of living materialized in the stonewalled architecture were no longer feasible. Being a person of Bokoni had become entangled with a specific pattern of configuring stonewalls, and people attempted to transfer these ideas onto gorges. They, however, were simultaneously informed

by the existing meanings and identities of gorges, and this shaped the specific configuration of gorge enclosures and terraces.

Schoenemann, P. (Indiana University) and Lindsey Kitchell (University College London)

[33] *Handedness and the Evolution of Tool Use in Humans*

The right-handed bias in humans is significantly stronger at the population level than what has been found for other primates. The functional connection this might have with the elaboration of tool use in general, and stone tool making in particular, has long been of interest. Tracing the development of handedness in the fossil record would allow for an assessment of the degree to which handedness is associated with technological advances evident in the archaeological record. The extent to which handedness can actually be assessed in fossils is a first step towards understanding this relationship. Research relevant to this question will be reviewed, including a study of 71 healthy human subjects for which brain asymmetries were first assessed from MRI, followed by an analysis of whether these correlated with handedness and throwing accuracy. A number of areas showing significant brain asymmetry were found, including primary motor areas devoted to the hand, left occipital and right frontal petalias (protrusions), and cerebellar areas involved in motor coordination. The extent to which these asymmetries correlate with handedness and throwing accuracy will be discussed, and will be integrated into a review of what is known about fossil hominin brain asymmetries.

Schoeninger, Margaret [110] see Somerville, Andrew

Schoepflin, Lisl [247] see Bryan, Adrienne

Schofer, Jeanne (Coconino National Forest) and Peter Pilles (Coconino National Forest)

[282] *The Legacy of New Deal Programs to Northern Arizona and Southwest Archaeology*

During the 1930s, federal New Deal programs financed and supported a number of archaeological projects in northern Arizona. Within National Parks and Monuments, surveys and excavations were undertaken so that people could see archaeological sites, and visitor centers were constructed to display and interpret archaeology for the public. Several major expeditions by the Museum of Northern Arizona were also supported by New Deal programs. Excavations from 1933 to 1939 were directed by professional archaeologists employed by the Museum with laborers and students financed by the U.S. Civil Works Administration, Federal Emergency Relief Administration, and the Works Progress Administration. This work took place during a time when little was known about the prehistory of northern Arizona and the field of Southwestern archaeology was relatively new. The Museum's excavations formed the basis for numerous publications by Harold S. Colton and his colleagues that greatly influenced the next 80 years of archaeological research and National Park Service interpretation. This paper explores the relationship of archaeological research conducted by the Museum with federal New Deal Programs and its enduring legacy to the archaeological profession and the American public.

Schollmeyer, Karen [34] see Huntley, Deborah

Schollmeyer, Karen (Archaeology Southwest)

[334] *Farmers' Responses to Resource Stress and Climate Change in the Prehistoric US Southwest*

Researchers in the semi-arid US Southwest have long linked abandonment, mobility, and other high-visibility culture changes to climate change, particularly shifts in precipitation patterns. Early researchers used synchronicity to infer causal relationships between cultural changes and climatic shifts. Recent work indicates a more complicated pattern in which some climatic shifts are contemporaneous with periods of population movement and upheaval, while other equally severe shifts are not accompanied by substantial archaeologically visible human responses. In this paper, case studies from the region demonstrate that prehistoric farmers adjusted their settlement and land

use strategies in response to their own perceptions of below-average conditions, sometimes well below thresholds modern researchers might identify as causing food stress or other resource acquisition problems. Climate changes are one component in a complex relationship between human population size, history and intensity of landscape use, and social factors involved in farmers' decisions to move or make other changes in their land use practices, and the strength of prehistoric reactions relative to different levels of stress varied widely. The importance of people's perceptions of changing conditions in decision-making has implications both for understanding past culture changes and for planning effective responses to modern climate change.

[69] *Discussant*

[278] *Chair*

Scholnick, Jonathan (UC Davis), Matthew Looper (California State University, Chico), Jessica Munson (UC Davis), Yuriy Polyukhovych (California State University, Chico) and Martha Macri (UC Davis)

[191] *Using Glyphic Variation to Infer the Social and Spatial Scale of Learning among Classic Maya Scribes*

This study uses Maya hieroglyphic inscriptions to trace the evolution of alternative writing conventions during the Classic period (ca. 250-900 C.E.). The third person ergative pronoun *u-* is represented by up to a dozen different graphemes in Classic Maya writing. These glyphs are also the most common set of signs found in the corpus of hieroglyphic inscriptions, regardless of media. The variation and frequency of these signs provide data to model cultural forces that shaped this writing system. We evaluate diversity in *u* glyphs to examine changes in the make-up of scribal traditions during the Classic period. Some have suggested that antagonistic polities used different signs to denote *u* glyphs. We evaluate this claim with antagonistic and other social networks using a comprehensive dataset of texts and network ties. In addition, we evaluate the role of geographic space in structuring choice between alternative *u* glyphs. These analyses contribute to our understanding of the social and spatial scales of learning among the Classic Maya.

Scholnick, Jonathan [248] see Looper, Matthew

Scholze, Gary [41] see Pierce, Wendy

Schomberg, Roman [87] see Scott, George

Schon, Robert (University of Arizona)

[417] *The Performativity of Measurement*

This paper examines the archaeological traces of measurement in light of the roles of mensuration in quotidian rituals. Most archaeologies of performance emphasize public spectacle, coordinated by elites, usually taking place in highly visible ceremonies. While some instances of measurement do fall under this rubric, most occur with less fanfare. Nevertheless, even mundane acts of measuring may be accompanied by some amount of pageantry. Differences in context, furthermore, yield varying archaeological traces. For example, the act of weighing goods privately requires little more than a somewhat accurate scale. The act of weighing in a public market, on the other hand, requires instruments of greater precision. More importantly, these instruments must appear standardized and precise in order to maintain trust between exchange partners. They may even show signs of verification by third parties, such as agents of a state authority. By considering the contexts and materiality of acts of measurement using cases from the Old World Bronze and Iron Ages, this study aims at improving our understanding of ancient metrology as well as the public performance of daily ritual.

Schortman, Edward (Kenyon College)

[314] *Through a Smoke Cloud Darkly: The Possible Social Significance of Candeleros in Terminal Classic Naco Valley Society*

Candeleros, fired clay artifacts with one to over 20 chambers, are widely distributed across Terminal Classic (A.D. 800-1000) contexts in the Naco valley of northwestern Honduras. Though reported from other parts of Mesoamerica, little is known about the varied ways this distinctive artifact figured in tasks engaged in by people of diverse ranks and might have been used in negotiating interpersonal transactions. This presentation provides initial responses to these queries based on a functional and distributional analysis of 150 candeleros derived from Terminal Classic contexts at the Naco valley political center of La Sierra. The items in question were retrieved from three residential complexes of varying sizes, levels of complexity, and involvement in different crafts. Patterns identified in the course of this work allow us to assess the extent to which candelero use correlated with socioeconomic status, domestic affiliation, and occupational specialization. As one of the only systematic studies of candeleros conducted in southern Mesoamerica, these analyses offer hypotheses concerning the artifact's social, economic, and political significance that can be evaluated in other settings.

[314] *Chair*

Schortman, Edward [314] see Del Giudice, Caroline

Schott, Amy (University of Arizona, Petrified Forest National Park)

[364] *Understanding Formation Processes of Archaeological Sites in Eolian Settings in the Petrified Forest National Park*

Located on the southern edge of the Tusayan Dune Field in northeastern Arizona, the Petrified Forest National Park contains abundant archaeology sites located in dune settings. Past and recent archaeological survey has shown an apparent correlation between archaeological site locations and eroded dune blowouts. It is likely that sites are located in dune settings due to their favorable environmental setting; however, it is not clear if the apparent distribution of visible sites in relation to eroded dunes relates most closely to cultural behaviors, or is more closely tied to exposure through post-depositional dune movement. This study uses spatial analysis of dune landscapes in several study areas to better understand the formation processes of archaeological sites in these dune environments. The relationship between archaeological site location and geomorphic landforms is explored to determine whether there is a significant correlation between site location and areas with dunes or dune blowouts. In addition, statistical analyses are used to explore whether geomorphic patterning is due to behavioral processes or due to natural processes of erosion and deposition. This is a first step in understanding formation processes, distribution, and visibility of sites in eolian settings in the Petrified Forest National Park.

Schoville, Benjamin (Institute of Human Origins, Arizona State University), Kyle Brown (University of Cape Town) and Jayne Wilkins (University of Cape Town)

[356] *Patterns of Lithic Edge Damage from the Open-air Middle Stone Age Assemblages at Vleesbaai and Oyster Bay, South Africa*

Much of our understanding of the South African Middle Stone Age (MSA) comes from deep sequences recovered from caves and rockshelters. These discreet, enclosed contexts represent one aspect of a foraging continuum; where many other activities take place on the continuous, open landscape. A different suite of taphonomic processes are also more likely to occur on open landscapes, complicating comparisons between site contexts. Developing meaningful inferences regarding past human behaviors requires testing models of both taphonomic and behavioral processes that influence observed archaeological patterning. Here we use assemblage-scale lithic edge damage patterning coupled with tool morphology (shape, size, and edge angle) to analyze two open-air MSA assemblages along the southern coast of South Africa. These assemblages contain components of microlithic, Howiesons Poort-like industries, which are poorly understood from open-air contexts. The archaeological edge damage distributions are compared to a long-term lithic trampling study undertaken over six-months at a small farm in Northern California, a fluvial tumbling experiment, as well as butchery and projectile experiments. We place our results within the context of a Paleoscape foraging system, where caves and open-air sites may represent different aspects of a transport, use, and discard spectrum.

Schoville, Benjamin [356] see Oestmo, Simen

Schrader, Sarah (University of California, Santa Cruz) and Michele Buzon (Purdue University)

[205] *A Bioarchaeological Assessment of Diet and Dental Health During the New Kingdom/Napatan Transition in Ancient Nubia (Tombos, Sudan)*

Nubia, once colonized by the Egyptian Empire during the New Kingdom Period (ca. 1550-1070 B.C.E.), became increasingly independent and powerful with the rise of the Napatan State during the Third Intermediate and Napatan Periods (ca. 1070-664 B.C.E.). This research addresses the social impacts of the New Kingdom/Napatan political and economic transition via the bioarchaeological examination of diet (carbon and nitrogen stable isotope analysis) and dental health (ante-mortem tooth loss, caries). We focus on skeletal remains from the archaeological site of Tombos due to the unique cultural and geopolitical positioning at the Third Cataract of the Nile River, but also make comparisons with other Nubian populations. The assessment of dental health (n=66) suggests a decrease in negative health indicators between the New Kingdom and Napatan Periods, indicating an improvement in overall health. Dietary reconstruction at Tombos is less conclusive; tentatively, the local Tombos diet does not appear to have changed substantially between the two periods (n=11); however, further testing is necessary. In conclusion, the local Tombos population appears to have maintained similar dietary habits and good health during the New Kingdom/Napatan transition.

Schreg, Rainer [93] see Harris, Susan

Schreiner, Thomas (University of California Berkeley), Enrique Hernandez (Mirador Basin Project), David Wahl (USGS) and Richard Hansen (FARES, University of Utah)

[408] *Preclassic Causeways of the Mirador Basin, Guatemala*

A vast system of inter-site highways (sacbes or sacbeob) traversed an inhabited countryside between the major urban centers of the Kan kingdom in the Mirador Basin. Development of this system began during the Middle Preclassic period and continued throughout the Late Preclassic period (ca. 600 B.C.– A.D. 150). Over time, these transportation routes branched and transformed within densely populated centers to become a network of elevated causeways, processional boulevards with ritual and cosmological significance, thoroughfares, and secondary roadways. In addition to transportation, communication, and ceremonial aspects inter-site and intra-site causeways functioned as critical elements of regional and localized water management strategies that integrated with upland terrace and wetland margin agricultural systems. Here we present some results from ongoing mapping and excavations of these impressive features of ancient Maya civilization that were conducted by the Mirador Basin Project during the past two decades of field study.

Schreiner, Thomas [408] see Hernandez, Enrique

Schrenk, Alecia

[299] *Using the Index of Care on a Bronze Age Teenager with Poliomyelitis: From Speculation to Strong Inference*

Bioarchaeology has come a long way in using differential diagnosis, attending to the Osteological Paradox, using biocultural frameworks to integrate different levels of analysis, and developing ways to work with small sample sizes and fragmentary remains. Designed by Lorna Tilley (U. Aukland), the Index of Care offers a new scientifically-based and systematic tool to collect and integrate a range of information on life history, disease processes, and cultural context. This online tool tests hypotheses using multiple lines of evidence with a rigorous four-step process for describing pathologies, determining disabilities, constructing a care model, and examining caregiving implications. In this study the Index of Care is applied to a previously described and published 18-year-old female from the Bronze Age site of Tell Abraq (UAE). The application of this tool provides a much more nuanced and complete interpretation of past pathology and caregiving. This study highlights the usefulness of the Index of Care in using strong inference and hypothesis testing on ancient cases of unusual and extreme diseases.

[299] *Chair*

Schriever, Bernard [274] see Taliaferro, Matthew

Schroder, Whittaker (University of Pennsylvania), Charles Golden (Brandeis University), Andrew K. Scherer (Brown University) and Jeffrey Dobereiner (Harvard University)

[86] *Stop and Go Traffic: Power, Movement, and Emplacement in the Piedras Negras and Yaxchilan Kingdoms*

This paper explores the many sides of the natural and supernatural landscape surrounding the Classic period Maya kingdoms of Piedras Negras and Yaxchilan with a particular focus on how the rulers of these polities struggled with one another for control of movement across the broken terrain of hills, cliffs, valleys, swamps, and rivers that define the Middle Usumacinta River basin. The standard image of a rather homogenous landscape in the Maya lowlands is quickly dispensed with in the Middle Usumacinta, and the challenges of transporting goods and conducting warfare across such a terrain was made all the more difficult by a complex network of defenses that regulated movement. Exploring the archaeological and epigraphic sources from Piedras Negras, Yaxchilan and their surrounding noble courts and hinterland settlements we can begin to envision and experience the dynamic sense of place that was central to the political lives in the Maya west.

Schroeder, Hannes [116] see Fregel, Rosa

Schubert, Ashley (University of Michigan) and Timothy Horsley (Horsley Archaeological Prospection, LLC, Department)

[173] *Determining Village Extent and Layout Utilizing Geophysical Survey and Excavation at the Mississippian Site of Cane River, North Carolina*

Geophysical techniques can help to clarify the extent of a site and show spatial relationships between structures, therefore guiding research and excavation strategies. When monuments and larger structural elements are absent, feature density can be a reliable proxy for occupation areas and village boundaries. Utilizing a combination of magnetometry and ground-penetrating radar survey at the Cane River site in North Carolina, we were able to locate borrow pits, storage pits, structures, and hearth features that are not readily detected using traditional archaeological methods. Subsequent coring and excavations over these geophysical anomalies provided evidence for continuity in village layout and allowed us to sample a variety of feature types, illuminating temporal and spatial patterns in community activities. This research has implications for understanding regional variability in Mississippian community social practices throughout the Appalachian Summit of North Carolina.

Schubert, Blaine W. [370] see Arroyo-Cabrales, Joaquin

Schuldenrein, Joseph [155] see Turck, John

Schulting, Rick, Angela Lieverse (University of Saskatchewan), Vladimir Bazaliiskii (Irkutsk State University) and Andrzej Weber (University of Alberta)

[131] *Interpersonal Violence among the Prehistoric Hunter-Gatherers of Cis-Baikal, Southern Siberia*

The large number of mid-Holocene cemeteries from Lake Baikal and its surrounding river valleys provide an unrivalled archaeological resource for the study of northern Eurasian hunter-gatherers. In this paper we present an overview of the skeletal evidence for interpersonal violence, comparing the Early Neolithic (7550–6800 cal BP) and Late Neolithic/Early Bronze Age (5700–3700 cal BP), two broad periods exhibiting different mortuary traditions and subsistence practices. Despite the nomenclature, which refers to material culture, these societies relied entirely on hunting, gathering, and especially fishing. Evidence for conflict takes the form of cranial trauma and projectile injuries. With the exception of a probable massacre event in the Early Bronze Age at the site of Shamanka II, levels of violence are not particularly high, and likely relate to both occasional disputes within

communities, and to sporadic conflicts between communities. The latter are not unusual among semi-sedentary hunter-gatherers, and could relate to contestations over the control of particularly productive fishing and sealing locations.

[131] *Chair*

Schulting, Rick [378] see Santana Sagredo, Francisca

Schultze, Carol (HRA-Seattle / Collasuyo Archaeological Research Institute (CARI-Peru))

[260] *Macro-Regional Cultural Development of the Interior Columbia Plateau*

Despite a wealth of data and continued opportunities for data collection, the prehistory of the Interior Columbia Plateau of the Northwestern United States continues to be organized and discussed on the basis of a handful of local regional chronologies. Many of those popularly in use were created decades ago and (in spite of a few notable exceptions) there remains a need for the archaeological community to generate a more synthetic chronology. This paper tests the premise that cultural evolutionary and political economy frameworks can be used to organize these regional chronologies into an overarching model for human culture history across the Plateau.

Schulz, Margaret (Colorado State University), Laurie Rush (US Army, Fort Drum, NY) and Duane Quates (US Army, Fort Drum, NY)

[43] *And Then Sometimes, The Public Engages You*

At Fort Drum, our responsiveness to public engagement has been a key element in creating scenarios that have benefited not only the program but the installation and the resource itself. In one example, pressure from Range Control and comments from the public resulted in the conversion of an off limits archaeological district into a training asset and further led to the site's use in global stewardship training. In a second example, a seemingly ordinary visit from a family member of a soldier killed on the installation during a training exercise led to the identification of a potentially National Register eligible site under Criterion A. Data recovery, public involvement, a historic marker and a ceremony were employed as a form of mitigation against the possibility of future development of the area. In both cases, compliance with the law and preservation of sites and the information they hold were coupled with public involvement to create a winning situation for all parties.

Schulze, Niklas [259] see Maldonado, Blanca

Schulze, Niklas (FCSyH-UASLP)

[346] *Copper Bells from the Templo Mayor of Tenochtitlan - Imports or Local Production?*

The studies of the offerings of the Templo Mayor of the late postclassic Aztec capital of Tenochtitlan have shown that these concentrate objects of many different materials, styles and origins. The question of how these objects reached the offerings has probably more than one answer, reflecting the complexity of the postclassic economic system. However, recent research has shown that several artifact groups that were thought to be imports were probably produced in strictly regulated workshops in, or close to, Tenochtitlan. Copper bells are a case in point: the bells - and copper objects in general - were often automatically associated with a West Mexican origin. However, the analysis of the copper bells from the offerings of the Templo Mayor has shown that their morphology and compositional homogeneity seem to indicate an origin from a limited number of workshops. Comparison with bells from collections of other regions of Mesoamerica make it increasingly probable that the Tenochtitlan bells were locally produced, forming part of what is referred to in the context of this session as the Imperial Style.

Schumacher, Michael [29] see Vawser, Anne

Schurr, Mark (University of Notre Dame), Patrick Donohue (University of Notre Dame) and Antonio Simonetti (University of Notre Dame)

[121] *Multi-Element Characterization of Early Nineteenth Century Pottery Sherds from Native*

American and Euro-American Sites

Fine earthenwares imported from England are a distinctive type of artifact frequently found on early nineteenth century Native American and Euro-American sites. Relatively rapid changes in decorative motifs and technologies can easily be identified by eye and provide information about site chronology and economic status. However, visual analyses of sherds usually can usually provide only general information because of the fragmentary nature of most assemblages. For example, transfer printed pottery can be dated and assigned to a specific manufacturer if the pattern name can be identified, but sherds are usually too fragmentary for such identifications. We present data about the chemical composition of sherds from two sites occupied during the first half of the nineteenth century: Pokagon Village, a Native American site (southwestern Michigan); and Collier Lodge, a Euro-American site (northwestern Indiana). Multi-element compositions determined by electron microscopy, micro X-ray fluorescence (μ -XRF), and laser-ablation-inductively coupled mass spectrometry (LA-ICP-MS) show that sherds with the same decorative methods from the two sites have different chemical compositions, indicating that different manufactures produced the pottery, and that manufacturing compositions changed over time. We show that multi-element characterization has the potential to produce new information about manufacturing sources, technology, and dating from very small sherds.

Schurr, Mark [165] see Bush, Dominic

Schwadron, Margo [83] see Doering, Travis

Schwadron, Margo (NPS-Southeast Archeological Center)

[333] *Battling the Rising Sea: Investigation and Protection of Turtle Mound, Castle Windy and Seminole Rest Shell Mound Sites*

Massive shell midden mounds were once common in the Canaveral region, but since the 1880s an estimated 68% of these sites have been destroyed. The shell mounds preserved within Canaveral National Seashore include one of North America's tallest shell mounds (Turtle Mound), one of the last remaining vestiges of an extensive shell mound culture that inhabited the region. Recent investigations of Turtle Mound, Castle Windy and Seminole Rest inform about interactions and influences between people, environment, coastal landscapes, and climate change (past, present and future). Unfortunately, these sites are undergoing severe erosion due to sea-level rise and climate change impacts. The development of a successful program combining ecosystem restoration, living shorelines and soft stabilization techniques to protect sites is presented, recognizing that a key component to this success is youth and civic engagement, and public outreach for community support.

Schwartz, Christopher (Arizona State University), Hannah Zanutto (Arizona State University), Ben Nelson (Arizona State University) and David Abbott (Arizona State University)

[273] *Intersite Difference in Distant Interactions, Hohokam Canal System 2, Phoenix Basin, Arizona*

Material evidence of interaction between prehispanic peoples in the U.S. Southwest and Mesoamerica is first detected ca. 2000 B.C.E. with the introduction of maize, figurines, and ceramics. Such markers of long-distance interaction, including copper bells, scarlet macaws, and other objects and symbols, increase in diversity and abundance in later periods. These objects and symbols moved up to 2000 km by social actions and mechanisms that remain obscure. Although the Hohokam had the strongest ties to Mesoamerica of any region in the U.S. Southwest, more could be done to examine local variation in that interaction. Also unclear is what role such distantly acquired objects might have played in water control practices. For example, were sites located near headgates more engaged in distant acquisitions than other sites in the canal systems? Scholars believe that these canal systems constituted relational communities. In this study we evaluate whether villages within Phoenix Basin Canal System 2, including the well-documented sites Pueblo Grande and Las Colinas, were differentially involved in distant interactions and how their involvement changed over time. This analysis of the distribution of interaction markers within a canal system

provides evidence about how individual sites and actors were differentially engaged with distant partners in Mesoamerica.

Schwarz, Kevin (ASC Group, Inc.)

- [183]** *Censer Fragmentation and Life History: Rural Domestic Settlement Enchainment and Accumulation Activities and the Classic-Postclassic Transition of the Petén Lakes Region, Guatemala*

Fragmentation theory is premised on the notion that actors purposefully broke valued goods, deposited fragments of them in meaningful places, and enchainment other social beings in relationships with gifts and exchange of them. They also accumulated whole objects in caches. This presentation examines the fragmentation premise for censers and non-slipped utilitarian ceramics in and around architectural spaces at the Quexil Islands, Guatemala. The site is a Terminal Classic-Late Postclassic Maya settlement in the Petén Department. The Classic-Postclassic transition features a transformation in architecture and social use of space in rural settlements and the use, taphonomy and life histories of these ceramics appear to shift as well. Whereas in the Late Classic period, the rural Maya were part of hierarchical society and their use of architecture and ceramic media reflected that hierarchy, in the Postclassic period there emerged a different pattern. Small, seemingly rural settlements, such as the Quexil Islands, had the ability to conduct censer ritual in the Postclassic. An epicentral ceremonial architectural pattern has substantial censer deposits, while a peripheral pattern of small censer fragments and other non-slipped ceramics predominates in residential contexts. The presentation concludes by considering evidence of up-network and down-network enchainment and accumulation activities.

Schwendler, Rebecca (PaleoWest Archaeology)

- [395]** *A Re-examination of Magdalenian Social Organization Ten Years Later*

A decade ago this author completed a synthesis of information about the circulation of exotic lithic raw materials, items of personal ornamentation, and portable decorated objects across western Europe during the Magdalenian ca. 17,000 to 12,000 B.P. Tests of hypotheses about the relationship between population density and visual display suggested that population density was probably not the sole driving force behind the types and intensities of visual displays used by generations of Magdalenian people. Rather, the unique social dynamics surrounding human colonization of new areas likely played a key role in people's choices about the kinds of materials and decorative forms they used. Furthermore, differences in social organization—specifically degrees of enforcement of social equality—probably contributed to the regionally and temporally diverse patterns of visual displays seen in the archaeological record. This paper uses information gleaned from the last 10 years of Magdalenian research to re-examine the author's original interpretations of Magdalenian social organization. By reflecting on how our understanding of Magdalenian lifeways has and has not changed over the last decade, we can identify vital future directions of investigation.

Schwert, Donald [260] see Radermacher, Matthew

Schyle, Daniel [64] see Olszewski, Deborah

Scott, George (University of Nevada Reno) and Roman Schomberg (University of Nevada Reno)

- [87]** *Sinodonty and/or Sundadonty: Revisiting the Three-Wave Model for the Peopling of the Americas*

Starting with a single root trait, C.G. Turner II developed a model for the peopling of the Americas that involved three migratory waves: (1) Amerind; (2) Na-Dene/Northwest Coast; and (3) Eskimo-Aleut. After expanding to 29 variables, he found the same general pattern and contended that all New World populations were derived from Sinodont groups in Northeast Asia. Recently, researchers have challenged the three-wave model on genetic, archaeological, and dental grounds, including the notion that some groups are derived from Sundadonts (Southeast Asians) rather than Sinodonts (Northeast Asians). To reevaluate the three-wave model and Sinodont origins of New World groups,

23 crown and root traits were analyzed in 31 large samples, including Southeast Asians (4), Australians (4), Northeast Asians (4), North American Indians (4), South American Indians (5), Mesoamericans (2), Na-Dene/Northwest Coast (4), and Eskimo-Aleuts (4). Unrooted neighbor-joining trees and ordinations exhibit the same pattern. At the two extremes are Australians and Native Americans. Southeast and East Asians fall between the extremes with Southeast Asians closer to Australians and East Asians closer to Native Americans. This analysis reveals no hint of Sundadont ancestry in Native Americans and supports the notion that the New World was peopled in three major waves.

Scott, David [121] see Warmlander, Sebastian

Scott, Elizabeth (Illinois State University/Illinois State Museum)

[154] *Consuming the French New World*

All of France's New World colonies were based on relationships with particular geographies, from eastern New France, to the western Great Lakes, to the Illinois Country, to Lower Louisiana, and to the Caribbean, according to the particular products and resources desired by the Crown, which may be thought of as the ultimate "consumer" of French colonial landscapes. Colonists and French descendant communities engaged with these different landscapes for both commercial and family subsistence purposes. Obtaining, producing, and moving such resources as furs, wheat and flour, hams, bear oil, salt, and sugar required a variety of social networks and power relationships among Europeans, Native Americans, and Africans. The cultural landscape of house lots, towns, agricultural lots, shipping routes, and resource procurement sites reflect how people perceived and interacted with the land and each other. Food traditions brought from France combined with local food resources in each region to produce foodways that reflected a particular colonial engagement with the landscape. Even with such differences, however, foodways were also similar among French communities, especially when compared to British and Anglo-American foodways in the same locations. This paper draws on zooarchaeological, archaeobotanical, ceramic, and archival data to address these topics.

Scott, Lindsay (Department of Anthropology, The University of Montana, Missoula MT), Anna Marie Prentiss (Department of Anthropology, The University of Mont) and Matthew J. Walsh (Department of Anthropology, The University of Mont)

[228] *Macroevolutionary Archaeology in 2015: Testing Historical and Evolutionary Hypotheses, for Example, about Arctic Migration Pulses*

Macroevolutionary archaeology seeks to examine cultural evolutionary processes at multiple hierarchical scales spanning artifact technology to economic, social, and political strategies. This approach offers the opportunity for scholars to test general hypotheses about tempo and mode of evolutionary change and it also lends itself to the development of formal tests of general hypotheses about human history in the longue durée. In this paper we present a review of current research in macroevolutionary archaeology and follow with a case study testing the independent (Paleoeskimo and Neoeskimo) arctic pulses hypothesis using archaeological data. It provides an opportunity to discuss the challenges and prospects of this research strategy. It also permits us to engage in a rigorous examination of a major hypothesis regarding human cultural and biological history, so far only rigorously tested using genetic data. Our approach incorporates a variety of phylogenetic and network models to assess potential cultural factors associated with arctic migrations during the past 5500 years. We seek to offer implications for understanding arctic migrations as case studies in cultural macroevolutionary process.

Scott, Sara (Montana State Parks)

[300] *Deciphering WPA Archaeology on the Northwestern Plains: Another Look at the Cultural Chronology of Pictograph Cave*

Pictograph Cave (24YL0001) located in south-central Montana was excavated by Works Progress Administration (WPA) crews between 1937 and 1941. Excavations extended to depths of 23 feet, yet no radiocarbon dates for the site were available until recently. Efforts to re-catalog and process the

artifact collection to professional standards were undertaken along with the creation of three-dimensional models of the excavations rendered from WPA stratigraphy maps. Newly created databases allowed for artifacts from the cave's lower levels to be easily identified and subsequently submitted for radiocarbon analyses providing chronometric dates for the sequence of human occupation in the cave. This paper discusses the results of radiocarbon dating analyses which indicate the earliest occupation of Pictograph Cave dates to the late Middle Archaic period, conflicting with the much earlier chronological sequence developed by William Mulloy in 1958. The cave's location on the landscape and its proximity to major travel routes along the Yellowstone River are also examined.

Scott, Rachel (DePaul University) and Finola O'Carroll (Irish Archaeology Field School)

[332] *Catholic Burial as Native Resistance in Post-Dissolution Ireland*

The Dominican friary in Trim, County Meath, Ireland, was founded in A.D. 1263 by Geoffrey de Geneville, Lord of Trim. An important religious center, the Black Friary was used for burial during the late Middle Ages both by the Dominican friars and by lay individuals living around the town. In 1540, as part of the dissolution of the monasteries, the commissioners of King Henry VIII suppressed the friary and sold its lands, buildings, and goods. However, although the site no longer possessed formal religious status, local Catholics still believed it to be holy ground and continued to inter their dead within the church and cemetery. In this paper, we consider the practice of post-Dissolution burial at the Black Friary, arguing that it not only reflected the deep attachment of the Catholic population to ancestral burial places but also constituted a form of native resistance to the imposition of English government and Protestant religion. Indeed, the right to burial in holy ground with appropriate funerary rituals later became a touchstone for Irish nationalism in the 18th and 19th centuries. The evidence for resistance at the Black Friary and similar sites thus foreshadows the contentious political and religious landscape of modern Ireland.

[332] *Chair*

Scott Cummings, Linda [62] see Varney, R.

Scott Cummings, Linda (PaleoResearch Institute, Inc.)

[186] *Tracing Zea mays through the Americas Using Maize Cob Phytoliths*

Dolores Piperno has addressed the origins of maize agriculture in the Americas through examination of samples from MesoAmerica. Ultimately, maize diffused throughout the world. Prior to globalization, maize spread throughout the Americas. Zea mays is represented by over 100 races in North America alone. My work has focused on the spread of maize agriculture, rather than its origins. Identifying races of maize is a daunting task for any region of the Americas. The most informative remains for this task, beyond ancient DNA, are phytoliths. Extracting phytoliths from cobs provides a record free of contamination by phytoliths of other origin. Measuring individual phytoliths to obtain population averages uses computer-assisted morphometrics to establish signatures for maize races that may they be traced through time and space. Statistical comparison of signatures obtained for existing races with signatures from archaeological samples first associates the archaeological signatures with those from existing races. Archaeological signatures then are placed geographically and back through time, suggesting contact between peoples and/or movement of people across the landscape. The results of statistical analysis suggest associations of existing races with archaeological assemblages. This association suggests our ability to assign race names to statistically similar races from the archaeological record.

[309] *Discussant*

Scott-Ireton, Della (Florida Public Archaeology Network) and Jennifer McKinnon (East Carolina University)

[72] *Diving to a Flash of Education: Archaeological Tourism at Maritime Sites*

Underwater archaeological sites around the world draw thousands of diving tourists lured by the

excitement of shipwrecks and the beauty of the marine environment. Through scientific research and beguiling information, archaeologists have the opportunity to educate these visitors about the history of the sites and, perhaps more importantly, about the need for preservation. Effective interpretation leads to appreciation of submerged cultural sites as links to our past, rather than simply as mines of "treasure" to be salvaged for personal gain. This paper describes a variety of interpreted maritime sites to show how archaeological tourism results in changed mindsets, engaged emotions, and informed visitors.

Scott-Ireton, Della [261] see Lees, William

Scribner, Zach [362] see Adams, Jesse

Seaberg-Wood, Forest [30] see Hoffman, Brian

Seager-Boss, Fran, Alfred Theodore (Knik Tribal Council), Kathryn Krasinski (Matanuska-Susitna Borough and Fordham University), Brian Wygal (Adelphi University) and Richard Martin (Knik Tribal Council)

[72] *Public Archaeology at Cottonwood Creek*

In Southcentral Alaska, Matanuska-Susitna Borough is among the Nation's most rapidly growing regions. At the cost of losing indigenous archaeological settlements, subdivision activities have mushroomed in response to increased population. Collaboration with the Knik Native Dena'ina Tribe is tantamount to saving numerous proto-historic settlements where inland rivers confluence with Knik Arm in Upper Cook Inlet. Working with the State and Knikatu Tribal Corporation, who own sites adjacent to Cottonwood Creek above Knik Arm, the borough is listing them in the National Register of Historic Places as an archaeological district. Long abandoned, the sites hold a key to ancestral living patterns for today's Native Dena'ina community. Archaeological surveys of the district resulted in discovering 14 semi-subterranean houses and 333 cache features. Members of Knik Tribe have been integral in locating, describing, and interpreting cultural features in addition to sharing information on their ancestral life-styles with school groups. The district designation will enhance current outreach educational plans the Knik Tribe is developing for youth and adults, including participation in excavations, conducting ceremonies, demonstrating fish harvesting and native plant use, and erecting interpretive signs. This presentation provides an overview of the collaboration between archaeologists and a Native Alaskan community.

[223] *Discussant*

Seager-Boss, Fran [302] see Martin, Richard

Seale, Heather [144] see Leon Estrada, Xochitl

Sealy, Judith (University of Cape Town), Navashni Naidoo (University of Cape Town), Julia Lee-Thorp (Oxford University), Emma Loftus (Oxford University) and Tyler Faith (University of Queensland)

[294] *Stable Carbon and Oxygen Isotopes in Faunal Tooth Enamel from Boomplaas and Nelson Bay Cave Record Late Pleistocene/Holocene Environments in the southern Cape, South Africa*

The Pleistocene paleoclimates and paleoenvironments of southernmost Africa are important in both global climate studies and studies of human evolution, but remain poorly documented through time and space. In order to contribute to this project, we have analyzed $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ in approximately 350 samples of faunal tooth enamel from Boomplaas Cave and Nelson Bay Cave, in the southern Cape, South Africa. The Boomplaas samples span the last ca. 70 kya, and show fluctuations in $\delta^{13}\text{C}$ indicating C3-dominated vegetation ca. 65 kya, between 26-20 kya and in the early Holocene. C4 grasses are markedly more common during the warm interval ~ 36-38 kya, corresponding to Antarctic Isotope Maximum 8, and between 18-14 kya. The Last Glacial Maximum shows a strongly

C3 signal, confirming the pattern in the nearby Cango speleothem. The faunal record from Nelson Bay Cave extends back only as far as OIS 2, but there is less variation in $\delta^{13}\text{C}$ through the sequence, indicating a mixture of C3 and C4 grasses from the LGM through to the Holocene. Comparison of records from multiple sites will help us to understand the extent to which patterns are regional or local, and perhaps shed light on the dynamics of climate systems.

Sealy, Judith C. [372] see Pfeiffer, Susan

Searcy, Michael [245] see Pitezal, Todd

Searcy, Michael (Brigham Young University)

[409] *Navigating the FAA's Turbulent Airspace in the United States Regarding UAVs*

There has been a significant increase in the use of UAVs throughout the world to aid in archaeological investigations. Unfortunately the current U.S. Federal Aviation Administration has enforced strict policies that prohibit most institutions and private firms to use these aerial vehicles. As a result archaeologists in the United States are falling behind in implementing an important tool in archaeological reconnaissance. This paper outlines the progress made thus far by the FAA to reform these regulations.

[409] *Chair*

Sears, Erin [86] see Bishop, Ronald

Sears, Erin (University of Kentucky)

[193] *Willfully Obscured: Figurines and Caves in the Maya Late Classic Period*

As both space and material are used to create interpretations or infer ancient ritual meanings concerning the Late Classic Maya, the consideration of caves and ceramic figurines provide interesting comparators as they evoke restrictions of intent and imagery within a regional setting. Opportunistic sampling of figurines from cave contexts for compositional analysis has resulted in chemically-based patterns from which one can glimpse directional patterns of movement from resource area to recovery context. The compositional data for the figurines obtained through neutron activation is interpreted with a perspective obtained through decades of similar analyses of ceramics from both lowland and highland Maya sites. This presentation provides variably robust vignettes involving figurines in caves, with specific reference along the Pasión river system, that contain aspects of both local performance and assumed trade.

Sebastian Dring, Katherine [34] see Silliman, Stephen

Sebillaud, Pauline [49] see Tang, Zhuowei

Sechrist, Laura [394] see White, Carolyn

Sedig, Jakob (University of Colorado)

[262] *Reevaluating Mimbres Late Pithouse to Classic Period Transformations of the Upper Gila*

Professional archaeological research has been conducted in southwest New Mexico's upper Gila valley since at least 1929, when Burt and Hattie Cosgrove completed a survey of archaeological sites. Projects of various scales have been carried out periodically since then, however minimal research has occurred at Woodrow Ruin, one of the region's largest sites. This paper presents new information from my recent dissertation research at Woodrow Ruin that is helping to redefine the Late Pithouse-Classic period occupation of the upper Gila. While Woodrow Ruin was previously noted for the number of surface Classic period rooms, it now seems that Woodrow Ruin also had a substantial Late Pithouse occupation, and was likely the hub of the upper Gila during the Late Pithouse and into the Classic. Analyses of artifacts from the site, particularly a ceramic NAA study,

have helped to demonstrate how trade and interaction changed through time in the upper Gila. New data have also demonstrated that Woodrow's influence in the upper Gila continued into the 11th century, although social organization changed substantially between the Late Pithouse and Classic periods.

Sedov, Sergey [141] see Ibarra, Georgina

Seebach, John (Colorado Mesa University)

[148] *Folsom Toolkit Replenishment at Chispa Creek, Texas: Comparing Bifacial to Unifacial Technologies*

Folsom technology has been characterized by Ingbar and others as employing a "serial replacement" strategy, where toolkits are replenished on a more or less continuous basis based on the proximate taskscape. Such replenishment is in evidence at Chispa Creek, a west Texas lithic workshop repeatedly occupied by Folsom foragers. Similar to Hanson, Wyoming, at least three local toolstone sources were used at Chispa to manufacture projectile points and a large number of unifaces. These occupations also saw a small number of depleted non-local tools left on site. Analyses of raw material use for both bifacial and unifacial tools, when compared to the size and state of tools at discard, illuminate the technological decisions being made at Chispa Creek, and allow us to test whether all components of the Folsom toolkit are serially replaced or whether such replenishment is related more to weaponry.

Seetah, Krish [116] see Fregel, Rosa

Seetah, Krish (Stanford University)

[116] *Objects Past, Objects Present: Materials, Resistance and Memory from the Le Morne Old Cemetery, Mauritius*

This presentation centers on two distinct material assemblages, both representing resistance, but in markedly different ways and at different times. It also introduces a new regional comparative of African religious syncretism, longanis, a belief system that developed within slave communities, and offers both insightful similarities to Atlantic counterparts, as well a unique features in its own right. The article, undertaking a first such appraisal for the Indian Ocean, applies an archaeological viewpoint to African burial and African belief practice, to both ancient and modern assemblages, in order to better assess the role that materials have played in serving as proxies for African toolkits and memory.

Segal, Irina [64] see Ekshtain, Ravid

Segura-Llanos, Rafael [155] see Bettencourt, Nichole

Seidemann, Ryan (Louisiana Department of Justice) and Christine Halling (Louisiana Department of Justice)

[19] *The Forensics of Commodification: Examples from Louisiana of the Acquisition, Analysis, and Legal Problems Related to Trophy Skulls Seized from Illegal Sales*

Since the inception of the Louisiana Department of Justice's human remains acquisition program in 2007, two Tibetan kapalas have been recovered from illegal sales. This commodification of human remains constitutes technical violations of the law, but the nature of the remains makes for an awkward fit to the existing laws. The forensic, bioarchaeological, and cultural analysis of these remains are difficult due to their altered nature, leading to problems of disposition. Questions inherent in the disposition of these remains include: have these human remains been ritually transformed into religious relics to which the law forbidding remains trafficking no longer applies? If such law does apply, what is a proper disposition of such remains? These questions and a review of the two acquired specimens are the subject of this presentation.

Seidemann, Ryan [220] see Halling, Christine

Seidensticker, Susanna [169] see Bongers, Jacob

Seinfeld, Daniel [8] see Nowak, Jesse

Sejas Portillo, Alejandra (University of Pittsburgh)

[250] *Primary and Secondary Chiefdom Emergence: A Comparative View from the Titicaca Basin*

The main hypotheses that explain the collapse of the Tiwanaku state, which flourished between A.D. 400 and 1250 in the Titicaca Basin, refer to the internal factional competition that destabilized its governance over the years, summed to agricultural production decline caused by drought episodes in the region. It is of great interest to compare the processes of political reconfiguration and the emergence of the post-Tiwanaku Pacajes chiefly polities with the formation of “primary” chiefdoms in this part of the Titicaca Basin. The aim of this poster is to assess this comparison through the study of the supra-local community scale, supra-local community centralization, demographic density, public works investment, and conflict, observing the trajectory of the polities from the Formative Period (1500 B.C.-A.D. 800), to the Late Intermediate Period (A.D. 1150 -1470).

Šejnohová, Marie [12] see Láznicková-Galetová, Martina

Sekedat, Bradley (UC Davis)

[398] *Craft, Industry, and Landscape, in the Roman Imperial Marble Trade*

This paper provides an introduction to the session and its associated topics, while also presenting a case study of marble quarries in the Roman empire. Long regarded as an example of imperial power shaping craft production in provincial settings, the case study presented here explores these political and social relationships as located practices that play out in a landscape context. The dynamic interplay between local environmental conditions, existing social practices, and political power demonstrates a marked influence on the creation of a coordinated imperial industry – the Roman marble trade. The development of an imperial craft or industry runs alongside substantial changes to settlement dynamics and changes to the very landscape itself. These changes to industrial landscapes and to the coordination of skilled and unskilled labor, however, operate in a fashion dissimilar to how other parts of the Roman provinces were incorporated into the imperial polity, while also demonstrating variability between stone-working sites. This paper therefore explores the influence of landscape and social context on the form of imperial craft production.

[398] *Chair*

Selden, Robert (Stephen F. Austin State University), Timothy Campbell (Texas A&M University), Suzanne Eckert (University of Arizona), Michael O'Brien (University of Missouri) and Mara Vasconcelos (Universidade Federal da Bahia)

[124] *Geometric Morphometrics & Elliptic Fourier Analysis of 3D Ceramic Data*

We demonstrate two quantitative methods for potential inter- and intra-group comparisons of archaeological ceramics. For 3D morphometrics, we define a single stable landmark that is consistent throughout our ceramic data, and employ opposing curves populated by semi-landmarks to capitalize on the shape variation that occurs in coil-built ceramics. Eight such curves are used to capture four complete profiles. The landmark data are then subjected to generalized Procrustes analysis (GPA) and principal components analysis (PCA). Additionally, we conduct an Elliptic Fourier Analysis (EFA) of 2D profiles produced from 3D scans of the vessels, decomposing outlines into a series of size invariant harmonics (shape variables). Results are paired with additional qualitative attributes (temper, firing, decoration, etc.) to better characterize the range of variation that occurs throughout the dataset. Ultimately, data such as these can be analyzed in terms of both temporal and spatial dynamics as a means of exploring various social behaviors.

Seligson, Kenneth, Tomás Gallareta Negrón (INAH, Universidad Autónoma Regional de Yucatán) and Rossana May Ciau (INAH)

[399] *Ring Structures and Lime Production at the Ancient Maya Site of Kiuic*

Powdered lime was one of the most important materials produced and utilized by the ancient Maya. It was a key ingredient in the mortar used to construct monumental edifices and residential structures, as well as in the lime plaster that coated the facades, floors and interior walls of these structures. Lime was even crucial for maintaining a viable maize-based diet through the nixtamalization process. By soaking maize in lime-infused water the ancient peoples of Mesoamerica not only softened the kernels for grinding but also unlocked the essential nutrient niacin for uptake into the body. Despite the obvious importance of lime to daily life in the ancient Maya world, there remains a relative lack of evidence concerning the ancient methods for producing this crucial material. Recent investigations of ring-like kiln structures in and around the ancient site of Kiuic in the Puuc region of the Yucatan peninsula contribute new evidence to the study of ancient lime production. This paper presents the preliminary results of the latest fieldwork at Kiuic and discusses the importance of the lime industry with regard to the local economy and resource management leading up through the peak of Terminal Classic Puuc society.

[399] *Chair*

Sellami, Farid [181] see Lejay, Mathieu

Sellen, Adam (Universidad Nacional Autónoma de México)

[58] *Using X-radiography to Reveal an Ancient Zapotec Urn*

Since the inception of thermoluminescence dating we have known that a significant number of Zapotec effigy vessels in museum collections are fakes, manufactured sometime in the early twentieth century. Some of these forgeries are composites that combine ancient and recent materials, but it is not clear how they were assembled, or how a conservator could restore such an object. In order to fully understand how these composites were manufactured and in what way they differ from ancient ceramics, we used X-radiography to analyze composites, fakes and ancient artifacts in a collection at the Royal Ontario Museum, in Toronto, Canada. Part of a broader study, we hope to find out more about the nature and origin of these creations from Oaxaca, products of a clandestine industry that has injected great quantities of fakes into the world market.

Sellet, Frederic (University of Kansas)

[148] *Discussant*

Sellier, Pascal [207] see Bruzek, Jaroslav

Semon, Anna (University of North Carolina) and Victor Thompson (University of Georgia)

[178] *David Hurst Thomas and the Guale Problem: Rethinking Late Prehistoric Mobility along the Georgia Sea Islands*

In his research along the Georgia Coast, David Hurst Thomas identified the "Guale problem" as one of the key issues for late prehistoric research in the region. The problem centers on the relative degree of Guale mobility and subsistence during the pre- and postcontact eras. One view is that these were highly mobile, moving seasonally as they exhausted resources. Alternatively, others posit a more sedentary existence where the rich estuarine environment supplemented by maize agriculture supported large relatively stable year-round villages. Here, we provide a retrospective on the contributions that Thomas and colleagues have made in resolving issues related to Guale mobility. As a rejoinder, we explore contemporary research on the issue and provide commentary on what exactly we know and future avenues of inquiry regarding late prehistoric mobility and village life along the Georgia Coast.

Seong, Chuntaek [80] see Choi, Seonho

Seong, Chuntaek (Kyung Hee University) and Jae Hoon Hwang (Seoul National University)**[80]** *Late Neolithic to Early Bronze Age Transition in Korea: Implications from the Evaluation of Radiocarbon Dates*

The present study attempts to reconsider the late Neolithic and early Bronze Age transition in central Korea based on evaluation of available radiocarbon dates. Issues regarding reliability of the radiometric dating and its implications on the reconstruction of occupational density are addressed along with methods of evaluating a large set of radiocarbon dates falling between 2000 B.C. and 1000 B.C. This in turn provides a basis for testing common assumptions of the transitional period in Korea. First, the current data suggest a significant drop of available radiocarbon dates during the final Neolithic and toward the Bronze Age, 2000 to 1500 B.C. Second, the number of available radiocarbon dates began to rebound from 1500 B.C., and there is a remarkable increase toward 1000 B.C. The sharp increase of the radiocarbon dates, archaeological sites and occupations during the early Bronze Age may be compatible with an assumption of a series of migrations from the north. We also attempt to test the sequential chronology of early Bronze Age assemblage types and present coexistence of different cultures in the central Korean Peninsula.

Sereno-Urbe, Juan and Mario Córdova Tello (INAH Morelos)**[249]** *Archaeological Project Amacuzac, Morelos and Guerrero Mexico*

In this poster, we present the results of the work carried out in the Mexican State of Morelos, which serves as a basis for the study of a wider region along the Guerrero-Morelos frontier. Since 2003 the archaeological project of Chimalacatlán has researched the southern section of the state of Morelos, in the region known as the Huautla highlands. The archaeological importance of the area was demonstrated by the work Florencia Müller in 1943. Our project first focused on the conservation of various architectural structures within the site, especially buildings that were heavily damaged. Then, we conducted intensive surveys to record all the archaeologically significant architectural elements found in the greater region, and many more sites were discovered around Chimalacatlán. Therefore, we think that it is imperative to extend the study region between the states of Morelos and Guerrero, to continue with surveys and follow-up excavations of the different sites established all along the river Amacuzac, the actual frontier between Morelos and Guerrero. Doing so we will be able to develop a better archaeologically understanding a wider region.

Serra Puche, Mari Carmen (IIA-UNAM)**[153]** *Ethnoarchaeology of Productive Activities Xochitecatl-Cacaxtla*

The archaeological site Xochitecatl-Cacaxtla gave ample evidence of productive activities in different residential areas of the settlement. The research has been enriched with ethnoarchaeological studies we have conducted on the current production of handmade ceramics, textiles, lapidary and mezcal in the communities of the region of Tlaxcala. This diversity of productive activities allows us to create a map of the "city" of Xochitecatl-Cacaxtla distinguishing areas specializing in the production of consumer goods and trade.

Serrudo, Eberth, Lawrence Coben and Erika Cabello**[134]** *The Inca Incorporation of the Canete Valley, Part 2: Strategies and Responses, Excavations at Huaca Daris*

Field research by the Canete Archaeological Project (CAP) has begun to unveil rich data regarding the Inca incorporation of the Middle and Lower Canete Valley. Utilizing both systematic survey and excavations, our work suggests a complex but intensive interaction between the Inca and those who occupied the valley before them. In this paper, we begin to tease out the imperial strategies of incorporation and local responses to them.

Serrudo T., Eberth [134] see Coben, Lawrence

Sevara, Christopher (VIAS, University of Vienna) and Brenda Baker (Arizona State University)

[240] *Death from Above: Using Remote Sensing Data to Examine Mortuary Landscapes along the Nile 4th Cataract*

The Bioarchaeology of Nubia Expedition project area stretches for over 30 kilometers along the right bank of the Nile in northern Sudan, from the modern village of Abu Tin at the top of the Great Bend west to the area across from Shemkhiya. Many of the numerous archaeological resources located within the concession have principal funerary components from multiple time periods, and their placement in the landscape with regard to specific topographic and environmental features is difficult to ignore. We use a combination of 2- and 3-dimensional historic and modern remote sensing data combined with in-field survey and excavation results to examine issues such as topographic prominence, intervisibility, and other spatial and contextual relationships between archaeological objects and the natural environment in our study area. Combined with a GIS-based, broad-brush style interpretation of modern land use based on historic landscape characterization approaches, these methods allow us to begin situating funerary monuments in the wider context of the landscape. This work, in turn, helps us understand archaeological resources in the region as interconnected components of a larger cultural dynamic with complex relationships to people and the environment in both the present and the past.

Sever, Thomas L. [199] see Sever, Thomas

Sever, Thomas (U. of Alabama, Huntsville), Thomas L. Sever (University of Alabama, Huntsville) and Robert Griffin (University of Alabama, Huntsville)

[199] *A Satellite-Based Perspective on Ancient Climate in Tropical and Desert Regions*

This research documents the effects of human activity upon tropical forests and desert landscapes. The investigation uses both satellite and airborne imagery to understand the dynamics of human adaptation and interaction upon these landscapes, and the role of natural and human-induced past and present changes to climate variability. These two subjects are highly interrelated since human-induced landscape changes can have strong impacts on climate, while natural climate variability can in turn exert strong pressures on the landscape, potentially exacerbating human-induced effects. Special emphasis will be placed upon the Maya lowlands of northern Guatemala and Belize, areas that are threatened by current deforestation and land use changes. It was in this region that the ancient Maya civilization began, flourished, and abruptly disappeared beginning around A.D. 800. Preliminary research suggests that the destruction of the landscape by human activity contributed to this collapse. These satellite-based techniques are also being applied to the northern desert of Peru.

Seyler, Samantha (New College of Florida)

[208] *Belt-Making Traditions and Identity at the Site of Uraca, Majes Valley, Peru*

This poster examines belt fragments recovered from the mortuary site of Uraca in the Majes Valley, Arequipa, Peru. The textiles utilized in this analysis were recovered during excavations in Sector I to the south, where interments were placed on a high bluff, and Sector II to the north, where interments were placed closer to the valley bottom. These sectors are not only defined by their geographical separation but also the variation in artifact and skeletal assemblages present between the two sectors, though presently it is not known if these variations are due to temporal or cultural differences. Through the analysis of technical attributes and design motifs of belts from both sectors, I define the tradition of belt-making that is represented at the site of Uraca and compare it to other textile traditions in the Majes Valley. These considerations are expected to provide information about whether the populations buried at this site are local or representative of people from different regions, as postulated in studies by other investigators working at Uraca. I examine the development of weaving practices in the Majes Valley and explore what they suggest about the dynamics between local groups and the Wari during the Middle Horizon.

Sgarlata, Cosimo (Western Connecticut State University)

[171] *What Goes Up Must Come Down: The Contribution of Upland Archaeology in Connecticut's Trap-Rock Ridges to Late Archaic Cultural Prehistory*

This research involved survey of West Rock Ridge, one of many Triassic "trap-rock" ridges in

Connecticut's Central Valley. These very rugged Triassic landforms are made entirely of basalt or diabase and rise like long linear spines above Connecticut's otherwise level and fertile Central Valley. The question of the research was whether data from this new and untested setting could contribute new insights into Prehistory of South Central Connecticut. Lithic analysis of numerous Late Archaic sites indicated not only intensive utilization, but also a wide variety of site types including ambush hunting, lookouts, seasonal camps and quarrying. Sources of lithic raw material included quartz, hornfels, and basalt from the ridges, but also a previously unknown high quality chalcedony originating from the geological processes which from which the ridges formed. Both the intensity and variety of Late Archaic occupation, in the absence of significant information from other cultural periods, accords well with a model postulating intensification of land use along with incorporation of more marginal environments; in coincidence with increasing population density for Late Archaic foragers, and packing of local territorial groups.

Sgouros, Rebecca [362] see Stirn, Matthew

Shackley, M. (UC, Berkeley) and Leah Morgan (Scottish Universities Environmental Research Centre)

[91] *Elemental and Isotopic Variability in Mogollon-Datil Province Archaeological Obsidian, Western New Mexico*

The Mogollon-Datil Volcanic Province in western New Mexico has been a subject of geological and geoarchaeological research for over three decades. These Tertiary Period major events incorporated significant areas of crust over tens of thousands of km² and the rhyolite glass produced from these events are consequently similar in elemental composition even though the five major sources are isolated over a 100 linear km radius, and cross a number of cultural territorial boundaries in the late prehistoric period. The obsidian sources are also archaeologically significant in that they were used throughout the chronology from Paleoindian through Historic times (ca. 13,000 ka to ≈A.D. 1600), and transported throughout the North American Southwest. The need to discriminate between these sources is crucial to archaeological interpretation. The elemental composition using mainly laboratory x-ray fluorescence spectrometry (XRF) is so similar between these sources, and the number of cultural territories throughout prehistory is so extensive that extreme care in source assignment is required. An isotopic and ⁴⁰Ar/³⁹Ar dating program was employed to provide discriminating clarity with good results. The isotopic and ⁴⁰Ar/³⁹Ar data do indicate that these sources are distinct, and using these results, a strategy for discriminating sources was devised using laboratory XRF.

Shafer, Harry J. [292] see Hester, Thomas

Shaffer Foster, Jennifer (University at Buffalo) and T.L. Thurston (University at Buffalo)

[63] *The Trip of a Lifetime: Archaeology, Tourism, and Irish-American Identity*

In America, millions of people claim Irish ancestry and celebrate their heritage in myriad ways. Many actively embrace the identity of Irish-American generations after their family members became U.S. citizens in the aftermath of the famine and socio-political turmoil of the mid-19th to early 20th century. Over the past two decades, the tourism industry in Ireland has flourished with Americans among the most numerous visitors each year. Several of the top destinations are those connected to the famine and ensuing Irish diaspora, events which continue to play crucial roles in the creation of Irish-American identity. Within Ireland, the era of the famine has seen relatively little archaeological excavation and analysis in part due to 20th century distaste for colonial topics. Irish national identity, in contrast, draws heavily from the Early Medieval period and the Iron Age, which have seen tremendous archaeological work and historical study. Thus, in archaeology and in the perceptions of identity, the time of the famine is somewhat disconnected from the rest of Irish history and prehistory. This paper examines the role of archaeology, nationalism, and tourism in the construction of Irish and Irish-American identity.

[63] *Chair*

Shahbazkhani, Desiree [358] see Sakai, Sachiko

Shakour, Katherine (Cultural Landscapes of the Irish Coast)

[405] *Sharing the Teapot and the Science: Challenges and Contributions in Shaping 21st Century Island Heritage in Ireland*

Crucial to heritage management in the 21st century is developing and maintaining cooperative relationships among archaeologists, the local community and decent communities. Different stakeholders have varied views of how to define the past, the cultural and historical relevance of people, places and objects and the extent to which this should be shared when creating multivocal histories. Focusing on the islands of Inishark and Inishbofin, Co. Galway, Ireland, located five miles into the Atlantic Ocean, the Cultural Landscape of the Irish Coast (CLIC) project provides an example of the active involvement of local descendant communities, and how this results in complex and sometimes contrasting bodies of knowledge. This project illustrates the collaborative yet challenging relationship between professional archaeologists, community members, local governmental agencies and the National Museum, all the while trying to understand daily life in post-18th century fishing villages. The combination of archaeological research with local histories produces a complex weaving of different knowledge universes, and results in a richer and more complex understanding of the past. This project also illustrates some of the challenges in managing heritage resources, including contested views of authority at different scales, long term research goals, and who has authority to speak about the past.

[315] *Chair*

Shakour, Katie [315] see Morrow, Sara

Shanks, Michael (Stanford University)

[297] *Ruth Tringham*

This talk reflects upon the work and career of Ruth Tringham in relation to the human experience of practicing archaeology.

Sharma Ogle, Mini (SWCA Environmental), Jamie Young (SWCA) and Amanda Childs (SWCA)

[95] *Effective Public-Centered Approach to Compliance work- Case study of the Angoon Airport Project, Alaska*

The Angoon Airport project located in rural southeast Alaska is proposing construction of a land-based airport and airport access road for the community of Angoon. Currently, the only methods of transportation to and from the community are floatplanes and ferry. Under the direction of the Federal Aviation Administration (FAA), SWCA is developing an environmental impact statement (EIS) with an emphasis on ensuring project information is truly accessible to this rural community. In addition to conducting traditional scoping meetings in Anchorage, Juneau, and Angoon, we have sought out opportunities to actively involve all stakeholders in the project, including providing traditional newsletters, an easy-to-navigate website, regular informal community visits and senior center luncheons, quarterly updates to the community, social media including Facebook postings, and calls to nongovernmental organizations (NGOs) to keep them updated on the status of the project. In conjunction with informal community visits, SWCA has also conducted in-person updates with the village corporation and city office. Although these are not required by the National Environmental Policy Act (NEPA) process, they encourage meaningful involvement by community leaders. One of the significant features of our public outreach approach was developing a plain-language format for the EIS and all materials that are intended for the public. This multifaceted approach has gone a long way in garnering community support for an otherwise challenging project.

Sharp, Kayeleigh (Southern Illinois University Carbondale) and Melissa Litschi (Southern Illinois University Carbondale)

[2] *Integrated Archaeometric and Spatial Analysis: A Preliminary Report on Spatial Data Mining in the Prehispanic Central Andes of Peru*

The Gallinazo and Mochica of northern coastal Peru lived side-by-side for centuries. However, the nature of their social interrelationships (one or two ethnic or social groups) is a continuing topic of debate as such complexity is one of the hallmarks of prehispanic central Andean civilization. How can meaningful dimensions of social differentiation and complex social interrelationships be elucidated through archaeological investigation? To answer this question, we present our integrated archaeometric and spatial analytical approach for studying Gallinazo-Mochica coexistence and social differentiation. Mixed-type data from various sources (GPS, pXRF, low-resolution microscopic, and unaided visual inspection, etc.) recorded during two short laboratory sessions in 2013 and 2014, and initial site surveys in 2010, were used in conjunction with various data mining techniques to identify meaningful patterns and establish association rules that will guide upcoming dissertation fieldwork. As this preliminary work shows, we have moved one step closer toward resolving critical debates by integrating high-powered tools used in geospatial and archaeometric analyses. As a means for eliciting broader nuances of social differentiation, the analytical power of such a combined approach is useful for researchers working in and out of the Andes.

Sharp, Kayeleigh [11] see Litschi, Melissa

Sharp, Emily (Arizona State University)

[250] *Quantifying Defensibility of Landscapes and Sites in Highland Ancash, Peru*

Warfare, as a social practice, can have profound consequences ranging from reorganization of sociopolitical boundaries to forced migration of communities and large-scale settlement pattern changes. This study quantitatively examines the increased concern for defense in the Early Intermediate Period (EIP) (200 B.C.–A.D. 600) by comparing defensibility of archaeological sites to the surrounding landscape in highland Ancash, Peru. Sites located on opposite sides of the Cordillera Blanca, specifically in the Callejón de Huaylas and the Callejón de Conchucos, are compared. In both regions, settlement locations on hilltops are common, particularly during the emergence of the Recuay culture (A.D. 1-700). Recuay-era sites were frequently built on top of supposedly defensible locations. In this analysis, a spatial defensibility index, developed by Bocinsky (2014), is used to assess if the sites built on ridgetops maximize defensibility by this index. This approach considers visibility and elevation indices. Additionally, the sites are ranked by defensibility in order to show the spatial distribution of the most defensible sites. Results are examined to see if they support the assertion that the Recuay purposefully constructed sites in highly defensible locations. All analyses are performed on a 30m digital elevation model in the statistical program R.

Sharpe, Ashley (University of Florida)

[22] *Critter Caching: Animals in Household Rituals at the Maya Site of Ceibal, Guatemala*

With an occupational history spanning nearly two millennia, the Maya site of Ceibal provides a rare opportunity to study the remains of ritual practices and domestic activities at household groups over a long scale of time. This study examines the zooarchaeological remains, both bones and shells, recovered from household caches, burials, and middens from several peripheral locations around the Ceibal site epicenter. The diversity of household types and extended time frame provides an opportunity to explore how the composition of middens and ritual deposits changed over time, how certain animal species and parts may have been appropriated toward different ritual performances (for example, human burials versus dedicatory caches), and how animals that were used in ritual activities at the peripheral household level compare to Ceibal's epicenter cache deposits. Finally, changes in domestic and ritual practices involving animals are compared over time in relation to what is already known of Ceibal's turbulent site history, in an effort to understand the manner and degree to which these societal developments affected the livelihoods of household occupants.

Sharratt, Nicola (Georgia State University)

[184] *From Dispersal to "Disappearance": A.D. 1000-1250 in the Upper Moquegua Valley, Peru*

In the Moquegua Valley, Peru, the decline of the greater Tiwanaku system circa A.D. 1000 was accompanied by a shift to a more dispersed settlement pattern, as populations moved out of the large towns of the middle valley and established smaller sites on the coast and in the upper valley. In

this paper I focus on the upper valley, where the longevity of occupation at post-expansive sites and the presence of secondary occupations offer an opportunity to examine the centuries' long trajectory of cultural transformation. I discuss the considerable recent excavation data from one site, Tumilaca la Chimba, to highlight temporal patterns of continuity and change in the upper valley, and consider how that data sheds light on the ultimate disappearance of Tiwanaku derived traditions from the archaeological record, some 250 years after regional political collapse. Further, in comparing community organization, burials, residential contexts, public space and material culture from Tumilaca la Chimba with neighboring settlements, I also critique a tendency to understand post-expansive upper valley sites as essentially monolithic and suggest that the considerable differences between Tumilaca la Chimba and contemporaneous communities invite us to reassess the nature of the local socio-political landscape post A.D. 1000.

Shaw, Jennie [168] see Sterling, Sarah

Shaw, Justine (College of the Redwoods) and Jennifer Mathews (Trinity University)

[295] *A Tale of Two Projects: Comparative Findings of the CRAS and Yalahau Projects*

The CRAS and Yalahau Projects of Quintana Roo have shared a similar trajectory for many years: although both projects have focused several seasons on individual sites with detailed mapping, excavations, and artifact analysis, the broader goal has been to address large areas of coverage, with relatively few excavations conducted into buildings. Both projects have focused on site location, with the use of local peoples as consultants and guides. Both projects are in regions that are generally unknown to outsiders, and are frequently left as blank spots on maps representing the ancient and historic Maya world. Despite this relative obscurity, these areas are facing major development pressures from tourism and a disappearing knowledge base about the environment and archaeological features found there. This paper will examine the similarities that the research of these two projects have revealed about these geographically adjacent areas, including shared ritual patterns, environmental challenges, and issues of mobility and visibility of the ancient population. Additionally, we will point out the clear distinctions between the occupational histories of the Cochuah and Yalahau regions, including geographic differences, trade routes, and different trajectories during the Prehispanic, colonial and historic periods.

Shea, Molly [202] see Tung, Tiffany

Sheets, Payson (University of Colorado)

[75] *A Variety of "Cerendipitous" Discoveries*

Research at the Ceren village archaeological site in 2013 and 2014 has made a variety of discoveries. The plant casts, made by pouring dental plaster into the voids, reveal much about agriculture in the middle of the rainy season some 1400 years ago. The maize plants were doubled over to dry the mature ears, but the Loma Caldera eruption occurred just before planting squash and beans. So what was that single mature squash plant doing in the milpa? What are the limits of preservation of weeds, and have we overestimated the degree of weeding? Why was there less care in microtopographic field management just outside the village, in contrast to within the village and farther south in the manioc fields? A sacbe runs through the fields, and we discovered the compaction of its central zone was extraordinary. But why were the sides so soft and the center so hard? And why were most of the footprints from people headed south? Our efforts in experimental archaeology to duplicate its hardness are presented, and we can only speculate as to what technology was employed to achieve it. Its surprising durability over a full year with no maintenance is described.

Sheets, Payson [75] see Egan, Rachel

Shelley, Steven (Quaternary Resource Investigations, LLC) and Nathan Montalvo (Quaternary Resource Investigations, LLC)

[122] *Experimental Replication of Stone Tools used For Agave and Similar Plant Harvesting and Processing*

There are numerous burned rock middens in the region around Fort Bliss. These sites are usually assumed to be agave processing locations, although it is possible that other types of plants, such as yucca, were being processed. Some of these sites have small quantities of artifacts, while others have fairly large numbers of artifacts, particularly modified flakes. We believe that this difference may relate to processing the plants for fiber, rather than food. We intend to replicate stone tools from these sites and use these tools to harvest and process agave and yucca for use as food and for fiber. We will then compare the wear patterns on the tools to determine if there are patterns associated with each type of processing. As part of the experiment we will also conduct efficiency studies that can be used to compare to other experimental work of a similar nature.

Shelley, William [140] see Muros, Vanessa

Shelton, Christopher

[356] *Rebound Hardness Results for the Raw Material In and Around Pinnacle Point, South Africa and the Implications Thereof*

The Middle Stone Age lithic assemblage at the Pinnacle Point site (Western Cape, South Africa) fluctuates between local, coarse-grained material and exotic, fine-grained, heat treated material throughout the human occupation layers. By understanding raw material choice, the first step in the chaîne opératoire, we can better understand these shifts in raw material representation. Quantifying the mechanical characteristics associated with knappability and comparing these ranked benefits to the costs of acquisition allows us to describe and compare utilized lithologies in and between sites in a reproducible and subjective manner. The Schmidt Rebound Hammer has been used in previous studies to quantify rebound hardness as a proxy for knappability of various raw materials within the gathering range of a site. The purpose of this study was to rank the relevant lithologies according to their desirability, and identify acquisition choice patterns. The research focuses on the two most prevalent raw materials from Pinnacle Point, quartzite and silcrete. This presentation reports the rebound hardness results and the implications thereof, and discusses the role of the Schmidt Rebound Hammer.

Shelton, Christopher [356] see Cleghorn, Naomi

Shen, Chen [179] see Chen, Hong

Shen, Chen (Royal Ontario Museum)

[179] *Discussant*

Shennan, Stephen

[191] *Population, Monuments, and Violence in Neolithic Europe*

The EUROEVOL project has recently created reconstructions of changing regional population densities based on summed radiocarbon probability distributions for a large area of western and central Europe for the period 8000-4000 BP, covering the later Mesolithic and Neolithic periods. These have revealed a pattern of population booms and busts in many regions following the arrival of farming. The project has also gathered data on the construction dates of enclosures surrounded by ditches, banks and palisades, and on the dates of significant violence events during this period. These data will be used to try and distinguish between two hypotheses: that the enclosures are an indicator of economic prosperity and the ability to invest in production beyond subsistence or that they are associated with instability as local population densities peak and stress available resources, as suggested by Turchin.

Shennan, Stephen [191] see Timpson, Adrian

Shensky, Andrew [172] see Henry, Edward

Shepard, Emily (Portland State University), Kisha Supernant (University of Alberta), Kenneth M. Ames (Portland State University) and Andrew Martindale (University of British Columbia)

[82] *Changing House Forms on the Northwest Coast of North America*

Traditionally, Northwest Coast houses were rectangular, post and beam dwellings. Architectural details varied regionally, ethnically and even locally. It is presently impossible to trace this variation archaeologically beyond a few coarse-grained statements. The earliest structures date to at least ca. 5000 cal BP; they are rectilinear and some at least are semisubterranean. The longest continuous sequence of houses is presently documented in the Prince Rupert Harbor region of northern British Columbia where, by 2500 cal BP, variation in house size becomes marked. The Salish Sea area also has a long sequence with several rectangular houses early, then a gap until ca 2500. After that date houses are the ethnographic shed roof style. On the Lower Fraser River, villages had a mix of rectangular surface houses and pit houses. What these changes trace, at minimum, are increasing demands on labor and resources.

Sheppard, Peter (University of Auckland)

[77] *The Use of a Bench-top SEM in Ceramic Characterization in Oceania*

Thanks to the efforts of Bill Dickinson, petrographic analysis of ceramic thin sections has been able to make an almost unparalleled contribution to sourcing studies in Oceania. In this paper, I will report on the use of one of the new generation desktop SEMs which will help us to continue and to build upon Bill's work. Examples will be drawn from studies of Lapita period ceramic assemblages in the Solomon Islands.

Sheridan, Alison [201] see Hurcombe, Linda

Sherman, Jason (University of Wisconsin-Milwaukee) and Leah Minc (Oregon State University)

[25] *Assessing Ceramic Production and Exchange in the Early Monte Albán State (Oaxaca, Mexico)*

In this paper we present the results of an ongoing study of ceramic production and exchange in the Valley of Oaxaca, Mexico, during the Late to Terminal Formative (500 B.C.–A.D. 200)—the period when the Monte Albán state formed and consolidated control over its hinterland and surrounding regions. We have found that adopting a multifaceted approach that combines chemical (INAA) data with detailed qualitative and quantitative mineralogical (petrographic) data enables us to differentiate cultural from natural factors affecting paste composition, and is more effective than a single analytic technique for establishing ceramic provenance in the geologically complex Oaxaca Valley. Detailed analyses of natural clays collected throughout the valley, as well as sherds from Monte Albán and other key archaeological sites in the Valle Grande subregion, have allowed us to identify 12 distinct ceramic production loci and to track the movement of different pottery wares within the heartland of this early state.

Sherwood, Sarah (Sewanee: The University of the South)

[190] *From Microstratigraphy to Ritual Behavior: the study of Earthen Monuments in Eastern North America.*

Traditionally the study of prehistoric earthen monuments has focused on their staged surfaces and the buildings and artifacts recovered there. Mound construction was simplified to volume, and the type of labor and oversight necessary to move basket loads of dirt. With rigorous attention to stratigraphy, there is a new interest and awareness of these earthen monuments as complex constructions. Selection, preparation, placement and maintenance of earthen materials allowed the establishment of mounds that were able to support substantial architecture, convey important cultural information as well as withstand natural forces that would have demolished simple piles of dirt. Researchers are now using interdisciplinary approaches, centered in the local geology and soils, to explore the links between cultural and natural landscapes to consider complex construction

techniques made possible by the selection and manipulation of earthen materials. Using examples from archaeological sites ranging in age from 3,000 to 800 years old, including Poverty Point, Monks Mound, Graveline Mound, and Shiloh, we demonstrate recent advancements in our methodological and conceptual approaches to shed new light on these significant monumental earthworks.

[190] *Chair*

Shibata, Masaki (Doshisha University Graduate school of Letters)

[145] *History of Research into the Jomon-Yayoi Transition*

This paper reviews the history of research and archaeological investigations into the transition from the Jomon to Yayoi Periods. This transition signifies a transition from a hunting-gathering economy to food-producing economy. Traditionally, Japanese archaeology has been characterized by building up relative chronologies of various regions based on pottery. From the 1930's to 1970's, the Yayoi Period was defined as a time period when the Yayoi pottery was used. However, rice paddies were discovered in stratum where Jomon pottery was discovered, which necessitated a re-consideration of this traditional definition. As a result, the Yayoi Period came to be re-defined as a time period when wet rice cultivation was practiced. In recent years, AMS dating has been applied to the date of the beginning of the Yayoi Period, and replica methods are applied to pressured imprint of seeds on pottery surface in order to identify crops raised at that time. These all contribute to our understanding previously-unknowns aspects of the Yayoi society.

Shields, Carl [144] see Cuevas, Mauricio

Shier, Melonie (University of Central Lancashire)

[128] *In Defense of the Fence in the American West*

The fence is integral to the mythology of the American West, particularly the barb wire fence, such as in the battle between cattle and sheep raisers, and between pastoralists and agriculturalists. The years of the open range were short lived in comparison to the decades of fence construction and maintenance. Serving as boundaries and divisions of landscape, fence lines can give valuable insight into how peoples shaped their landscapes in the past and continue to shape it in the present. Although they were often set in line with the Cartesian grid of land division, many lines also follow the landscape, limiting access of people and animals to particular resources of importance. These divisions can allow for archaeologists to discover which landscape features peoples in the past protected and which they did not. Often constructed of mass produced materials, fence lines can give insight into technological changes, consumerism patterns, landscape based identity, and stylistic preferences. This paper will discuss the significance of fence lines as linear features, as well as discuss possible dating strategies for fence lines, particularly barb wire fence lines.

Shillito, Lisa-Marie (University of Edinburgh)

[210] *Technological Choice or Environmental Constraints? Fuel Use at Boncuklu and Çatalhöyük*

By combining sediment micromorphology with microbotanical and geochemical analysis, we can gain insights into the archaeological record that are otherwise invisible. By characterizing fuel deposits as a package of remains rather than focusing on a single class of material (including charcoal, ash, burnt sediments and associated artifacts) we are better able to reconstruct their formation processes, and thus the activities that produced them. Using examples from the early Neolithic settlements of Boncuklu and Çatalhöyük, this paper will discuss the contribution of microarchaeological approaches to the investigation of fuel use in prehistory, and how it can help disentangle technological choices versus environmental constraints on the selection and use of fuel resources.

Shimada, Izumi [371] see Szumilewicz, Amy

Shimada, Izumi (Southern Illinois University) and John Merkel (Institute of Archaeology, University College London)

[371] *The Organization and Technology of Sicán Metalworks: pXRF Analysis of Floors and Associated Residues*

The technical sophistication and versatility of 1000-year old Middle Sicán gold and other metalworks on the Peruvian north coast have long been appreciated. How were the artisans, raw materials and diverse manufacturing activities organized and managed? This paper aims to answer this and other technical, behavioral and organizational questions based on the 2014 excavation of a large and well-preserved workshop at the base of the monumental temple mound of Huaca Loro at the Middle Sicán capital of Sicán. Systematic application of portable X-ray fluorescence analysis to copper, gold, silver, arsenic and lead concentrations in floors and floor-context production debris such as ash and charcoal, together with abandoned furnaces, tools, scrap and slag, allow tentative reconstruction of the spatial organization, manufacturing sequence, scale and intensity of copper and gold alloy metalworks. As with other manufacturing activities studied thus far, this craft production was also characterized by a multiplicity of small production groups working close to each other. It appears that each of the six major temple mounds at the Sicán capital hypothesized to have represented six governing elite lineages had its own attached and closely supervised metal workshop.

Shing, Richard [77] see Bedford, Stuart

Shipman, Pat (Pennsylvania State University)

[28] *The Paleolithic Domestic Dog Hypothesis*

Using morphological and statistical techniques, Germonpré and colleagues have identified over 40 Paleolithic dogs, ranging from ~36,000 to 13,900 cal yrs BP. These unusual canids have a different dietary signature from wolves at the same sites according to isotopic analyses. MtDNA analyses by Thalmann and others show that at least Paleolithic dog had a unique mtDNA sequence. I propose that these canids represent early domesticated dogs which significantly improved human hunting success. Eight predictions based on ethnographic, archaeological, and biological information can be used to test the Paleolithic Domestic Dog Hypothesis. 1) Additional early dogs will be identified at human but not at Neanderthal sites. 2) Sites with early dogs will yield higher densities of faunal remains and retouched stone tools than Mousterian sites. 3) Early dogs will be discovered at additional sites yielding many individual mammoths. 4) Sites with early dogs will include many wolf remains. 5) Sites yielding early dogs will suggest longer occupation or larger population size. 6) Isotopic studies at additional sites will reveal dietary differences between early dogs and contemporary wolves. 7) Early dogs will be large-bodied, sturdy animals. 8) Both early dogs and early humans will show adaptations to enhanced communication.

Shipton, Ceri (University of Cambridge), Antoine Muller (University of Queensland), Chris Clarkson (University of Queensland), Richard Jennings (University of Oxford) and Mike Petraglia (University of Oxford)

[33] *Hominin Cognition across the Acheulean to Middle Paleolithic Transition*

In 2013 I suggested that changes in behavior at a transitional Acheulean to Middle Paleolithic site in India were characterized by increases in generativity, hierarchical organization and recursion, and that the transition was perhaps underpinned by improved working memory. Here I present the results of a knapping experiment that compares the recursive and hierarchical complexity of Acheulean and Middle Paleolithic knapping sequences in order to test this claim. I then look at how differences in Acheulean and Middle Paleolithic cognition are manifested at the landscape level by comparing two remarkable preserved Paleolithic landscapes in the Arabian Desert: Dawadmi and Jubbah. The tools transported, the areas on the landscape used, and the degree of reduction intensity are contrasted between the two periods. I conclude that there are demonstrable differences between Acheulean and Middle Paleolithic hominins in behaviors that may relate to working memory, and speculate that this transition in human evolution might reflect the origins of narrative communication.

Shiratori, Yuko (The Graduate Center, CUNY)

[219] *Where is Temple? Construction and Use of Ceremonial Group at Tayasal*

Since the 1970s, a ceremonial group dating to the Late Postclassic period at the archaeological site

of Tayasal has been excavated by several archaeological projects. These efforts have greatly contributed to the understanding of the Late Postclassic period and the Itza Maya communities in the Petén lakes region. The ceremonial group includes a Postclassic "basic ceremonial group" on the west and a probable Late Preclassic E-group on the east. Excavations revealed architectural arrangements and use of the ceremonial group by the Itza during the Postclassic period. The basic ceremonial group and a modified arrangement called "temple assemblage" were first identified in Mayapán, Yucatán. The presence of a Mayapán-style temple assemblage supports a connection between Yucatán and Petén. This paper examines construction and use of the ceremonial group by the Itza and explores the probable location of a temple in the ceremonial group at Tayasal, compared to other Postclassic sites with temple assemblages.

Shirley, Meagan (College of Wooster) and P. Nick Kardulias (College of Wooster)

[205] *Anglo-Saxon and Viking Ship Burials as Indicators of Rank and Wealth*

This study compares the funerary practice of ship burials in Anglo-Saxon and Viking societies. The custom of ship burial is an expression of rank and wealth held by an individual during their lifespan. In addition to common outward appearance of rank shown through such funerary treatment, similar artistic traditions are evident from grave goods and hoards. Items such as jewelry, furniture and boats are crafted in related styles that also express their owner's rank through the materials and motifs. Several aspects of Anglo-Saxon and Viking culture are examined to provide a foundation for the analysis of rank in these societies. Ship burials provide unique insight into the elite culture of northern Europe in the latter half of the first millennium A.D. These types of burials include the presence of female occupants, which presents a new aspect of Viking society to study. The inclusion of males and females in a similar funerary setting and the luxury goods included in their burials suggests that both genders could hold significant roles in Anglo-Saxon and Viking society.

Shock, Myrtle [157] see Bueno, Lucas

Shock, Myrtle (UFOPA) and Filippo Stampanoni Bassi (MAE-USP)

[326] *Borderlands in the Amazon Forest: Can We Draw Boundaries?*

Amazonian occupations from 2500 BP to contact have been characterized into expansive traditions based on ceramic vessels. Meanwhile, ethnographic records point to diverse ethnic groups residing across the basin. Seeking variables that may be associated with precolumbian cultural diversity, we explore a possible intersection between groups, an area located at the headwaters of five tributaries to the Negro and Amazon Rivers. Archaeological data deriving from analyses of settlement structure, lithic technology, subsistence, and ceramics provide the context for reflecting on whether culturally meaningful boundaries can be defined between this and other regions or if the mixture of characteristics is indicative of other cultural interactions.

Sholts, Sabrina [207] see Tichinin, Alina

Shott, Michael (University of Akron)

[280] *Pros and Cons of Consulting Collectors: A Case Study from the River Raisin in Michigan*

In survey, we collect what lies on the surface. But so have others, for decades or more. Ignoring private collections risks neglecting a selective but informative part of the accumulated record. One way to gauge collector effects is to compare what archaeologists found in survey to private collections from the same places. In 1975-77 the University of Michigan surveyed the River Raisin watershed in southeastern Michigan. I compare Michigan's results to what collectors had found already and, because the survey was probabilistic, estimate the number of period components first ignoring and then including data from private collections.

[223] *Moderator*

Shoup, Daniel and Luca Zan (University of Bologna)

[201] *The Shipwrecks of Pisa: Management, Professional Optimism, and Bureaucratic Myopia*
Between 1998 and 2000 archaeologists discovered nine well-preserved Roman shipwrecks at San Rossore, Pisa, 500 m from the leaning tower. Shortly afterward a grand vision for a “museum with three vertices” was articulated: a public excavation area plus a conservation laboratory and museum of Mediterranean navigation, to be constructed in an underused 16th century barracks nearby. But despite urgent conservation needs, neither the public excavation nor the laboratory opened until 2005, while the museum is still unfinished. Irregular and unpredictable budgets caused organizational chaos, while the inclusion of the project in the City of Pisa’s urban redevelopment efforts added complexity and delays. Moreover, the grand vision of three interconnected institutions became an obstacle in itself: in the absence of an administrative culture that was able to bring projects “down to earth”, the universalist and utopian tendencies of professional discourse fostered a tendency to choose the “best” project over the most feasible one, adding cost, risk, and uncertainty to an already challenging project. Based on extensive archival research, our paper reconstructs the 15-year history of the project and explores the emergent management issues at this unique site, including the role of professional optimism, bureaucratic myopia, urban planning, and uncertainty.

Shurik, Katherine (Louisiana State University)

[133] *Role of Handstones in Mesoamerican Ballgame*

Handstones are one of the artifacts that associated with the Mesoamerican ballgame. However, barely any research has been published about them, since 1961, when Stephan Borhegyi first analyzed them. He identified that handstones vary in size and shape. In the past, it has been suggested that they could be used to serve the ball when initiating the ballgame. Recent analysis of their size, abrasion, and context in imagery identifies the improbability of using them as a serving tool. Not a single image in the sample displays a player holding a handstone while playing the game. All images that contain handstones display a ritual and/or mythological context, most frequently directly connected with sacrifices. These include purely mythological images of various gods interacting and sacrificing another deity and images with historical figures that are being sacrificed and crossing into mythological realm, as a result of it.

Sianto, Luciana [415] see Dos Santos, Isabel

Siegler, Jennifer (Emory University)

[411] *Chimú-Inka Ceramics: Quantifying Differences between Colonial Forms and Their Influences*

Between 1428 and 1534 the Inka conquered the world’s largest territory controlled by a single state including 1300 km of coastline from the 1460 conquest of their main rivals, the Chimú. Studies on Inka provincial administrative policies are increasingly important in understanding the pre-conquest Andes; however, there has been no study of the effects of Inka subjugation on the art of their most powerful former enemy. Ceramics from the Chimú-Inka period offer a striking example of how characteristics from provincial and Inka artistic traditions were combined. This presentation examines three Chimú-Inka vessel forms to assess the level of artistic control imposed by the Inka state: stirrup spout vessels, urpu, and portrait head vessels. The first two forms origins are clear, with stirrup spout vessels continuing an ancient, persistent North Coast vessel type, while urpus are an Inka invention. The final form is a hybrid product originating from the colonized north coast, containing elements of both Chimú and Inka artistic traditions. Proportional analyses comparing vessels of the original culture to the Chimú-Inka version indicate quantifiable distinctions in the two samples, suggesting that Inka administrators allowed a certain degree of flexibility while imposing the acceptance of their own tradition’s forms.

Siemens, Alfred (University of British Columbia)

[350] *Discussant*

Sieron, Katrin [189] see Morales, Jorge

Sierra, Roger (Undergraduate Student, Dept. of Anthropology, University of Miami), Traci Ardren (Dept. of Anthropology, University of Miami) and William Pestle (Dept. of Anthropology, University of Miami)

[152] *Preliminary Analysis of Marine Shell Artifacts in the Southern Florida Keys*

The Stock Island site (8MO2), located in the southernmost Florida Keys, was a black dirt midden affiliated with the Glades tradition. Construction of the Monroe County Detention Center in the 1980s destroyed the site, necessitating the uncontrolled and uncontextualized recovery of a large quantity of ceramics and faunal (osteological and malacological) remains. Unprovenienced collections from this salvage work reside in numerous repositories across the state of Florida. In this work, we present the results of a preliminary analysis (taxonomic identification and tool-type categorization) of the marine shell artifacts and ecofacts held by the University of Miami's Department of Anthropology. The assemblage is dominated by two taxa of marine gastropods (*Strombus gigas* and *Busycon contrarium*), which together account for nearly 60% of the collection (NISP), the majority of which were secondarily used as tools (picks, chisels/gouges, and hammers). This analysis provides insights into subsistence practices and material adaptation in the prehistoric southern Florida Keys.

Sierra Sosa, Thelma Noemi (THELMA N. SIERRA SOSA)

[413] *El comercio en el norte de la península de Yucatán visto a través del sitio clásico de Xcambó, Yucatán*

El sitio de Xcambó ha sido definido como el puerto comercial y administrativo de los períodos Clásico Temprano y Clásico Tardío, a la fecha, el principal o quizá el único a lo largo de la costa de la península de Yucatán. Debido a su carácter, es lógico encontrar en él un amplio cúmulo de información con respecto de la llegada a la península, de materiales foráneos, además en él está la respuesta a otras interrogantes como, el manejo de la sal y su distribución, el control de otros productos costeros que viajaron hasta el sur de la península o hacia el peten de Guatemala y Belice y por otro lado, la llegada de objetos y materiales del área de Campeche, Tabasco, Veracruz y Chiapas, entre otros.

Sieverding, Heidi [230] see Boen, Renee

Sievert, April [3] see Thomas, Jayne-Leigh

Sikora, Martin [116] see Fregel, Rosa

Silliman, Stephen (University of Massachusetts Boston) and Katherine Sebastian Dring (Eastern Pequot Tribal Nation)

[34] *Taking and Giving: Finding the Balance in Community Archaeology*

One of archaeology's seemingly inescapable practices is the act of taking, and it remains one of the hardest aspects to manage for communities that work with archaeologists because of its appropriative nature and colonial legacies. A way to balance this "taking" is to emphasize at least as much "giving" in the process, which requires a level of sharing and dialogue that are only now becoming part of archaeologists' conceptual and methodological toolkits. This paper considers these issues in the context of the Eastern Pequot Archaeological Field School, a project underway since 2003 between the Eastern Pequot Tribal Nation in southeastern Connecticut and the Department of Anthropology at the University of Massachusetts Boston. More than ten years of ongoing dialogue, pedagogical enhancements, flexibility, and mutual respect – plus the tribe's continuing battle with the federal acknowledgement process – have generated community and scholarly products and opportunities that try to embody that tenuous and ever-shifting balance between giving and taking.

Sills, E. Cory [243] see Feathers, Valerie

Sills, E. Cory (University of Texas at Tyler), Linda Howie (HD Analytical Solutions | The University of Wester) and Heather McKillop (Louisiana State University)

[413] *Ancient Maya Trade and Communication as Evidence by Petrographic and Iconographic Analysis of Unit-Stamped Pottery*

The Paynes Creek salt works of southern Belize were a massive industry for the production of salt for trade with inland Maya consumers during the Classic period (A.D. 300-900). The salt workers lived elsewhere, perhaps at the nearby trading port of Wild Cane Cay, which was a large contemporary settlement. The infrastructure of production includes wooden buildings preserved below the sea floor. The majority of artifacts recovered from survey and excavations consist of briquetage—locally-made pottery used to evaporate brine in pots over fires to make salt. A minor component of the ceramic assemblage consists of unit-stamped pottery which has a distribution from the south coast and inland sites of southern Belize, to sites in adjacent Guatemala, including Seibal, Altar de Sacrificios, and sites in the Petexbatun. We discuss the iconographic, spatial, and petrographic evidence of unit-stamped pottery from the Paynes Creek salt works. The compositional characteristics of the pottery are compared with various potential geological sources to help identify where pots were made. In the absence of salt, we use unit-stamped pottery as a proxy for helping to reconstruct the Paynes Creek salt production and identify the inland consumers of this basic biological necessity.

Silva, A. [9] see Wagner, Ursel

Silva, Rosicler (Pontifica Universidade Católica de Goiás) and Julio Cezar Rubin de Rubin (Pontifica Universidade Católica de Goiás)

[155] *Geoarchaeological Issues in Lago Rico Archaeological Site, Central Plateau of Brazil*

The first results of the archaeological research being developed at the interfluvium of the Peixe and Araguaia rivers, indicate the possibility to applying geoarchaeological issues to address a number of issues related to the Lago Rico site, on the left bank of the Peixe river. This site features cultural remains in a section of a low slope as well as two other areas. The first in the alluvial terrace by a lagoon and the second in the floodplain, upstream of the first section, evidencing the erosive-depositional behavior of the river in the archaeological site area. The depositional segment, presents evidence of a different environmental context from the current one (an ancient erosive margin), allowing the hypothesis that part of the site may have been eroded transporting cultural remains downstream. To investigate these hypotheses, geoarchaeological analyses are fundamental to identify the cultural remains in the lagoon area and the depositional margin and obtaining information to aid in characterizing the behavior of the river channel and description of stratigraphic profiles.

Silva, Fabiola and Jane H. Kelley (University of Calgary)

[245] *The Current State of Looting, Preservation, and Education in the Casas Grandes Region*

The looting of archaeological artifacts is a worldwide phenomenon prompting the destruction of our world heritage. Looting and the antiquities market across the U.S/Mexico border is a complex bi-national issue that has highly impacted the archaeological record. A previous examination of the history of looting in Casas Grandes, Chihuahua, Mexico demonstrates three periods of looting: the Museum Period (1900-1939), the Private Collector Period (1940-1979), and the Present Period (1980-present). This paper will examine the Present Period and the contributing factors that have led to the further destruction of sites in the Casas Grandes region; as well as what strategies local government officials, INAH, and other archaeologists are implementing to counter such destruction.

Silva, Rolando (Anthropology Graduate, University of Texas Rio Grande Valley)

[265] *Remote Sensing as a Method of Promoting Group Identity: Rediscovering Edinburg's African-American Cemetery*

Edinburg, Texas, was founded in 1909 some 15 miles north of the Rio Grande in the then newly irrigated "Magic Valley." A decade later Hillcrest Memorial Park Cemetery was established, with a remote corner of the burial ground allocated for African-Americans. Many of the earliest people interred hailed from rural households, and so due to a lower socio-economic status, some graves had no markers. Concerned citizens and the descendants of the deceased have since taken to

assisting grounds keeping at the cemetery, placing historic markers and new burials. Unfortunately, there are still men and women identified only by memorial homage. To offer service towards this issue, in the Spring of 2013 a remote sensing survey using ground-penetrating radar (GPR) was conducted to attempt categorization of the burials and their condition in the environment, as part of a larger methodological study considering the utility of remote sensing equipment for archaeogeological research in the Rio Grande Valley. This fieldwork benefits from the support of the community and will shed light on a largely forgotten founding minority population.

Silva De La Mora, Flavio and Rodrigo Liendo (UNAM)

[46] *Understanding the Local Communities through the Study of Lithics and Communication Routes in the Northwestern Maya Lowlands during the Classic Maya: Recent Studies in the Region*

The region known as the Northwestern Maya Lowlands encloses a large geographic and cultural area that included, and was part of, a large system of exchange of goods, people and ideas. Archaeological evidence recovered in the region serve as evidence of the complex system of communication routes and local settlements that were part of local communities and practices. The communication routes and archaeological sites localized between the Usumacinta River and Tulija River serve as a case study of the different dynamics and practices that affected and united the local communities through the use of obsidian tools during the Classic. The study of lithics and communication-exchange routes can help us understand the local technologies, practices and communities of the ancient inhabitants.

Silverstein, Jay (JPAC/Univ of Hawaii), Ishiba Ranoli Oñasoje (CIESAS, Centro de Investigación y Estudios Superio), Sarah Chapman (University of Birmingham) and Robert Littman (University of Hawaii)

[409] *Modeling Space at Tell Timai: Composite Imaging at Greco-Roman Thmuis, Egypt*

Ancient Thmuis represents one of the best preserved examples of a Greco-Romano-Egyptian metropolis in the Nile Delta. However, preservation of the tell is variable, with sections on the periphery having been stripped by systematic looting of mud and red brick to buildings while in the center of the tell walls three stories tall and well-defined streets are common. Archaeological work and subsequent preservation have depended on a variety of imaging methods to reconstruct segments of the city. Recently, a quadcopter has been incorporated into the methods employed providing some outstanding initial results.

Simek, Jan and Alan Cressler

[353] *A Regional Perspective on Mud Glyph Cave Art in Southeastern North America.*

We provide an overview of a signature prehistoric cave art form in the Southeast of North America: "Mud Glyph" images traced and/or carved into plastic sediments inside the dark zones of caves. Today, we know of 21 such mud glyph caves in Tennessee, Alabama, Kentucky and Virginia. Sometimes, mud glyphs form elaborate cave art compositions. While this art form has roots in the Archaic Period more than 3000 years ago, its greatest frequency occurs during the Mississippian Period after A.D. 1000. The subject matter of the art varies, but prehistoric religious iconography associated with the Mississippian Period is very common.

Simek, Jan [353] see Pritchard, Erin

Simmons, Scott (University of North Carolina Wilmington) and Elizabeth Graham (University College London)

[147] *The Island and the Mainland: Connections between Maya Communities on Ambergris Caye and North-Central Belize*

Ancient Maya occupation on Ambergris Caye has been documented from Preclassic through Postclassic times. Work at the site of Marco Gonzalez has concentrated on several structures in which we have found solid evidence for connections to Maya polities in northern Belize and beyond. Nonetheless, relationships with mainland communities changed substantially over time. Although the

northern location of the caye makes it seem logical that its closest connections were with north-central Belize communities, there is evidence that connections with northern Belize in particular intensify in Terminal Classic times and continue through the Postclassic. Here we discuss the material evidence for these connections through time.

Simmons, Alan (University of Nevada Las Vegas, Department of Anthropology) and Rolfe Mandel (University of Kansas)

[190] *Site Formation Processes and Stratigraphy of Akrotiri Aetokremnos, Cyprus: The Devil is in the Details*

Akrotiri Aetokremnos is a small collapsed rockshelter that has provided evidence of the earliest well-documented human presence on the Mediterranean island of Cyprus. It is, in fact, amongst the earliest numerically dated site on any of the Mediterranean islands. A large suite of radiocarbon ages indicates that Akrotiri Aetokremnos was occupied around 12,000 cal. B.P., during the Late Epipaleolithic. More controversial than the ages is the association of extinct endemic pygmy hippopotami with cultural materials, as this relates to the continuing discussion of human-related Pleistocene extinctions. Our claim of a direct association has been challenged, despite well-published archaeological and geoarchaeological data to the contrary. This paper addresses the site's stratigraphic sequence and formation processes, both of which indicate that the remains of pygmy hippos are in direct association with cultural features and artifacts.

Simmons, Lindsey [361] see Burt, Amanda

Simms, Steven R. [10] see Lugo Mendez, Anastasia

Simms, Stephanie (UCLA)

[130] *Neglected Root Crops of the Prehispanic Maya*

Root crops represent a major lacuna in the archaeological record of the Maya area and discussions of prehispanic Maya foodways in general. Only a handful of exceptional cases furnish direct evidence for the exploitation of root crops. Most notably at Ceren, the recent discovery of entire fields dedicated to manioc cultivation suggests that maize was not the only agricultural staple in this village community. Researchers working throughout the humid tropics have employed microbotanical analyses—phytoliths and starch—to overcome issues of preservation and reveal more detailed information about domestic plant economies, especially regarding root crops. Here I report the results of a systematic study of microbotanical remains from the Puuc Maya residential hilltop site of Escalera al Cielo (EAC). The remains include starch from at least three root crops—arrowroot, manioc, and *Zamia* sp.—that were processed with handheld grinding stones, in addition to abundant arrowroot phytoliths recovered from various domestic contexts. These new data from EAC demonstrate the tremendous potential of microbotanical studies, which can reveal the role of root crops in prehispanic Maya foodways, as well as larger-scale issues of local land management strategies.

Simms, Steven (Utah State University) and Andrew Ugan (Far Western Anthropological Research Group)

[296] *The Faces of Intensification: An Application of Selection Thinking*

The application of HBE and selection thinking can shed light on the study of intensification. This vantage treats intensification as a process, not a threshold, and treats behavior not as normative cultural forms (e.g., “intensive farmers”), but as fluctuating frequencies among alternative adaptive strategies comprising a behavioral mix that may be culturally encoded. There are many ways to work hard. Here we employ case studies from Mendoza, Argentina, and the Great Basin, Southwest, and Midwest of North America to explore the “faces” of intensification.

Simon, Katie [7] see Klehm, Carla

Simon, Katie, Adam Wiewel (University of Arkansas), Eileen Ernenwein (Eastern Tennessee State University), Kristin Safi (Washington State University) and Carla Klehm (Washington University in St. Louis)

[8] *The Near and Far: How Aerial Thermography Can Elucidate Findings in Ground-Based Geophysical Datasets*

From dense ground cover to subtle geophysical signatures, researchers utilizing ground-based geophysical methods often encounter a variety of challenges limiting their potential for successful interpretation. With two case studies, we demonstrate the utility of augmenting near-surface geophysics with thermal and color photogrammetric models generated from aerial imagery. These studies include two projects supported through the SPARC program: the late Pueblo II great house at Largo Gap in New Mexico where ground-penetrating radar (GPR) survey was made difficult by dense rubble across steep slopes, and Iron-Age sites along the eastern edge of the Kalahari Desert in the Bosutswe region of Botswana, where constrained survey areas make the interpretation of magnetic susceptibility, electrical conductivity, magnetic gradiometry and GPR anomalies challenging. Both geophysical surveys were augmented by aerial platform surveys using thermal and color sensors. These two imagery types were processed using structure-from-motion photogrammetry software to produce orthophotographs and 3D terrain models. These aerial data sets were successful in elucidating new features in the near-surface geophysical data sets.

Simon, Rebecca, Dani Hoefer (Project Archaeology Leadership Team) and Sarah Baer (SWCA Environmental Consultants, Inc.)

[98] *Colorful Collaboration in Colorado: Recent Work by the Project Archaeology Colorado Chapter*

Colorado archaeologists have a long history in promoting Project Archaeology by providing data for curricula, field work opportunities, and training workshops. Nonetheless, for several years the participation was minimal. A revival of Project Archaeology in Colorado began in 2012 with a teacher training workshop in Broomfield, hosted by SWCA Consultants. Since then, the program steadily increased its presence across the state. Through the devoted efforts of its members, the Colorado Chapter provided facilitator/teacher workshops, developed partnerships with local organizations including the Colorado Council of Professional Archaeologists, Bureau of Land Management, and State Historic Preservation Office, and helped in the evaluation of new materials. This poster presents the standing legacy of Project Archaeology in Colorado while highlighting the success of recent programs and efforts.

Simon, Elizabeth (Department of Archaeology - Simon Fraser University) and Hugo F.V. Cardoso (Department of Archaeology - Simon Fraser University)

[204] *Preliminary Testing of Facial Approximation Methods for Finding the Pronasale in Children*
Facial approximation has been increasingly used in archaeological human remains but its accuracy in children is often uncertain due to the lack of research in this area. There are currently several methods in use to predict the nose pronasale position, but they have all been developed for use in adults. Considering that the face, including the nose, undergoes significant size and shape changes during growth, the validity of these methods in children is largely unknown. Preliminary testing of Gerasimov's (1951,1977) method was performed on lateral cephalograms of 22 12 year-old subjects consisting of 10 males and 12 females. The x-rays were imported into Photoshop where the soft tissue outline was removed and the method was blindly tested. Testing showed that in females the estimated pronasale tends to be systematically more anteriorly located, and in males it tends to be systematically more inferiorly located. This may be related to sex-specific changes in facial growth. Additional testing of this method and quantification of differences between the estimated and real pronasale can help to determine whether or not they work on facial approximations of children.

Simon, Arleyn

[277] *Past, Present, and Future of Archaeological Legacies: Reassessing the Chavez Pass Burial Collections for NAGPRA Repatriation*

A recently completed NAGPRA documentation project for the Chavez Pass Burial Collections at Arizona State University facilitated a multi-faceted reassessment of the expansive collections of the

site, originally recovered from 1976 through 1982 by ASU archaeologists. In the reassessment, teams of physical anthropologists and archaeologist used original site records, maps, specimen logs, museum catalogs, photographs and reports to reexamine contextual identification of burials and associated funerary objects. The USDA Forest Service Southwest Regional Office and Coconino National Forest provided funding for the NAGPRA documentation over a four year period. Results of this recent documentation effort, utilizing current state-of-the-art methodologies, allowed careful reassessment and more realistic estimations of both numbers of individual and associated funerary objects for the repatriation. Thorough documentation of the burial collections has provided extensive data for use by the Forest Service, the Hopi and Zuni Tribes who received the collection, and for future researchers.

[277] *Chair*

Simonetti, Antonio [121] see Schurr, Mark

Simons, Dwight, Tom Wake (University of California Los Angeles, Cotsen Institute) and Alex DeGeorgey (Alta Archaeological Consulting)

[293] *Fins, Feathers, and Furs: Fish, Bird, and Mammal Remains from a Stege Mound Complex Site, CA-CCO-297*

During approximately the last thousand years, people at CA-CCO-297 focused upon taking small schools of fishes, aquatic and marine ducks, and sea otters. These were obtained from estuarine habitats immediately adjacent to the site. Seasonality profiles for fish, bird, and mammal species indicate procurement occurred throughout the year. Harvesting of these taxa was facilitated by the use of watercraft, nets, and hunting tactics including mass collection, prey switching and coharvesting. Preparation techniques indicate processing emphasized production of animal products focused on both on-site needs and as commodities.

Simons, Dwight [293] see DeGeorgey, Alex

Simova, Borislava (Tulane University) and David Mixter (Washington University in St. Louis)

[376] *Resignification: Public Ritual and Changing Cultural Landscapes at Actuncan, Belize*

Across the Maya Lowlands, dedication ritual served a vital role in endowing public and household spaces with meaning and function. Through ritual, structures acquired the soul-force, or k'ulel, necessary to sustain activity within their walls. However, many structures lived (at least) two ritual lives: one associated with their original intended function, and a second following the abandonment of their initial use. We argue that through ritual resignification the original meanings of public spaces were harnessed and reshaped to match new uses and the changing needs of the local populace. In this presentation, we specifically discuss three locations originally vested with value through royal, elite, and exclusive forms of ritual. Each is later resignified to establish powerful locations for community-oriented inclusive ritual to meet the needs of shifting social and political institutions. The loci of interest are an elite residential structure, a palace compound, and the plaza of a triadic temple group at the site of Actuncan, Belize. Parallels and deviations in the structure of ritual deposits within these loci speak to shifting access, and their examination clarifies how the architectural vestiges of Preclassic royal power were differentially incorporated into the Terminal Classic, post-royal landscape of Actuncan.

Simpson, Ian (University of Stirling), Konrad Smiarowski (City University New York), Christian Madsen (National Museum of Denmark) and Michael Nielsen (National Museum of Denmark)

[351] *Soil Nutrient Management in Norse Greenland*

In this paper we set out to establish the role of soil nutrient management in the sustainability and resilience of livestock agricultural systems in Norse Greenland (ca. late 9th – 14th centuries A.D.). Using a landscape sampling framework that includes large, medium, and small sized farms we use thin section micromorphology and associated SEM-EDX analyses of cultural soils and sediments in home field areas. We identify materials used in the endeavor to sustain soil nutrients together with nutrient levels achieved. Radiocarbon dating of charcoal from the anthrosols provides a robust

chronological framework for our stratigraphies. Our findings allow us to identify selection of materials and the intensity of endeavor to sustain nutrient status across different types of farm and with different environmental conditions over time. The paper concludes by assessing the viability of the contrasting management strategies that emerge from the study.

Simpson, Kay (Cultural Resource Analysts, Inc.) and Brian Glusing (Fort AP Hill)

[363] *The Capture of John Wilkes Booth*

After the assassination of President Abraham Lincoln, the ill-fated escape effort of John Wilkes Booth ended in Virginia on the doorstep of Richard Garrett, where Booth was shot by pursuing federal forces and died on April 26, 1865. Garrett's Farm, frequently the subject of Booth-related intrigue, was purchased in 1940 by the U.S. Army and is part of Fort A.P. Hill, an Army training installation. Although Garrett's house and other structures are long gone, the former Garrett house site is now situated in the median of a divided highway and is the subject of many unauthorized roadside visits each year. As stewards of the land and the highway respectively, Fort A.P. Hill and the Virginia Department of Transportation are undertaking archaeological studies to document the Garrett Farm site. These studies seek to evaluate the integrity and determine the cultural significance of the Garrett Farm site, particularly as it represents the last of the many sites that make up Booth's escape route. The studies also aim to explore the potential to use the site, in cooperation with Historic Port Royal and Caroline County, for public exhibition in April 2015 on the 150th anniversary of the capture of John Wilkes Booth.

Sims, Marsha (Nat Resources Conserv Svc)

[150] *The Southern Hummingbird, Give Me Five*

This research is on the use of the outrepasse or overshot technique of flintknapping of the Clovis culture and the "sacred" use of this technique by the Aztecs in order to connect paleoindian archaeology to culture heroes. In the record of the Aztec, Huitzilopochtli, a culture hero, fought the Four Hundred Southerners and he sacrificed these gygantomachy on the field. A reenactment of this sacred drama is a game called tlachtli and it is played on the ball court called tlacho in the New World. A weapon used in the Aztec iconography is a serpent-headed boomerang or incomparable dart.

Sinclair, Anthony (University of Liverpool)

[93] *Mapping Archaeological Research 2004-2013: A Network of Sources, Authors and Concepts*

Citations data provide an important but underutilized resource through which to appreciate the structure and relationships of archaeology as a discipline. This data can be visually mapped to present the key structures of scientific disciplines. This poster will present three network maps of archaeological research based on an analysis of citations index data from more than 20,000 archaeological research outputs published between 2004 and 2013 inclusive. Each map contains information on more than 1000 elements, positioned and clustered by association to surrounding elements and ranked by importance. These maps include; (i) the network of cited archaeological sources, (ii) the network of archaeological authors, and (iii) the network of terms or concepts used in current archaeological research. These maps provide a unique visual through which to understand the multidisciplinary nature of archaeological research, the nature of its specialties, and the essential knowledge concepts that are required for an understanding of archaeological research. The network of cited authors can be viewed as the disciplinary research core supporting contemporary research.

Sinclair, Alan [225] see Hoffman, John

Sinensky, R. [364] see Mack, Stephanie

Sinensky, Robert (Reuven) (University of California Los Angeles)

[364] *All Potted Up: Exploring Seasonality at Small Late Pueblo II and Early Pueblo III Sites at Petrified Forest National Park*

Researchers have conducted archaeological investigations within the vicinity of what is now Petrified Forest National Park (PEFO) for over 100 years. Although the majority of archaeological sites identified at Petrified Forest National Park consist of small habitation sites that date to the late Pueblo II (1030-1125 A.D.) and early Pueblo III (1125-1225 A.D.) periods, archaeologists have gathered little information regarding the habitation practices of people during this transitional time period. Late PII and early PIII archaeological sites often only contain single room structures, ranging from coursed masonry dwellings, to pithouses and jacal structures. Archaeologists often refer to single room masonry structures as fieldhouses, but have conducted little research to substantiate this claim. Archaeologists conducting ongoing survey of nearly 100,000 acres of recently acquired lands surrounding PEFO have identified numerous small late PII and early PIII habitation sites. Since the introduction of modern excavation methods, which include flotation analysis, no small late PII/ early PIII sites have been excavated at the park. Analysis of paleobotanical samples from a complete vessel found eroding out of a single room structure at a late PII/ early PIII site provides insight into the habitation practices of people during a significant period of change.

Singels, Elzanne (University of Cape Town), Karen Esler (Stellenbosch University), Richard Cowling (Nelson Mandela Metropolitan University), Alastair Potts (Nelson Mandela Metropolitan University) and Jan de Vynck (Nelson Mandela Metropolitan University)

[294] *Foraging for Bulbs in the Cape Floristic Region*

Underground storage organs (USOs) serve as a staple source of carbohydrates for many hunter-gatherer societies. While the way of life of hunter-gatherers in South Africa's Cape is no longer in existence, there is extensive historical and archaeological evidence of hunter-gatherers' use of such plants as foodstuffs. This is to be expected, given that the Cape supports the largest concentration of plants with USOs globally. To meet the goals of the Paleoscape project, the importance of evaluating the USO resources of the area is a crucial part of modelling the resources that would have been available to hunter-gatherers during glacials. In the past, optimal foraging models were built on data collected from observing hunter-gatherer foraging, this is impossible in the Cape due to the lack of hunter-gatherers. To this end we evaluate the foraging potential of USOs by identifying how abundant edible biomass is in a coastal setting of the southern Cape, how easily it is gathered, and how nutritious it is based on experimental methods. From preliminary experiments we demonstrate that USOs are a readily available food resource in the southern Cape landscape and that they more than likely played a critical role in providing food for early humans.

Singer, Zachary (University of Connecticut) and Brian Jones (Connecticut State Museum of Natural History)

[150] *Documenting Variability Among a Geographic Cluster of Paleoindian Sites on the Mashantucket Pequot Reservation in Southeastern Connecticut*

Over the past thirty years, many Paleoindian sites have been identified near the Great Cedar Swamp on the Mashantucket Pequot Reservation in Southeastern Connecticut. Examination of isolated Paleoindian lithics and three excavated sites, Hidden Creek, Ohomowauke, and Raspberry Trail highlights Paleoindian site variability on the local landscape. The comparison of the lithic technological organization, intra-site patterning, and age of occupations among the sites provides insight into the diversity of Paleoindian land-use around Mashantucket.

Singleton, Hayley (University of Florida)

[163] *Recent Investigations of Subsistence at the Garden Patch Site (8DI4): A Study of Faunal Remains from a Platform Mound and Adjacent Midden*

In summer 2013, a platform mound and newly identified midden deposit were tested at the Garden Patch site, a Woodland multimound center located on the northern gulf coast of Florida. The subjects of this research study are the faunal remains from the dense midden of Area X and adjacent Mound II, a platform mound constructed of shell midden. Results indicate a highly marine based diet focused on the nearby marsh and shallow Gulf waters. A series of dates suggest the Area X village midden accumulated over a 200-year period during and after the rapid construction of Mound II. Given the contemporaneity and proximity of the two assemblages, the potential significance of faunal remains is considered in terms of feasting and ceremony.

Sinopoli, Carla (University of Michigan)

[398] *Discussant*

Sitek, Matthew (UC San Diego), Sarah Baitzel (UC San Diego), Kathleen Huggins (UC San Diego) and Paul Goldstein (UC San Diego)

[184] *Second-Hand Spaces: Abandonment and Reoccupation during the Final Stages of a Tiwanaku Provincial Temple (Omo M10A)*

The Tiwanaku colonies in Moquegua, Peru represent some of the best preserved archaeological remains left by this south central Andean polity. This has led to a detailed understanding of daily life and ceremonial practices of these Tiwanaku colonists. However, our understanding of how these lifestyles and practices were transformed during and after the disintegration the highland core is still relatively limited. This paper will take a site-specific approach to explore this enigmatic period of Tiwanaku history. Omo M10 boasts the only Tiwanaku monumental structure built outside the highland homeland, several cemeteries, and a domestic sector. This site shows clear signs of socio-political collapse - the domestic sector was razed, walls in the temple structure were toppled, and cemeteries appear to have been looted. M10 also shows signs of continuity in the form of well-established, but limited reoccupation - not just in the domestic sector but in the temple as well. This reoccupation of the temple will be our primary focus. The changes in practice and use of space in the monumental complex also correspond with stylistic shifts in ceramic iconography that point to the emergence of a locally-based identity, in which memory and tradition continued to play a pivotal role.

Sitek, Matthew [250] see Huggins, Kathleen

Skaggs, Sheldon (Bronx Community College CUNY), Duncan Balinger (Kennesaw State University) and Terry Powis (Kennesaw State University)

[24] *Defining a Late Classic Maya Granite Workshop at the Tzib Group, Pacbitun, Belize*

The ancient Maya site of Pacbitun is centrally located between the major ecozones of the Belize River Valley and the Mountain Pine Ridge of West-Central Belize. Investigations in 2012 and 2013 began on a group of mounds, known as the Tzib Group, located outside of the core zone of Pacbitun in order to investigate what is now believed to be a ground stone tool workshop. The workshop produced grinding implements made from granite. Excavations in 2014 into the main mound of the group uncovered more than 500 kilograms of granite debitage as well as large quantities of mano and metate perform fragments varying in size and stage of production. Based on ceramic and radiocarbon dating, the granite workshop is dated to the Late Classic (A.D. 700-900) period. Workshops of this nature are rarely found, and most of what we know has previously only been gleaned from ethnographic data. Magnetic gradiometry was also performed in 2014 to determine the capabilities and limitations of this technique in identifying stone tool production locations. Guided by the geophysical results and the research previously conducted by Ward (2013), we sought to further document the context, scale, and intensity of production of this workshop.

Skeates, Robin

[74] *Causalities, Time-Scales, and Processes of Environmental and Cultural Change in Italy between the Final Upper Paleolithic and Early Neolithic*

This paper reconsiders the significance of a generally warmer and wetter climate, expanded plant ranges and sea level rise to human groups in mainland and island Italy between the Final Upper Paleolithic and Early Neolithic. Fundamental cultural changes in demography, subsistence strategies and social organization certainly coincided broadly with these environmental changes, and do suggest a degree of human adaptation, although the cultural resilience of hunter-gatherer lifestyles should not be under-estimated. But do the available data allow us to be more precise about possible causalities, time-scales and processes in Italy? And, more specifically, do they enable us to identify the impact on human groups of Berger and Guilaine's (2009) claimed abrupt climatic deterioration event around 8200 years ago?

Skibo, James [4] see Malainey, Mary

Skibo, James (The University of Utah Press)

[280] *Discussant*

Skinner, Jessica

[301] *Entheses and Activities: A Metric and Non-metric Analysis of Enteseal Change of the Shoulder Complex within the Milwaukee County Institution Grounds Population*

The analysis of the features that mark tendon and muscle insertion sites on bone has been used in an attempt to reconstruct past life activity patterns of individuals and populations represented by skeletal remains. Many of these analyses have focused on comparing evidence from these individuals with known musculoskeletal and biomechanical data. Recent experimental tests have illustrated that defining these correlations is more complex than expected (Mariotti et al., 2007). Modern clinical data has expanded our understanding of the development of these markers as a result of enthesopathy and enteseal change, enabling further examination of the underlying forces affecting these changes, such as age and concurrent pathology. To further this study, an analysis of individuals from the Milwaukee County Institution Grounds Cemetery collection is conducted, using the entheses-type-selection technique (Villotte 2010) and an enteseal change scoring method proposed by Henderson et al (2010). 3D morphometric analysis is also utilized. The shoulder complex of adult individuals exhibiting a range of skeletal health conditions is analyzed. This study examines the implications of age, concurrent pathology, and activity for skeletal and enteseal health, as well as the utility of enteseal change analysis for the purpose of determining past life activities.

Skoglund, Peter (University of Gothenburg)

[137] *Approaches to Scandinavian Rock-Art*

The aim of this paper is to discuss and evaluate some general trends in Scandinavian rock-art research. For a larger part of the 20th century scholars from the history of religion had a strong impact on the interpretation of south Scandinavian rock-art. Images were contextualized by a comparative approach where scenes and details from rock-art were compared to similar phenomenon in other media. Today, this perspective is complemented by a variety of approaches; but a dominating perspective focuses on landscape archaeology and the maritime character of many rock-art sites. The landscape perspective is often combined with an interest in chronology and the notion that the same panel could have been used by different people for a very long time. Based on a case study of rock-art in southernmost Sweden, I will evaluate the different approaches and argue that they both may contribute to an understanding of the south Scandinavian rock-art tradition. However, their relevance may vary through time as the rock-art tradition underwent rather significant changes during the course of the Bronze Age.

Skousen, Benjamin (University of Illinois)

[142] *Pilgrimage Centers, Infrastructure, and Cahokian Politics*

Archaeological and historical evidence suggests that pilgrimage centers were vital to the infrastructure, politics, and religions of cities and civilizations throughout the ancient world. The precolumbian city of Cahokia was no different. In this paper, I argue that the Emerald site, a major pilgrimage center east of Cahokia, was integral to the formation of a new political-religious order circa A.D. 1050. Ceramic, architectural, and botanical data show that large groups periodically gathered there to feast, participate in large-scale construction projects, witness rare lunar events, and renew ties with kin and other-worldly beings and powers. I contend that intermittent public gatherings at Emerald allowed continual negotiations between people of diverse ethnicities and backgrounds, which in turn created a communal identity that made this new orthodoxy possible. Emerald, like other pilgrimage centers throughout the world, was an important place where Cahokian politics and religion were simultaneously constructed, enacted, and experienced. Furthermore, this case underscores the problem of examining infrastructural projects, politics, and religion separately.

Skowronek, Russell and Ronald Bishop (Smithsonian Institution- Museum of Natural History)**[416] *Ceramic Production, Supply, and Exchange in the San Francisco Presidio Jurisdiction***

In the late eighteenth century Spain occupied the San Francisco Bay Area and rapidly transformed the region through the introduction of agriculture, animal husbandry, Roman Catholicism, the Spanish language and the use of pottery. This presentation focuses on the latter, and considers the questions surrounding local manufacture, importation, and exchange of ceramics among the missions, presidio and pueblos of the San Francisco Presidio Jurisdiction. Through the application of instrumental neutron activation analysis of ceramic materials, local production of unglazed and glazed earthenwares is shown in addition to glazed ceramics originating from nonlocal sources. These patterns provide insights into the manufacture, supply, and exchange of ceramics in the San Francisco Bay Area, and through them a window on the material expression of the colonial experience.

Slachmuylders, Jean-louis [309] see Vrydaghs, Luc

Slater, Philip (University of Illinois Urbana-Champaign) and Stanley H. Ambrose (University of Illinois Urbana-Champaign)**[174] *Technological Organization Strategies during the East African Late Stone Age: Blade Production and the Evolution of Standardized Technology***

OI Tepesi rockshelter (GsJi53) is located in Kenya's central Rift Valley on the southern slope of Mt. Eburu, northwest of Lake Naivasha. Its 30-meter high rear wall and 45-meter wide floor would have provided prehistoric inhabitants with a vast habitable area. Excavated deposits span the most recent 17,000 years, from the Iron Age back to the late Pleistocene LSA. Almost 200,000 artifacts, including pottery, lithics, fauna, ostrich eggshell and ochre, were recovered during two seasons of excavation. A series of hearths with associated cut and burned bones were also exposed. A sample (n=3039) of flaked obsidian artifacts of a new Late Pleistocene LSA lithic industry was analyzed by typological classification and quantitative morpho-metrics. Backed microliths, burins, scrapers and expedient tools dominate the blade-based assemblage. Results of this analysis provide insight into techniques of systematic blade production and the development of standardized technology at the end of the last glacial maximum. This analysis contributes to our ultimate goal of investigating the evolution of modern human behavior by analysis of technological organization strategies during the Middle and Late Stone Ages in East Africa.

Slater, Donald (Phillips Academy, Robert S. Peabody Museum, & Brandeis University)**[355] *Hallowed (under)Ground – Ancient Maya Dark Zone Use Patterns in the Subterranean Realm of Yaxcaba, Central Yucatan, Mexico***

Cave explorers and scholars classify the different light zones of underground spaces into three categories – light, twilight, and dark. Despite the practical challenges ancient people faced while traveling into and through dark zones (those entirely devoid of light), it is common across the Maya region to find rich evidence that demonstrates that these spaces were heavily utilized during Precolumbian times. Research conducted during the 2009 - 2011 field seasons of the Central Yucatan Archaeological Cave Project (CYAC), however, produced data that suggest that the dark zones of three major caves near the pueblo of Yaxcaba were seldom accessed in ancient times despite evidence of extensive usage in each caves' light/twilight zones. This paper presents these data in stark contrast to what is most commonly observed at other Maya cave sites, while providing interpretations that may help explain this locally isolated phenomenon.

Slaughter, Mark (Bureau of Reclamation) and Jon Czaplicki (Bureau of Reclamation)**[90] *Black Mesa Cultural Resources: An Update***

The Black Mesa Archaeological Project (1967-1987) was undertaken to clear archaeological sites to mine coal for the Navajo Generating Station to provide power for the Bureau of Reclamation's Central Arizona Project. The original permit for this work expires in 2019. The Bureau of Reclamation is in the process of re-permitting (from 2019-2044) all of the connected features of the project that

include the Kayenta Mine on Black Mesa, a railroad, and two large powerlines. This paper will present on-going cultural resource activities connected with the re-permitting process.

Sliva, Jane (Desert Archaeology, Inc.)

[55] *Who Goes There? Tracing San Pedro Phase Migration and Social Dynamics in the Borderlands with a Revised Projectile Point Typology*

The projectile point assemblage from Las Capas (AZ AA:12:111 [ASM]) provides a case study for using a social dynamics model to explain shifts in point design during the San Pedro phase (1200-800 B.C.) in the Tucson Basin. Available evidence indicates that the population of Las Capas and the residents of a possibly related settlement directly across the Santa Cruz River maintained a separate projectile point design orientation from other settlements in the northern Tucson Basin during the early San Pedro phase, but produced points conforming to the local design canon during the late San Pedro phase. This poster presents an updated projectile point typology for the borderlands, and combines chronological point data with additional lines of material culture and biological evidence to argue that the earlier occupation of Las Capas represents a migrant population from northern Sonora, Mexico, who failed to achieve social equity with or assimilate into the existing social fabric of the Santa Cruz River floodplain; the later reflects a re-occupation of the site by an endemic group exhibiting typical San Pedro phase Tucson Basin technology.

Sload, Rebecca

[355] *Primacy of the Cave at the Sun Pyramid, Teotihuacan*

Multiple lines of evidence indicate that the cave determined the definition of the Sun Pyramid. As the earliest monumental construction at Teotihuacan, it is hypothesized that the Pyramid/cave was built within a pan-Mesoamerican worldview that valued the mountain cave, including acknowledging artificial caves as caves, pyramids as mountains, and sacred space as created via engineered spatial relationships. Ceramics and radiocarbon dates indicate contemporaneous construction of and modification to cave and Pyramid. Contemporaneity at the outset reinforces that they were a unit, a mountain cave. It is in modification, however, that the clearest evidence is found. The decision to close the cave appears to have prompted changes to the Pyramid, whose spatial relationships to the cave suggest purposes significant to it. Pyramid modifications are hypothesized as also redefining the Pyramid sans cave. Interpretation of the meanings of changes to the cave and Pyramid is reinforced by finds from recent re-excavation of a 1933 tunnel on the east-west centerline of the Pyramid at its base. In all cases, events appear driven by the cave.

Slotten, Venicia (University of Cincinnati) and David Lentz (University of Cincinnati)

[75] *Paleoethnobotanical Remains Associated with the Sacbe at the Ancient Maya Village of Cerén*

Paleoethnobotanical research conducted during the 2013 field season at Joya de Cerén in El Salvador focused on the analysis of plant remains found on the surface and associated features of an ancient Maya sacbe (causeway) that were well protected beneath tephra deposited by the volcanic eruption of Loma Caldera around A.D. 660. Plant remains were retrieved from the sacbe surface, adjacent drainage canals, and agricultural fields on either side of the sacbe. Because the plant remains found in association with this sacbe were well preserved, a rare occurrence in Mesoamerica, the data recovered from Cerén are quite significant and unique to the study of Maya plant use activities as well as Maya causeways. The project collected over 60 macrobotanical samples and 160 flotation samples processed in a water flotation tank. Prominently represented in these samples are *Spilanthes* cf. *acmella* achenes, *Zea mays* cob fragments, *Phaseolus* sp. cotyledons, *Amaranthaceae* seeds, *Fimbristylis dichotoma* achenes, *Mollugo verticillata* seeds, *Portulaca oleracea* seeds, *Crotalaria* cf. *sagittalis* seeds, and abundant charcoal remains. Recovered plant remains reveal trends associated with each context as well as distance from the site center, and offer a perspective an essentially economic perspective of Maya sacbeob.

Slotten, Venicia [75] see Lentz, David

Sluka, Victoria (University of Notre Dame), Chase M. Anderson (University of Notre Dame), Donna M. Glowacki (University of Notre Dame) and Edward J. Stech (University of Notre Dame)

[274] *Reducing Human Error and Identifying Unknowns: X-ray Fluorescence as a Tool for Identifying Paint Composition of Mesa Black-on-White Pottery*

Although Mesa Verde Black-on-white pottery paste and temper have been well-studied, the composition of the decorative black paints and white background slips to identify available resources and the varying recipes used across time and space has received much less attention. Paints are typically categorized as either coal-based (organic) or iron-based (mineral), and archaeologists have long used visual differences to identify these two paint bases. While it has been shown that even novices can usually achieve better-than-random accuracy in visually identifying the two paint types, there is still a margin of human error as well as a void of information related to linking specific organic or mineral sources with compositions. Using X-ray fluorescence, we began by characterizing modern test tiles with possible paint recipes produced using local resources (southwest Colorado) to better understand how elemental composition varies with different, known paint recipes. Analyzing known samples created an interpretable baseline that not only permits discerning how the use of slightly different recipes influences composition, but also can be a comparator for archaeological unknowns. We tested the latter utility by comparing the paint composition of samples from Goodman Point Pueblo with the baseline, enabling stronger linkage to the use of specific mineral-based recipes.

Smagur, Emilia [286] see Hanus, Kasper Jan

Small, David (Lehigh University)

[259] *Discussant*

Smallwood, Ashley (University of West Georgia), Thomas Jennings (University of West Georgia), David Anderson (University of Tennessee) and Jerald Ledbetter

[333] *Testing for Evidence of Paleoindian Responses to the Younger Dryas in Georgia*

For the Southeast, Meeks and Anderson (2012) propose Younger Dryas (YD) climate changes triggered a human population crash and/or substantial reorganization. We use the Georgia point record in the Paleoindian Database of the Americas to test for evidence of changes in landscape use through the Paleoindian period and consider these changes in the context of the Georgia paleoenvironmental record spanning the YD. Based on differences in point frequencies, distributions, stone types, and transport distances and directions, we conclude the Coastal Plain was a focus of early settlement, but by the end of the YD, Paleoindian settlement shifted into the Piedmont.

Smiarowski, Konrad [351] see Simpson, Ian

Smiarowski, Konrad (CUNY Graduate Center)

[351] *Climate Change and Resource Management in Eastern Settlement Norse Greenland: Zooarchaeological Perspective*

Changes in climate regimes have played a significant role in the cultural settlement patterns of Greenland for several millennia. This presentation focuses on the Norse Settlement ca. 985-1450 CE and how the terrestrial and marine animal resources were utilized, managed and modified in the face of climatic and environmental changes at all levels of the Norse social strata. Datasets from small tenant farms, middle size independent farms and magnate farms are utilized to understand the site specific, local, and regional management strategies and the level of their long-term sustainability. The Eastern Settlement strategies are compared with parallel data from the Western Settlements. Their comparison aids in understanding the collapse of the whole Norse colony, a century after the abandonment of one of its two core components, the Western Settlement.

[351] *Chair*

Smith, Beth P. [6] see Creger, Cliff

Smith, Adam (Cornell University)

[14] *Discussant*

Smith, Chelsea (University of California, Davis)

[28] *Investigating Genetic Structure and Dietary Ecology through Ancient DNA and Stable Isotopic Analysis of Prehistoric Dogs from San Nicolas Island, California*

The study of prehistoric dogs has become a global trend. Not only did they fulfill a variety of roles and were an important part of past human societies, but they can be used to understand human-modified environments and human movement. On the California Channel Islands the domestic dog has been shown to be a significant component of the archaeological record. Dogs are uncovered in a variety of cultural contexts and their presence on the islands dates to the middle Holocene. Despite their cultural significance, little is known about prehistoric dogs on the Channel Islands. In this study ancient DNA and stable isotope analysis was performed on dog remains recovered from San Nicolas Island, California, from both known archaeological contexts and those collected by Loye Miller during the early 20th century. Preliminary aDNA results identified a mtDNA clade novel to the Americas and isotopic data suggest that these animals primarily subsisted on marine resources. The purpose of this research is to develop data that can be used to elicit information on the genetic lineage and diversity of Channel Island dogs, along with their dietary ecology. In addition this research underscores the importance of revisiting legacy archaeological and natural history collections.

[28] *Chair*

Smith, Geoffrey (University of Nevada, Reno), Madeline Van der Woort (University of Nevada, Reno) and Aaron Ollivier (University of Nevada, Reno)

[35] *The Pre-Mazama Occupation of the LSP-1 Rockshelter, Warner Valley, Oregon*

For the past five years, a crew from the Great Basin Paleoindian Research Unit, University of Nevada, Reno, has excavated in the LSP-1 Rockshelter in Warner Valley, Oregon. Our work has identified a modest record of pre-Mazama (~7,700 cal BP) occupation comprised of lithic tools and debitage, a well-preserved faunal assemblage, shell beads, and hearth features. In this paper, we highlight major trends in the LSP-1 assemblage and place it within the broader context of northern Great Basin prehistory. In doing so, we highlight the critical role that caves and rockshelters play in interpretations of human behavior in a region dominated by open-air lithic scatters.

Smith, Mark

[70] *Discussant*

Smith, Susan, Karen Adams (Crow Canyon Archaeological Center, Cortez, Colorado) and Kristin Kuckelman

[85] *Five Hundred Years of Plant Use in the Sand Canyon Locality, Southwestern Colorado*

For more than 20 years, the Crow Canyon Archaeological Center has systematically acquired flotation, macrobotanical, and pollen samples from structure floors, thermal features, middens, and other contexts during the testing or excavation of many ancestral Pueblo sites dating from a wide range of time periods. In this study, we synthesize uses of plant materials through nearly 500 years of the Pueblo occupation of the Sand Canyon locality in the northern San Juan region. In order to control for differences in plant use attributable to local environmental variation, we focus on the archaeobotanical data for 16 settlements that were located within a 2 km radius on the landscape. Samples from thermal features and middens provide evidence of short-term activities and long-term plant use spanning the Pueblo I, Pueblo II, and Pueblo III periods; late Pueblo III villages are particularly well represented. We examine subsistence practices through time, including reliance on maize agriculture, wild plant use, seasons of occupation, differences in domestic vs. nondomestic use of kivas and public architecture, and possible long-term anthropogenic effects on plant communities. We also scrutinize the data for evidence of subsistence stress or other impetus for the

early A.D. 1280's regional depopulation.

Smith, Geoff (MONREPOS Archaeological Research Center, RGZM)

[87] *Re-evaluating the Evidence for Systematic Exploitation of Mammoth during the European Middle Paleolithic*

The recurrent presence of mammoth, elephant and rhinoceros at Middle Paleolithic sites, together with Neanderthal isotopes signaling meat as a prominent protein source, have been used to argue for a central role of these species in Neanderthal subsistence. Key to this model are the bone heap horizons from La Cotte de St Brelade (CSB, Jersey), previously interpreted as game drive debris resulting from systematic Neanderthal hunting. However, this hypothesis has never been rigorously tested. Therefore, this paper presents new CSB faunal analyses, contextualizing behavior at the site and in the wider landscape. Furthermore, a broader European perspective assesses the overall role and importance of megafauna in Neanderthal diet.

Initial Neanderthal occupation at CSB was intensive, though, through time visits became more infrequent. Mammoths, alongside other large mammals, were clearly butchered, but increasing carnivore presence suggests a more complex site formation scenario. In general, similar mammoth-dominated sites are rare in Western Europe, indicating a main focus of Neanderthals on large herbivores, with only a minor, opportunistic, role for megafauna. Therefore, currently, the isotope signal and zooarchaeological evidence cannot sustain a one to one equivalency. Whilst Neanderthal diet was meat-orientated, the archaeological data does not indicate systematic contributions from megafauna.

Smith, Gerad (University of Alaska Fairbanks)

[110] *The Caribou Didn't Come Back: Modelling Human Migration Variations through Local Ecological Changes*

The objective of this paper is to model the effect that the presence/absence of specific ecological variables, such as certain prey species, has on the passive movement of raw materials from their point of origin to their point of deposition in the archaeological record. This study takes place in the Talkeetna Mountains of Southcentral Alaska. The model was built using ArcGIS, informed through ethnographic, historic, and modern ecological and archaeological data, and structured using a theoretical framework from Human Behavioral Ecology. The results suggest significant differences occur in human migration patterns based on the presence/absence of specific prey items, and these inform further hypotheses of site structure and placement on the landscape.

Smith, Kevin (University of California, Davis)

[139] *Examining the Function of Lithic Crescents as Transverse Projectile Points: An Experimental Approach*

Flaked-stone crescents are an artifact type unique to the western portion of North America, and based on direct obsidian hydration and associated radiocarbon dates this artifact was used between the terminal Pleistocene and early Holocene. Previous studies have attempted to uncover the function of this artifact, associated with the earliest inhabitants of western North America, hypothesizing the use of crescents as sickles, ulus or hide scraping tools, among other uses. Recent studies have demonstrated a high correlation between crescent distributions and seasonal waterfowl migration routes. Following on this research, I test the hypothesis that stone crescents functioned as transverse projectile points by analyzing crescent collections within California. Results produced from analysis of lithic-reduction sequences, material-selection strategies, wear and breakage patterns, as well as data derived from replicative and experimental studies (e.g., testing impact fractures, hafting strategies, material performance) appear to support the hypothesis that these artifacts were effective weapons for the acquisition of waterfowl.

Smith, Heather (Center for the Study of the First Americans)

[150] *The Late Pleistocene Transmission of Fluted-Point Technology across a Continent: A Morphological Investigation*

The Northern Fluted-Point Complex represents a Paleoindian occupation in northern Alaska and the Canadian Yukon and appears to form part of an adaptive strategy similar to that of late Paleoindians in the North American plains. This paper presents the results of a shape analysis that uses geometric morphometrics as a tool to identify major factors of variability in fluted projectile-point morphology across a continent by comparing artifacts from Alaska and more temperate regions in North America. Geographic patterns in such variability demonstrate whether fluted-point technologies were "grafted" onto more autochthonous northern complexes or represent movement of discrete Paleoindian groups northward at the end of the Pleistocene. Discussion addresses the role of fluted technology in the context of human dispersal across America and their adaptive context in late-glacial Arctic and Subarctic ecosystems.

Smith, Madeleine (The Ohio State University) and Abigail Buffington (The Ohio State University)

[162] *Feeding the Troops? Patterns of Agricultural Production in the Macrobotanical Remains of Nabatean-Late Roman Sites in the Wadi ath-Thamad, Jordan*

The macrobotanical record from Khirbat ez-Zona, a Late Roman period castellum, reveals a pattern of crop refuse that does not fit the grand narrative of Roman agricultural practice or previous studies of contemporaneous military structures in the region. The Eastern Mediterranean witnessed a considerable boom in both population and agricultural productivity during the Late Roman period. This productivity can reflect the practices of an empire from religious ritual and pilgrimage, to preparation for important visits and festivals and lastly, feeding armies. In a recent macrobotanical study on a similar landscape in the Wadi Araba within the hinterlands of Petra, Ramsay and Smith argue for a largely local origin for agricultural production. Khirbat az-Zona is also in the hinterlands of an important urban center for the empire, Madaba. This study, which ultimately used 40 samples, attempted to address if this trend toward local production is also found in places such as Wadi ath-Thamad, where ecological conditions provided the basis for earlier periods of high agricultural productivity, in contrast to the Wadi Araba. In an effort to isolate the effect of Roman presence on agricultural productivity, samples from Nabataean domestic sites in the region were also sampled.

Smith, Michele (Haffenreffer Museum of Anthropology), Juana Lazo (Independent Researcher), Alan Coogan (Portland State University) and Maria Cecilia Lozada (University of Chicago)

[187] *Ramada Textiles from Southern Peru: Death's Social Skins*

Textiles from the Ramada culture of southern Peru are currently understudied and poorly understood. Recent research in the Vitor Valley suggests that the Ramada culture was a regional Early Intermediate-to-Middle Horizon cultural manifestation, contemporary with both Nazca, to the northwest, and the Wari traditions, but with its own distinct expressions of cultural identity. This paper presents preliminary analyses, using archaeological textiles from a cemetery dated to 550 A.D., which suggest that the Ramada culture exhibits its own grammar and patterns of textile production, decoration, and use. The use of textiles in Ramada mortuary contexts displays different strategies and internal expressions of identity that were used to reflect regional identity, gender and age as well as group affiliation. While preliminary, these analyses have opened the way for more holistic approaches to defining dress and identity within the Ramada cultural complex in southern Peru.

[255] *Discussant*

Smith, Michael (Arizona State University)

[194] *The Economics of Aztec Inequality or, the Inequality of the Aztec Economy*

In discussions of Aztec society, economy and inequality are typically treated as separate realms. The former is discussed in terms of production, exchange, and consumption, while the latter is framed around nobles versus commoners and various hierarchies. Although no one would claim that these two topics are unrelated, the full extent of their interconnection is rarely acknowledged. We cannot understand Aztec economic processes and institutions without reference to patterns of inequality, nor does Aztec inequality make sense apart from consideration of the economy. Frances Berdan has made contributions to both topics, and to their joint analysis. I explore the connections among the

economy and patterns of inequality, putting Frannie Berdan's research into a broader context.

[194] *Chair*

Smith, Erin (Department of Anthropology, University of Miami), William Pestle (Department of Anthropology, University of Miami), Francisco Gallardo (Centro Interdisciplinario de Estudios Intercultural) and Christina Torres-Rouff (Department of Anthropology, University of California)

[203] *Isotopic Analysis of Dietary Variation in Formative Period Chile*

Northern Chile's Atacama Desert is one of the driest environments on Earth. In fact, it has been suggested that the region serves as a good model for living conditions on Mars. By employing a number of resource management strategies including complex systems of trade, humans have lived in the inhospitable region for millennia. Here we present the results of stable isotope analysis of seven Formative Period (1500 B.C.-A.D. 500) humans from the Ancachi site near the modern town of Quillagua. Analysis of carbon and nitrogen isotopes from human bone collagen and hydroxyapatite, as well as floral and faunal remains, allows us to study the variability in protein and carbohydrate components of these individuals' diets. These data, as well as the comparison of burial methods between Ancachi and several coastal cemeteries, allow us to examine patterns of exchange and social mobility on an individual level. By comparing these data to those of hundreds of other individuals in a broader ongoing study, we can examine patterns of dietary variation in the region which indicate systematic regional exchange of food and other goods.

Smith, Kevin (Haffenreffer Museum, Brown University)

[215] *Color Matters: The Selection and Use of Lithic Raw Materials in Viking Age and Medieval Iceland*

As our abilities to source stone tools increase, our questions become ever more sophisticated as our methodologies reach deeper into the elemental and isotopic levels and an ever-broadening range of statistical analyses. Yet we also recognize that lithic raw materials were selected by their past users for entirely different reasons. A wide range of approaches have been used to explore the roles of proximity, accessibility, mechanical qualities, and exchange relationships, among others, in determining how and why the stone tools and debitage we recover were initially acquired and accumulated in the sites we excavate.

However, relatively few analyses take the actual color of lithic raw materials seriously into account. Color is often regarded as a secondary accident of a raw material's chemical composition or physical structure rather than as the primary reason for its original acquisition and use. This paper will explore case studies from domestic and sacral contexts in Viking Age and Medieval Iceland to argue that selection for color may sometimes have been the primary reason for acquiring and accumulating lithic raw materials for utilitarian use, for specific roles in ritual settings, and even in manuscript preparation. Color was therefore also a key determinant of quarry/source selection.

[255] *Moderator*

Smith, Bruce (Smithsonian Institution)

[226] *Current and Future Directions in Archaeobotany*

Recent advances in archaeobotany are discussed, and emerging research domains and future challenges are outlined. Particular emphasis is paid to the challenges of replication of results, and the curation of archaeobotanical collections for future researchers.

[414] *Discussant*

[414] *Chair*

Smith, Cecilia (University of Illinois at Chicago)

[238] *Negotiating Power at the Spanish-Philippine Frontier: What Evidence of Indigenous Prestige Economies Reveals about Indigenous-Colonial Interaction*

Historical documents provide most of what is currently known regarding Spain's subjugation of the

Philippine archipelago. However, in this paper I discuss how archaeological evidence of indigenous prestige economies enriches our understanding of the interaction between the encroaching Spanish colonizers with indigenous polities. My study of imported ceramics found in the Malangwa watershed, Negros Oriental indicate that, contrary to Spanish records, indigenous access to foreign prestige goods did not diminish in this region during the early phases of colonization. Instead, the spatial distribution of imported ceramics reveals an intensification of the indigenous prestige economy through the 18th century. This means that in response to the Spanish installed *encomenderos*, who demanded tribute from the polities of Negros, local leaders increased their use of imported wares to solidify regional alliances and loyalties. Thus, while European writings claim that exotic trade was significantly restricted to Europeans after the mid-16th century and that the *encomienda* came to “define” the economy of Negros, the archaeological evidence demonstrates: 1. Indigenous access to foreign goods increased after the mid-16th century and 2. The added demands of *encomienda* tribute did not come to define the economy Negros, but rather, encouraged the intensification of the traditional prestige economy.

Smith, Morgan (Texas A&M University)

[243] *A Geoarchaeological Review of the Guest Mammoth Kill Site (8MR130) in the Silver River, Florida*

The first field school on an underwater prehistoric site in the United States was conducted on the Guest Mammoth site in the Silver River, near Ocala, Florida in the 1970s. This site was touted as a Columbian mammoth kill site, the first found east of the Mississippi River. The excavators presented evidence of this in the form of a single fluted point, six direct percussion flakes, and several pressure flakes found associated with the remains of an adult and a juvenile mammoth. In addition, three of the mammoth bones exhibited potential butchering evidence. However, the sole publication on this site is a five page article published in the Florida Anthropologist in 1983. Poor reporting and contextual issues caused the Guest Mammoth site to fall into archaeological purgatory. Following the trend of re-investigating sites of this nature, the Guest Mammoth site was re-evaluated in the summer of 2014 by archaeologists from Texas A&M University and the University of Wisconsin, La Crosse. This paper will evaluate the known contextual, geologic, and artifactual evidence concerning the site while integrating the information gathered from recent field assessments of the site to determine the Guest Mammoth's place in the North American archaeological record.

Smith, J. Gregory (Northwest College) and Charles L. F. Knight (University of Vermont)

[259] *Variation and Similarity in Obsidian Tool Styles and Technologies at the Zaragoza-Oyameles Source Area, Puebla, Mexico*

The nature and degree of interaction between the Classic period centers of Teotihuacan and Cantona is investigated through two types of obsidian artifacts that characterize Early to Late Classic period obsidian use in the central-east highlands of Mexico: prismatic blades and bifacial dart points. At the Zaragoza-Oyameles source area in eastern Puebla, Mexico the recovery of dart point preforms next to obsidian quarries, combined with chemical analysis indicates that these points were crafted at the source using local obsidian. Surface data indicates that they were part of a linked-reduction sequence that also produced sub-prismatic cores. We investigate the context of the dart points, as well as in the methods of obsidian extraction and its manufacture into sub-prismatic cores at the Zaragoza-Oyameles source area. We then compare information on known caches of dart points at Teotihuacan, and the nature of Teotihuacan-era obsidian extraction and core-blade reduction at the Pachuca obsidian source. In doing so we hope to illuminate variation and similarity in the obsidian reduction sequences and the commodities produced that are associated with these two, large and densely populated regional centers.

Smith, Eugene (University of Nevada Las Vegas), Amber Ciravolo (University of Nevada Las Vegas), Minghua Ren (University of Nevada Las Vegas), Panagiotis Karkanis (The Malcolm H. Wiener Laboratory for Archaeologica) and Curtis Marean (Arizona State University)

[294] *Cryptotephra Discovered at Pinnacle Point Site 5-6 May Correlate with the 74 ka Eruption of Toba in Indonesia: Implications for Resolving the Dating Controversy for Middle Stone Age Sites in Southern Africa.*

Cryptotephra was identified in a sediment stack at Pinnacle Point Site 5-6, South Africa, and occur as small glass shards (less than 100 μm in size). Shards are found in sediment from the Shelly Ashy Dark Brown Sand (SA.D.BS) and the Ashy Light Brown Sand (ALBS) layers with weighted mean OSL dates of 70.6 ± 2.3 and 71.1 ± 2.3 ka respectively. The shards are intimately mixed with sediment and are rare. A preliminary shard distribution profile shows that shards are distributed continuously through the section in two broad peaks separated by a zone of zero shards within the lowermost SA.D.BS. Major element analyses performed on several shards using electron probe microanalysis indicate that they are rhyolite with SiO_2 varying from 72.15 to 77.56 wt. %. Major element chemistry is similar to distal tephra of the ~74 ka eruption of Toba volcano in Indonesia providing for the first time, evidence that Toba ash may have reached southern Africa. The discovery of cryptotephra at PP5-6 provides a powerful new method to create a precise chronological tie-point between archaeological sites and to help identify when a suite of uniquely human features first appeared in our evolutionary history.

Smith, Lisa (University of Montana), Patricia Stavish (National Park Service), Iraida Rodriguez (National Park Service) and Brandon Mauk (Colorado Mesa University)

[300] *Embedded Activities: Preliminary Analysis of Landscape Use and Mobility Patterns in Colorado National Monument*

Ongoing archaeological survey of Colorado National Monument, located on the eastern edge of the Colorado Plateau, reveals that much of the area is a continuous landscape of non-discrete lithic scatters with light to dense concentrations of artifacts. The ephemerality of many of the sites, coupled with their lack of distinct boundaries, poses a challenge for understanding landscape use and mobility patterns of the hunting and gathering people who utilized the area. To circumvent this issue we draw from regional ethnographic and archaeological data, along with archaeological, hydrological, plant, and wildlife data, recently gathered from the monument, to form testable hypotheses of landscape use and mobility patterns of the locality. Our preliminary analysis of these data suggest that intensive lithic raw material procurement and early-stage reduction activities were likely embedded with other seasonal activities such as hunting and Piñon nut harvesting. Moreover, we establish that results of this study that can be used to guide the next stage of this research, which includes subsurface testing for identification of intact deposits.

Smith, David (Anthropology, University of Toronto, Mississauga)

[313] *The Contribution of Canimar Abajo, Cuba to an Understanding of Early Populations in the Greater Antilles*

Excavation at the site of Canimar Abajo, situated in northern Cuba, has yielded new data that contribute to our understanding of early populations in the Greater Antilles. AMS radiocarbon dates on human bone collagen provide a secure chronology for a mortuary context dating to the 2nd millennium B.C. Analysis of starch grains recovered from human dental calculus demonstrates that common bean (*Phaseolus vulgaris*) was cultivated by at least 1200 B.C. Stable isotope analysis of human bone collagen provides evidence of dietary preferences and indicates that a C4 plant, possibly maize (*Zea mays*) was consumed.

Smith, Beverley (University of Michigan -Flint)

[331] *Loon, Fish, and Beaver: Inland Lake Subsistence and Settlement from the Northern Lower Peninsula of Michigan*

Small Late Woodland period occupation sites around Hubbard Lake, MI provide a rare opportunity to examine the empirical evidence of seasonality and subsistence from faunal assemblages in the Upper Great Lakes region in light of long-standing models. While much work has been done regarding the Inland Shore fishery of the Upper Great Lakes, there have been few opportunities to consider Inland Lake localities and their importance in Juntunen phase strategies of settlement and subsistence.

Smith, Stuart (UC Santa Barbara)

[334] *Gift of the Nile? Climate Change and the Origins and Interconnections of Egyptian Civilization within Northeast Africa*

The Greek historian Herodotus, cribbing from Hecataeus of Miletus, famously wrote, "Any sensible person sees at once... that the Egypt to which the Greeks sail is land acquired by the Egyptians and a gift of the river...." Scholars today see the same basic landscape as Herodotus did before them in Egypt and northern Sudan, a narrow strip of green fed by the Nile and surrounded by an absolute desert. This distinctive ecology thus continues to play a central role in models for the origins of the ancient Egyptian state that downplay ancient Egypt's broader African interconnections. From the 1930's through the present day, however, a group of deep desert explorers and archaeologists have documented that during the Neolithic period much of the Sahara was a vast grassland with seasonal and perhaps permanent lakes. This paper discusses evidence from recent research, including data from the UCSB Dongola Reach Expedition, that points to interlinkages between the cultures of the Upper Egyptian Nile, the Sahara and Sudanese Nubia, demonstrating how interaction combined with climate change in the form of a punctuated but gradual desiccation of the Sahara contributed to the rapid emergence of the Egyptian state while maintaining robust connections across northeast Africa.

Smith, Scott (Franklin & Marshall College)

[411] *The Politics of Connectivity at Khonkho Wankane, Bolivia*

Located in the southern Lake Titicaca basin of Bolivia, the Late Formative period (200 B.C. – A.D. 500) center of Khonkho Wankane was a dynamic place where groups of mobile agropastoralists and caravan drovers engaged with resident ritual specialists. In a social context characterized by diversity, population fluctuation, and mobility, what form did political practice take? I review evidence from Khonkho Wankane for interaction with areas throughout the south central Andes and I explore some of the ways that earlier traditions, both local and distant, were cited and modified at Khonkho Wankane. I argue that ritual specialists at Khonkho Wankane creatively deployed and reconfigured a diversity of objects, ideas, and traditions to negotiate the politics of periodic ritual encounters and events.

Smitheram, Craig [241] see Howland, Matthew

Snead, James (California State University Northridge)

[27] *Discussant*

Snijders, Ludo and Tim Zaman (TU Delft)

[58] *Colorful Pictures: Understanding the Material of the Mesoamerican Precolonial Codices*

In this session the most recent advances are presented of an ongoing interdisciplinary project aimed at better understanding the materials of which, and with which, the Mesoamerican Precolonial codices were made. These materials are as varied as ranging from turquoise from the southern United States to cochineal from Oaxaca, jaguar skins from the tropical areas and Maya Blue from the Yucatan peninsula. As such, this understanding allows for a reconstruction of the whole complex practice of their creation, as well as a reconstruction of the large trade network that underlies this. Furthermore one of these codices is of special interest to this project: the Codex Añute (Selden). As it is a palimpsest, this document has two distinct phases of creation and use. As a result of a collaboration of technical specialists and archaeologists within the project a new technique is being developed. This fully non-invasive technique will allow for the color reconstruction of subsurface features independently of the material composition of the paint. This advantage should allow for a reconstruction of the covered images in this largely organic document.

Snitker, Grant (Arizona State University)

[167] *Humans, Fire, and Food Production: Examining the spatial and temporal patterns of changing burning practices during the transition to agriculture in the Western Mediterranean*

One of the principle objectives of current archaeological research is to improve our understanding of the recursive relationship between humans and their environments through time. Following this objective, archaeological and paleoecological analyses have demonstrated that fire and humans have a coupled relationship in almost every biome on earth. The processes through which humans

modify landscapes with fire reflect the complexities of human-environmental relationships, especially in the context of early food production. This poster focuses on the transition to agriculture in the Western Mediterranean (5,600-5,400 cal. B.C.). Paleoecological studies characterize this period by a substantial increase, or “spike,” in fire frequency, which has been interpreted as a change in human burning practices (i.e. Bal et al. 2011; Gil-Romera et al. 2009). In an effort to expand these interpretations, this project utilizes geospatial (GIS) and temporal comparisons between radiocarbon dates for early agricultural sites and “spikes” in charcoal frequency from regional pollen cores to examine the relationship between food production and burning in the Western Mediterranean. This work seeks to enrich our understanding of the timing and geographic extent of early agricultural burning practices, while also contributing to the overall efforts to characterize the dynamics of food production in social-ecological systems.

Snow, Dean (Pennsylvania State University)

[82] *The Neolithic Transition in Northern Iroquoia*

While details remain debated, the general outline of the emergence of semi-permanent sedentary domestic architecture in Northern Iroquoia is well understood. Communities comprised of bark longhouses came to be associated with subsistence maize horticulture over the course of the last millennium prior to European contact. Various factors triggered periodic community relocations throughout Northern Iroquoia, migratory events that were usually short-distance but occasionally involved long-distance moves. Migration is known to promote and reinforce matrilocality and matrilineality in communities, but there appear to be examples in other regions of these institutions thriving in the absence of migration. This raises the general question of how securely archaeologists can infer such social institutions from settlement patterns and other evidence used for inferring paleodemography. The potentials (and their limits) of contributions from Northern Iroquoian archaeology to more general research into paleodemography and the Neolithic Transition are discussed.

Snow, Meradeth (University of Montana), Kathleen Hauther (University of Tennessee) and Ashley McKeown (Texas State University)

[264] *Ancient DNA and Cranial Morphometric Analysis into Ancestry of Five Burials from Colonial Delaware*

Five burials were excavated from a small Colonial cemetery at the Elkins site in New Castle County, Delaware by Hunter Research, Inc. for Delaware DOT. The remains were analyzed for mitochondrial DNA haplogroups in conjunction with a standard skeletal biological assessment. Analysis of the mtDNA demonstrated European maternal lineages for all of the individuals. Additionally, an infant and an elderly male shared a derived haplogroup T haplotype, suggesting a matrilineal relationship between them. The infant was also established as male by amelogenin genetic testing. The craniofacial morphology of three of the adults is consistent with that seen in other early Colonial Europeans in the Chesapeake and Middle Atlantic, although it could be misinterpreted as indicating African ancestry. These individuals serve as an excellent example of this early Colonial pattern in Europeans and the mtDNA analysis confirms the European ancestry for all individuals from this cemetery.

[264] *Chair*

Sobotkova, Adela [40] see Connor, Simon

Soderberg, John (Ohio State University)

[30] *The Intersection of the Sacred and the Everyday in Medieval Ireland*

A common vision of the medieval Irish monk involves the aesthetic alone at the edge of the world occasionally appearing to bring flashes of the sacred to the rest of us. Here, the sacred is carefully delimited from the profane. Archaeology has done much in recent decades to elaborate this portrait of the monk into a fuller vision of life at monasteries with all of its mundane entanglements. But, archaeology has largely deferred the task of considering the impact of all that information on how we think of these monasteries as sacred sites. One promising way forward is reconceptualizing ideas of

the sacred so that they do not depend on dichotomies between sacred and profane. As the term 'everyday religion' suggests, the relevant pairing can shift to sacred and everyday: the goal being to understand religious practices as entwined with the general practices of being human. The goal of this paper is to frame recent zooarchaeological work on monasteries in medieval Ireland in terms of everyday religion. Though the animal bones are not remains of sacrifice in the classical sense, considering them from the perspective of everyday religion can make them more than just evidence of foodways and identity politics.

Soderland, Hilary (University of Washington School of Law)

[218] *Chair*

Soler , Ana María [399] see Straulino, Luisa

Solibiéda, Axelle [350] see McKey, Doyle

Solinis-Casparius, Rodrigo (University of Washington), Anna S. Cohen (University of Washington), Florencia Pezzutti (Colorado State University) and Christopher T. Fisher (Colorado State University)

[21] *Working with the Ejido: Negotiating Archaeology and Local Politics in Michoacán, Mexico*
Ejido communities became common after the Mexican Revolution (1910-1920) as a way of dividing land and leadership among an equal number of individuals. The Ejido of Fontezuelas in the eastern Lake Pátzcuaro Basin, Michoacán, controls the rugged landform known as the Classic through Postclassic period (A.D. 200-1521) site of Angamuco. Since 2009, the Legacies of Resilience Project has negotiated and worked with Fontezuelas community members. Here we discuss some of the obstacles that we encountered including intra-Ejido politics and inter-community land use relations. Our discussion is situated within the volatile political situation in western Mexico in recent years.

Solis, Reyna (POSGRA.D.O IIA-UNAM)

[346] *Spheres of Production of the Lapidary Objects at the Sacred Precinct of Tenochtitlan: The Legitimacy and Extent of the Power of the Aztec Empire*

In the Great Temple and the surrounding structures at the Sacred Precinct of Mexico Tenochtitlan, the archaeologists recovered thousands of lapidary objects devoted to the religious cult of the Mexica society. Great quantities of them were considered foreign productions or relics related with certain Mesoamerican styles and traditions. In this research we will show that the technological analysis, using Experimental Archaeology and the characterization of the manufacturing traces with SEM, allowed us to identify three spheres of production inside the Sacred Precinct. Based on these results, we discuss the existence of a local style and its differences with the other lapidary traditions detected. The former was employed for reinforce the status and legitimacy of the Tenochcan elites, while the latter the extent of the power of the Aztec Empire.

Solís Ciriaco, Reyna Beatriz [217] see Valtierra Vega, Daniel

Solleiro, Elizabeth [141] see Ibarra, Georgina

Solometo, Julie (James Madison University)

[303] *Painting as Process: The Context of Mural Production in the Puebloan Southwest*

Murals have played a role in Pueblo religious practice since the A.D. 900s. Mural painting seems to have reached its zenith in the late 1300s to 1600s when richly detailed scenes of anthropomorphs, animals, and objects were produced at multiple sites in the American Southwest, providing glimpses of a complex ritual system. While scholars have traditionally approached these wall paintings from a motif-centered perspective, ethnographic observations of 19th and early 20th century mural painting permit a contextual analysis. In this paper, I reconstruct the ritual role and significance of Pueblo

mural painting in the historic era and suggest parallels in form and function with the precolumbian works. In particular, I examine the significance of sequences of multiple paintings and their relevance to understanding ceremonial organization in the 15th and 16th centuries.

Somerville, Andrew [32] see Fauvelle, Mikael

Somerville, Andrew (University of California, San Diego) and Margaret Schoeninger (University of California, San Diego)

[110] *Leporids and Landscapes: Stable Isotope Ratios of Rabbit and Hare Bones Reflect Local Environmental Conditions at Modern and Archaeological Sites*

This study investigates the utility of stable isotope analysis ($\delta^{13}\text{C}$ apatite, $\delta^{18}\text{O}$ apatite, $\delta^{13}\text{C}$ collagen and $\delta^{15}\text{N}$ collagen) of leporid (rabbit and hare) bones to monitor the environmental conditions in which the animals lived. Since leporids were one of the most commonly consumed vertebrates in the prehispanic New World, their skeletal remains are frequently found at archaeological sites. The relatively small home ranges and short lifespans of leporids, moreover, make them an ideal species to monitor temporal changes in local environmental conditions. Here we present the preliminary results of stable isotope analysis of 145 modern specimens representing multiple environmental zones from across the United States and Mexico. Strong correlations between local environmental characteristics (i.e., mean annual precipitation, grass coverage, and ecosystem type) and bone isotope values indicate the utility of using leporid bones in environmental research. These baseline data are compared with archaeological leporid isotope values ($N=320$) from four archaeological sites (Teotihuacan, La Quemada, La Ferrería, and Pueblo Grande) in different ecological regions, demonstrating the applicability of such analyses.

Sonderman, Elanor (Texas A&M University)

[27] *Addressing the Curation Crisis through Research in University Legacy Collections*

Despite their critical importance, the care and management of archaeological collections has not always been at the forefront of the discipline's overall methodology or federal and state regulations that are intended to mitigate harm to those resources. A seminal paper by Marquardt et al. (1982) argued for the existence of a crisis in the curation of archaeological collections. Marquardt, et al. (1982) as well as Childs (1995, 2003) and Sonderman (1996) highlight the ethical responsibility to both the public and the archaeological profession to properly curate collections so their future research potential can be realized. My previous experience working with collections at the University of Delaware and more recently at Texas A&M University and the University of Texas has demonstrated that many universities are behind state and federal collections repositories on the collections management curve. Universities frequently house the largest collections in their respective states, but few urge their graduate and undergraduate students to pursue research with these collections. In pursuit of research opportunities in legacy collections, particularly within the Texas River Basin surveys, I have encountered a set of challenges that underscore the importance of proper documentation and collections access.

Sonnemann, Till (Leiden University), Menno Hoogland (Leiden University), Corinne L. Hofman (Leiden University), Eduardo Herrera Malatesta (Leiden University) and Jorge Ulloa Hung (Instituto Tecnológico de Santo Domingo)

[199] *Amerindian Archaeological Site DEM Construction and Analysis from UAV Flights*

The archaeological footprint of Caribbean precolumbian settlements is often subtle; limited to surface scatter of shell, lithic and ceramic material. In the northern Dominican Republic, slight differences in topography have been identified as additional evidence for Amerindian habitation sites. Circular platforms from 7 to 10 meters in diameter were dug into the hill slope and levelled to form the base of round houses, as shown in recent excavations by the Nexus1492 project. The terraced settlements on the flanks of hills provided inter-visibility between villages, and the opportunity to observe the sea, but were located away from the main food source, fish and molluscs, and even fresh water. In combination with terrestrial surveys, aerial mapping of the site complements our understanding of configuration and extent of this settlement type in its environment. Improved usability and price drop

of unmanned aerial vehicles and easy use of photogrammetric software provides the opportunity to record archaeological features. Produced from vertical and oblique aerial photos, the created DEMs highlight the small topographic changes even beneath low canopy. The result provides the possibility to extract contours, shading, small topography changes, and its implementation in a GIS environment and coarser DEMs for regional aspect analysis.

Sonnenburg, Elizabeth [192] see OShea, John

Sonnenburg, Elizabeth (University of Michigan Museum of Anthropological Archaeology), John O'Shea (University of Michigan Museum of Anthropological A) and Ashley Lemke (University of Michigan Museum of Anthropological A)

[280] *Where the Hunters Hunted: Paleoenvironmental Reconstruction of the Submerged Archaeological Landscapes of the Alpena-Amberley Ridge, Lake Huron*

Understanding of early Holocene hunter-gatherer archaeological sites relies heavily on paleoenvironmental data, as many of these sites are ephemeral and have little archaeological visibility on the landscape. In rare cases, such as on the Alpena-Amberley Ridge in Lake Huron, highly visible hunting structures are preserved which offer a unique insight into early hunter-gatherer lifeways, while targeted sediment sample collection provides high-resolution paleoenvironmental information. Since 2011, over 200 sediment samples have been collected by divers and ponar sampler on the Alpena-Amberley Ridge from areas with and without cultural features. These samples have undergone particle size analysis, loss on ignition, microdebitage and testate amoebae analysis. Testate amoebae analysis shows that the area was a patchwork of small microenvironments of boggy ponds, larger inland lakes and forested swamp. Both testate amoebae and sedimentary also point to localized flooding in some areas of the Ridge. The study of this unique archaeological landscape provides a picture of the paleoenvironment while contributing to the understanding of how prehistoric peoples may have utilized the landscape for the hunting of large game.

Sorensen, Kathryn

[38] *Chair*

Sorensen, Kathy [38] see Mathews, Jennifer

Soressi, Marie [190] see Dibble, Harold

Sorotou, Aphrodite (University of Glasgow)

[14] *Current Approaches to Landscape Characterization as Tools for the Understanding of Highlands-Lowlands Interactions*

In the European Landscape Convention 'landscape' means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. This view approaches landscape as an integrated and integrating concept, requiring a holistic approach to the investigation, protection, management, and planning of space, consistent with the objective of sustainable development. Landscapes are dynamic socio-ecological systems emerging from long-term historical development of human societies in dialogue with constraints and opportunities presented by their surrounding topography and environment as they change through time. Following this approach, the proposed paper will outline potential strategies and tools for the understanding of diachronic lowlands-highlands interactions in an inter-disciplinary manner through the prism of a landscape perspective. It will draw on examples from a variety of European contexts and will try to respond to major challenges of landscape change as examples of the diachronic interaction of the societies in lowlands with the ones living in mountainous areas.

[14] *Chair*

Sorrell, Danny [48] see Purcell, David

Sosa, Danny [32] see Des Lauriers, Matthew

Sosna, Daniel (University of West Bohemia, Czech Republic), Lenka Brunclikova (University of West Bohemia, Czech Republic) and Tomas Urban (University of West Bohemia, Czech Republic)

[321] *Too Loud a Solitude: Landfills in the Landscape*

In this paper, we examine the role of landfills in the construction of landscape. Landfills represent ambiguous spaces where material remains of human action are disposed and forgotten. They tend to be hidden from the view of persons passing by and only those who gone astray might encounter these blind spots on the map. Yet, landfills are well known to the professionals who plan and manage large amounts of waste to transform it into a new kind of assemblage that shapes landscape. In contrast to other parts of landscape, landfills show unprecedentedly stable growth. If we accept the view that landscape is materialized time, than landfills represent intriguing type of temporality converted to material form. In this paper, we use the combination of the phenomenological and garbological approaches to understand the spatiotemporal aspects of landfills, which are situated in different parts of West Bohemia (Czech Republic).

Soto, Martha

[298] *Feather Headdresses among the Offerings at Tenochtitlan's Great Temple*

The excavations conducted during the seventh field season of the Templo Mayor Project have uncovered a large quantity of organic matter, thus the conservation team has dedicated a large part of their efforts to the treatment of these rare materials. During the cleaning of these materials, feathers associated with heron bones were identified. In a level below them were found more remains of feathers belonging to the headdresses of Tlaloc masks. The degree of their deterioration required us to clean and examine them under a stereoscopic microscope, which revealed two different types of feathers: white and iridescent green. This coincides with some iconographic representations where the headdresses of rain gods are decorated with heron and quetzal feathers. This kind of discovery allows us to answer some of the questions about the meaning of Mexica offerings.

Soto, Martha [298] see Matadamas Gómora, Diego

South, Katherine (Southern Illinois University Carbondale)

[219] *Conceptualizing Early Pottery Value in the Petén Lakes of Guatemala*

Research projects focused on the Middle Preclassic period (1000-350 B.C.) in the Maya lowlands continue to enhance our understanding of the social, economic, and political lives of early Maya people. The emergence of status differentiation during this time is recognized through different components of the archaeological record, including the presence of prestige goods. While exotic goods such as jade, marine shell, and pyrite mirrors are typically recognized as indicators of social status, the role of pottery within this framework is more nebulous than it is during later periods. How pottery was used and valued during this time drives the current study. Incorporating both production attributes and contextual deposition of Middle Preclassic pottery provides several inroads for a better understanding of how pottery began its trajectory as a prestige good in Maya culture. Using pottery excavated at Nixtun-Ch'ich' in addition to other sites around the Petén Lakes, the concept of pottery value and the process of valuation are considered through multiple lines of data related to production and use. Results from this research advance our understanding of pottery economics and provide a baseline for discussing how pottery developed as a prestige good in Maya culture.

Sparks, Shane [7] see Elder, James

Sparks, Shane (ICF International), Elder James Tait (ICF International), Daniel Stratten (ICF International), Grant Novak (ICF International) and Crilly Ritz (Snohomish County,

Washington - Public Works Department)**[358]** *Using LiDAR and Relative Elevation Modeling (REM) to Identify and Analyze Archaeologically Sensitive Alluvial Landforms*

Alluvial landforms are highly sensitive areas with the potential to contain both surface exposed and buried archaeological deposits, but systematic analysis and identification of these landforms has proved problematic in the past. Although large alluvial terraces can be identified visually on topographic maps, with high resolution LiDAR, and with Digital Elevation Models, smaller, subtler terraces, and other complex alluvial landforms can be problematic due to stream gradient issues and resulting elevation differences along a stream alignment. On a recent project on the Lower Stillaguamish River in western Washington, we employed a new restoration and habitat modeling tool, relative elevation modeling (REM), to eliminate the gradient issue and enhance terrace rises through LiDAR slope analysis. The results have provided pronounced and enhanced visibility of subtle features and show promise for providing adequate data to assign relative dating for sites associated with different terrace elevations on the same watercourse.

Spaulding, Britta (University at Buffalo)**[63]** *The Redneck vs. The Humble Farmer: How Popular Imagination Influences Studies on Rural Identity*

Rural forms of life and their material remains are rich sources of information for archaeologists on what was the largest economic demographic in the Western world until around 1900. Distressingly, influences from popular imagination and culture, with their many simplistic notions about the rural individual as either an idiotic bumpkin or a noble, humble tiller of the soil, continue to plague interest in, and conclusions about, rural remains and identity. Historical archaeologists have to contend with the problematic opinions of wealthier landlords or “city folk” in contemporaneous documentation, but they also must continue to confront how modern culture has influenced views on seeing rural people and communities. As development continues in these areas, we will lose the variety of rural material remains, whether they are those of a single farmstead or home, or of a larger village or community. There has been some improvement in preservation and restoration, but more is needed for education and heritage. Accepting the real variety of identities in rural areas—and the need therein to acknowledge race, class, and gender as attendant issues—is the first step towards more nuanced analyses, as well as representing the material there as valuable for continued archaeological research.

Speakman, Robert [9] see Hunt, Alice

Speer, Charles (Texas State University)**[185]** *A Comparison of the Effectiveness of Instrumental Techniques at Differentiating Outcrops of Edwards Plateau Chert at the Hyper-Local Scale*

Portable X-ray Fluorescence (pXRF) has become a common tool in compositional studies of archaeological materials due to its quick analytical time and ever-increasing capability with new models and technology. Additionally, pXRF is also beginning to see widespread use for sourcing archaeological materials. This study compares pXRF with two other widely accepted analytical techniques, Laser Ablation – Inductively Coupled Plasma – Mass Spectrometry (LA-ICP-MS) and Instrument Neutron Activation Analysis (INAA). These techniques are compared and contrasted in order to determine the accuracy and precision of using pXRF to determine the composition of Edwards Plateau chert. As a case study, three unique chert outcrops only several hundred meters apart (hyper-local) at the Gault site (41BL323) in central Texas are tested with each of the techniques. The qualitative/quantitative differences of each instrumental technique on Edwards Plateau chert is assessed using the geochemical data retrieved. The geochemical data is evaluated with multivariate statistics in order to determine which instrumental technique is most effective at distinguishing between these three unique Edwards Plateau chert outcrops. This study also seeks to determine if any of the instrumental techniques can effectively separate out geochemical differences of Edwards Plateau chert outcrops at the hyper-local scale.

[185] *Chair*

Speller, Camilla [312] see Rodrigues, Antonia

Spellman, Christina [175] see Peelo, Sarah

Spenard, Jon (University of California, Riverside)

[355] *Architectural Ambivalence: An Interpretation of the Nohoch Tunich Bedrock Outcrop Complex, Pacbitun, Belize*

Archaeological investigations of the Nohoch Tunich Bedrock Outcrop Complex (NTC) located near the prehispanic Maya site of Pacbitun, Belize, revealed a karst landscape that was heavily, yet subtly modified during the Terminal Classic period (A.D. 700-900). Analysis of construction techniques reveal that the modifications were made to conform to a purposefully crude aesthetic aimed at maintaining and enhancing the wilderness essence of the outcrop, while transforming it into a cultural space. Maya perceptions of the wilderness inform this discussion. Rather than being evil, morally corrupt, and dangerous as is commonly asserted, recent studies indicate that the wilderness was also considered the source of beauty, pleasure, and paradise. Comparisons to similar landscape modifications and use by the Aztec suggest that the changes made to the NTC may be the result of transforming that outcrop into a pleasure park-like place, although on a less grandiose scale. Rather than conflicting with the position of the current cave archaeology paradigm, application of this Aztec pleasure park model allows for maintaining that karst features were used for ritual purposes, but that also those spaces could have been parts of larger conceptual places, particularly when clustered close together like those of the NTC.

Spence-Morrow, Giles (University of Toronto)

[187] *Scaling the Huaca: Constructing Late Moche Identity through Architectonic Re-presentation of Place at Huaca Colorada, Jequetepeque Valley, Peru*

Following Descola's "modes of identification", Andean ontology has recently been suggested to represent a combination of animism and analogism that establishes strong intersubjective relationships wherein humans, objects and places are intrinsically linked while simultaneously creating a highly hierarchical scale based on the properties of each autonomous entity. In order to operationalize this animistic-analogical ontology, mimetic processes of imitation and transformation serve to link and effectively collapse these asymmetric relationships. Through a consideration of how ontologies of spatial scale and the mimetic properties of miniaturization have been manifested among the ancient Moche of the Jequetepeque Valley, Peru this paper will present a set of material symbols that served to construct individual and community identities. Specifically, the role of portable maquetas or miniature architectural models of ceremonial edifices as they relate to full-scale architecture found at Huaca Colorada will serve as the focus of my discussion. This examination will analyze these particular examples of scalar transformation not merely as acts of representation but as the mimetic distillation of temporal, spatial and material aspects of modes of being in the world, and how renovation sequences of sacred architecture were simultaneous acts of place-making and identity construction.

Spencer, Kaylee (University of Wisconsin - River Falls) and Maline Werness-Rude (Eastern Connecticut State University)

[133] *Columns and Ideology-Building in the Northern Maya Lowlands*

Ancient Maya builders working in the Northern Lowlands often introduced and distributed columns throughout the architectural volumes they created in a way that distinguished them from their southern neighbors. While northern column usage served pragmatic needs by being load-bearing and facilitating entrance and egress, we explore the possibility that selection and placement of structural supports also seems to have functioned in a highly ideological fashion. We will use case studies from sites such as El Meco, San Gervasio, Santa Rosa Xtampak, Sayil and others to examine similarities and differences in the ways architects used this building form across and within sub-regions. In doing so, we will particularly focus on identifying column types based on shape, size, proportionality, and surface treatment. We will also analyze the ways in which columns are

distributed vertically in building facades and aligned horizontally when found in single story structures. As we will demonstrate, such usage is often idiosyncratic, seeming to implicate specific viewing and activity patterns that vary from center to center, a pattern we hope to further codify through analysis.

Spencer, Susan [265] see Okray, Jillian

Speth, John D. [396] see Morin, Eugene

Spielmann, Katherine (Arizona State University)

[69] *Moderator*

[69] *Discussant*

Spiros, Micayla [124] see Card, Jeb

Spivak, Deborah [31] see Whalen, Verity

Sportman, Sarah (Archaeological and Historical Services, Inc.)

[61] *"Unsavory the Qualities of that Soup": Diet and Foodways at Old New-Gate Prison and Copper Mine, East Granby, Connecticut, 1790-1819*

The Connecticut State Historic Preservation Office contracted AHS, Inc. to conduct a multi-phase archaeological survey at the National Historic Landmark Old New-Gate Prison and Copper Mine in East Granby, Connecticut, prior to planned repairs to the ca. 1790 prison guardhouse. Beginning in 1773, the Old New-Gate copper mine was used as a prison and criminals, Tories, and POWs were incarcerated there during the Revolutionary War. In 1790 Old New-Gate became the first state prison in the U.S. and operated in that capacity until 1827. Prisoners initially worked the mines, although a nailery and other industries were later established. Healthy prisoners were lodged underground in the tunnels and older and infirm inmates slept on the ground floor of the guardhouse. Excavations, conducted around the guardhouse in 2013, revealed stratified, state prison-era deposits dated to 1790-1819 and containing nail-manufacturing debris, architectural items, domestic artifacts, and over 1300 well-preserved animal bones. This work includes an analysis of the faunal remains, which represent the vestiges of meals prepared and consumed by inmates and guards. The faunal evidence, contextualized through primary accounts of prisoners and overseers' reports, provides insight into the dietary conditions and foodways at one of the nation's oldest prisons.

Spriggs, Matthew [77] see Bedford, Stuart

Springate, Megan (University of Maryland)

[269] *Criterion Q: Archaeology, Context, and the National Park Service's LGBTQ Heritage Initiative*

The National Park Service (NPS) is undertaking a Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) Heritage Initiative. Purposes include increasing the number of LGBTQ historic and heritage properties listed on the National Register of Historic Places (NRHP) and as National Historic Landmarks (NHL), as well as encouraging interpretation of LGBTQ history at sites managed by the NPS. The creation of an archaeological context facilitates the evaluation of properties under NRHP Criterion D and NHL Criterion 6 (properties that have yielded or may be likely to yield, information important in prehistory or history) – criteria that consider a properties' archaeological potential. The archaeological context presented here was prepared as part of the LGBTQ Heritage Initiative, and speaks directly to evaluating archaeological properties for the NRHP and NHL.

[269] *Chair*

Springer, Alana [143] see Wienhold, Michelle

Sprovieri, Marina [412] see Lazzari, Marisa

Spurr, Kimberly [277] see Pilles, Peter

Spurr, Kimberly (Museum of Northern Arizona / Past Peoples Consulting) and Peter J. Pilles (Coconino National Forest)

[277] *The Sinagua and the Western Pueblo Tradition: Perspectives from Bioarchaeology*

Genetic and cultural relationships among ancient and historic populations in the American Southwest have long been of interest to archaeologists, and more recently to descendant communities.

Documentation of more than 1500 human remains and 4000 associated funerary objects from US Forest Service land in anticipation of repatriation under NAGPRA provides abundant new information to address this topic. This poster discusses research using metric and nonmetric skeletal data and discrete skeletal traits to explore the origin and dispersal of Sinagua populations in central Arizona. Tracing the movement of populations through sites such as Nuvakwewtaqa offers insight on the relationship of the Sinagua to later Western Pueblo populations, particularly in the Hopi region.

Stack, Adam (Harvard University), Sarah Martini (Harvard University) and Matt Liebmann (Harvard University)

[239] *Using Surface Archaeology to Estimate Ancestral Jemez Population Dynamics, A.D. 1300-1700*

Determining the population of ancestral Pueblo villages has beguiled inquisitive observers from the 16th century down to the present day. Spanish explorers and colonial settlers floated wildly variable population estimates upon their initial visits to Pueblo villages. Today archaeologists are no different, offering demographic estimates that often differ by orders of magnitude. This “population problem” plagues the Jemez region of northern New Mexico in particular. In this paper, we present the results of our recent attempts to estimate the populations of large ancestral Jemez villages using surface maps generated from UAV (drone) data, LiDAR, and intensive ceramic sampling. We begin from historically documented examples (Pueblo villages dating to the post-1680 period), deriving a formula to estimate total floor area based on extant surface remains. We then apply those estimates to the large Jemez pueblos of the Classic Period (A.D. 1300-1600) and the early historic (A.D. 1600-1700) era to derive maximum population estimates.

Stacy, Merisa [204] see New, Briana

Stafford, Thomas [250] see Gutierrez, Maria

Stahl, Ann (University of Victoria)

[23] *What's in a Label? Archaeological Taxonomies and Social Processes Past and Present*

The Banda area of west central Ghana is a quintessential example of what Igor Kopytoff (1987) long-ago dubbed the Internal African Frontier—an ‘interstitial’ region between ‘established societies’ that is home to a dynamic composition of people, languages and practice forged by newcomers and autochthones alike. In presumed contrast with their ‘established’ neighbors, frontier societies are ones in which processes of improvisation and the negotiation of social boundaries seem more apparent. While the concept of frontier societies has proved influential in African archaeology, it is one for which archaeology’s taxonomic arsenal of bounded cultures and phases is ill-equipped to deal. Drawing on long-term archaeological investigations of frontier processes in the Banda area, I explore the salience of analytical approaches aimed at discerning the fluidity of social boundaries for both archaeological taxonomy and how the past is mobilized in the present.

Stahl, Peter (University of Victoria), Florencio Delgado (Universidad San Francisco de Quito) and Fernando Astudillo (Simon Fraser University)

[119] *Historical Ecology and Archaeology on the Galápagos Islands*

The poster introduces an interdisciplinary project recently initiated on San Cristóbal Island, the easternmost island of the Galápagos archipelago. Initially focusing on the 19th century plantation of Manuel J. Cobos, the project explores the nature and temporal depths of human involvement in ecological transformation, as novel or 'emerging' ecosystems, defined by their novelty, cultural origin, and subsequent endurance in the absence of humans, were developed within the context of what was to become an internationally renowned biological preserve. Through a partnership established between the University of Victoria, Universidad San Francisco de Quito, and Simon Fraser University, the project addresses a "Galápagos Paradox," the central conservation dilemma facing the park today.

Stahlschmidt, Mareike (University of Tübingen) and David M Carballo (Department of Archaeology, Boston University)

[249] *Employing Micromorphology at the Tlajinga District in Teotihuacan to Investigate Site Formation Processes and Household Activities*

Recent excavations of the PATT (Proyecto Arqueológico Tlajinga, Teotihuacan) have explored two residential zones and the southern extension of the Street of the Dead in the Tlajinga district, located in the southern periphery of Teotihuacan. Excavations at the residential zones are directed at investigating neighborhood dynamics including social organization, craft specialization and domestic ritual. Excavation at the Street of the Dead are directed at evaluating the processes of urbanization at the periphery of the urban epicenter. As a complement to architectural and artifactual studies, micromorphological analyses and Fourier-Transform Infrared spectrometry have been employed on excavated sediments, which present powerful tools for the investigation of archaeological deposits. This geoarchaeological approach is aimed at answering the following questions: Is occupational specialization visible in the sediments? Is obsidian microdebitage present in the sediments, which would indicate in situ obsidian working? What kind of fire use is represented? What differences can be observed in the archaeological deposits of the residential compounds 17:S3E1 and 18:S3E1? What microscopic traces of activities and construction material and technology are preserved within the sediments? Was the Street of the Dead excavated into the bedrock-like, undurated substrate, known as tepetate? What is the infill history of the SOTD?

Stammers, Rhiannon (The Australian Archaeomagnetism Laboratory, La Trobe University, Australia), Andy Herries (The Australian Archaeomagnetism Laboratory, La Tro) and Nicola Stern (Dept. Archaeology, Environment and Community Plann)

[139] *Testing the Greasy Luster: A Mass Gloss Analysis of Coarse Grained Silcrete from the Willandra Lakes World Heritage Area, South-Eastern Australia*

The heat treatment of silcrete for lithic production has been identified as far back as 72,000 years ago, using a variety of scientific techniques. However, in most contexts simple visual assessment, notably the appearance of a lustrous red surface, is used to identify the use of heat treatment. Mass Gloss Analysis (MGA) is a quantitative, non-destructive method designed for measuring the increase in luster noted on heat-treated lithics. Initially developed to investigate microcrystalline silcretes in South Africa, these studies illustrated an increase in gloss on the interior surfaces of blanks heat-treated prior to lithic production. This study explores whether MGA is applicable to coarse-grained silcrete by analyzing lithics from the Chibnalwood Lake Beach Quarry, in the Willandra Lakes World Heritage area, south-eastern Australia. Actualistic and laboratory studies of silcrete from the Willandra Lakes region provide a comparison to the archaeological assemblage. The experimental material displayed an increase in gloss unit when heat treated compared to the control samples. This suggests that MGA is applicable to coarse-grained silcrete, although the increase was not as well defined as studies on microcrystalline material. Comparison between experimental samples and the Chibnalwood archaeological assemblage indicate that the assemblage was produced on non-heat treated blanks.

Stampanoni Bassi, Filippo [326] see Shock, Myrtle

Stanish, Charles [169] see Bongers, Jacob

Stanish, Charles (Cotsen Institute, UCLA)**[169]** *Conditional Cooperation and the Ritualized Economy of Paracas*

The Pampa de Carmen above the Chincha valley contains a series of Paracas period archaeological features including geoglyphs, ceremonial mounds, settlements and small stone structures. I discuss how these features integrate the pampa into a monumental ritual landscape focused on five major settlements. I interpret these features to be a means to attract people from outside the region to periodic market fairs held in the neutral chaupiyungas areas between highlands and coast. These fairs promoted sustained economic cooperation between these rich areas and were, in turn, the economic mainstay of the Paracas economy in Chincha.

Stansell, Ann (CSUN)**[27]** *Excavating the Collections: Redefining Archaeological Practice in the 21st Century through Utilizing Existing Assemblages*

The Northridge Archaeological Research Center (NARC), which began as a student club on the campus of San Fernando Valley State College in 1969, was involved in more than 800 cultural resource management projects throughout Southern California before falling inactive in 1996. Accessibility of the collections has been variable over the years. In recent years however, these legacy collections which are now housed at and administered by the Anthropological Research Institute at California State University Northridge (CSUN) in the Department of Anthropology, are becoming more accessible to students as graduate projects. This paper highlights the legacy collections in the holdings of CSUN's Anthropological Research Institute and their future research potential.

[27] *Chair*

Stanton, Travis [244] see Pagliaro, Jonathan

Stanton, Travis (University of California Riverside)**[344]** *Regional Maya Politics in the Late and Terminal Classic Northern Lowlands*

Linda Schele and David Freidel devoted a chapter of *Forest of Kings* to understanding the political relationships among Chichen Itza, Coba, and the Puuc cities during the Late and Terminal Classic periods. Much of their discussion was based on the iconography of Chichen Itza, although some was focused on the preliminary research that Freidel had initiated at Yaxuna by the time the book was published. In this paper I discuss more recent archaeological data from all three sites with a focus on Yaxuna. Current analyses indicate that there were several waves of outside influence after A.D. 600, but that the city of Yaxuna did not play an important role in the demise of Coba at the hands of the Itza.

[344] *Chair*

Stapleton, Charles [66] see Stapleton, Maria

Stapleton, Maria (Northern Illinois University) and Charles Stapleton**[66]** *Persistence of Aztec Religious Belief Materialized in the Early Colonial Religious Architecture of the Central Mexican Highlands*

Late Classic conceptualizations of sacred space, cosmologies, calendrical systems, and religious symbols combined to form a powerful and enduring core of indigenous religious beliefs that persisted well into the Early Colonial period in the central highlands of Mexico. Indigenous builders and artisans reconstructed their temples, now Christian, within pre-existing Aztec sacred space, often following indigenous alignments of cosmological significance. The elaborate facades of these churches were sites for the public display of potent indigenous religious symbols and clear references to the Aztec ritual calendar and belief system. The materialization of prehispanic religious belief in the form of Early Colonial religious architecture was a widespread phenomenon that took hold in smaller rural religious spaces as well as those of larger urban centers. The authors' findings from in-situ research of such architecture in rural communities in the central Mexican highlands

provide persuasive evidence of the persistence of the materialization of Aztec religious belief in the Early Colonial religious architecture of the highlands of central Mexico.

Stark, Barbara (Arizona State Univ)

[194] *Ceramic Emulation: Empires and Eminent Polities Seen from Afar*

A systematic evaluation of emulation of powerful capitals using ceramic comparisons requires consideration of (1) degrees of similarity, (2) legacy traditions, and (3) depositional contexts and sample sizes. This analysis uses ceramics from the Mesoamerican Gulf lowlands on the west side of the Lower Papaloapan River in a comparison to ceramics from Teotihuacan during the Early Classic Period and from the Aztec Triple Alliance during the Late Postclassic Period. Replication, imitation, and adaptation of ceramic traits are assessed for different levels of analysis and according to categories of vessel function. The Late Postclassic case provides a better-known imperial context, while Teotihuacan expansion has more diverse and debated characteristics. Both ceramics linked to wealth and status and those in use by the general population are important for a systematic analysis.

Stark, Sören (Institute for the Study of the Ancient World/NYU)

[234] *Territorial Barriers in Central Asia: Investigating the "Long Wall" of Bukhara (Uzbekistan)*

Territorial barriers are a widespread phenomenon in many micro-regions of Western Central Asia where they specifically take the shape of large-scale oasis walls, surrounding the entirety or large parts of the agricultural hinterland of important urban centers vis-à-vis stretches of desert or desert-steppe in the region. Nonetheless, starting with their dating, our understanding of these sizable monuments is still very insufficient. The most monumental and best preserved one of these territorial barriers, the "long wall" of Bukhara--at least 250 miles long and complete with an impressive array of adjoining fortresses and watchtowers--, is since 2011 subject to comprehensive investigations carried out in the framework of an American-Uzbek field project. The results of four seasons of extensive field surveys and excavations (the latter including substantial works at a border fortress and the citadel of a border town) allow, for the first time, substantiated conclusions regarding the chronology of the barrier and provide important new insights into questions related to the purpose(s) of Bukhara's "long wall" system in the context of political and economic dynamics in Sogdiana during the first millennium CE.

Stark, Miriam [349] see Carter, Alison

Starke, Chelsea [30] see Hoffman, Brian

Starkovich, Britt [135] see Conard, Nicholas

Starkovich, Britt (University of Tübingen)

[396] *Systematic Butchery of Small Game at Kephalaria Cave (Peloponnese, Greece)*

An ongoing faunal analysis at Kephalaria Cave documents a remarkable standardization in the butchery of small game animals during the Upper Paleolithic. The site spans several phases of occupation, including small Middle Paleolithic, early Upper Paleolithic, and Aurignacian components, but the majority of the materials are from the post-Aurignacian Upper Paleolithic, Epigravettian, and late Upper Paleolithic (possibly Mesolithic) periods. Diverse ungulate taxa are found at the site, but the faunal remains are heavily dominated by small game, particularly hares, partridges, and fish. This abundance of small game is similar to later Upper Paleolithic layers at nearby Klissoura Cave 1. The representation of partridge and hare body parts is biased toward meat-rich elements, suggesting that these taxa were skinned outside of the cave, possibly at a spring directly adjacent to the site. A particularly striking feature in the assemblage is cut marks on the distal tibiotarsus of at least 40 individual partridges, which indicates standardized skinning of these birds across multiple late Upper Paleolithic layers. This might reflect the practicalities of removing the skin and feathers from the body before consumption, as well as the use of feathers for decoration.

Starr, Isabel (Wellesley College), James McGrath (University of Iowa) and Will Russell (Arizona State University)

[324] *Depictions of Human Facial Decoration on Mimbres Pottery as an Indication of Social Affiliation*

The Mimbres tradition is known for its intricate geometric and figurative pottery designs. Analysis of ceramic iconography found on Mimbres pottery allows archaeologists to hypothesize about Mimbres life and social structure. Using data from provenienced, figurative vessels documented in the Mimbres Pottery Images Digital Database (MimPIDD), we investigate the possible relationships between human facial decoration and social identity. Our analysis considers facial decoration in relation to depictions of anatomical sex, inferred gender, physical activities, interpersonal interactions, and depositional contexts.

Stauffer, Grant [8] see Nowak, Jesse

Stauffer, John and Kent Reilly (Texas State University)

[182] *In the Fields of the Thunder Lord, Playing the Apalachee Ball Game: Archaeological and Ideological Evidence for Its Antiquity*

This presentation examines the archaeology, folklore, and iconography attesting to the antiquity of the Apalachee Ball Game. We will examine the "Apalachee Ball Game Myth" as recorded by Friar Juan Paina in 1670 as well as several Mississippian carved shell objects (ca. A.D. 1350, Craig Mound, Spiro, Okla.) that thematically express episodes in this myth. From the evidence gleaned from these several sources we can demonstrate that the ideology underlying the Apalachees' Ball Game dates from at least the Middle Mississippian Period (1150—1350 A.D.).

Stavish, Patricia [300] see Smith, Lisa

Stech, Edward J. [274] see Sluka, Victoria

Steele, Teresa [165] see Brandl, Kathleen

Steele, Laura (Eastern New Mexico University)

[212] *Interpretations of the Use of Avian and Mammalian Fauna at Sapa'owinge (LA 306)*

Ethnographic reports of ancestral Puebloan peoples from the twentieth century suggested a food taboo for turkeys, except in rare cases. In contrast, some archaeological interpretations involving sites that predate A.D. 1300 have concluded that turkeys were an integral part of the Puebloan diet. From a modern, secular perspective, archaeologists often assume that there is a distinct separation between the use of animals for ritual and dietary purposes. This paper argues that it is impossible to separate the prehistoric uses of animals for ritual or ceremonial practices from their use for dietary consumption. By taking a random stratified sample from midden, room, and kiva contexts from the ancestral Tewa site Sapa'owinge excavated by Florence Hawley Ellis from 1963-1969, the significance of turkey use trends through time is determined with comparative indices. A careful examination of relationships among avian and mammalian fauna and humans during the Classic period contributes to our understanding of the integral, complex roles animals played in northern Rio Grande puebloan life.

Steele, Teresa E. [53] see Martisius, Naomi L.

Steelman, Karen (University of Central Arkansas), Victoria Muñoz, Jeremy Freeman and Carolyn Boyd

[353] *Discovering Hidden Layers with X-Ray Vision: New Applications of pXRF to Rock Art Studies*

Exploring new applications of portable X-ray fluorescence spectroscopy to the study of rock art, we report the determination of paint layer stratigraphy based upon measured elemental levels. In Lower

Pecos rock art, we were able to discern when red and yellow paints superimpose black paints based on elevated levels of manganese. This ability to see underneath paint layers with "X-ray vision" shows great promise in answering stratigraphic ambiguities, complimenting Dino-Lite digital microscopy. In addition, we collected Munsell color designations for each pXRF analysis spot so that we could compare major elemental levels with pigment color and value. We were also able to confirm suspected gunshot damage at a rock art site. These results highlight the advantages of this non-destructive technique.

Steere, Benjamin (University of West Georgia)

[26] *The View from One Thousand Houses: A Macro-Regional Approach to Household Archaeology in the Southeastern United States*

In this paper I reflect on Steve Kowalewski's influence on my research on houses and households in the native Southeast. In the early days of my graduate training, Steve encouraged me to move away from a single-site focus and instead think about household archaeology as a broadly comparative anthropological enterprise undertaken at a macro-regional scale. It was a good idea. To meet Steve's challenge, I constructed a database that catalogs the architectural features of 1258 structures from 65 sites in the Southern Appalachian region and surrounding areas. From this large sample of houses I identified and analyzed broad spatial and temporal patterns of variation in domestic architecture, including changes in the size and spacing of houses, changes in architectural investment, and a secular trend toward the increasing segmentation of houses. Using a theoretical framework developed from household archaeology and anthropology, I argue that certain aspects of this architectural variation can be explained by changes in household economics and household composition, symbolic behavior, status differentiation, and settlement patterning. More generally, I propose that large-scale patterns of diachronic and synchronic variation in domestic architecture are best explained by changes in social organization.

Steffen, Anastasia [128] see Renteria, Rebecca

Steffen, Anastasia (Valles Caldera National Preserve)

[239] *ArcBurn: Measuring Fire Vulnerability in Southwestern Landscapes*

How can the archaeological record be used as a chronicle of prehistoric forest fires? How do cultural resource managers today evaluate the potential impacts of wildland fires? The "ArcBurn" project, funded by the Joint Fire Science Program, is a collaboration among archaeologists, fire scientists, forest ecologists, and fire managers. This project was created to develop hard data on fire effects to ensure that the best science is effectively and appropriately used to guide management plans, and that these plans are defensible and reasonable under dynamic environmental conditions. We are using laboratory and field experimentation to quantify the fire dose that causes unwanted damage to three kinds of artifacts: pottery, obsidian, and architectural stones. We also measure indirect fire effects by assessing post-fire erosion. The context for this work is the Jemez Mountains of northern New Mexico, a fire-prone landscape where wildfires in the last three decades have dramatically increased in size and severity, resulting in profound impacts to this rich and previously stable archaeological record. We review the goals for this project, provide our preliminary results, and discuss the increasing relevance of archaeological perspectives in comprehending and responding to climate change.

[159] *Discussant*

Steidl, Catherine [385] see Gosner, Linda

Stein, Martin (Bureau of Land Management, Carlsbad Field Office)

[138] *A New View of the Desert - The Permian Basin Programmatic Agreement Research Program in Southeastern New Mexico*

The research program described in this paper is providing much needed new information for a portion of southeastern New Mexico that was previously understudied. The program is funded by an innovative approach to Section 106 compliance which trades redundant survey information for

monetary contributions to a dedicated research account. The Permian Basin Programmatic Agreement (PA) has been in effect for six years. The purpose of the PA (formerly the Permian Basin Memorandum of Agreement or MOA) is "...to implement a creative, directed program to resolve adverse effects and, in particular, the cumulative and indirect effects of full-field oil and gas development and other industrial-related development undertakings in southeastern New Mexico and result in better decisions affecting the management of historic properties in the Permian Basin." This paper briefly outlines the state of our knowledge of the prehistory and history of southeastern NM before implementation of the PA, describes the "nuts and bolts" of the operation of the PA, and details the contributions made to date by projects funded through the program.

Steinbrenner, Larry (Red Deer College)

[246] *The Mystery of Managua Polychrome Part II*

This presentation continues the discussion of Managua Polychrome I began in a paper presented at the 2014 SAA general meeting. Part I of this study focused on early attempts to describe and define Managua Polychrome, a distinctive Late Postclassic ceramic type characteristically found in the Managua-Masaya region of Pacific Nicaragua that has been largely neglected by archaeologists working in Greater Nicoya, and discussed the connections between the type and Nimbali Trichrome, a ceramic type associated with Chiapa de Corzo. Part II will focus on the relationships between these types and near-identical ceramic types found in supposed Mesoamerican enclaves in countries lying between Nicaragua and Chiapas (including Honduras and El Salvador). This paper will discuss whether these types can be used to delineate some of the trade routes that connected Lower Central America to Mesoamerica—a topic pertinent to ongoing efforts to understand the arrival of Mesoamerican peoples in Greater Nicoya during the Postclassic Period.

[246] *Chair*

Steinbruchel, Amber Joliz (University of Hawaii at Manoa), Aaron Chang (University of Hawaii at Manoa), John Kribaum (University of Florida) and Adam Lauer (University of Hawaii at Manoa)

[205] *A Bioarchaeological Investigation of an Explosive Impacted Skeleton from Ifugao, Philippines Cordillera*

The Ifugao Archaeology Project (IAP) investigates the sparse prehistoric and colonial archaeological record of the Philippine Cordillera. The biological anthropology of the area is almost completely unknown. A single adult human skeleton has been recovered from primary archaeological context in the Ifugao area. The paucity of skeletal remains is largely due to cultural practices that include the processing and collection of juvenile and adult skeletons for ritual storage. One adult human skeleton was found by farmers after the explosive removal of a boulder. Despite the fragmentation and missing elements caused by the explosion, as the only skeleton recovered from primary context in the area, this individual provides information on health and diet in Ifugao. The skeleton represents a male in relatively good health. There are low levels of osteoarthritis in the joints and vertebra, and a possible infection in the tibia. The skeleton has robust muscle attachments, especially in the legs. Dental and oral health information suggests that the diet was low in cariogenic foods, but periodontal disease may have been present. Isotope analysis gives information on the diet and geographic history of the individual and, together with dating information, can help to contextualize the individual in time and space.

Steinhart, Zara [407] see De Boer, Deanna

Stelle, Lenville (Illinois State Archaeological Survey)

[353] *Chair*

Stelson, Laura (German Archaeological Institute/ University of Bonn)

[100] *Applying Digital Technologies to Older Sets of Data: A Study of the Spatio-Temporal Distribution, Design and Function of the Carved Stone Altars at Copán*

The term "altar" is a western concept which has been used in the study of the ancient Maya to describe a plethora of carved stone artifacts, ranging from small pedestals, to carved boulders, to three-dimensional, multi-component, carved sculptures. In many cases, it seems unlikely that the only purpose of these altars was to serve as a place to deposit sacrifices. After spending two field seasons cataloguing the carved stone altars at Copán, Honduras, the chronological trends in shape and style became readily apparent amongst the 78+ examples at the site, especially amongst the pieces dating to the Late Classic period. My research goal is to answer questions such as whether the changes in the form and style of these altars across time and space might reflect a change in their function, or if these differences in style correlate to the positioning of certain altar types in certain locations such as in front of a stela or inside of a structure. The MayaArch3D geo-spatial analysis tool, which allows complexly structured data to be queried based on both geographical and chronological parameters, allows me to apply these new questions, and a new methodological approach to a long-existing set of data.

Stemp, James [376] see Sullivan, Kelsey

Stenton, Douglas [185] see ten Bruggencate, Rachel

Stephens, Jay (School of Anthropology, University of Arizona) and Pam Vandiver (Department of Materials Science and Engineering, U)

[122] *Technical Analysis and Replication of Corinthian Polychrome Slips, 8th - 6th Centuries B.C.E.*

Polychrome slipped and decorated pottery from Corinth, Greece, developed over two centuries from monochrome, dark brown slips and washes on a calcareous yellow clay body to a wide range of decorative techniques. Once significant experimentation with color variability began, five colors were produced. Some slip colors involve multiple-step processing to control glass content and degree of sintering; the control of particle size to produce variable roughness and a matte or semi-matt or glossy appearance. Others involve reprocessing of materials from another craft specialty. Considerable evidence supports nearly continuous development and engineering of the ceramic slips, although no data support the improvement in composition or processing of the ceramic bodies. We present the results of study of 29 sherds with 57 examples of Corinthian polychrome slips, measuring 10 to 35 microns in thickness, that were collected by Marie Farnsworth in the late 1950s and 1960s from Greek archaeological sites. Black, red, white, wine red (or purple) and overlying, matte banded slips were studied by optical microscopy, petrographic and scanning-electron microscopy with semi-quantative energy dispersive x-ray analysis, as well as wavelength-dispersive electron microprobe (EPMA) elemental mapping and analysis. Results from compositional analysis were then used to replicate the five slip colors.

Stephens Reed, Lori [324] see Trowbridge, Meaghan

Stephenson, Keith (USC Institute of Archaeology and Anthropology) and Karen Smith (South Carolina Institute of Archaeology and Anthropology)

[275] *A Chronology of Complicated Stamping in the Lower Savannah River Valley*

The presence of Middle Woodland period complicated stamped pottery in the lower Savannah River valley would represent the earliest examples of this type of surface treatment in the South Appalachian region, if the dating were certain. Here, we attempt to construct a chronology of complicated stamping for the lower Savannah River valley by reference to sites and assemblages for which age can be inferred by independent means. We simultaneously attempt an attribute-based analysis of complicated stamped pottery in the region to more fully understand its developmental history from the Middle Woodland onward.

Steponaitis, Vincas (UNC-Chapel Hill), Megan Kassabaum (University of Pennsylvania) and John O'Hear (University of Mississippi)

[8] *The Uses of Platform-Mound Summits at a Coles Creek Site in Southwest Mississippi*

Excavations at Feltus (Jefferson County, Mississippi) have yielded considerable evidence on how the summits of platform mounds constructed during the middle Coles Creek period (A.D. 900-1100) were used. These summits showed multiple veneers of black and yellow sediments, portions of which were heavily burned. Also present were small pits that may have been votive deposits, as well as large, bathtub-shaped cooking pits. The summits were kept clean, but dense middens accumulated on their flanks. Charred posts may or may not indicate the presence of roofed buildings. All in all, these summits reveal very complex histories of ritual use.

Sterling, Sarah, Ian Hutchinson (Simon Fraser University (retired)) and Jennie Shaw (Salix Archaeological Services)

[168] *Geochronology of the Tse-whit-zen Project*

The use of high precision dates provides a chronological framework for reconstructing environmental conditions at the Tse-whit-zen site (45CA523) in Washington state. The geochronology of the site is derived from high-precision radiocarbon dates taken from finely excavated deposits, with ages spanning the time period from ca. 2000 BP to contact. We have added 36 high precision AMS dates from short lived organic material, recovered from intact contexts, to the 52 original dates reported in 2006. Combined, these data allow development of the temporal sequence of beach building events in the sand deposits underlying the site, as well as the sequence of cultural deposits of long and short duration over the course of the site's occupation. Higher and lower frequencies of C14 ages over time serve as proxy means for estimating relative changes in population during the site's occupation; these changes in population are partially driven by environmental conditions. Bayesian analysis of vertical sequences of dates reveal periods of diminished site activity that correspond to known regional seismic events. The sequence of beach building also reveals a period of lowered seas relative to land level after ca 2000 BP, typical of generally drier climatic conditions.

Sterling, Sarah [168] see Dick, Kristina

Sterling, Kathleen (Binghamton University)

[395] *The Concept of "Domesticity" in Magdalenian Life*

A number of recent publications about Magdalenian life have used terms such as "domestic" or "household" and their derivations to differentiate between different types of sites or tools, and perhaps also to underscore the fact that archaeology is about people, not just materials. This language also reflects the influence household archaeology has had in expanding studies of sedentary societies. It is not clear, however, that a distinction between domestic and non-domestic activities is appropriate for mobile societies. "Domestic" is typically opposed to "hunting," reinforcing old dichotomies that imply others such as "public-private" and "man-woman." Does "domesticity" add to interpretations of Magdalenian archaeology, or is it a modern conception that over-simplifies aspects of the Magdalenian record?

Stern, Nicola [139] see Stammers, Rhiannon

Stern, Richard (NORTHERN LAND USE RESEARCH ALASKA)

[302] *Recent NLURA Research in Northern Alaska*

Northern Land Use Research Alaska, LLC (NLURA) investigated 20 locations in northern Alaska during the last 5 years. Research included survey and excavation for oil and gas development projects, pipelines, roads, community infrastructure, mining, and transportation. This paper provides an overview of the work accomplished, highlighting significant discoveries made and contributions of CRM to our understanding of northern Alaska prehistory and history.

Sterner-Miller, Katherine (University of Wisconsin-Milwaukee), Robert Jeske (University of Wisconsin-Milwaukee) and Robert Ahlrichs (University of Wisconsin-Milwaukee)

[139] *Understanding Oneota Stone Tool Functions: A Case Study of Precision and Accuracy in Use-Wear Analysis*

A combination of assemblage analysis, microwear analysis and blood residue analysis allows us to build a new understanding of the role of lithic material in the technological economy of Oneota groups in eastern Wisconsin. One foundation of this approach is accurate and replicable recognition of use-wear patterns. Blind tests have been an essential component of use-wear research since the 1970s. In this paper, we describe a study of 100 experimentally made and used chipped stone tools. Made from two types of chert that were commonly used by occupants of Oneota sites near Lake Koshkonong, Wisconsin, the tools are used in a wide range of activities. Three analysts assess each tool using low and high power microscopy, and the degree of agreement on use identifications is ascertained. This study provides a large sample to measure the analysts' accuracy and precision in recognizing use-wear on stone tools from a specific archaeological context.

Stevanovic, Mirjana

[297] *Ruth's Archaeology*

My contribution to this session will be a personal account of a long-term professional relationship with Ruth as a student and colleague. Ruth and I began the collaboration in the Former Yugoslavia, a country that ceased to exist, and continued with projects in Israel, Bulgaria, and Turkey. Together we were learning the local archaeological practices and were developing our own. Each of us brought something to this process of learning: she - her anthropological interpretation of the material culture, and I - the experience and method of excavating it. Also, we shared many research interests, such as household archaeology, house-fire and burning, and mudbrick architecture. Ruth's work on the archaeology of the Balkans was important for several reasons. One is that her focus on the prehistory of this region renewed attention and deepened the interest in its archaeology. Further, her work made an impact on young archaeologists in the region, and especially on those with whom she collaborated. Ruth included all the team members in active thinking and interpretation process contrary to the local, well-established old-school archaeologists who ignored local input. Paradoxically she brought in more equality to the archaeological practice than existed in the nominally socialist/communist country.

Stevens, Stanley [166] see Wolverton, Steve

Stevens, Nathan (Far Western Anthropological Research Group, Inc.) and Jeffrey Rosenthal (Far Western Anthropological Research Group, Inc.)

[383] *Geology, Historical Contingency, and Ecological Inheritance in California's Southern Sierra Nevada*

The Late prehistoric archaeological record of the Southern Sierra Nevada can be distilled down to two very visible elements: bedrock mortars and obsidian. Both were imported from outside the area, with obsidian coming from the east and the idea of the bedrock mortar coming from the west. We argue that the presence of transported obsidian, much of it deposited prior to 1000 cal BP, and the later establishment of bedrock mortars encouraged more persistent use of this landscape. We see this as an example of the downstream effects of niche construction.

Stevens, Chris (Institute of Archaeology, University College London.)

[414] *Exploring the Multiple Pathways towards Agriculture within China: The Case for Rice and Millets*

Studies of evolutionary change within selected traits for rice indicate a period of interaction from the cultivation of morphologically wild plants (*Oryza rufipogon*) to the eventual farming of domesticated rice (*Oryza sativa* ssp. *japonica*) that lasted around 3000 years. The shift from the collecting of wild foods to dependence on cultivation was equally protracted. While rice was likely taken into cultivation in a number of areas across China it is only in the Lower Yangtze between 6000 to 3000 cal. B.C. that the full transition from early cultigens to fully domesticated plants is so far evidenced. The pathways towards the domestication of millets (*Panicum miliaceum* and *Setaria italica*) are far less clear. Their probable cultivation is attested from a number of sites, possibly as early as 7000 cal. B.C., within northern China, based upon finds of charred grains, isotope evidence and agricultural tools. Unlike rice however the start of cultivation and the end of domestication period are as yet

unknown. This paper presents comparative models for rice and millet, which explore the morphological changes seen within these plants resulting from human selection and how such changes in themselves modified human behavior.

Stevenson, Christopher M. [412] see Mulrooney, Mara

Stewart, Sarah T [47] see Banning, Edward

Stewart, Brian (University of Michigan) and Peter Mitchell (University of Oxford)

[135] *Beyond the Shadow of a Desert: Illuminating Southern Africa's Foraging Spectra*

There is arguably nowhere more susceptible to the tyranny of the ethnographic record than southern Africa. From Man the Hunter's quintessential foragers to the revisionists' marginalized proletariat, Kalahari hunter-gatherers cast shadows far longer than those created by the desert sun. There is no denying that this extraordinary record – central to both economic and social approaches to southern African prehistory – has greatly enriched our picture of the past. Unsurprisingly, however, the subcontinent continues to confront archaeologists with behavioral signatures outside the range of variation documented in the Kalahari. Two decades after Kelly's landmark publication, and fifteen years into the paradigm shift towards an African origin for behavioral modernity, the time is ripe for a re-evaluation of southern Africa's foraging spectra. In this paper we provide this, and advocate for a cross-cultural approach that integrates evolutionary theory with ethnography and ethnoarchaeology drawn from within and beyond the Kalahari. If this is critical for studies of prehistoric foragers across the globe, it is particularly pressing in southern Africa with such a diversified ecology and deep antiquity of humanity.

Stewart, Haeden (University of Chicago)

[258] *Crossing the Line (Part II): Taphonomies of Toxicity in Contemporary Archaeology*

This paper is the second part of a two-part dialogue on the use of taphonomy as an archaeological technique in both prehistoric archaeology and the archaeology of the contemporary. Part II explores how using the concept of taphonomy to study the accumulation of harmful toxins in the environment and in the human body opens up new avenues of study for an archaeology of human-environment interactions in the contemporary nuclear and industrial age. Intimately tied to the waste of human activity, and dangerous to both human and non-human bodies, toxins bind bodies into communities of shared danger and toxic harm. Toxins index historical processes of production and consumption, as well as the taphonomic processes of dispersal, disintegration and accumulation connecting them to the bodies they harm. Bodies congeal toxic traces that individuate as well as gesture towards global dynamics. These traces can be 'excavated' to reconstruct individual and collective histories, long-term processes of environmental degradation, and to understand collectivities constituted by emerging toxic dangers. In thinking fishing as archaeological practice, I argue that locating toxicity as a central archaeological concern facilitates useful exchange across different archaeologies, as well as broadening what we consider to be archaeological method.

[258] *Chair*

Stewart, Carlyn (University of Arizona) and Gregory Luna Golya (Penn State University)

[364] *Documenting Lithic Landscapes of Petrified Forest National Park, Arizona*

Archaeological lithic landscapes can encompass a broad range of geographic settings – local to regional – where lithic procurement activities by people have left indelible evidence of lithic resource use. The Petrified Forest National Park (PEFO), Arizona on the Colorado Plateau is best known for its massive exposure of late Triassic period petrified logs in the park. Petrified wood lithic debitage and tools dominate the lithic assemblages of prehistoric sites at the park. However, the park also includes large lithic pavements of chert cobbles and petrified wood chunks and gravels. Both petrified log concentrations and lithic pavements have not been documented during past archaeological surveys despite the ubiquity of debitage from lithic testing, reduction, and production activities, in part, because of the widespread spatial extent of the areas. Archaeological survey

conducted at PEFO during the summers of 2013 and 2014 has incorporated lithic pavements, procurement areas, and scatters into the archaeological landscape of the park. Additionally, archaeologists have begun adding lithic procurement areas to previous surveyed areas. This poster presents an analysis of selected lithic pavement procurement areas at PEFO, their spatial extent, geological origins, water drainage associations, and attraction for human settlement especially among archaic and early farming populations.

Stimson, Micah, Nathan Goodale, David G. Bailey and Alissa Nauman

[92] *Elemental and Microscopic Characterization of Quartzite Stone Discs and Knives from the Slocan Narrows Pithouse Village, Upper Columbia River Region*

Chipped stone tools made from fine-grained quartzite with thin mica-rich (phyllitic) lamellae are commonly recovered from archaeological contexts along the Upper Columbia River in the interior Pacific Northwest. In this study we present the results of a comprehensive analysis of a collection of quartzite discs and knives recovered from the Slocan Narrows Pithouse Village. Our analysis includes examination of microscopic use-wear traces to attempt tool function interpretation, as well as elemental characterization through energy dispersive x-ray fluorescence spectroscopy to identify the number of potential geological sources of the raw material. Because these quartzite tools commonly occur across a wide geographic range, this study provides a foundation for additional studies of quartzite tools that may eventually lead to a better understanding of human land use practices in the Upper Columbia River region.

Stine, Linda (University of North Carolina Greensboro)

[72] *Bringing Visitors to State Historic Sites: Remote Sensing and Hands-on Research*

North Carolina's Department of Cultural Resources is pressed by state legislators to justify keeping historic site properties open and its Office of State Archaeology (OSA) staff gainfully employed. The state university system has also seen its share of cuts. By pooling research interests and resources, OSA and University of North Carolina Greensboro archaeologists and geography professors and students could highlight potential below-ground features and could excavate at two sites. The project included the Historic Sites Division leadership and was open to an interested public. Regional multi-media emphasized the importance of historic sites for research, education, public enjoyment, and tourism.

Stiner, Mary [40] see Munro, Natalie

Stiner, Mary (University of Arizona) and Steven Kuhn (University of Arizona)

[296] *OFT and EVO-DEVO: Antithetical or Mutually Beneficial?*

Short-term constraints that motivate people are an important part of the process social and economic change. Proximate decision (optimality or satisficing) models are particularly useful in archaeology because they play upon basic resource needs and costs in situations where behavior cannot be observed directly. These models are not enough, however, to account for the larger processes by which repeated interactions change the nature of the co-evolving species and the conditions of selection across generations. Thus at least two levels of mechanics and their respective temporal domains must be recognized in co-evolutionary studies such as in Niche Construction Theory (NCT). The fact that many of the empirical patterns that attract NCT thinkers come from research based on simpler models such as behavioral ecology testifies to the potentially complementary relations between these distinct levels of theory.

[406] *Discussant*

Stirn, Matthew (Jackson Hole Historical Society and Museum), Rebecca Sgouros (Jackson Hole Historical Society and Museum), Robert Curran (University of Wyoming), Megan Jones (University of Wyoming) and Connor Johnen (University of Wyoming)

[362] *Teton Archaeological Project: Preliminary Report of the 2014 Field Season*

Following nearly a decade of high-elevation research in the Wind River Range of Wyoming, the

Teton Archaeological Project seeks to record and interpret prehistoric alpine occupations of the Teton Range. The 2014 field season was multi-focused with three primary goals of exploring previously unsurveyed areas for archaeological sites, investigating ice-patches for thawing artifacts, and testing the survivability of lipid biomarkers on high-elevation surface artifacts. The work performed in this inaugural season will set the stage for future alpine surveys, excavations, and paleoenvironmental studies in the Teton Range.

Stiver-Walsh, Laura [26] see Martínez Tuñón, Antonio

Stöckli, Matthias (Dep. de Antropología y Sociología, Universidad del Valle de Guatemala)

[242] *Dance and Music in Maya Rituals: The Case of Tecum*

According to the 16th-century Título K'oyoi, the K'iche' captain Tecum participated in two elaborate ceremonies before leading his army into war against the Spanish conquerors. Both included dance and music and even though he later was killed in battle, Tecum somehow continued to dance until the present day, now taking part in the preparation and performance of the so-called Dance of the Conquest. This "fact" alone tells important things about the concepts and functions of dance and music in Maya society. The paper attempts to reconstruct the ritual elements, their "assembly plan," and some goals and meanings of the two pre-conquest ceremonies by means of both contemporary data and insights gained from the ethnomusicological study of the Conquest Dance as performed today in the Guatemalan highlands. The latter are particularly helpful as reminders of the processual character of rituals which is often based precisely on the performance of music and dance. In the case of Tecum one of the goals of such dynamism was and is the transformation of the dancer from one kind of being into another, -- the main thesis of this paper.

Stoll, Marijke (University of Arizona)

[20] *The Practice of Play in the Sport of Life and Death: Exploring Regional Variation in Ballgame Material Culture and Ideology*

There is little argument that the Mesoamerican ballgame was a ritualized and politicized communal sport with great geographical breadth and incredible time-depth. It is also commonly accepted that the ballgame, as a cultural institution, was intimately linked to a political, elite-centered ideology based on cosmology, sacrifice, and agriculture, related to sociocultural themes of conflict, competition, and the resolution or negotiation of both. This interpretation of the ballgame as ritual practice, however, has remained stagnant over the past several decades. Moreover, it disregards local and regional variation across time in both ballgame symbolism and ideology, leaving unexplored the significance that these differences and similarities entailed for Mesoamerican intra- and intercommunity social networks. In this paper, I address these issues by applying a practice-oriented approach to a regional investigation of ballgame material culture, including those objects and symbols associated with game performance and related activities. Importantly for the study of ritual and religion in the past, practice theory enables the exploration of the recursive relationship between materiality and ideology. Using this perspective, I will demonstrate how the specific ballgame practices that produced these regionalized material remains trace back to complementary, competing, and even overlapping ballgame ideologies.

Stoll, Marijke [182] see Anderson, David S.

Stone, Abigail (Washington University in St. Louis)

[23] *Economies and Identities in Flux: Consequences of the Arrival of Specialized Fulani Pastoralists in Mali's Inland Niger Delta*

In the Sahel, the Fulani are considered the archetypal cattle herders. Although their spread across West Africa is poorly understood, their arrival had profound effects on local populations. In Mali's Inland Niger Delta, historical sources and isotopic analysis of archaeological cattle, sheep, and goat teeth from the site of Jenné-jeno and the modern town of Djenné suggest that specialized Fulani pastoralists arrived in the Delta between the 13th and 15th centuries A.D. This coincided with dramatic upheaval in local subsistence practices, with a shift from a largely generalized, agro-

pastoral system to one where ethnic identity became tightly linked to subsistence specialization. This paper draws on archaeological, ethnographic, and historical data to explore how socio-political changes, including the arrival of pastoralists whose identity was strongly tied to mobility and cattle, impacted the identities and subsistence regimes of local populations. I argue that despite archaeological evidence for cultural and ethnic continuity, the boundaries and meanings of group identity in this area underwent dramatic transformations. I caution that even in situations where modern subsistence and ethnic configurations are a seemingly good fit for the archaeological record, group identities are a fluid construct and can change radically in the face of historical forces.

[23] *Chair*

Stone, Tammy (University of Colorado Denver)

[99] *The Integration of Archaeology and its Principles into the Core Curriculum*

Introduction to Archaeology is often included in the college/university wide core curriculum (social/behavioral science module), as well as being a required class for undergraduate majors. This inclusion allows us to introduce the SAA curricular goals to a larger community. At the University of Colorado Denver, multiple laboratory sections of 15 students each are attached to very large lecture sections. The laboratories provide hands on exercises tailored to the historic and prehistoric archaeology of the area. By concentrating on local concerns, students develop fundamental analytic skills, participate in data analysis, and have issues of local diversity and social relevance brought home. In Fall 2014, one laboratory section was linked to a freshman seminar class (topic local history), a freshman composition class and co-curricular activities centered on Denver and Colorado history to form a Living Learning Community (LLC) for first time freshman. The linked classes and content emphasis on local history and prehistory in this LLC reinforces ideas about the relationship of the past to the present, diversity of experience in local areas and the importance of preservation and stewardship. Examples of laboratory exercises and co-curricular activities will be discussed.

Stone, Elizabeth

[237] *Discussant*

Stone, Jessica [238] see Fitzpatrick, Scott

Stone, Jessica (University of Oregon)

[328] *Prehistoric Population Mobility in the Caribbean: Genetic and Isotopic Investigations at Grand Bay, Carriacou, West Indies*

Archaeological research at Grand Bay, a large Late Ceramic Age (ca. A.D. 400-1300) Amerindian village site on Carriacou in the southern Caribbean, has revealed evidence that sheds light on Precolumbian adaptations to small island environments. More than a decade of research here and at other locations on Carriacou have yielded dozens of human burials, including many found in mortuary contexts rarely seen in this part of the Lesser Antilles. Ongoing bioarchaeological research on past lifeways of prehistoric settlers has moved from osteological and paleodietary analysis to the extraction of ancient DNA and heavy isotope ratios of Pb and Sr to examine genetic affinities and mobility among islands and adjacent mainland areas. While the data are preliminary, interdisciplinary research on Carriacou is providing new data on the inter-island movement of people, artifacts, animals, and cultural behaviors.

[328] *Chair*

Stoner, Wesley (University of Arkansas)

[25] *The Analytical Nexus: Multi-Technique Approaches to Ceramic Composition*

Archaeologists have employed many different approaches to characterize the composition of ceramic pastes, but until recently only a minority of studies have used multiple analytical techniques to examine the same sample. An "analytical technique" is used here to mean a single perspective that characterizes an aspect of a ceramic paste. Since humans created pottery using different processes and recipes, it follows that each perspective teaches us about a unique aspect of the

potter's behavior and social context. We have moved beyond the argument of "which technique is better?" into a phase of research that asks "which social or technological behavior does this technique reflect?" It is unrealistic to expect that all perspectives will be represented in any case study, but we must situate the different techniques within a framework that permits interpretations bringing us from technical observation to social deductions. The analytical nexus of these different techniques allows archaeologists to create a rich description of the social decisions and geoarchaeological processes that affect ceramic systems. I exemplify one version of the analytical nexus with my own research in Mexico using petrography, NAA, and LA-ICP-MS.

[79] *Chair*

Storey, Rebecca [206] see Walters, Michael

Storm, Rebecca [299] see Wilson, Andrew

Stothert, Karen (Center for Archaeological Research--UTSA)

[186] *Contributions of Dolores Piperno to the History and Folklore of Coastal Ecuador*

Personal and professional reminiscences from 1979 to the present of the life and works of Dolores Piperno- great person, smart graduate student, and distinguished scientist whose contribution to the early history of Ecuador (culture Las Vegas) has been transformational.

Stott, Jamie

[322] *Archaeological Education and Public Outreach through Social Media*

With advances in technology and greater access to public lands, archaeological sites are more vulnerable now than ever before. With photos and site locations being shared across the internet, it is pertinent for us as archaeologists to pierce the veil between academics, professionals, and the general public. Visitation to archaeological sites often results in adverse effects including visitor footpaths, touching or climbing on cultural resources, presence of modern trash, and vandalism to the site through looting or intentional destruction. By using common social media outlets such as Facebook, Instagram, Twitter, and personal blogs, we can begin to educate the public on proper site etiquette. By using the internet as a tool for public outreach, we can begin to distribute the sense of cultural resource ownership from land managers, academics, and professionals to the general public.

Stout, Dietrich (Emory University)

[33] *Stone Tool-Making and the Right Cerebral Hemisphere*

Neuroscience research has linked both language and tool-use to neural circuits in the left hemisphere, leading to hypotheses of co-evolutionary interaction between these behaviors. However, it is known that the right hemisphere also contributes to language, particularly with respect to large scale (e.g. prosody, context) processing. Studies of actual tool-making, as opposed to simple use, are sparse, but similarly suggest right hemisphere involvement in the more complex and temporally extended processes involved in the goal-directed transformation of durable objects. In support of this, neuroimaging studies of experimental stone tool-making in our lab have consistently implicated right parietofrontal circuits. This includes evidence of brain activation observed using FDG-PET and fMRI, as well as experience-dependent white-matter structural changes observed using DTI. Comparative (chimpanzee, human, macaque) anatomical studies further indicate a derived rightward asymmetry of this parietofrontal tract in humans. We propose the hypothesis that human frontoparietal circuits in both hemispheres underwent adaptations for Paleolithic tool-making that were behaviorally co-opted ("exapted") to support proto-linguistic communication and subsequently altered by secondary adaptations specific to language, especially in the left hemisphere.

Straight, Kirk

[338] *In this Chapel of Ritual: The Life and Death of Temple XIX at Palenque, Chiapas*

The excavation of Temple XIX at Palenque, Mexico from 1998-2002 garnered considerable attention primarily for the recovery of monuments with preserved inscriptions and iconography carved in stone and modeled in stucco. The fragmented state of several monuments, evidently victims of systematic mayhem in antiquity, preoccupied the excavators constantly as monument fragments were recovered from inside and outside the approximately 9 by 34 meter building. These monuments have now been consolidated and are on display in the site museum near the ruins in Chiapas. Although the epigraphy of these monuments has been discussed extensively in press, the context of their recovery has not received the same attention. As primary supervisor of the Temple XIX excavations I have a unique perspective on the construction, dedication, use, and termination of the building. In this paper I review the recovery program and contextualize how Temple XIX was used by the ruling court of Palenque in the mid-8th century A.D. I then address the termination of the structure and the apparent dereliction of the entire South Group (or South Acropolis) in the second half of the 8th century A.D. prior to total abandonment of the site in the early 9th century A.D.

Strange, David (University of Wisconsin-Milwaukee)**[301] *Evidence for Antemortem or Perimortem Trauma among Individuals Recovered from the 2013 Milwaukee County Institution Poor Farm Cemetery Excavations***

2013 excavations at the Milwaukee County Institutional Grounds (MCIG) cemetery resulted in the recovery of approximately 685 burials containing over 700 individuals, adding to the existing collection of 1649 individuals excavated in 1991 and 1992. The individuals from the 2013 excavations were inventoried and examined macroscopically for evidence of pathology and trauma. Sean P. Dougherty (2011) observed that the pattern of traumatic fractures among the 1991 and 1992 collection reflect not only a tendency for interpersonal violence, but also non-agonistic events inherent through the hazards of life among the impoverished of Milwaukee during the burgeoning Industrial Age. Dougherty classifies evidence of post-mortem medical intervention such as the craniotomy and other signs of autopsy as trauma. It is the case that that many types of impetuses exist for postmortem intervention procedures. In the analysis of the 2013 collection, only antemortem or perimortem signs of trauma will be the accepted parameters. It is expected that this study will reveal similar trends of interpersonal violence and occupational hazard, but a tighter classification of how we define "trauma" should lead to a finer-grained understanding of the lives of the poor in turn of the century Milwaukee, Wisconsin.

Stratten, Daniel [358] see Sparks, Shane

Straulino, Luisa, Ana María Soler (Instituto de Geofísica, UNAM), Sergey Sedov (Instituto de Geología, UNAM), Sandra Balanzario (Instituto Nacional de Antropología e Historia) and Teresa Pi (Instituto de Geología, UNAM)**[399] *Dzibanché Stuccos: Archaeomagnetism Dating and Manufacture Techniques***

The archaeological site of Dzibanché, Quintana Roo, has polychromed stucco remains that seem to date to the Middle Classic when the Kaan dynasty ruled at Dzibanché. The aim of this investigation was to determine the composition of the stucco and the painting (petrography, SEM-EDS, XRD) and date them. The antiferromagnetic hematite in paintings contains remanent magnetization (PiRM). The magnetic record could date them if changes in direction and intensity of the geomagnetic field have been well characterized. The employed curve for dating is improved from Wolfman (1 to 1200 d.C.) with new archaeomagnetic data supported by radiocarbon dates. Stucco contains mainly calcite, dolomite, chert, clays, soil and some organic features; the pictorial layer has at least two layers of red pigments mostly constituted by hematite. Four murals were sampled, eight to ten oriented specimens were taken with double-sided tape. The samples were demagnetized by alternating fields (10 to 40 mT) in order to get their characteristic magnetization. The mean directions were obtained employing Fisher statistics and dating was performed with Bayesian statistics (RENDATE). Obtained dates: A.D. 626-647, Structure 2; Pequeña Acrópolis palaces, A.D. 394-429 & A.D. 500-529, southern, A.D. 417-528, eastern, and A.D. 445-497, northern palace.

Strauss, Stephanie (The University of Texas at Austin)**[151]** *Izapa's Place in the Discourse on Early Hieroglyphic Writing*

Izapa occupies a curious place in the study of Mesoamerican writing and semiotic practice. Although the linguistic affiliation of ancient Izapa is unknown, glottochronological estimates suggest that Izapa stood at a multilingual crossroads between proto-Mihe-Sokean and proto-Mayan speaking populations. The blended visual vocabulary of Izapa-style monuments, coupled with the site's location and chronology, further prompted early scholars to place Izapa on a transitional, regional continuum between the better-studied artistic traditions to its east and west. Epigraphically, this slippery view of Izapa often results in its uncritical inclusion in the greater "Isthmian" writing tradition; and yet the lengthy inscriptions found on La Mojarra Stela 1 and the Tuxtla Statuette are not seen at Izapa. As it is very likely that the people of Izapa had at least some degree of exposure to the early, linguistically transparent writing systems that surrounded them, their use of a text-independent communicative strategy was intentional and significant. How, then, are we to read Izapa-style monuments? What are we to make of the distinctly glyph-like elements so often embedded into their complex pictorial narratives? This paper thus explores these uniquely Izapan "iconoglyphic" elements, reinserting them into the discourse on early Mesoamerican writing and linguistically unbounded signaling practices.

Strawhacker, Colleen (National Snow and Ice Data Center, University of Colorado), Peter Pulsifer (National Snow and Ice Data Center, University of C) and Shari Gearheard (National Snow and Ice Data Center, University of C)

[288] *Data Management and Cyberinfrastructure for Traditional and Local Knowledge and Archaeology in the Arctic*

Scientists are realizing the importance of social science research to fully understand how the rapid environmental change in the Arctic will affect human populations living in the Arctic and beyond. Millions of dollars are invested in scientific research, including in the social sciences, on the changing Arctic every year, and with that investment, scientists have begun stressing the importance of preserving these collected data for future analysis. With the increased recognition of the importance of social science data, however, numerous challenges and obstacles exist to effectively managing data from the social sciences. Data from the social sciences, for example, frequently take a different form from data from the physical sciences and can be highly dependent on context. This paper will present the various ongoing efforts in cyberinfrastructure for traditional and local knowledge and social sciences (with a focus on archaeology) in the Arctic, including The Exchange for Local Observations and Knowledge of the Arctic (ELOKA, <http://eloka-arctic.org>). We will also address the challenges of managing data from the social sciences, including maintaining privacy of subjects, preserving context of the data, and ensuring the data are preserved for the future.

Streeter, Richard [351] see Dugmore, Andrew

Streit, Katharina [91] see Campeau, Kathryn

Strickland, Amanda [113] see Parker, Evan

Stride, Sebastian [73] see Angourakis, Andreas

Striker, Sarah (Arizona State University)**[109]** *Categorical Identity and Decorative Style in an Ancestral Wendat Sequence*

This study takes a new approach to Iroquoian ceramics, considering decorative style as evidence for categorical identification. Categorical identity is a shared association with a category such as an ethnic or religious group. Along with relational identification – direct interpersonal relationships – categorical identification is a key element of collective identity. Historical sociologists study these elements of collective identity to understand how individual and collective social relationships facilitate collective action – sustained cooperation toward a common goal. I use this framework to

understand how individual and collective social relationships change over time and contribute to socially cohesive communities. I examine four successively occupied Ancestral Wendat (Iroquoian) communities (1400-1550 C.E.). Previous work traces village aggregation and coalescence through changes in village plans from smaller, dispersed communities to the exceptionally large Mantle site. A spatially-integrated village plan and shared public space demonstrate collective action and a socially cohesive community at Mantle. I evaluate categorical identification by assessing the consistency of ceramic decorative styles within each village using consensus analysis. Intra-site spatial patterns of similarity as well as developments throughout the site sequence indicate whether categorical relations changed over time, and how these developments contributed to social cohesiveness at the Mantle site.

Striker, Sarah [277] see Ruiz Y Costello, Donna

Stringer, Chris [415] see Buck, Laura

Stromberg, Caroline (University of Washington, Seattle)

[186] *3D Morphology of Grass Short Cell Phytoliths: Unlocking the Evolution of Grasses and Grassland Ecosystems*

Grass-dominated ecosystems occupy > 40% of today's earth's land surface. Documenting when this prominent biome emerged was traditionally hampered by the rarity of identifiable grass fossils. Recently, phytoliths have emerged as a vital tool for tracking the evolutionary history of grasslands. Key to understanding ancient grassland composition is studying the 3D morphology of silica grass short cell (GSSC) phytoliths. GSSCs have long been known as broadly diagnostic within grasses, but a landmark paper (Piperno and Pearsall 1998) demonstrated the full taxonomic potential of GSSC shape. For example, 3D shape distinguishes between forms that look similar in one view, such as saddle-types in bamboos and chloridoids. Incorporating study of 3D morphology in phytolith analysis of Cretaceous-Cenozoic (66-2 million years ago (Ma)) samples from the Americas, Europe, and Asia has radically changed our understanding of grassland evolution. This work shows that open-habitat grasses (e.g., pooids, panicoids) diversified 10-20 million years before becoming ecologically dominant in North and South America, suggesting that different environmental factors promoted diversification vs. dominance. GSSC analysis also reveals that (C3) stipoid pooids dominated early savanna/grassland vegetation rather than tropical (C4) grasses as previously thought. Ongoing investigation of GSSC 3-D shape promises to further revolutionize our view of grassland evolution.

[186] *Discussant*

Stuart, David (The University of Texas at Austin)

[196] *Early Maya Script and Visual Culture: A Chronological and Geographical Reassessment*

This paper presents evidence for a lowland origin of Maya hieroglyphic writing and iconography during the Late Pre-Classic period. It calls into question long-standing models of highland-lowland interaction that have assigned temporal priority of Maya monumental art and visual culture to the southern highlands and Piedmont region. In addition to the several known sculpted and inscribed monuments from the Peten region, archaeological evidence from the site of San Bartolo has revealed integrated programs of script and iconography in place in the lowlands by 300 B.C.E., well before their first known appearance on datable monuments in the southern region, at Takalik Abaj and Kaminaljuyu. In integrating archaeological, epigraphic and art historical perspectives, this paper considers a model wherein examples of Maya visual culture at such highland and piedmont centers can be viewed as lowland-inspired, indicating an intrusive political and cultural (though not necessarily ethnic) presence that was also relatively short-lived, diminishing by the beginnings of the Early Classic era.

[344] *Discussant*

Stuck, Jennifer (CSU Dominguez Hills), Claudio Carini (CSU Dominguez Hills), Beatrice Villagomez (CSU Dominguez Hills) and Jerry Moore (CSU Dominguez Hills)

[327] *Penetrating the Old Woman's Gun: A GPR and Artifact Analysis of a Mexican American War Battlefield Site*

This paper will address the validity of the claim that the Battle of Rancho Dominguez (Battle of Old Woman's Gun) took place on the lower terrace of the Rancho Dominguez. In the summer of 1846, the US military took control of Los Angeles. Soon after, the Mexican Army was able to regain the city. Captain Mervine, of the US military, landed his troops in San Pedro hoping to regain Los Angeles. Folk history tells of Captain Mervine's troops being besieged in the early hours by Californios, wielding a four-pound cannon ("the old woman's gun") and diversionary tactics. An archaeological investigation involving a GPR survey was followed by excavation and artifact analysis. A two cm in diameter iron ball was uncovered, which is consistent with iron shot used by the Mexican Army in 1846. Findings led to the investigation into the whereabouts of "the old woman's gun". Results offer support for the existence of the Battle of Old Woman's Gun and its approximate location, in Los Angeles. The present findings augment the literature on the Mexican American war, particularly the role of the Californios, the fate of the "old woman's gun" and the Rancho Dominguez area.

Stuckey, Sarah [185] see Morrow, Juliet

Stueber, Daniel [64] see Nowell, April

Stueber, Dan [386] see Binning, Jeanne

Stull, Scott [124] see Rogers, Michael

Sturdevant, Jay, Brenda Todd (National Park Service, Denver Service Center), Wendy Ross (National Park Service, Knife River Indian Villages) and Craig Hansen (National Park Service, Knife River Indian Villages)

[29] *Preservation Practice at Knife River Indian Villages National Historic Site: Using New Planning Frameworks to Identify and Address Impacts to an Archaeological Landscape*

Knife River Indian Villages National Historic Site was set aside to preserve, research, and interpret the archaeological and cultural landscapes of the Hidatsa-Mandan villages at the confluence of the Knife and Missouri Rivers. Both park enabling legislation and NPS policy direct park staff to preserve archaeological resources unimpaired for future generations. However, defining what preservation means and how it is put into practice presents a challenge for park managers as they attempt to preserve archaeological resources in balance with natural processes. In 2013, the park began a comprehensive Archaeological Resources Management Plan as part of the new NPS planning framework. These efforts focus on increasing tribal and public involvement in a long term resource management strategy incorporating both NPS and traditional tribal values. This paper will explore these issues and discuss the ways that this planning strategy may guide resource preservation and maintain relevancy into the future.

Sturm, Jennie O. [273] see OBrien, Lauren

Sturm, Jennie (TAG Research)

[358] *Using Geospatial Strategies and Ground-Penetrating Radar to Study Sites in the American Southwest*

In American archaeology, ground-penetrating radar (GPR) has enjoyed its longest use in the Southwest. While this method has long been used to locate features of archaeological interest, much of the focus has now shifted from using this technique as a prospection tool to one that can be used directly in the study of archaeological sites. This reflects an increasing sophistication in the ways practitioners process, interpret, and visualize GPR data, which capitalizes on this method's high-resolution, three-dimensional mapping capabilities. Furthermore, combining these data with other geospatial techniques such as aerial photography and high resolution GPS survey means it is possible to associate buried features to surface phenomena, thereby opening up the types of

questions that can be addressed while also preserving sensitive archaeological sites. This presentation draws upon examples from the American Southwest to show how this approach is being used to study sites in relation to the larger archaeological landscape. Far from being a simple prospection tool, the use of GPR in archaeology is enjoying a revitalization as advancements in the way geospatial methods are combined generate data that can be used directly in the interpretation of the archaeological record.

Sturt, Fraser [3] see Bedford, Clare

Stutts, Stephanie [98] see Howell, Ryan

Stutts, Stephanie (University of Oklahoma)

[357] *Paleoindian Use of the Western Ouachita Mountains, Oklahoma*

At present, the archaeological record of eastern Oklahoma reflects abundant evidence of prehistoric occupation in the region's river valleys, from the Paleoindian period onward. Conversely, little archaeological work has been done in the upland environments of the Western Ouachita Mountains. Yet these uplands are notably rich in resources, ranging from high quality lithic sources, lush plant-life, diverse animal species, and many streams and rivers providing water throughout the year. I therefore hypothesize that the western Ouachitas would have been used by prehistoric people throughout prehistory, starting in Paleoindian time. This paper preliminarily evaluates this hypothesis by synthesizing first, what few archaeological findings have been reported for the Ouachita high country; and second, what archaeologists have learned about Paleoindian use of the nearby Eastern Ouachita Mountains and Southern Ozarks of Arkansas. I conclude that there is a high probability that Paleoindian groups did indeed use the Western Ouachita Mountains, and probably in highly diverse ways. I end by suggesting potentially fruitful next steps for evaluating this literature-derived conclusion through fieldwork.

Styles, Bonnie

[69] *Discussant*

Suarez, Rafael (Depto. Archaeology. Universidad de la República (Uruguay))

[150] *Living on the river shore: Late Pleistocene and Early Holocene Human Adaptations in the Uruguay River Basin*

This presentation provides new data on investigations on the middle basin of Uruguay River. The most recent research on Northern Uruguay in the K87 Tigre type site has yielded radiocarbon dates with similar ages to Clovis (ca. 13,000 cal yr BP). At a regional level, a settlement pattern emerges where the Paleoamerican residential sites are located on the banks of Uruguay River near the mouth of arroyos, near "rapidos", natural passages (pasos), and small cascades (cachoeiras). This pattern suggests that the sites are located in strategic places, where there are significant concentrations of resources related to hunting, fishing and raw material procurement and others resources necessary for human life as fresh water, firewood, wood and plant fibers among others. Recent definition of two Paleoamerican cultural complexes: Tigre (12,300-11,200 cal yr B.P.) and Pay Paso (11,081 to 10,065 cal yr B.P.), allows understanding the cultural diversity for post-Fishtail times. This data is important because it allows recognizing and understanding of the technological reorganization occurred during the Pleistocene-Holocene transition in the Uruguay River basin.

Subiaul, Francys [122] see Ranhorn, Kathryn

Sugimoto, Kassie [203] see Gadison, Davette

Sugimoto, Kassie (North Carolina State University), Ann Ross (North Carolina State University) and Danielle Kurin (University of California, Santa Barbara)

[384] *Facial Asymmetry: Bio-indicators of Stress in Post-Wari Populations*

The role of climatic conditions on sociopolitical systems has been a highly discussed theme in archaeology. Over the past decade, archaeology has had great advancement in the realms of method and theory which have facilitated interpretations of environmental influences on social development. This paper presents research that investigates the biological responses to either environmental or social stresses to help elucidate how ancient Andean populations coped during periods of climatic instability and social and political unrest. Specifically, this paper will discuss the results of a Fluctuating Asymmetry (FA) analysis collected from a Late Intermediate Period (ca. A.D. 1000—1400) skeletal population from the Peruvian south-central highlands. This study analyzed 72 crania using a Microscribe digitizer to record three-dimensional coordinates of standard bi-lateral facial landmarks. Since bilateral structures tend to develop symmetrically under ideal conditions and asymmetrically under stressed conditions, FA is a suitable proxy to measure the developmental instability in human populations. FA was used to compare Chanka populations to illuminate the social conditions after the collapse of the Wari Empire. This research rejects environmental deterministic frameworks and will present alternative explanations to clarify how non-climatic stress can influence skeletal development.

Sugiura, Yoko (Instituto De Investigaciones Antropologicas, UNAM), Gustavo Jaimes (Doctorado en Estudios Mesoamericanos FFyL-UNAM) and Diana Martínez (IIA-UNAM)

[129] *La vida cotidiana a través de las vasijas ofrendadas en el contexto doméstico en Santa Cruz Atizapán y San Mateo Atenco, Estado de México*

Hablar de la vida cotidiana puede resultar un tema bastante complejo, ya que ésta se compone de múltiples prácticas, las cuales se entretienen, de manera intrincada, por acciones y actividades. Éstas se desarrollan en diversos espacios desde los domésticos y más privados hasta aquellos con carácter público que se denotan su carácter ritual, cívico o administrativo. En el presente trabajo, se aborda la problemática a través de las prácticas colectivas desarrolladas por acciones recurrentes de grupos humanos determinados durante el Clásico tardío (450-600/650dC) y el Epiclásico (600/650-900/1000dC), en específico de la manera de ofrendar una serie de vasijas cerámicas de uso cotidiano, incluyendo las utilizadas como urnas funerarias mediante análisis morfo-funcional, así como de su contenido de macro-restos botánicos.

Sugiura-Yamamoto, Yoko [129] see Muñoz, Maria De

Sugiyama, Saburo (Aichi Prefectural U./Arizona State U.) and Leonardo López Luján (National Institute of Anthropology and History, Me)

[298] *New 3D Map of the Templo Mayor Architecture, a Symbol of Mexica Cosmology and Political Power with Teotihuacan Tradition*

The 3D map of the Great Temple complex has been elaborated in 2007-2014 with detailed features of thirteen overlapping architectural stages. We first analyze and describe visually each stage calculating dimensions and orientation of the main pyramid complex. Enlarging process gradually changing the spatial distribution and orientations of the temple complex will be discussed in terms of native perspective of cosmology and expanding political power. The E-W orientation and symbolic architecture have been interpreted in relation to astronomical movements and cosmology; however, these hypothetical interpretations need to be reanalyzed with more precise, detailed, and comprehensive map we are creating three-dimensionally for the first time. Our paper also focuses on a new aspect, possible measurement unit or units used by Mexica at the Templo Mayor precinct. Historical references and propositions made by previous studies of Mesoamerican measurement units including those of Teotihuacan will be applied to the new site map to define Mexica standard units. Finally symbolic significance, particularly dichotomy of the Sun/Moon, Dry/Wet, Warfare/Fertility, Male/Female, etc. relating to South/North directionality, integrated in the twin temple of the Templo Mayor will be explored as Teotihuacan tradition representing expanding political force of the Mexica Empire.

Sugiyama, Nawa (Smithsonian Institution) and William L. Fash (Harvard University)

[366] *Human/Animal Interactions in the Copan Valley from the Beginning to the End of the Copan Dynasty: Stable Isotope Analysis of the Felids from Altar Q and the Motmot Dedicatory Offerings*

In fifth century Copan, Honduras, beneath the city's first dynastic monument a complete puma was offered beside a female human burial. Over three centuries later, under the watchful eye of sixteenth and final ruler of the dynasty Yax Pasaj, a series of sixteen felids (many of them jaguars) were placed in the dedicatory cache of Altar Q, the "stone of the founder." Here we investigate the remains of some of the largest carnivores on the landscape, the jaguar and puma, to analyze human-felid encounters. These large predators were instrumental icons of power and rulership, but as two of the endangered species that are no longer found in the Copan Valley we must question how humans interacted with these animals, and what they symbolized. Zooarchaeological and isotopic data from these two momentous dedicatory offerings are utilized to reconstruct the entire ritualization process: where and when were these animals acquired, and is there evidence that they were kept in captivity? Why did the ancient Copanecos conduct this sacrifice, and what was the underlying cosmology behind these violent acts? From the beginning of the ceremonial precinct to the demise of the Copan dynasty, human-animal encounters helped re-order and reify the sociopolitical landscape.

Sugrañes, Nuria and Fernando Franchetti

[252] *Distributional Studies in North Patagonia, Argentina. An Archaeological Ceramic Approach*

During the last ca. 3000 years BP, there was a change in the socioeconomic organization of hunter-gatherers in Southern Mendoza, north Patagonia, Argentina. New technologies, like pottery and bows and arrows, were incorporated and allowed the exploitation and occupation of marginal areas, such as highlands and arid environments. Technological strategies, mobility and use of space are linked in this research by a distributional analysis of archaeological ceramics from southern Mendoza archaeological sites. The objective is to evaluate the use of pottery in different locations with differential access to water and resources. By considering the patterns of presence, absence and quantities of pottery sherds, different mobility and subsistence strategies can be understood in the study area.

Sullivan, Lynne (University of Tennessee) and Michaelyn Harle (Tennessee Valley Authority)

[187] *Phased Out: The Distinctive Identities of Late Mississippian Communities in Eastern Tennessee*

An often-made presumption is that an archaeological phase (defined mainly by pottery or projectile point types) represents a social group with shared identity. This perspective can conceal other types of cultural variation and practices that may be more significant for presenting and representing group identity. The broadly-defined Dallas Phase in the Upper Tennessee Valley provides a late Mississippian-period example of this type of presumption. While there are broad similarities in pottery styles throughout this large region, there also are distinct differences among architectural styles, mortuary practices, and community plans, as well as in biological variation, which went unrecognized by previous scholars because collections from large, New Deal-era excavations were not studied for decades. This variation at the community level also is situated in differing histories of Mississippian development between geographic localities within the region. An exploration of variation among late Mississippian communities in eastern Tennessee exposes unique characteristics and facets of group identities that archaeological terminology has concealed. The new, comparative view presented in this paper also reveals a dynamic landscape of distinctive communities rather than a monolithic, normative "culture."

Sullivan, Lauren [248] see Sweeney, Angelina

Sullivan, Elaine (UC Santa Cruz)

[287] *3D Saqqara: Using 3D GIS to Reconstruct Visibility and Communal Memory at an Egyptian Necropolis*

The integration of GIS and 3D modeling now allows for the recreation and visualization of entire ancient landscapes. 3D Saqqara uses these capabilities to create a truly four-dimensional

exploration of the cemetery of Saqqara, Egypt. The project offers a workflow for how 2D archaeological and architectural data can be transformed into 3D representations of the ancient built and natural environment, while maintaining the geo-spatial coordinate system of GIS and allowing for both quantitative and qualitative visual analysis (specifically 3D aware line-of-sight analysis). By simulating the changing architectural landscape of an entire archaeological site over time, the project demonstrates how the nexus between landscape and memory at ancient sites can be examined in innovative ways. These temporal visualizations allow us to question how the transformation of architectural spaces over time effected peoples' interpretation and memories of past and contemporary communities.

Sullivan, Kelsey (University of Oregon), James Stemp (Keene State College) and Jaime Awe (Northern Arizona University)

[376] *Two Newly Discovered Maya Chert Tool Workshops in the Belize Valley: Results of the 2014 Surface Reconnaissance*

Few lithic workshops have been found in the Belize Valley of Western Belize. This paper presents the results of surface reconnaissance and debitage collection at two newly discovered chert tool workshops near the villages of Esperanza and Teakettle in the Cayo District of Western Belize. Each of these workshops consists of a single large mound of debitage and includes tools aborted or broken at various stages of manufacture. At both locations, the main tool types produced were oval bifaces and long, narrow bifaces. Based on comparisons to tool types and reduction techniques at other Maya production locations, such as Colha in Northern Belize and El Pilar in Western Belize, both the Esperanza and Teakettle mounds likely date to the Late Classic period (c. A.D. 600-800). The main sources of chert observed at these two workshops appear to be cobbles locally obtained from the nearby Belize River. Preliminary results indicate that the focus of these workshops was the manufacture of utilitarian tools for consumption by farming households distributed throughout the Belize Valley.

Sun, Yan (Gettysburg College, PA)

[234] *Local Communities in the Northeastern Frontier of the Central Plain during the Late Second and Early First Millennium B.C.*

This paper will discuss how local communities in the northeastern frontier of China used metal artifacts and mortuary practice to articulate identity and delineate their cultural and political affiliations among themselves in the region and with polities in the Central Plain during the late second and early first millennium B.C., which was a period that witnessed the rise and expansion of state powers in the Central Plain, namely, the Shang and Zhou. Previous studies examined material culture from the perspective of state expansion and emphasized the dominance of Shang and Zhou culture in this frontier region. This paper instead views the "frontier" as a "center" in which people and communities interacted and negotiated their identities. It introduces the concept of local agency and emphasizes the indigenization of imported artifacts and ideas, as well as discusses the complex socio-political landscape to explain the varied choices made for material cultures by in the frontier communities.

Sunell, Scott (UCLA) and Jeanne Arnold (UCLA)

[310] *The Antecedents to the Specialized Microdrill Industry on Santa Cruz Island, CA*

I analyze more than 400 lithic artifacts associated with the development of intensive Chumash shell-drilling activities from four sites on Santa Cruz Island (SCRI), CA. By the second millennium CE, the Chumash of the northern Channel Islands had developed a specialized bead-making industry and a parallel industry of formal microdrills to perforate those beads (as documented by Arnold [1987]). During the latter part of the Middle Period (A.D. 900-1150), trapezoidal microdrills dominated; in the mid-Middle Period (A.D. 500-900), by contrast, ad-hoc drills with non-standardized methods of manufacture prevailed. These artifacts are flake-drills, identified in small numbers at sites on both the islands and the mainland. I track the origins of microlithic technology on the islands with the region's largest known collection of flake-drills and identify a period of production experimentation at SCRI-474. Type A flake-drills were produced expediently from small flakes and shatter. Type B drills were made on flake forms characterized by bit placement on the long axis. These assemblages chronicle local knappers' experimentation with techniques that would revolutionize the small drill production

process in the region, presaging methods that would become common practice and documenting the earliest steps toward the standardized microdrill industry.

Sunseri, Charlotte (San Jose State Univ)

[34] *Archaeologies by Community Mandate: Who Makes the Call?*

Historically, precious little academic archaeology has occurred under the watchful eye of descendant communities who have witnessed generations of researchers come and go, sometimes with no direct contact regarding the results of archaeological investigations in their ancestral places. Despite more recent overtures to mend these practices, we (as a discipline) are still woefully lacking in this regard. Nevertheless, significant changes in the role of cultural patrimony to that of lynchpin in the mobilization of "community" within the last few years has not only challenged the privileges of the academy, but has also brought researchers closer and more deeply engaged in the contemporary struggles of their hosts and collaborative partners. This reification of community power has meant new kinds of risks and rewards for both sides, and directly impacts the types of research questions addressed in a collaborative project. This paper draws upon examples of nascent research agendas in California, New Mexico, and South Africa to explore why and how what might be seen as taking a chance with research is perhaps the most powerful commitment of all.

[34] *Chair*

Sunseri, Jun [34] see Sunseri, Charlotte

Sunseri, Jun

[406] *A Saint Jude's Box for Zooarchaeologists In the Making*

Taking on graduate students and shepherding them through the harrowing process of becoming PhD's is something few faculty take lightly. Within the rigorous methodological sub-discipline of Zooarchaeology, even fewer would commit to the requisite long and close apprenticeship with students whose backgrounds lay "outside of the box" of faunal-focused research. Yet, Diane populated her research cluster with a dynamic mixture of scholars from disparate backgrounds, just as she kept the famous "Saint Jude's Box" in her lab for those pieces defying some element of analysis. Though some of these scholars seemed bent on tackling impossible projects, the mentorship and support network sustained among those bone-filled cabinets has resulted in scholarship based around the world and sometimes in the most unlikely of research directions, drawn from the spirit of adventure and resilience modeled by the lab director herself.

[34] *Chair*

Supernant, Kisha [82] see Shepard, Emily

Supernent, Kisha [80] see Ames, Kenneth

Surface-Evans, Sarah (Central Michigan University) and S.K. Haase (Central Michigan University)

[72] *Promoting Responsible Heritage Tourism through Public Archaeology at Two Great Lakes Lighthouses*

Central Michigan University recently undertook a series of public archaeology projects in cooperation with local historical societies and county governments in to investigate two northern Michigan lighthouses that are public parks. The McGulpin Point Lighthouse operated from 1869 to 1906 and was purchased by Emmett County in 2009. The 40 Mile Point Lighthouse was built in 1897, was deeded to Presque Isle County in 1998. The modern political and socioeconomic conditions of the two counties are extremely different, but in both cases archaeological investigations were sought to attract public to the parks. Emmet County, located at the Straits of Mackinaw, already relies heavily on tourism (particularly heritage tourism) for its economy. Presque Isle County, located in the northeast side of the Michigan's Lower Peninsula has extremely high unemployment and few tourist destinations. We compare and contrast the public archaeology projects at these two sites and

explore the ways in which archaeology produced more meaningful experiences with history for tourists and community members. In both cases, our work also included educating society members and public officials of their ethical obligations for responsible heritage tourism.

Surmely, Frédéric [333] see Franklin, Jay

Surovell, Todd (University of Wyoming) and Matthew O'Brien (California State University, Chico)

[148] *Ethnoarchaeological Perspectives on Folsom Households*

Over the few decades, households have been identified in a handful of Folsom sites. Although it should surprise no one that the Pleistocene inhabitants of North America built, lived in, and used domestic structures, it may be surprising we know relatively little about how those household spaces were organized. This problem is hardly unique to Folsom. It could be argued that this is true of hunter-gatherer household archaeology as a whole. Part of the difficulty we encounter in interpreting intra-household spatial patterning is that relatively little research has focused on the factors that govern the spatial organization of human behavior within households in nomadic contexts. Inspired by Folsom household archaeology, the Dukha Ethnoarchaeological Project was designed to examine the general factors affecting where people choose to do things in a modern setting, and how decisions people make regarding spatial positioning should be reflected by material residues in the archaeological record. In this paper, we examine some of the factors affecting the spatial organization of human behavior in the households of nomadic Dukha reindeer herders in northern Mongolia, and how understanding this phenomenon can provide insight into the household archaeology of prehistoric hunter-gatherers.

Susak Pitzer, Angela (University of California, Los Angeles)

[101] *Raw Materials, Reuse, and Refuse: A Multi-Disciplinary Study of Karanis Glass*

This multi-disciplinary study comprising archaeological, scientific, and morphological analyses as well as ethnoarchaeology and textual analysis, interrogates how value was assessed in the ancient world by examining Roman glass from Karanis, Egypt. Onsite portable X-ray fluorescence spectrometry (pXRF) analysis of recently excavated glass was conducted since the Egyptian government prohibits the export of artifacts for further analysis. This research, combined with pXRF and electron microprobe analysis of museum specimens from Karanis, helps distinguish glass compositional groups. A database including several variables--chemical composition, morphology, style, use, reuse, discard, and date--enables the exploration of relationships among variables using statistical analysis to compose a new typology of Karanis glass. An ethnoarchaeological study of modern glass workers in Cairo and in Hampshire, UK allows a reconstruction of the production sequences (*chaîne opératoire*) involved in producing glass objects and relationships between value and technology. The decisions artisans made during the production of glass objects forms the foundation of this typology because they reflect shared conceptions of value in Roman Egypt. This study examines how changes in glass types used at Karanis relate to fluctuations in the economy and to changes in the social, ideological, and political landscape during the Roman Period.

Sutton, Amanda (University of Georgia)

[153] *Toward a Theory of Dispersal as an Adaptive Strategy: Adoption, Migration, and Cultural Survival in the Archaeological Record*

Dispersal of human populations is often perceived as synonymous with abandonment and collapse. Alternatively, cross-cultural studies of historic and contemporary dispersal suggest it should instead be considered a strategic adaptation to external pressures. I argue that strategic dispersal represents a conscious, purposeful transformation of social and cultural structures in the face of bifurcation, resulting in cultural continuity and the selective adoption of external cultural traits and materials. This phenomenon is visible through the archaeological record; however, the most productive way in which to examine strategic dispersal and cultural entanglements is through a synthesis of the archaeological and ethnohistoric records. Utilizing ethnohistorical, ethnographic, and archaeological data from the Americas, West Africa, and Madagascar, this paper examines several

case studies, exploring strategies of dispersal as mechanisms of cultural self-preservation in the face of colonial violence and cultural entanglement. Insights derived from this review are then used to contextualize the 17th-century dispersal of the Huron-Wendat from their homeland in Ontario, Canada. The results of this study offer a new way to conceptualize strategies of migration and cultural integration, and the ways in which people negotiate social, ideological, and economic spheres in the face of colonial entanglements.

Sutton, Wendy (USDA Forest Service, Gila NF)

[282] *Blast Caps and Other Stories of the CCC on the Gila National Forest: Imaging and Reimagining the North Star Road*

The CCC and other New Deal agencies were active across the Gila National Forest during the 1930s. The North Star Road (which experienced earlier use as a Military Road) runs alongside the Gila Wilderness, the nation's first wilderness area, established in 1924. The road is now sandwiched between the Gila Wilderness and the Aldo Leopold Wilderness (part of the first Wilderness established in 1964, under the Wilderness Act). Significant work was conducted along the North Star Road by the CCC. How does the work conducted within this corridor reflect community priorities and values associated with the early wilderness movement? How do we manage this unique landscape and its cultural, recreational, and natural values into the future?

Suvrathan, Uthara (Cornell University)

[49] *Spaces and Places: Examining Historic Maps from South Asia*

This poster presents a preliminary attempt to systematically interpret and analyze historical cartographic data from South Asia. Information from historic maps of South Asia is combined with archaeological settlement data to reconstruct the nature and distribution of regional administrative and religious centers in south central India. Preliminary research in the area suggests that regional administrative centers often occupied a place in local pilgrimage and trade networks. However, this position was not static and seems to have been closely linked to multiple factors such as the political strategies of elites, imperial expansion, regional trade systems, and the establishment of religious institutions. By examining a wide corpus of medieval and colonial maps of South Asia, dating from the 16th century to the early 19th century, and comparing this data to published archaeological settlement data, it is possible to trace some of the spatial and temporal configurations of the loci of political and religious authority. In addition, the poster comments on western and indigenous ideas of the organization (and control) of space.

Suyuc, Edgar O. [408] see Hansen, Richard

Swaim, Abby

[359] *Documentation of Missouri White-tailed Deer Chronoclines: Implications for Archaeology, Paleoecology, and Conservation Biology*

Multiple ecological factors (e.g., Bergmann's rule, competition, reproductive rate, home range size, food quality and quantity) may cause changes in animal body size over time. White-tailed deer (*Odocoileus virginianus*) are ideal for studying these variables due to their importance today (to hunters and to wildlife enthusiasts), their known phenotypic plasticity in response to ecological factors, and their high frequency in zooarchaeological collections. Using post-cranial, weight-bearing bone measurements, I determine if stunting of modern Missouri white-tailed deer has occurred relative to prehistoric deer. Possible causes including forage availability, predation and intraspecific competition are evaluated. Missouri samples are compared to modern and prehistoric deer samples from central Texas as a means to gauge current and paleoecological similarities and differences between the two states. The advantages of incorporating paleozoological data with modern conservation biology are highlighted.

Swain, Todd (National Park Service)

[83] *Legal Issues Concerning Cultural Heritage Resources Damage Assessments*

The Archaeological Resources Protection Act (ARPA) was passed in 1979. ARPA requires archaeologists to calculate three different types of value to quantify the amount of loss in federal looting incidents: archaeological value, commercial value and cost of restoration and repair. In 2002, a section was added to the U. S. Federal Sentencing Guidelines to cover the damage, theft and trafficking of Cultural Heritage Resources. These guidelines also require archaeologists to calculate the amount of loss for sentencing purposes. Despite hundreds of training courses and numerous court rulings concerning archaeological damage assessments, many archaeologists are still ill-prepared to complete a document that will withstand scrutiny within the federal legal system.

Swanson, Steve [137] see Vorsanger, Andrew

Swanson, Steve (Arizona State University)

[182] *Mimbres Games, Gambling and Gods*

This paper reviews the archaeological evidence for the presence of games played by the prehistoric inhabitants of the Mimbres region in the US Southwest/Northwest Mexico, emphasizing perishable materials recovered from cave/rock shelter deposits and iconic imagery present on Mimbres ceramic vessels. The archaeological evidence is compared with ethnographic information for gaming and gaming-related activities among Western Puebloan groups. Gaming and gambling among the ethnohistoric Hopi, Zuni and Acoma were important ritual as well as secular activities, and serve as an interpretive framework for understanding the relationship of prehistoric games and gambling with Mimbres ritual.

Swantek, Laura (Arizona State University)

[51] *Understanding Changes in Social Complexity during the Prehistoric Bronze Age on Cyprus: A Bottom-Up Approach*

For at least the last 5,000 years, competition for social and economic control led to the acquisition of social power and wealth by some individuals or groups and the emergence of complex social systems. This paper will present the preliminary results of a larger study intended to identify the changing network structures that underlie society at the household, village and regional scales and led to the emergence of social complexity as a system-level phenomenon during the Prehistoric Bronze Age on Cyprus (2400-1700 Cal B.C.E.). Using data from excavated settlements and cemeteries as proxies for facets of social and economic inequality-- including differential access to resources, labor, and exchange networks-- this research quantifies wealth based on Gini Coefficients and identifies changes in social networks and the emergence of social complexity through time and across space. It incorporates theories and methodologies developed in the interdisciplinary field of complex systems science and network theory in conjunction with anthropological thinking. The results of this work will give us an understanding of how social complexity emerges and changes in middle-range society and offers a more in-depth understanding of the Prehistoric Bronze Age on Cyprus.

Swavely, Ty [316] see Marinkovich, Erik

Sweeney, Angelina (The University of Texas at Austin), Robyn Dodge (The University of Texas at Austin), Fred Valdez, Jr. (The University of Texas at Austin) and Lauren Sullivan (The University of Massachusetts Boston)

[248] *Sourcing the Clay: LA-ICP-MS Analysis of Ceramics from the Programme for Belize Archaeological Project, Northwestern Belize*

This poster presents results of recent provenance research of Lemon Cream ceramics from the Programme for Belize Archaeological Project (PFBAP) region located within the Rio Bravo Conservation Management Area in Northwestern Belize. We used laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) on Lemon Cream wares from four different sites within the PFBAP region to determine the elemental signatures and compared them to the elemental signature of clay deposits uncovered in a chultun. The resulting elemental data bear on the nature of possible specialization of ceramics from Hun Tun, a small community located within the hinterlands

of La Milpa.

Swenson, Edward [142] see Berquist, Stephen

Swenson, Edward (University of Toronto)

[237] *Rethinking the Urban Microcosm in the Ancient Andes: The Extended Neighborhoods of the North Coast of Peru*

Anthropologists have argued that early urban neighborhoods were equivalent to small villages that maintained kinship relations and economic dependencies characteristic of the rural sphere. Other scholars have noted that different urban centers (including in Mesoamerica, Angkor, and New Kingdom Egypt) were similarly configured as “sociograms” of larger territorial and ethnic boundaries. The political landscape of the North Coast of Peru offers important comparative data by which to assess the social, spatial, and symbolic divisions of pre-industrial cities. An analysis of the residential sectors of a number of Moche settlements in the Jequetepeque Valley reveals that distinct neighborhoods can be tied to rural and likely kin-based affiliations. However, the diversity between these centers and the non-fixed and extended nature of Jequetepeque neighborhoods reveal that North Coast urbanism defies reduction to an Asiatic mode of urbanism (Marx’s “ruralization of the urban”) or related village-state models. Instead, the distinctive neighborhood configurations are best explained in terms of historically specific religious and political ideologies.

[404] *Discussant*

Swetnam, Thomas [110] see Guiterman, Christopher

Swetnam, Thomas (Laboratory of Tree-Ring Research, University of Arizona) and Joshua Farella (Laboratory of Tree-Ring Research, University of Ar)

[239] *Fire, Forests, Climate and People in the Jemez Mountains: A 500-Year, Landscape-Scale Perspective*

Forests and human communities are now extremely vulnerable to large, severe wildfires during droughts as a consequence of fire exclusion and other land use practices. The extent to which this vulnerability is influenced by extreme climate events and past land-uses remains unclear. Combined studies of climate, fire and human histories from the same landscape can help reveal the relative roles of people and climate variations in driving spatial patterns and temporal trends of wildfires. The Jemez Mountains of north-central New Mexico are an exemplary case of the influences of long-time human occupation of fire-prone, forested landscapes. The southern Jemez Plateau is unique as a case study landscape because it contains many ancient Puebloan village and “field house” ruins located within ponderosa pine forests and pinyon-juniper woodlands. This landscape also contains the densest network of tree-ring reconstructions of fire and climate histories combined in the world, which we have assembled over the past 30 years. In this presentation, I will explore the trends and patterns of fire, climate and human history over the Jemez Plateau during the past 500 years, utilizing these tree-ring reconstructions and the chronology of human occupation of these landscapes from archaeological investigations.

Swidler, Nina (Annulare Consulting, LLC), Johna Hutira (Northland Research, Inc.) and Joyce Francis (Arizona Game and Fish Department)

[197] *Amity Pueblo: A Different Sort of Horror*

In 2011, a portion of Amity Pueblo, located in northeastern Arizona on State land, was extensively damaged by a federally-funded development project. After heavy equipment disturbed features and burials, exposing over 40,000 cultural items, it was no surprise that Arizona permanently cancelled the project. While archaeologists previously evaluated the Pueblo as eligible for listing on the National Register under Criterion D for its scientific research potential, four tribes countered that Amity is a TCP, eligible under Criteria A, B, C, and D. State and federal agencies, tribes, and interested parties are currently trying to develop a research design/treatment plan that satisfies everyone’s concerns. These discussions underscore two seemingly divergent worldviews and interpretations of NHPA’s intent, creating a quandary all too familiar to indigenous communities and

one that is endlessly debated by Academy members. Namely, considering Amity's eligibility under Criterion D, most archaeologists advocate for a standard archaeological data recovery approach, despite the State's commitment to preserving Amity in perpetuity. In contrast, the tribes and a few others favor a less physically invasive approach, including site burial and conducting ethnographic assessments with the culturally affiliated tribes. Here we examine the debate to ascertain the most reasonable, ethical, and prudent treatment strategy.

[197] *Chair*

Swift, Jillian (UC Berkeley) and Patrick Kirch (UC Berkeley)

[339] *The Rat's-Eye View: Tracing the Impacts of the Human-Introduced Pacific Rat (*Rattus exulans*) on Mangareva through Stable Isotope Analysis and Zooarchaeology*

Early Polynesian voyagers transported a suite of plant and animal species to each new island they colonized, forming the foundation of the Polynesian subsistence economy and leading to long-lasting transformations of island landscapes. The Pacific rat (*Rattus exulans*) was nearly ubiquitous on these journeys, perhaps as a potential food source or simply an inadvertent stowaway. With few natural predators, rat populations multiplied quickly after arrival and spread across island landscapes. Their introduction was potentially devastating to native forests and their consumption of small birds and eggs may have led to or exacerbated avifaunal extinctions and extirpations. The limited home range of Pacific rats offers potential to investigate changing environmental conditions on a localized scale. Recent excavations on Mangareva (Gambier Islands) uncovered three sites with continuous well-stratified deposits dating from colonization to European contact (~A.D. 950-1650). Dietary reconstruction of Pacific rat remains from these sites via bone collagen stable isotope analysis reveal an archipelago-wide pattern of rat dietary change postdating the disappearance of most avifaunal species from the zooarchaeological record. Inter-site analysis indicates variation in the nature of these dietary changes, suggesting rat dietary reconstruction provides a new outlook on localized environmental change and adaptive response in island systems.

Swoger, Christopher

[91] *Obsessively Opacifying Obsidian: Adapting Three Dimensional Laser Scanning Techniques*

Three dimensional (3D) imaging technologies are being increasingly utilized by archaeologists to improve the accuracy of material analysis. To facilitate the development of these technologies, it is crucial to determine the limits of different devices and materials. This project focused on the challenge of scanning obsidian blades with the Next Engine HD 3D Laser Scanner, a popular and inexpensive choice among researchers. The Next Engine device was used to scan six small obsidian blades from several Late Holocene sites in northern Kenya. In order to probe the limits of the technology when confronted with dark and reflective surfaces, several simple non-permanent surface treatments and scan techniques were tested on the obsidian blades including the application of an opacifying powder, a coating of cornstarch, and the use of the multidrive object stand. Results are compared with images created using standard lithic illustration methods, photography, and 3D photogrammetry to determine their usefulness in analysis.

Swords, Molly (University of Idaho)

[45] *Unearthing Sandpoint's Chinatown: the Archaeology of Sandpoint, Idaho's Overseas Chinese*

Established in the early 1880s, Sandpoint, Idaho became a bustling railroad and lumber town with commercial businesses sprouting up along the Northern Pacific railroad tracks. Overseas Chinese came through the town when building the railroad, but quickly moved on along with the construction. Who then, were the Overseas Chinese that came and settled, making Sandpoint their home? Archaeological investigations of the original town site uncovered a structure referred to as Sandpoint's "Chinatown" within the city's historical records. While this "Chinatown" area may be small, excavations yielded a plethora of artifacts that give a glimpse into the lives of these Sandpoint residents. This paper will discuss the artifacts recovered from this "Chinatown," and shed more light on the lives of Overseas Chinese in northern Idaho.

Sykes, Naomi (University of Nottingham) and Holly Miller (University of Nottingham)

[339] *Animal Diaspora and Culture Change*

Animal introductions are frequently equated with the introduction of new dietary ingredients; however, this paper will argue that access to 'meat' is seldom the motivation for the importation of exotic species. By examining a number of case-studies pertaining to Britain it will be proposed that many faunal introductions were both inspired by, and resulted in, social, economic and ideological change. Many species were associated with specific deities and because they were imported from beyond the 'known realms' of Britain, were viewed as cosmologically powerful. In this way, the arrival of new species brought real changes for human behavior, impacting upon the way in which identities and relationships were negotiated.

Szpak, Paul (University of British Columbia), Christyann Darwent (University of California, Davis) and John Darwent (University of California, Davis)

[166] *Historical Marine Ecology in Northwestern Greenland: Insight from Stable Isotope Analysis*

This study presents stable carbon and nitrogen isotopic compositions for zooarchaeological specimens from three sites in Inglefield Land (northwestern Greenland) representing approximately the last 1,000 years. Isotopic compositions for planktivorous seabirds (little auks, *Alle alle*) reveal general stability in biogeochemical cycling at the base of the food web since the end of the Medieval Warm Period. On the other hand, marine mammals (ringed seal, bearded seal, walrus) exhibit variable foraging habits across time, with surprisingly high amounts of niche overlap relative to other regions in the Arctic. The results are discussed in light of prehistoric human settlement and subsistence in the region and the potential effects of anthropogenic perturbations on the marine ecosystem.

Szremski, Kasia (Vanderbilt University)

[227] *Entangled Encounters between the Chancay and Chaupiyunginos in the Huanangue Valley, Peru*

This paper builds off of recent calls to re-evaluate Murra's model of verticality and explores the utility of entanglement theory as an alternative way to understand the different relationships that developed between groups living on the western slopes of the Peruvian Andes during the Late Intermediate Period (1100-1470 CE). Entanglement theory is increasingly being used in Old World archaeology to examine the complex types of interdependencies that develop between groups when exotic goods are inserted into local systems of value (Dietler 2010). Recent data from the Huanangue Valley suggests that similar processes may have occurred between the Chancay and chaupiyunginos during the Late Intermediate Period; however the mechanisms through which entanglement occurred in the valley are still being defined. This paper will examine botanic and faunal data from excavation at the sites of Campo Libre and Salitre in conjunction with least cost path analysis in order to reconstruct the dynamics of interaction between the Chancay and Huanangue valleys and to show that the Chancay settlers living in the Huanangue Valley were doubly entangled as they were dependent upon local chaupiyunginos for access to irrigation water as well as on their coastal counterparts for access to peanuts and marine resources.

[227] *Chair*

Szumilewicz, Amy (Southern Illinois University, Carbondale), Izumi Shimada (Southern Illinois University, Carbondale), Carlos Elera Alvarado (National Sicán Museum, Ferreñafe, Peru) and César Samillán Torres (National Sicán Museum, Ferreñafe, Peru)

[371] *Biography and Symbolism of Sicán Painted Textiles: First Approximation*

Simple cotton cloths primed as canvases and painted with complex imagery are the rarest group of fiber arts found in the Andes. Long-term excavations of Middle Sicán (900-1100 CE) elite cemeteries at the site of Sicán on the North Coast of Peru, however, have shown that high quantities of these paintings, often in polychrome and over 10m in length, decorated the interior surfaces of elite tombs. In this paper we present evidence for their manufacture and use, as well as approaches to preserving and reconstructing their rich iconographic content. The use of cane or wooden frames and supports, as well as the portability and varied imagery, size and shape of cloths suggest that

they were used as situationally adaptable means of creating appropriate ritual spaces in the world of both the living and the dead. Additionally, using the documented examples from attached cemeteries of two major temple mounds at Sicán, we compare painted textiles from two distinct contexts as a new line of evidence for understanding how deceased individuals in tombs associated with each temple may have differentiated their socio-political station, economic roles, or familial ties through visual culture in death.

Szymanski, Ryan (Washington State University)

[176] *Nested Proxies: Multi-scalar Approaches to Interpreting Human-Landscape Interactions*

Interpretive challenges involving issues of equifinality and causation can chronically hamper environmental reconstruction efforts, as numerous physical, environmental, or anthropogenic processes may potentially be responsible for creating observed raw data patterns. Nested multi-proxy and multi-scalar analyses offer potential means of approaching these difficult conceptual issues which can plague interpretations reliant on single lines of proxy evidence. A dataset comprised of multiple paleoecological proxies, including pollen, phytoliths, and fungal spores, derived from a five meter sediment core from Mtwapa Creek, Kenya, is presented in order to illustrate these issues and means of resolution. Using the different origin points, production, distribution, deposition modes, and associations of these proxies, I argue that discord in data between these sources can aid in isolating some of the possible environmental scenarios which may have produced particular data patterns, and may enable researchers to more effectively separate anthropogenic versus climatic impacts on past environments. It is proposed that more intensive study of the microbotanical content of sediments is critical to improving paleoecological, and by extension, archaeological knowledge of ancient landscapes and their inhabitants.

Tackney, Justin [238] see Fitzpatrick, Scott

Takamiya, Hiroto (Sapporo university) and Hitoshi Yonenobu (Naruto University of Education)

[115] *Transition from Hunting and Gathering to Food Production on the Ryukyu Archipelago, Japan*

It has been suggested that in order for *Homo sapiens* to colonize islands, food production is necessary. Indeed most islands were successfully colonized by farmers. However, some islands were colonized by hunter-gatherers. These islands are characterized by 1) large areas 2) close proximity to a continent or large island 3) consistent availability of sea mammals 4) Dispersal of edible plant and/or animal resources from the mainland or 5) a combination of these features. Recent archaeological studies have revealed that the islands of the Ryukyu archipelago, especially Amami and Okinawa archipelagos, do not possess any of the above mentioned features but were successfully colonized by hunter-gatherers. In this region, like other regions of the world, archaeologists have been interested in the transition from hunting and gathering to food production. Accordingly, several hypotheses have been proposed. This paper will present intensive paleoethnobotanical studies together with latest radiocarbon C14 dates to discuss the timing and development of this transition.

Takaoka, Ian (Northern Kentucky University) and Jozie Banas (Northern Kentucky University)

[52] *Nukubalavu 1: A Preliminary Examination of Mid-Sequence Ceramics and Culture Change on Vanua Levu, Fiji*

We present new data from the ceramic assemblage from the site of Nukubalavu 1 in Natewa Bay on Vanua Levu, Fiji. The site was excavated in the summers of 2013 and 2014; it is one of the only excavated sites on the island of Vanua Levu. Over 29,400 sherds were analyzed, many of which are diagnostic, typical of stylistic phases in the Fijian ceramic sequence. The assemblage includes Late Lapita (ca. 2500 BP), Fijian Plainware (ca. 2500-2100 BP), and Navatu (ca. 2100-900 BP) phases of the Fijian mid-sequence, representing what are considered distinct culture historical periods in Fijian prehistory. In the summer of 2014, we discovered an increased amount of grog, white sand, and coarse black sand used as tempers. Arc dentate decoration is visible on some fragments, and a previously unrecorded style of surface decoration, a fish-hook shaped design, was discovered on

shallow bowl fragments from excavations during both years. Concurrent to these designs are highly everted vessel forms, extremely sharp or rounded lips, and entire vessel sections with firing clouds, soot residue, and red ochre paint, which have the potential of yielding detailed information about manufacture and use by Fijian communities during the mid-sequence period.

Talcott, Susan, Jelmer Eerkens (University of California, Davis), Eric Bartelink (California State University, Chico) and Ken Gobalet (California State University, Bakersfield)

[293] *Stable Isotope Perspectives on Diet and Mobility in the California Delta*

Isotopic variation in individuals allows us to track differences in diet, mobility, and migration between various demographic categories including age, status, and sex. We use stable isotopes of carbon and nitrogen to analyze diet and oxygen to examine human mobility from a range of sites in Yolo and Solano counties, with a focus on how marine vs. freshwater aquatic resources were exploited. Stable isotope results are compared to faunal remains from the same sites to establish baseline data for interpreting human diet and mobility patterns. Preliminary isotopic results show significant heterogeneity among individuals in regard to access to high trophic-level marine protein.

Anadromous fish such as salmon and sturgeon are presumably the primary contributors to high trophic level marine protein, though residential shifts or logistical mobility to coastal locations is also possible. Heterogeneity in aquatic resource use has important implications for understanding food procurement and fishing practices in the California Delta.

Taleghani-Nia, Lili [355] see Brady, James

Taliaferro, Matthew (Gila National Forest), Bernard Schriever (Stell Environmental), Jeff Speakman (Center for Applied Isotope Studies, the University) and Elizabeth Toney (Gila National Forest)

[274] *Exploring Technological Organization through Time: Mimbres Pottery Production*

For some time, archaeologists have sought to characterize the manner in which ceramic technology was organized in the Mimbres area of southwestern New Mexico. Recent syntheses of INAA compositional data allow for a more thorough characterization of the organization parameters associated with ceramic technology in the Mimbres region. Here, we present a more contemporary analysis of the manner in which ceramic technology was organized in the Mimbres area using Costin's (1991) organization of production parameters coupled with extant compositional data derived from over 3000 samples submitted for chemical characterization by means of INAA. The results of these analyses demonstrate that ceramic technology in the Mimbres area became increasingly organized at the community level through time. We then offer a few suggestions as to why this pattern possibly emerged.

Taluban, Kaleb [90] see Vasquez, J. Javi

Tamanaha, Eduardo [186] see McMichael, Crystal

Tanaka, Yutaka (Ibaraki University)

[145] *Wide-Range Regional Interaction Prior to State Formation in Late Prehistoric Eastern Japan*

In Japan, pottery of various regions was transported for long distances in different directions at the same time and was incorporated into local pottery assemblages from the late second to third centuries A.D. This happened prior to the appearance of the highly-standardized keyhole-shaped burial mounds all over Japan and, in western Japan, local adoption of the type of pottery typical of the Kinki region where the central polity emerged. In eastern Japan, the type of pottery under the influence of the Tokai region, an eastern neighbor of Kinki, was locally adopted in various regions. Because of these observations, archaeologists have focused attention on the move of people from Kinki and Tokai. Results of analyses of settlement patterns, pottery, and micro-geography in eastern Japan reveal that settlements at that time were located along the routes of water transportation and that local people in eastern Japan moved along the routes for short distance but not in

neighborhood. The nature of the wide-range interaction in eastern Japan in the late second and third centuries was a chain of such short-distance interactions among local people.

Tang, Zhuowei (Jilin University), Lixin Wang (Jilin University), Pauline Sebillaud (Jilin University), Duan Tian-jing (Jilin University) and Gyoung-Ah Lee (University of Oregon)

[49] *Neolithic development in eastern Dongbei region, China*

Dongbei region, an inclusive name for three provinces of Heilongjiang, Jilin, and Liaoning in Northeast China is distinguished from the Huanghe culture (Yellow River) by a distinct cultural sequence beginning in the Early Holocene. Compared to Liaoning region, which is better known outside China, Jilin, a province bordering North Korea has been left mostly unknown despite its critical geo-political importance throughout prehistory and history. Jilin is a home of multi-cultural interactions, flowing different cultural customs, goods and idea throughout prehistory and history. This paper presents the sequence of the early Neolithic occupations from 10,000 – 8,000 BP to the later Neolithic period, locally known as the Hamin culture (6,000 – 5,000 BP), based on ecological and archaeological studies in two sites, Houtaomuga and Shuangta. Our research focuses on changes in diachronic changes settlement and subsistence changes as well as differences in two settlements.

Tang, Jigen [67] see Wolin, Daniela

Tankersley, Kenneth (University of Cincinnati)

[155] *Quaternary Chronostratigraphy and Archaeology of Big Bone Lick, Kentucky, USA*

Big Bone Lick in northern Kentucky has been a critical site in the historical development of North American Quaternary vertebrate paleontology and archaeology since the 1700s. Solid-sediment cores, stream profile excavations, vertebrate paleontology, archaeology, accelerator mass spectrometry radiocarbon and optically stimulated luminescence dating, and stable carbon and nitrogen isotope analyses were undertaken to address the lack of a modern study of the Quaternary chronostratigraphy and to provide a framework for past and future paleontological, geoarchaeological and paleoenvironmental studies at BBL and elsewhere throughout the US Midwest. Three major geomorphic surfaces are recognized at BBL, which represent significant periods of floodplain aggradation, since the Last Glacial Maximum. These date to the Early Woodfordian Tazewell (25-19 ka), the Late Woodfordian Cary (14-12 ka), and the Late Holocene (5 ka to the present). Unconformities suggest that significant periods of degradation occurred during the transitions between cold and dry to warm and moist climates from the Older Dryas to Bølling Oscillation and again from the Younger Dryas to the Holocene Climatic Optimum. Increased anthropogenic activities since ~5 ka led to increased soil erosion and floodplain aggradation. Stable isotopes demonstrate that the landscape was dominated by C3 vegetation since the Last Glacial Maximum.

[185] *Discussant*

Tankosic, Zarko [289] see Watts-Malouchos, Elizabeth

Tantaleán, Henry (Cotsen Institute of Archaeology, UCLA)

[169] *Re-Creando una Huaca: Utilizando el sitio de Cerro Gentil como una Huaca local*

En esta ponencia se analizan los contextos de banquetes y funerarios para explicar el uso de un sitio Paracas Tardío con características originalmente rituales-políticas para fines de recreación de las élites locales mediante practicas de rituales e internamiento de los cuerpos de individuos de élites locales. se explora el potencial del uso del concepto de huaca para época Paracas y se señalan una serie de indicadores arqueológicos para identificar otros posibles contextos similares contemporáneos y posteriores.

[169] *Chair*

Tantaleán, Henry [169] see Weinberg, Camille

Tapia, Eduardo [48] see Miguel Quesada, Francisco J.

Tascon-Penaranda, Edna [313] see Martinez-Cruzado, Juan

Tasic, Nenad [348] see Whittle, Alasdair

Taube, Karl

[194] *The Birth of Ehecatl: The Cultural Origins of the Avian Wind God OF Central Mexico*

One of the most striking deities of the Aztec pantheon is Ehecatl-Quetzalcoatl, a duck-billed being embodying such ethereal concepts as rain-bringing wind and the breath of life. He is in jarring contrast to Quetzalcoatl, who although embodying the same concepts of wind, is a quetzal-plumed rattlesnake in Aztec thought. This study argues that in contrast to the plumed serpent, Ehecatl-Quetzalcoatl constitutes a relatively recent introduction of an avian wind deity from eastern Mesoamerica into Central Mexico during the Postclassic period. Similar duck-billed human figures appear as early as the Early Formative in coastal Chiapas, and continue in Middle Formative Olmec and Late Formative Isthmian and Maya iconography, including the Tuxtla Statuette and the West Wall mural at San Bartolo. For the Late Classic Maya, there is explicit epigraphic and iconographic evidence of a duck-billed wind deity, and in striking contrast, such a being is completely unknown in the rich corpus of documented imagery from Teotihuacan, Cacaxtla, Xochicalco and other sites of Classic Central Mexico. I will note that the Initial Series Group at Chichen Itza provides a remarkably detailed corpus pertaining to this wind deity during the Early Postclassic, quite probably when this being was introduced into highland Mexico.

Tavera Medina, Ana Carito (Universidad Nacional Mayor de San Marcos)

[250] *The Presence of a Gallinazo Component During the Middle Moche Period In the Lower Jequetepeque Valley*

This work seeks to characterize the presence of the Gallinazo component in the lower Jequetepeque valley during the Middle Moche period through an analysis of funerary contexts from the sites of San José de Moro, Mazanca, Dos Cabezas and Pacatnamú. Using bibliographic sources and excavation data, this project searches for indicators within burial traditions of interaction between two different cultural groups that coexisted spatially on the north coast of Peru. Through an analysis of a number of grave contexts, this work aims to illuminate the interaction of possible distinct populations with similar cultural traditions, but with distinct stylistic developments. The ultimate objective is this study is to assess whether Gallinazo local elites were subordinated to Mochica elites using the frequency of ceramic styles corresponding to each cultural group within the funerary contexts from the Middle Moche period.

Taylor, Jeremy [25] see Whitbread, Ian

Taylor, Geoffrey (UC Berkeley)

[347] *Middle Formative Plant Use on the Taraco Peninsula, Bolivia*

The Middle Formative (800-250 B.C.) on the Taraco Peninsula was a period of burgeoning status and wealth differentiation that saw the rise of platform mound construction and the intensification of quinoa farming nearby the shores of Lake Titicaca. This paper will present data from a macrobotanical analysis of the site Alto Pukara, a 3.25 hectare village excavated in 2000 and 2001. A thorough examination of the distribution of charred plant remains across all contexts of a single structure will be undertaken with the goal of explaining use of space and general patterns of plant use. These data will be compared to those generated from prior analyses of two other villages on the Taraco Peninsula: Chiripa and Kala Uyuni. Through this, the paper will contribute to a regional chronology of plant use spanning the entire Formative period (1500 B.C. - A.D. 500), with particular attention to how fuel and foodways shifted in relation to status differentiation and farming practices. Due to an absence of botanical data from the heavy fraction for Alto Pukara, the paper will also focus

on the statistical analysis of how the heavy fraction of flotation samples affects the archaeobotanist's view of past plant use.

Tchorzynski, Stacy

[308] *Discussant*

Teeter, Wendy (Fowler Museum at UCLA)

[160] *Moderator*

[224] *Discussant*

Tegtmeyer, Caryn, Debra Martin (University of Nevada, Las Vegas) and Kyle Waller (University of Missouri)

[245] *Exploring the Effects of Endemic Warfare and Violence on Women and Children at Casas Grandes*

Bioarchaeologists have consistently explored the role that males play in warfare and raiding but the impact of warfare on women and children has been less of a focus. Other studies have shown that women sometimes play a role in fighting, and that women and children suffer from things such as declining resources, losing males from the household, and forced relocation. Casas Grandes provides a case study for the examination of women and children during what was likely to have been a period of endemic warfare. Data regarding age-at-death, burial location, indicators of morbidity, and preliminary trauma are examined in order to compare sex and age subgroups throughout the occupation. The analysis of the skeletal remains show that both men and women show evidence of trauma and poor health, and that children show instances of physiological stress. Data derived from the Casas Grandes burials are compared with health profiles from other contemporaneous groups not involved in warfare. These results suggest that warfare and its effects go far beyond what happens to the male combatants.

Teixeira-Santos, Isabel [127] see Reinhard, Karl

Tejada, Barbara (California State Parks)

[27] *A "Lost" Collection Makes Its Way Home: The Long Road of the Lost Village of Encino*

When a major village site was encountered during construction monitoring in the early 1980s, newspapers declared that the "Lost Village of Encino" had at last been found. In reality, archaeologists suspected its presence since the 1950s based on descriptions of the Portolá expeditions of 1769 and 1770. The resulting archaeological data recovery produced a large collection of artifacts, as well as human and animal burials. Subsequent disputes between the developer, archaeologists, the Native American community, the State Department of Parks and Recreation and even the California Legislature tested the limits of relatively new cultural resources laws in California, and the Encino Village collection remained in limbo, without a complete analysis or a permanent home. This paper will discuss the current efforts to address the situation and to bring this important San Fernando Valley collection back home, so that both researchers and the Fernandeno people have an available connection to the past.

ten Bruggencate, Rachel (University of Manitoba), Brooke Milne (University of Manitoba), Mostafa Fayek (University of Manitoba), Robert Park (University of Waterloo) and Douglas Stenton (University of Waterloo)

[185] *Palaeo-Eskimo Exploitation of Inland Chert Quarries on Southern Baffin Island, Nunavut, Canada*

The southern Baffin Island chert sourcing project was initiated in 2007. Eight years of fieldwork and geochemical analysis have allowed us to refine our chert characterization technique and its instrumental application. We have successfully characterized two large chert quarries in the interior of southern Baffin Island using solution ICP-MS trace element analysis. We have also linked chert artifacts from one of these quarries to a nearby Paleo-Eskimo occupation site, demonstrating

transport of quarried material to the site for further reduction, rather than direct exploitation of locally available secondary cobbles. Our present four-year project is now entering its final stage and is focused on applying our refined characterization technique to coastal chert samples from previously investigated Paleo-Eskimo archaeological sites. With the obtained geochemical signatures, we aim to link the coastal materials to inland quarries to provide another line of evidence to reconstruct and evaluate ancient seasonal land use patterns in this region of the Arctic. Much of the lithic landscape of southern Baffin Island remains undocumented. We expect that some artifacts will fall outside the chemical distribution of known quarries. Future field and laboratory research will be directed at documenting and characterizing as yet unknown sources represented by these artifacts.

Tenconi, Marta (University of Sheffield), Peter Day (University of Sheffield), Elina Kardamaki (Tiryns Excavations), Joseph Maran (University of Heidelberg) and Alkestis Papadimitriou (4th Ephorate of Prehistoric and Classical Antiquity)

[25] *Transport Jars at the Mycenaean Citadel of Tiryns, Greece: New Evidence from Petrographic Analysis of Trade in the Late Bronze Age Eastern Mediterranean*

The analysis of Transport Stirrup Jars in the Aegean world has been seen as a test-case for the relative effectiveness and reliability of chemical and petrographic analysis in terms of provenance. These jars are important as they moved in large quantities between the 'Minoan' and 'Mycenaean' worlds and because they sometimes feature inscriptions in Linear B, reflecting elite control of production and consumption in Crete, as well as in a variety of mainland 'palaces'. This makes the vessels key to our understanding of palatial Bronze Age economies, their modes of control, their collapse and successors. Encouraged by recent successful work in Kommos, Crete, which revealed large scale commodity exchange, this project looks to the Mycenaean world and specifically at the fortified citadel of Tiryns. After an important macroscopic study previously reported at SAA, a large number of TSJs and also a range of Canaanite Jars of Levantine style, which are known to have transported commodities such as resins and oils, have been analyzed by thin section petrography. The provenance of the jars provides important new evidence for trade and exchange in a period thought of as the twilight of the Mycenaean Palaces.

Terry, Karisa (Central Washington University), Masami Izuho (Tokyo Metropolitan University), Noriyoshi Oda (University of Tokyo), Jeffrey Ferguson (University of Missouri) and Ian Buvit (Central Washington University)

[53] *Obsidian Access and Territoriality at the Upper Paleolithic Shimaki Site, Hokkaido, Japan*

Although Hokkaido Japan boasts a rich concentration of obsidian resources, studies focusing on its role within Paleolithic hunter-gatherer subsistence and territorial systems are in their infancy as high-quality geochemical analysis is just emerging. Combining XRF geochemical obsidian sourcing analysis coupled with qualitative and quantitative data on individual artifacts, we are able to conduct fine-grained exploration of tool stone procurement, consumption, and use of an entire artifact assemblage (tools and debitage) from the Last Glacial Maximum occupation (21,400 14C years ago) of the Shimaki site. We first compile XRF geochemical obsidian sourcing data on all artifacts to map the abundance of obsidian sources utilized at the site. Next, we correlate obsidian source and tool/debitage type to reveal underlying preference patterns based on specific raw material characteristics (e.g., size, shape). Consumption rates of tools are then compared to construct behavioral scenarios of how the obsidian resources were managed after procurement or exchange, as well as group mobility patterns in relation to subsistence resources. Finally, we speculate about the possible extent of and influence of geographic barriers on Shimaki hunter-gatherers' foraging territory.

Testard, Juliette (Paris 1 / UMR 8096 Archéologie des Amériques)

[39] *Women, Metaphors of Alterity. Expressing Elites Interactions at Cacaxtla-Xochitecatl (Tlaxcala) and Xochicalco (Morelos)*

Recent strontium analyses have revealed that many women buried in the Feathered Serpent Pyramid in Teotihuacan changed their environment at least two times during their lifetimes. This suggests that their role, especially in cultural interactions, was particularly important, a hypothesis already presented by Gillespie and Joyce (1997) for Maya societies. An iconographic study of mural

painting, figurines, and sculptures from Cacaxtla-Xochitecatl and Xochicalco, two Epiclassic cities well known for their eclectic styles, sheds on light an important concern in representing women, not only as fertility metaphors, but also as leaders, warriors, captives and ritual specialists. The evidence presented leads us to ask whether this figurative transformation reveals a real resurgence of intermarriages, or if it is a metaphoric way to express a relationship between political entities.

Testolini, Veronica (University of Sheffield)

[79] *Cooking Vessels of the Early Medieval Village of Miranduolo, Tuscany: A Petrographic Study*
Excavations at Miranduolo, Tuscany revealed a substantial Medieval settlement and castle, with a rich architectural and ceramic sequence from the 7th-13th century. The ceramic record is dominated by coarseware, mainly cooking pots, which offer a reliable indicator of date at the site, but also a window on everyday life, of choices regarding food preparation equipment. Petrographic analysis has been employed in order to understand if these coarsewares were produced by the village inhabitants for their own use in a household context, or whether they are the product of one or more external centers, with subsequent distribution of their products. Changes in these patterns over the six centuries of occupation are of interest, as the site developed from a small village to a local center of power. The study demonstrates that during the early middle ages Miranduolo was a consumer of cooking pottery, apparently not a producer. Several different fabrics were identified, some of which correlate to geology and analyzed material produced at other centers in Tuscany. Specific raw material choices, such as calcite temper, are also of interest. One of the main sources for the Miranduolo cooking vessels is a nucleated workshop active since the late Roman period.

Thakar, Heather (Temple University)

[41] *Evidence of Specialization and Intensification of Small Seed Exploitation on Santa Cruz Island, California*

This paper reconstructs shifts in botanical foraging behavior on Santa Cruz Island, California and quantitatively demonstrates specialization and intensification in the exploitation of small oily and starchy seeds from the terminal Early Period (ca. 3000 cal. BP) through the late Middle Period (ca. 1000 cal. BP). This shift accompanied an increased reliance on terrestrial food resources overall. A recently recognized climatic transition (2800 cal. BP-1800 cal. BP) likely altered the geographic distribution and productivity of marine and terrestrial resources across the Northern Channel Islands of California. The data presented in this paper suggests that increased reliance on terrestrial plant food resources reflects adaptation to decreased productivity of the nearshore marine environment and increased productivity terrestrial food resources.

Tharalson, Kirsten (University of Oklahoma)

[166] *X-Ray Analysis of Mandibles from a 2000 Year-Old Bison Kill Site in Western Oklahoma*

The seasonality of the kill events from Certain site in Beckham County, Oklahoma is determined through x-ray analysis of bison mandibles. The distribution of bison dentition at archaeological sites has been studied extensively to provide information about seasonality, age, diet, and migration patterns. Because bison calf at roughly the same time during the year, understanding the age at death determines the seasonality of the kill. Knowing the seasonality of a bison kill reveals when a site was utilized and where on the landscape people were at different times of the year. Through x-ray analysis of several Bison mandibles from the Certain site, an age profile of the individuals analyzed can be created and the seasonality of the kills can be determined. The age profile created from the dentition is compared here with the age profile created from epiphyseal fusion rates of the bones from the same site. In addition, the seasonality of the kills as determined by x-ray analysis is compared with previous seasonality estimates.

Theodore, Alfred [72] see Seager-Boss, Fran

Thomas, David (American Museum of Nat History)

[341] *Alpine Adaptive and Paleoenvironmental Change at Alta Toquima (Central Nevada)*

Why did some Great Basin foraging families spend their summers atop the very highest place in their world? Julian Steward briefly considered this question in the 1930s, but the issue resurfaced with the chance discovery of Alta Toquima, a 31-pithouse residential site at 11,000 feet. More than 150 14C determinations from Alta Toquima and nearby Gatecliff Shelter permit fine-tuned comparisons of cultural and paleoclimatic change spanning the last 7000 years. The Alta Toquima residences track both short- and long-term xeric signals (meaning that people lived in alpine houses mostly in times of drought). Conversely, Gatecliff Shelter tracks short-term mesic pulses when Monitor Valley foragers stayed at lower elevations during wetter intervals.

[1] *Discussant*

[341] *Chair*

Thomas, Jayne-Leigh (Indiana University), Meghan Buchanan (Indiana University), April Sievert (Indiana University), Heather Alvey (Indiana University) and Lee Drake (University of New Mexico)

[3] *Mistaken Identity?: A Reassessment of the Angel Mounds Historic Cemetery Site Using Anthroposcopic and XRF Analyses*

In 1940, a collection of human skeletons were excavated from a historic cemetery on Mound F at Angel Mounds State Historic Site, near Evansville, Indiana. Based on the presence of a single historic grave stone, these remains were determined to be Euroamerican. However, after further study of morphological characteristics and copper staining, we suggest that several individuals are of Native American descent. An evaluation of the elemental composition of the copper staining using a portable X-ray fluorescence spectrometer (XRF) suggests that the copper objects placed within the burials were composed of native copper as opposed to European copper. The results of this research have implications for the future of these individuals, as a reassignment of 'Native American' to these human remains will place the collection under the purview of the Native American Graves Protection and Repatriation Act. The study underscores the importance of re-investigating human remains identified decades ago, and questioning 20th century assumptions about ethnic and cultural identity.

[3] *Chair*

Thomas, Scott [35] see O'Grady, Patrick

Thomas, Ben (Archaeological Institute of America)

[72] *Bridging the Great Cultural Tourism Divide: Working with the Tourism Industry*

A growing public interest in archaeotourism has resulted in greater numbers of visitors to archaeological sites as well as tourism being increasingly being seen as a use for sites for both social and economic reasons. While additional visitors can generate more revenue for local interests, they also increase human impact on the site. Tourism operators, archaeologists, and heritage managers frequently work at the same sites, but they often work in isolation. While many sites are preparing for tourists, collaboration between these groups would greatly strengthen the sustainability of the cultural assets and the amenities provided. A few years ago, the Archaeological Institute of America (AIA) worked with the Adventure Trade Travel Association (ATTA) to put together a manual on responsible tourism for visitors, site managers, and tour operators. Collaborations of this nature provide ideal starting points for cooperation and for archaeologist and cultural heritage managers to express their needs and concerns. This paper discusses the advantages of working with the tourism industry and provides insights into the positive nature of the collaboration between the AIA and ATTA.

[72] *Chair*

Thomas, Katherine (East Carolina University)

[311] *A Comparative Analysis of a Potential Tavern Site in Jackson, North Carolina*

Residents of Jackson, North Carolina in Northampton County have found what they believe to be an 18th century tavern site. The area was inhabited by the Tuscarora until the Tuscarora War ended in

1715, after which European settlers began to move into the region. The residents of Jackson believe this to be a tavern owned by Jephtha Atherton. This research assesses this claim by comparing those artifacts to the artifacts at two other contemporary taverns: Dudley's Tavern in Halifax, North Carolina and Wetherburn's Tavern in Colonial Williamsburg. This will also provide a chance to create an artifact pattern for North Carolina's colonial taverns.

Thomas, Colin

[371] *Smelting and the Sacred at Dos Cruces: Technological and Ritual Activity at a Chimú Era Smelting Site*

In November 2013 the Las Minas Archaeometallurgical Project completed excavations at the Chimú Era copper smelting site of Dos Cruces in the Zaña valley. Dos Cruces is an artificially terraced hill located near a river and several known copper mines. The site was divided into 4 distinct sectors, each of which was put to a different use. This paper focuses on excavations and preliminary laboratory results from the industrial or smelting sector of Dos Cruces, an area filled with slag, furnaces, and other smelting remains. Large areal exposures revealed a system for producing metal significantly different to earlier smelting sites in the region including wall systems for directing wind toward furnaces and an absence of blow tubes; indicating a discontinuity in technological tradition following the Chimú occupation of the region. In addition, multiple indications of ritual activity were found including animal sacrifice, ritualized killing of furnaces, feasting and production of chicha, offerings of imported ceramics, and at least 3 episodes of site burial and rebuilding. These discoveries provide some of the first insight into the non-technical aspects of the poorly understood topic of smelting in the Andes.

Thomas, Noah

[406] *Parallel Practices: The Importance of Joining Creative Action and the Sciences in the Work and Legacy of Diane Gifford Gonzalez*

As a scholar, novelist, and poet, Diane Gifford Gonzalez's contribution to archaeology is proof that the pursuit of the arts as a personal endeavor enriches practice. Artistic practice fosters perception of associative relationships, develops a trust in the intuitive, and cultivates personal skill sets linking material media, form and meaning. In engaging in such parallel practices Gifford Gonzalez has fostered an approach to archaeology that has bridged the gap between positivist and post-modern approaches, to create an enriched discipline of multivocality and resonance. This paper explores the importance of a personal engagement in the arts for the growth of the discipline as a whole.

Thomin , Michael [261] see Nohe, Sarah

Thompson, Victor [26] see Pluckhahn, Thomas

Thompson, Adam, Aaron Poteate (University of Oregon), Scott Fitzpatrick (University of Oregon) and William Ayres (University of Oregon)

[52] *Early Settlement of Atolls in Eastern Micronesia: Investigations on Mwoakilloa Atoll*

While atolls are the most ubiquitous island type in the Pacific, there has been a general dearth of archaeological research to help elucidate when they were settled prehistorically and how they fit into regional systems of exchange and interaction, particularly in Micronesia. Recent fieldwork on Mwoakilloa Atoll in the eastern Caroline Islands have shown that settlement of the island ca. 1700 cal. BP coincides with the earliest occupation of larger high islands in the region (1700-2000 BP). Investigations also demonstrate the anthropogenic creation of a mound on the main islet, suggesting long-term occupation and more intensive food production strategies. Preliminary zooarchaeological analysis also indicates the incorporation of several well-known commensals (dogs, rats, and chickens). Results show that dogs and rats were brought to the island around the time of initial occupation. As would be expected, however, major protein sources consisted primarily of marine foods, with a heavy reliance on nearshore fish supplemented by mollusks and several terrestrial animals.

Thompson, Kerry (Northern Arizona University)**[97]** *"Soundcheck": On the Status of Native American Oral Histories in Archaeological Practice*

Many archaeologists support the inclusion of Native American oral histories in archaeological practice; however, the use of oral histories in archaeology is not systematic or singular. In order to develop a clearer picture of the application of oral history in American archaeology, I quantified and analyzed the use of oral histories in peer-reviewed articles. This poster presents the results of an analysis of journals in American archaeology from 1980 to the present that demonstrate the different uses to which oral histories are put, the frequency with which oral histories are used in archaeological practice and the contributions oral histories make to our archaeological understanding of the past.

[97] *Chair***Thompson, Victor (University of Georgia)****[105]** *Discussant***[178]** *Chair***Thompson, Jessica (ConocoPhillips), Christopher Merriman (University of New Mexico), Clayton Meredith (University of New Mexico), Keith Prufer (University of New Mexico) and Megan Walsh (Central Washington University)****[155]** *Human-Climate-Landscape Interactions within the Rio Blanco Basin, Southern Belize*

Excavations of alluvial terraces along the Rio Blanco, near the Maya site of Uxbenká in southern Belize, Toledo District, record Holocene human impacts and sediment aggradation from the pre-ceramic through the modern period. Assuming sediment aggradation rates on the terraces are inversely related to basin-wide hill slope erosion allows us to develop a landscape evolution model during the Holocene and investigate possible anthropogenic vs. climatic effects on the landscape. Radiocarbon dates and soil profiles from several units on the Holocene terraces adjacent to the Rio Blanco define periods of landscape stability followed by rapid aggradation. Our results suggest that sediment aggradation rates, and hence erosion of the landscape, was highest during the Middle Holocene and is coincident with the transition to sedentary communities and the adoption of agriculture. Erosion rates and the consequent sediment aggradation rates on the terraces were lower during the Classic Maya period until the present. Our study suggests anthropogenic influences, rather than climate alone, lead to widespread erosion of the landscape during the Middle Holocene.

Thompson, M (Arizona State University)**[372]** *Ancestors and Ancestral Spirits: Understanding the Spirits of the Dead in Prehispanic Settlements of the American Southeast and Southwest*

This paper addresses the social memories and identities of the spirits of the dead in the Prehispanic American Southeast and Southwest to consider their involvement in socio-political affairs. I argue that archaeology can begin to identify different kinds of spirits in the mortuary record, and that these spirits play different, unique roles in respective communities. I describe an effort to recognize ancestors, ancestral spirits, and/or collective groups of the dead in a Mississippian period village on the Georgia coast and two Protohistoric period towns at Zuni. The study involves a comparative mortuary analysis that examines the performance of mortuary ritual at the Irene Mounds site in Georgia and at the Zuni towns Hawikku and Kechiba:wa. Here, I focus on a multivariate statistical approach for characterizing and interpreting body treatment in the mortuary record. Analysis results highlight the memories and identities that the living created for the spirits of the dead in these settlements and emphasize the relationships that people maintained with these beings. This work encourages us to recognize that Prehispanic communities of the Southeast and the Southwest were composed of both the living and the spirits of the dead.

[161] *Moderator***Thompson, Amy (University of New Mexico)****[263]** *A Comparative Analysis of Settlement, Environment, and the Social Landscape at the*

Ancient Maya Centers of Uxbenká and Ix Kuku'il, Toledo District, Belize

This paper compares two ancient Maya centers in the Toledo District of Belize, Central America. The two Classic Period (A.D. 250 – 800) Maya polities of Uxbenká and Ix Kuku'il are located ~ 7 km apart in the southern foothills of the Maya Mountains. Ongoing work at Uxbenká suggests that it is both the earliest established and the longest occupied site in the southern Belize region. Thorough radiocarbon dating and ceramic sequencing by the Uxbenká Archaeological Project has resulted in a detailed occupational history of Uxbenká beginning in the Late Preclassic (400 B.C. – A.D. 250), with abandonment of the site during the Terminal Classic period (A.D. 800 – 1000). Ix Kuku'il, which was first excavated in 2014, appears to have been occupied during the Late Classic (A.D. 600 – 800) period, with some evidence for local settlement predating the establishment of monumental architecture. GIS analysis of settlement patterns suggests variations in spatial organization between the two centers, and preliminary artifact analysis hints at variations in material goods and production as well. This presentation will compare Uxbenká and Ix Kuku'il through an analysis of settlement patterns and the distribution of resources and artifacts associated with the two sites.

[263] *Chair*

Thompson, Jessica (Emory University), Jordan Towers (Everick Heritage Consultants Pty Ltd) and Christopher Henshilwood (University of the Witwatersrand)

[356] *Tortoises as Indicators of Diet, Site Formation, and Paleoenvironments in the Middle Stone Age Record of the Southern African Coast*

Tortoises are one of the most common faunal components at many Middle Stone Age (MSA) sites on the southern coast of South Africa. They provide protein, fat, and other 'animal' resources in a 'collectable' package, which gives rare insight into the collected component of MSA diet. At most MSA sites, tortoise assemblages are dominated by *Chersina angulata*, a medium-sized tortoise with sufficient calories to provide approximately 20 – 30% of the daily energetic requirements for an active adult hunter-gatherer. *C. angulata* have distinct sexual dimorphism and allometric growth stages that allow past population structure and human predation patterns to be reconstructed quite specifically by pairing zooarchaeological and taphonomic data with data collected from tortoises killed in recent bushfires. Tortoise assemblages from Pinnacle Point Cave 13B and Blombos Cave show distinct differences in skeletal element abundances, taxonomic composition, and bone surface modification. This indicates differences in human and non-human predation patterns, although processing sequences were likely similar. The distinct ecologies and sizes of the tortoise species found at each site also highlight potential differences in paleoenvironmental conditions.

Thompson, Daniel

[418] *Exploring the Ethics of Archaeological Site Prospection in Google Earth*

With the release of Google Earth for consumer use, archaeologists were an early professional group to begin exploiting this resource for identifying potential archaeological sites around the world. However, it seems as though the ability to detect sites using this powerful tool might have advanced faster than the ethical considerations of site detection, validation and protection that most countries require today. This paper will explore the history of site prospection via Google Earth and the ethical considerations that arise when potential archaeological sites are detected using this widely accessible platform. Case studies will be presented in which such work is conducted within the framework of legitimately permitted surveys as well as examples where potentially significant sites have been identified without any official permission at all. The ultimate goal will not be to present a set of ethical guidelines for those who use Google Earth for site prospection but rather to begin a conversation to determine what those ethical guidelines might be moving forward as the satellite imagery improves and the ability to identify potential sites increases.

Thornton, Christopher (National Geographic Society)

[71] *Discussant*

Thornton, Taylor [230] see Wiewel, Adam

Thornton, Erin (Washington State University) and Arthur Demarest (Vanderbilt University)**[338]** *At Water's Edge: Ritual Maya Animal Use in Aquatic Contexts at Cancuen*

Excavations at the Late Classic Maya site of Cancuen (Petén, Guatemala) uncovered small-scale hydraulic systems including stone-lined canals and reservoirs within the site's architectural core. The abundance of other nearby potable water sources, along with the elaborate form of the system demonstrate that it served an ideological rather than practical function. This interpretation is supported by the artifactual material deposited in the reservoirs, as well as by the fact that the hydraulic system connects and flows between several of the site's ritual architectural complexes. Moreover, the reservoir located in front of the site's royal palace contained the remains of at least thirty slain individuals, who may represent members of the royal court massacred during the site's collapse. This paper reports the animal remains found within the site's reservoirs to further explore the nature and extent of ritual and disposal activities within these aquatic contexts. Inter and intra-site comparisons are also used to contextualize the results within broader discussions of how we identify ritual activity in the zooarchaeological record, and the role of water in ancient Maya ideological and political systems.

[338] *Chair*

Throgmorton, Kellam (Binghamton University) and Richard Wilshusen (History Colorado)**[82]** *A Historical-Processual Approach to Household Architecture in the Northern U.S. Southwest*

The transition from lightly built, short-term or ephemeral structures to substantially built, sophisticated dwellings occurred between A.D. 400 and 1400 in the Ancient Pueblo Southwest. At the early end of this period, most dwellings were occupied by a single household and may have only been occupied for about a decade. By the end of this period, nearly the entire population of the northern Southwest lived in multi-household, apartment-style dwellings that housed entire villages for generations. This 1000 year architectural transition obviously evinces many concurrent changes in Ancient Pueblo society. Our paper focuses on the middle portion of this period of architectural and social development from A.D. 650-1150. During this interval, both more and less substantial dwellings were simultaneously constructed by households with different social and cultural backgrounds. We consider these differences in houses and households from the perspective of historical process, which include population movement and dialectical relationships within Ancient Pueblo society.

Thulman, David (George Washington University)**[80]** *The Use of Bayesian Statistics to Increase both Precision and Accuracy in Radiocarbon Dating*

Many archaeologists struggle to make sense of radiocarbon dates, especially those with large overlapping sigmas. Even with modern analytical techniques that increase precision, the results can be confusing. Bayesian statistics, which employs prior information to constrain posterior results with sets of radiocarbon dates, can lessen confusion and increase precision without using ad hoc measures, such as averaging or ignoring dates with large errors. The power and utility of Bayesian analyses is demonstrated using the suite of dates from Dust Cave and sets of related dates from several Paleoindian and Early Archaic cultural phenomena in North America to clarify their relationships and infer population dynamics.

Thurston, T.L. [63] see Shaffer Foster, Jennifer

Thurston, T. (SUNY Buffalo) and Aadel Franzén (Jönköping Läns Museum)**[154]** *Opulent Harvest in a Kingdom of Stones: Landscape and Livelihood in a Marginal Upland Zone*

Relationships between subjecthood and rulership in northern European societies changed significantly between the late prehistoric and early modern eras, as long-extant nations were absorbed by emergent states. Using a landscape approach to food production and livelihood affordances, we study changing conditions and production strategies of forest agropastoralists in a marginal Swedish upland, through episodes of climate change and turbulent interaction with

governing powers. Perspectives on relationships between farmers and kings have long been dominated by top-down theories, suggesting that subject populations are forced or coerced into submission by 'rising' states. In contrast, we argue that governments are supported by the productive capacity of their constituents, and rulers are held in place (or not) based on the authority granted by their subjects, even in authoritarian states.

Tian-jing, Duan [49] see Tang, Zhuowei

Tibbits, Tawny (University of Iowa), Ellie Harrison-Buck (University of New Hampshire) and Terry Powis (Kennesaw State University)

[58] *Granite and pXRF: An Experimental Approach to Nondestructive Sourcing of Ground Stone Tools*

Portable x-ray fluorescence (pXRF) is a rapidly spreading yet controversial technology in archaeology. Current research on pXRF technology has produced marked improvements in calibration standards and accuracy of results. Previous studies using pXRF have focused primarily on obsidian and basalt; however with current advances in technology it is possible and necessary to test the applicability of pXRF to accurately characterize heterogeneous materials. This research proposes a methodology for analyzing heterogeneous materials, specifically granite, via pXRF with the aid of international standards for calibration. Preliminary data obtained from Maya ground stone tools collected from Belize indicate pXRF can be successfully employed as a method for distinguishing between granitic plutons. Belize ground stones present an ideal case study due to the isolated nature of granitic outcrops within the Maya Mountains. The Maya Mountains are composed of three petrographically distinct but visually similar two-mica granite plutons. By collecting multiple data points per granite artifact it is possible to obtain an average geochemical composition that is an accurate reflection of the material. This will allow for possible locating of source regions and production sites within and near the mountains as well as a more thorough reconstruction of ancient exchange patterns.

Tica, Cristina (University of Nevada Las Vegas) and Xenia-Paula Kyriakou (Independent)

[132] *Osteoarthritis in the Elbow and Knee from a Modern Documented Cemetery Collection in Cyprus: Using "New" Bones to Understand "Old" Ones*

Osteoarthritis is one of the more ubiquitous and abundant forms of pathology seen on ancient material. Osteoarthritis (OA) has a complex etiology with variable clinical characteristics. Documenting it is important because it may shed light on aspects of lifestyle (e.g. occupational), and social and cultural habits. Osteopathology studies conducted on modern, documented skeletal collections can add an important dimension. The aim of this paper is to present patterns of OA in the elbow and knee associated with both primary and secondary causal factors related to the development of the condition in a modern skeletal collection. Additionally, this paper discusses how different factors may contribute in the development of OA, and how these should be considered by the bioarchaeologists when interpreting OA in ancient populations. The objective of this paper is to showcase that advanced age is not necessarily the only causal factor, nor is it the only reason for the presence of OA.

Tichinin, Alina (California State University, Chico), Eric Bartelink (California State University, Chico), Gunita Zarina (Institute of Latvian History, the University of La), Sabrina Sholts (National Museum of Natural History, Smithsonian In) and Sebastian Wärmländer (Division of Biophysics, Stockholm University)

[207] *The Relationship between Cribra Orbitalia, Zinc Deficiency, and Dietary Habits in Children from 17th-18th Century Jēkabpils, Latvia*

In this study we investigated 28 skeletons of children (age 0-18 years) from a 17th-18th century cemetery in the city of Jēkabpils, Latvia. The cemetery is located in the city center, and was part of a salvage excavation effort in 2011 due to ongoing construction work. It is still unclear to which church and Christian denomination the cemetery belonged. Bioarchaeological evidence indicates high mortality for children: half of the burials were children under the age of 14, while a third were under the age of four. Life expectancy at birth is estimated to have been only 21.6 years. Seven of the 28

children (25%) showed evidence of cribra orbitalia lesions in the superior eye orbits, providing possible evidence for nutritional stress. To investigate the causes of this condition, stable isotope (C, N, O) and trace element analysis was carried out for all subadults. Individuals with cribra orbitalia displayed lower zinc levels in their bones than individuals without this pathological condition. Stable isotope data are further used to explore dietary variation between affected and non-affected individuals. These results allow us to identify a possible connection between cribra orbitalia, zinc deficiency, and food consumption patterns.

Tiedens, Shari [225] see Loendorf, Chris

Tierney, Meghan (Emory University)

[31] *The Human/Animal Continuum in Nasca Sculptural Ceramics (c. 1-450)*

Studies of Nasca polychrome ceramic iconography from many phases identify shamans in various roles. In ceremonial scenes shamans drink from cups filled with the entheogenic pulp of the San Pedro cactus, dance, play instruments, don costumes as supernatural imitators, and preside over rituals related to agriculture. Rarely however, is less immediately understandable ceramic imagery interpreted through the lens of shamanism as a Nasca worldview. Shamanic thinking privileges ambiguousness, trance states (i.e. existence in the “in-between”) and, most importantly here, overlap between the human and natural worlds. If shamans were a vital part of Nasca culture, as depicted in narrative ritual scenes, then we must begin to decipher how shamanic modes of thought infused other representations, as well. This paper examines a group of early period (c. 1-450) sculpted polychrome vessels that represent the shaman in transformation. These vessels, in particular, offer unique examples of how Nasca artists solved the visual problem of depicting the visionary experience of a shaman, who is at once human and animal. A wide range of representations along the continuum of human/animal embodiment and perception exist within the early Nasca ceramic corpus; human/bird and human/marine animal combinations appear to be most common.

Tiesler, Vera (Universidad Autónoma de Yucatán)

[158] *Forms and Meanings of Human Fire Exposure among the Northern Lowland Maya*

This paper explores some of the forms, occasions, and meanings of human fire exposure among the Northern Lowland Maya during the Classic period. Conceptual points of departure are native concepts of heat, smoke and fire, together with their transformative powers in human beings, ritual enactment, and physicality. These notions provide blueprints for the spectrum of treatments documented in the area's mortuary record, spanning veneration, profanation and/or sacrifice. Combining forensic anthropology with archaeoethnology, and advocating sequenced pathway reconstructions, I first untangle and pattern broader, evolving trends in heat uses in the area's material register, which include peri- and postmortem exposure by boiling, smoking, roasting, charring, and cremation of fresh corpses vs. decomposing vs. fully skeletonized bodies. The regional survey shows not only the elites but also the broader commoner sectors to have engaged extensively in heat treatments of their dead already by the first millennium A.D. Selected case studies from big-site cores —concretely, Yaxuná, Dzibanché, and Calkmul— grant a deeper understanding of the broader ritual charts that involved heat exposure by and for nobility.

[410] *Discussant*

[158] *Chair*

Tiesler, Vera [370] see Chi, Julio

Tifental, Emilia (University of Montana) and Hannah Cail (University of Montana)

[312] *The Dogs of Housepit 54: A Taphonomic Analysis of Recovered Canine Remains at Bridge River, British Columbia*

Since 2003 the excavations at the Bridge River site have exponentially expanded our understanding of the communities that inhabited the Fraser River Canyon over 1,000 years ago. The most current excavations at Housepit 54 have provided further evidence of the many facets of Fraser River life,

among these is the role of dogs. The possession and use of dogs in the Fraser River Canyon is well documented through excavations and traditional knowledge. Remains of domesticated dogs in Bridge River households have been interpreted as markers of inter-household wealth and status. The present study is conducted to develop a better understanding of the role dogs played in Housepit 54 during its various occupations. A close analysis of all skeletal remains of canines recovered from Housepit 54 is undertaken with a focus on taphonomic processes. We then consider implications for interpreting human behavior regarding dogs.

Tikhonov, Alexei N. [74] see Van Kolschoten, Thijs

Till, Jonathan (Abajo Archaeology) and Winston Hurst

[85] *The Bluff –Twin Rocks Community: Community Formation, Persistence and Evolution in the Northwestern San Juan Region*

The valley of Bluff, Utah, is one of many localities in southeast Utah where the archaeological record may show evidence of a succession of Puebloan community centers from the A.D. 500s through the 1200s (Basketmaker III – Pueblo III periods). These remains can be (1) the formation and dissolution of successive, independent, econocentric communities that came and went in a location with economically advantageous qualities (water and arable land); or (2) a single, persistent, sociocentric community whose configuration and community center shifted through time across the valley. We briefly discuss the archaeological implications of these alternative scenarios, and suggest that Puebloan cultural tradition might favor the latter over the former.

Tilley, Lorna (Australian National University)

[299] *Thinking and Theory in the Bioarchaeology of Care*

The bioarchaeology of care is a case-study-based, contextualized approach for inferring and interpreting the experience of disability and health-related care response in the past that is based on evidence for experience of disease found in human remains. It is supported by the Index of Care, a non-prescriptive online instrument intended to assist researchers in working systematically through the four stages of bioarchaeology of care analysis. This presentation opens with an overview of the bioarchaeology of care methodology, covering the principles shaping its design as well as its potential and limitations. It goes on to address the most commonly-voiced objections to the archaeological inference of care, before discussing the conceptual foundations on which the new approach was constructed (focusing particularly on theories of agency and on the role of osteobiography). Finally, this presentation will consider why it is important for archaeology to acknowledge the implications of the giving and receipt of care wherever evidence permits in terms of enriching academic knowledge, realizing our ethical obligations to the individuals whose remains we analyze and whose lives we (re)produce, and providing the general public with a perspective on past life and behavior that may help inform debate in the present.

[299] *Chair*

Timmins, Peter

[90] *Beach Ridges, Sand Dunes and Buried Sites : Recent CRM Investigations at Inverhuron, Ontario*

In the 1950s avocational archaeologist Fritz Knechtel discovered several important archaeological sites near Inverhuron Bay, Ontario, on the eastern shore of Lake Huron. Early professional investigations were conducted by Tom Lee and J.V. Wright of the National Museum of Canada and Walter Kenyon of the Royal Ontario Museum. In 2014 a proposed infrastructure project provided an opportunity to re-locate and test several of Knechtel's sites. This paper presents the results of this project and discusses the challenges of conducting an archaeological assessment in an area of raised cobble beaches and shifting sand dunes overlain by recent development. Despite extensive 20th century cottage development in the area, portions of three previously documented sites were found preserved under up to two meters of windblown sand and road fill.

Timpson, Adrian (UCL), Katie Manning (UCL), Stephen Shennan (UCL) and Enrico Crema

(UCL)**[191] *The Evolution of Farming and the Boom and Bust of Culture***

Occam's razor judges the success of any model by its ability to explain the evidence with the greatest simplicity. We present two powerful yet simple models; the first evaluates the transition from hunting and gathering to farming within an evolutionary framework, by considering farming as a phenotypic mutation under positive selection. This allows us to estimate the selection coefficient and map local times of first appearance and fixation. The second evaluates the appearance and eventual disappearance of cultures through time, revealing a fundamental shape in the distribution of cultural traits. Both models provide textbook examples of simple patterns that underlie complex processes.

Timpson, Adrian [288] see Manning, Katie

Ting, Carmen**[147] *The Production and Exchange of Early Postclassic Elite Wares in the Eastern Maya Lowlands***

This paper investigates the role played by Marco Gonzalez in the production and exchange of elite wares, as represented by the Zakpah ceramics, during the Early Postclassic period. Located in Ambergris Caye off the coast of northern Belize, Marco Gonzalez was occupied continuously throughout the Classic to Postclassic transition, with strong Early Postclassic (ca. A.D.950/1000–1200/1250) evidence yielding one of the largest Zakpah ceramic assemblages alongside Lamanai. By using various archaeometric methods (e.g. thin-section petrography, pXRF, and SEM-EDS), the resultant compositional and technological data reveal that the community at Marco Gonzalez was not actively engaged in the production of elite wares. All Zakpah ceramics recovered from Marco Gonzalez were imported from multiple producers in mainland northern Belize. In fact, such concentration of Zakpah ceramics from diverse sources at Marco Gonzalez can be argued to be evidence indicating the involvement of the community in redistributing elite wares. It is further suggested that Marco Gonzalez could have acted as the link between local and regional markets, thus promoting greater socio-political, economic, and ideological integration among elites in the eastern Maya lowlands during the Early Postclassic period.

Tipon, Nick (Graton Rancheria)**[106] *Discussant***

Tobias, Mark [354] see Wilshusen, Richard

Todaro, Simona [79] see Montesana, Roberta

Todd, Brenda [29] see Sturdevant, Jay

Todd, Brenda (University of Colorado, Boulder)**[159] *Discussant***

Tokovinine, Alexandre [86] see Belyaev, Dmitry

Tokovinine, Alexandre (Peabody Museum, Harvard University)**[244] *Holy Lords and Holy Lands: Territory in Classic Maya Inscriptions***

One of the significant challenges in dealing with indigenous classification systems is establishing continuities and discontinuities between Pre-Contact, Colonial, and Modern situations. The present paper addresses this question with respect to the concept of territory among the Ancient Maya, specifically, the speakers of Ch'olan and Yukatekan languages. It considers the corpus of Classic period inscriptions from the Southern Maya Lowlands as well as sixteenth and seventeenth century

documents and dictionaries from a wider region. Textual sources indicate that the term kab “land” referenced political and ritual landscapes and would be distinct from lum “earth” which carried agricultural connotations. At the same time, Classic period texts were ambivalent to how political institutions such as the royal court and its subjects were linked to kab. Moreover, nearly all place names in the inscriptions apparently did not belong to the kab or lum categories. These findings are of direct relevance to understanding Ancient Maya territories based on archaeological evidence. The results caution against applying indigenous toponyms to spatial entities of certain scale and using terms with territorial connotations (e.g., “kingdom”) in reconstructing Ancient Maya political geography.

Toll, H. (Museum of New Mexico OAS)

[354] *Still High on Pueblo Alto: Tom Windes' Mounds of Accomplishment*

Among Tom Windes' huge list of accomplishments in archaeology, his work at Chaco Canyon and Pueblo Alto is especially noteworthy. The lasting nature of this contribution is clear in that Pueblo Alto and mounds at greathouses continue to be discussed and interpreted. This paper further considers the Pueblo Alto mound stratigraphy and the use and occupation of the pueblo in the context of recent discussions of these data. The discussion ranges from the very specific to more general implications. Pueblo Alto and its mound were essential elements of the Chaco landscape and remain so to our efforts to understand it.

Tomasto-Cagigao, Elsa and Peters Ann (University of Pennsylvania Museum of Archaeology a)

[31] *The Body and the Ancestor: Comparing Evidence Of Individual Biograph and Social Representation at Paracas Necropolis*

Until recently, our understanding of Paracas Necropolis was based on objects divorced from their contextual data. Research in archives and museum collections has allowed us to re-link object with context, and a complete restudy has been carried out for some gravelots. In these cases, systematic bioanthropological observations have provided more reliable and more detailed information on the persons at the center of the mortuary bundle. Age and biological sex have been re-evaluated based on current methods. Therefore, observations of funerary practice and the garments, tools and weapons that adorn one or more display layers can be more usefully interpreted as expressions of gender identity and social status. Information on diet, health and habitual activities of the deceased individual can be compared with the symbolic expressions of identity in ritual contexts and the layered construction and reconstruction of an ancestral personage. We will evaluate the ways in which information on the life of each person coincides with or contradicts a social model based on the effigy later constructed around their body.

Toms, Phillip [174] see Cole, James

Toney, Elizabeth [274] see Taliaferro, Matthew

Toney, Elizabeth (Gila National Forest, Silver City Ranger District)

[282] *Combatting the Erosion Menace: The Enduring Legacy of the CCC Within the Silver City Watershed*

By the summer of 1933, the Civilian Conservation Corp (CCC) had constructed over 3000 checkdams within the Silver City Watershed. Men working in Little Walnut CCC Camp located a few miles outside of Silver City, New Mexico were focused on rehabilitating the Silver City Watershed from 1933-1940. Many of these features are still visible and functioning on the lands administered by Gila National Forest, Silver City Ranger District. These water and erosion control features are not only a testament to the craftsmanship of the CCC men who constructed them, but also a testament to conservation ethic that in large part began with Aldo Leopold's assertion that soil erosion was a “menace” to the social and economic future of the Southwest. The CCC built upon this ethic and rapidly acquired the techniques in building checkdams throughout the Silver City Watershed so that by the end 1934 over 15,000 erosion control features had been constructed within the watershed.

This paper explores the enduring legacy of these features within the Silver City Watershed and explores how to manage these CCC landscapes.

Tonoike, Yukiko (Yale University)

[402] *Interactions during the Iron Age in the Lower Khabur Basin of Northeastern Syria: Insights from Ceramic Petrography*

The semi-arid steppe of the Lower Khabur Basin of northeastern Syria is a climatically marginal zone for agriculture, yet there have been episodes of settlement over the past 9,000 years. Archaeological surveys have recorded more than 300 sites whose age, type, and distribution on the landscape are reflections of changing socio-natural systems. The region is particularly suitable for detecting changes in both environmental and socio-political spheres because of its environmental marginality, yet centrality to the political needs of states and empires. Focusing on the Iron Age, evidence for internal and external sources of changes in the settlement and abandonment of the landscape will be examined through stylistic and technical materials analyses (mainly ceramic petrography) of ceramics, as well as the nature of the sites and their distribution on the landscape. In view of historical sources that describe changes from town-based local polities to state and imperial installations through the ages, as well as the importation of populations to implement these plans, this will be the first step in assessing how known historical events are reflected in the ceramics.

Topi, John (University of Missouri) and Philip Leflar (University of Missouri)

[245] *Geometric Morphometric Approaches to Casas Grandes Ceramic Specialization*

Previous studies of the Casas Grandes region have suggested that several craft items, including ceramics and ground stone, were produced by part or full-time specialists. In this study, we build upon previous approaches to ceramic specialization by conducting geometric morphometric analysis on an extensive collection of scaled digital photographs of Viejo and Medio period whole vessels. Geometric morphometrics allows for the statistical analysis of shape as indicated by the relationship between landmark and semi-landmark points on the outline or surface of artifacts; these methods allow for the examination of shape and size, gathered from linear measurements, and can be used for both 2D and 3D analyses. Application of geometric morphometrics to ceramics has developed slowly but allows for greater understanding of variation in vessel form and decoration. Our results suggest a change in the variability of vessel form and decreased variability in certain aspects of ceramic decoration, including a decrease in the width of painted line on some vessels types, from the Viejo to the Medio period. Decreased variability in vessel form and decoration suggest increased specialization in ceramic production and has implications for broader questions of social organization and leadership strategies in the Casas Grandes area.

Torpy, James (College of Wooster) and P. Nick Kardulias (College of Wooster)

[51] *Religious and Mortuary Landscapes in Archaic Cyprus*

During the Archaic period (750-480 B.C.) the island of Cyprus underwent a dramatic transformation as new city-kingdoms rose to dominate its political landscape. This shift resulted in increased competition for resources, establishment of political boundaries, and emergence of a pronounced social hierarchy within the new polities. The site of Athienou-Malloura, surveyed and excavated by the Athienou Archaeological Project, includes a Cypro-Archaic sanctuary and nearby tombs on the hill of Maghara-Tepesi, four of which have been excavated. The present study compares the site of Athienou-Malloura to other comparable sites from around the island, in order to ascertain the distribution and role of rural sanctuaries and cemeteries during this period of increasing social complexity and political competition. The sites are compared in relation to locations of the city-kingdoms, as well as access to natural resources such as arable soil and copper ore. It has been proposed both on Cyprus and elsewhere that grave monuments and religious sites partly functioned to create and enforce various status claims during turbulent periods. Building from more abstract speculations on Archaic Cypriot political boundaries, this study attempts to map a more nuanced view of the interplay between topography and human use of the landscape during this time.

Torrano, Alexis [73] see Frances, Guillem

Torrano, Alexis (BSC-CNS (Barcelona Supercomputing Center-Centro Nacional de Supercomputacion)), Andreas Angourakis (Facultat de Geografia i Història.Universitat de Ba), Veronica Martinez (Facultat de Geografia i Història.Universitat de Ba) and Josep Maria Gurt (Facultat de Geografia i Història.Universitat de Ba)

[402] *CAMOTECER: Beyond the Shard. Modeling and Simulating Variability in Central Asian Pottery Technology*

Pottery technology is a well-studied field of archaeological research. However, particular contributions are often limited to a partial characterization, due to the technical and theoretical backgrounds of the researchers involved. Pottery samples are interrogated separately through chemical analyses, petrographic characterization and the assignation to both decorative and functional classes. In most cases, the results of such myriad of studies remain relatively unconnected up to a general archaeological discussion. Despite the radical methodological differences, all aspects of pottery studied by archaeologists were defined by a single system of decisions and constraints of potters, which is partially universal and partially contextual. We propose modeling methodology to integrate and explore data on pre-industrial pottery, which we applied on a pottery data set from the Surkhan Darya region, Uzbekistan. We designed a synthetic pottery ontology to enclose different aspects related to a single pottery data set. Next, we create a measure of difference between pottery samples and relatively characterize the context of pottery-making in different places and periods. Furthermore, in order to explore the logical relationships between the variables measured, we build a Bayesian model that can generate virtual samples given certain constraints during pottery production.

Torrence, Robin (Australian Museum)

[412] *More than a Pretty Face? Exploring the Allure of Obsidian Valuables from Papua New Guinea*

Brilliant, shiny, translucent, black. On the surface, everything made from obsidian is inherently attractive. So why are some obsidian artifacts more highly valued than others? Using the example of obsidian use in West New Britain, Papua New Guinea, properties that go beyond physical attributes are explored as potential factors in the creation of valuables: e.g., exoticism; ownership of resources; social links; symbolism; performance; staged production; specialist makers.

[412] *Chair*

Torres, Jimena [251] see San Roman, Manuel

Torres Cubillas, Luz Alicia [189] see Martinez Taguena, Natalia

Torres Estrada, Heber Delfino [242] see Orrego Corzo, Miguel

Torres-Rouff, Christina [203] see Pestle, William

Torvinen, Andrea (Arizona State University)

[21] *Refinement of the La Quemada Chronology and Its Implications for Inter-polity Interaction along the Northern Frontier of Mesoamerica*

During the Epiclassic period (A.D. 500-900), the northern frontier of Mesoamerica consisted of a regional network of polities focused on large, hilltop centers including the site of La Quemada in the Malpaso Valley of Zacatecas, Mexico. While extensive archaeological research has been conducted at the site, a seriation of the La Quemada-Malpaso Valley Archaeological Project ceramic assemblage remains to be finalized. Establishing the chronology of La Quemada is essential for two reasons: (1) to ensure the occupational history of La Quemada is accurately integrated into the regional chronology of the northern frontier; and (2) to establish the chronological control necessary for addressing changes in the social interactions in which La Quemada residents engaged. Previous analyses found that red-on-buff and incised-engraved types predominate in most proveniences

through the entire occupation of La Quemada; therefore, the type-based analysis will be informed by an attribute analysis focused on seriating design motifs (e.g., frets, steps, zigzags, and life forms). Such an approach may allow us to identify fine-scale variations in the frequency of red-on-buff and incised-engraved ceramics through time, which will enhance our ability to order proveniences based on their assemblage composition.

[21] *Chair*

Tosa, Paul [239] see Price Steinbrecher, Barry

Toscano, Lourdes (CENTRO INAH YUCATÁN) and Gustavo Novelo Rincón (CENTRO INAH YUCATÁN)

[183] *Entre ollas y metates: exploraciones en la cocina real de Kabah, Yucatán*

Una de las partes más importantes dentro del espacio residencial, ya sea que se trate de la gente común o de la elite, es sin duda alguna el área donde se preparan los alimentos (K'óoben). En este trabajo hablaremos sobre la cocina encontrada en el Grupo Este de Kabah, el cual interpretamos como el complejo palaciego donde residió la familia gobernante al menos durante el Clásico Tardío-Terminal. Un análisis de las características del espacio construido, así como la presencia de 30 metates y cientos de fragmentos de vasijas de diferentes formas, nos dio la pauta para proponer que en la cota más baja se localizaba el K'óoben del conjunto palaciego. Las exploraciones efectuadas a lo largo de cuatro años ampliaron la evidencia y junto con los análisis de suelos nos han permitido asomarnos a la compleja organización que implicaba preparar abundante comida para satisfacer el delicado paladar de la elite.

Tostevin, Gilbert (University of Minnesota) and Luke Premo (Washington State University)

[191] *The "Taskscape" and Its Effects on Cultural Diversity: A Spatially Explicit Model of Mobility and Cultural Transmission*

Ethnoarchaeology has shown that culturally learned behavior is structured in its performance in many ways. For archaeologically-visible artifactual behavior, this performance is structured both geographically, in terms of where the artifacts are made and used on the landscape (what Ingold calls "the taskscape"), as well as temporally, in terms of the sequential nature of operational chains which can be distributed among taskscape locations. Yet cultural transmission theory has not yet explored how behaviors of mobile foragers are learned differently due to their enactment at different locations, what Tostevin calls "taskscape visibility." Here, we show how mobility affects the diversity of two selectively neutral cultural traits that differ only in the parts of the taskscape in which they can be transmitted between foragers. The trait transmitted only from residential bases shows greater diversity than the trait transmitted from residential bases and logistical camps. In addition, the former shows a positive effect of increased logistical mobility while the latter shows little to no effect. Without an appreciation for the ways in which mobility and taskscape structure cultural transmission in space, the differences in the diversity of the two traits might be incorrectly interpreted as resulting from qualitatively different mechanisms of cultural transmission.

Toth, Nicholas [215] see Zipkin, Andrew

Toussaint, Mark (University of Nevada Las Vegas) and Debra Martin (University of Nevada Las Vegas)

[380] *Bioarchaeology of the Arabian Bronze Age: Humeral Entheseal Changes and Burial Patterns at Tell Abraq*

Tell Abraq is an archaeological site from the Arabian Bronze Age, located near the Persian Gulf Coast of the modern-day country of the United Arab Emirates. A sealed, two-chamber mud-brick tomb on site, in use from approximately 2200 – 2000 B.C., yielded a 1.4-meter-thick matrix of commingled human remains, soil, and artifacts, representing a MNI of 403 individuals, of which nearly three quarters are adults. Although the remains are fragmentary, they still offer rich insights into the biocultural interactions of Bronze Age society in this population. This aim of this study was to categorize enthesal changes at the sites of major muscle attachments on the humerus, and to look

for intersections of musculoskeletal stress marker category, biological sex, and burial location within the tomb at Tell Abraq. The presence or absence of specific patterns in these intersections helps to shed light on the degree of social stratification represented in the bodies of those buried in the tomb, and possibly on Bronze Age formulations of gender at this site.

[380] *Chair*

Towbin, Henry [327] see Triozzi, Nicholas

Towers, Jordan [356] see Thompson, Jessica

Towner, Ronald [128] see Renteria, Rebecca

Towner, Ronald (Tree-ring Lab, University of Arizona)

[354] *Tree-Ring Dating the Gallina: The Herb Dick Collections and Beyond*

The 1970s were a period of intense activity in the Gallina heartland of north-central New Mexico. Excavations by James Mackey and Sally Holbrook and by Herb Dick documented dozens of Gallina sites and structures in the Llaves Valley alone. Unfortunately, analysis and publication did not always follow excavations, particularly in Herb Dick's case. His untimely death in 1993 left much of his excavated material in disarray. Through the efforts of several individuals and institutions, however, his tree-ring samples have been transferred to the Laboratory of Tree-Ring Research in Tucson for analysis and curation. Here, we present the results of dendroarchaeological analysis of his collections from the Dam Ridge, Hacha Ridge, and Huerfano Mesa locales. These samples, combined with a synthesis of all Llaves Valley dendroarchaeological samples, help delineate the spatio-temporal variability and social organization of the Gallina occupation in the heartland of this enigmatic culture.

[239] *Discussant*

Toyne, J. Marla [78] see Toyne, Jennifer Marla

Toyne, Jennifer Marla (University of Central Florida), J. Marla Toyne (University of Central Florida) and L. Alfredo Narvaez (Museo de Tucume, Peru)

[78] *The Bravery and Beauty Within: Skeletal Analysis of the Ancient Chachapoya People at Kuelap*

In early 17th century historical descriptions, Garcilaso de la Vega describes the Chachapoya people of Peru as "very brave", "the men well-formed and the women extremely beautiful". While the archaeological remains cannot address the veracity of these statements, the analysis of the skeletal remains from important Chachapoya complexes, such as Kuelap, provide the only direct means of reconstructing a biological profile of these ancient people, including aspects of their physical morphology, health, diet, and mobility. Kuelap is one of the largest sites in the area and the mortuary contexts are diverse, including individual burials, collective tombs, and secondary deposits, yet the preservation of skeletal materials is good. These preliminary osteological data synthesize the skeletal collection from Kuelap observed to date (n=589), including partial and complete individuals. Here we highlight the estimated age-at-death profile, stature estimates, patterns in cranial modification, and patterns in traumatic injuries in order to model the physical nature and local biology of the Chachapoya peoples compared to others in the region and the broader Andes.

Trabert, Sarah (University of Iowa), David Hill (Metropolitan State College of Denver), Margaret Beck (University of Iowa), B. Sunday Eiselt (Southern Methodist University) and Jeffrey Ferguson (University of Missouri)

[361] *Not so Exotic After All?: Results from A Characterization of "Puebloan" and "Micaceous" Ceramics from Dismal River Aspect Sites*

Small numbers of supposedly "Southwestern" sherds appear at many sites on the Great Plains. Some Dismal River aspect (A.D. 1650-1725) people living on the Central and High Plains had

extensive contact with people in northern New Mexico and may have lived with Puebloan migrants in the late 1600s. Exotic ceramics appear at several Dismal River sites including red slipped wares and micaceous sherds. Using a combination of NAA and petrography, we characterized a sample of these sherds from several Dismal River aspect sites in Kansas and Nebraska to better determine the origin of these northern Rio Grande ceramics. Using NAA, we determined that some of the micaceous sherds were likely made in northern New Mexico while others were made elsewhere. A lack of comparative data from mica sources in Colorado and Wyoming make further sourcing difficult. Red slipped sherds from sites in Scott County, Kansas that look similar to Tewa Red wares, were instead constructed from materials available to potters in western Kansas. Northern Rio Grande potters living with Dismal River aspect groups maintained culturally specific ceramic technologies such as the use of red slips while also importing micaceous vessels from both their traditional homeland and from other sources.

Trachman, Rissa (Elon University) and Savannah Bradley (Wake Forest University)

[113] *Household Shrines, Caches, and Burials: The Role of Ritual in Domestic Economy at Dos Hombres, Northwestern Belize*

Household economies have been addressed from several perspectives in northwestern Belize. The resource specialized community model (Scarborough and Valdez 2003; 2009) emphasizes locally available resources in production and consumption at the community scale. The model has great validity in the hinterland communities and is clearly evidenced in household investigations near Dos Hombres Belize in the form of the raw materials utilized in stone tool production. In addition, the function of those tools is clearly related to manipulating mostly local resources. While this economic model is still being tested in the Dos Hombres civic ceremonial center, it is also possible that many local resources are being utilized for producing much of what was needed in the kingdom. What this paper is concerned with is the proportion of both local and non-local material culture recovered in domestic contexts that are specifically related to domestic ritual: burial goods, shrines, and caches. These ritual assemblages make up a significant proportion of the overall domestic assemblages both at Dos Hombres and its hinterlands highlighting the importance of ritual goods in the domestic economy of northwestern Belize.

Trachman, Rissa [248] see Kieffer, C. L.

Trask, Willa [249] see Meredith, Clayton

Traslaviña, Teddy Abel [81] see Wernke, Steven

Trein, Debora (University of Texas at Austin)

[155] *Human Impact on a Monumental Landscape at the Microscopic Level: An Ancient Maya Community and Its Temple*

This paper discusses the results of geochemical and micromorphological analysis of sediment samples in and around a monumental temple structure at the site of La Milpa, northwest Belize. This analysis forms part of a project that aims to examine community agency and practice in public monumental spaces, in particular how the actions of diverse groups of agents influence the functions of monumental architecture. Artifact and architectural evidence gathered over five field seasons at Structure 3 has indicated that the Late Classic period (550-850 CE) constituted a time of intense access and use of the areas surrounding the temple structure. However, this dataset was found to be insufficiently fine-grained to enable the identification of specific types of activities, necessary in understanding how Structure 3 functioned in relation to the La Milpa community. In order to identify and differentiate between discreet activity areas, geochemical characterization of sediments through ICP-MS and sediment micromorphology were employed in over 100 loose sediment and 20 sediment core samples taken from and around Structure 3. Both these techniques are considered to be highly successful in the study of activity areas in the archaeological record, but have had a relatively limited history of application in the Maya Lowlands.

Trejo, Valentina [2] see Méndez, César

Trelogan, Jessica (Institute of Classical Archaeology, University of Texas at Austin), Lauren Jackson (Institute of Classical Archaeology, University of) and Maria Esteva (Texas Advanced Computing Center, University of Texas)

[123] *Unlocking the Data behind the Chora of Metaponto Publication Series: "On-The-Fly" Solutions for Sharing and Archiving an Evolving Collection*

As archaeological research moves from the traditional model of print publication (as the definitive word), to a larger continuum of interpretation and reinterpretation, access to the supporting data is crucial. To do so, however, adds extra burden on academic units with large legacy collections, publication backlogs, and dwindling budgets. Digital repositories provide a home for static collections, but are not ideal for dynamic collections generated and evolving throughout the research lifecycle, nor do they provide an interactive space for ongoing discussion. The Institute of Classical Archaeology and Texas Advanced Computing Center have developed a set of lightweight solutions to prepare the ICA collection for preservation and sharing without interrupting ongoing work.

Leveraging existing University of Texas system cyberinfrastructure and expertise, we have streamlined our processes and provided a team of international collaborators the ability to enhance our full collection, while preparing it "on-the-fly" for archiving and providing a portal to the data through which a continuing dialog can be conducted. This poster illustrates our model of a distributed "collection architecture" that integrates archival and presentation instances of the ICA collection, presented via a set of web-based digital companions to the Chora of Metaponto book series.

Tremayne, Andrew (University of California Davis), John Darwent (University of California Davis), Christyann Darwent (University of California Davis) and Kelly Eldridge (University of California Davis)

[302] *Iyatayet Revisited: Oh Giddings, What Have You Done?*

This paper presents the results of our reinvestigation of Iyatayet, a multicomponent mid-late Holocene site located in northwest Alaska. Iyatayet is well known as the type site for both the Denbigh Flint Complex and the Norton Tradition in Alaska. Originally, excavated by J. L. Giddings from 1948-1952, this national historic landmark was retested in 2012 and 2013 to assess site condition, threats and disturbances, its current research potential, and to re-evaluate Giddings' interpretations by collecting samples using modern excavation methods. Our team mapped the site using a total station, excavated a series of controlled shovel tests to ascertain the extent of Giddings activities, and placed seven 1x1-meter tests in key areas to ground truth Giddings work and to fill in missing data deemed unessential at the time. One of our major revelations is that little is left of the Denbigh occupation, but Norton deposits are well preserved. Additionally, this work allowed us to update the site chronology using AMS radiocarbon dating methods on twelve organic samples. Collection of over 10,000 artifacts including, stone tools, obsidian flakes, microdebitage, ceramic sherds, organic tools and faunal remains allow for us to confirm some of Giddings original assertions and to refine others.

Tremblay Critcher, Lori

[299] *Potential Applications of the Bioarchaeology of Care Methodological Approach for Historic Institutionalized Populations*

In the 19th century, mental institutions were created in the United States to provide care for the mentally ill. These state institutions of care were designed to serve as cultural buffers to protect mentally ill individuals from the harsh conditions that they would have otherwise been exposed to in other state institutions, such as prisons or poorhouses. In this paper, I examine whether and to what extent Tilley's (2012) "Bioarchaeology of Care" methodological approach provides a means to evaluate the efficacy of these state institutions to serve as cultural buffers as well as the limitations of this approach in doing so.

Tresserras, Jordi [170] see Mendizabal, Tomas

Trever, Lisa (University of California, Berkeley)

[303] *Discussant*

[303] *Chair*

Trevin Pita, Vanesa [394] see Bondura, Valerie

Tricarico, Anthony (University of Central Florida)

[249] *Urban Agriculture within the Valley of Oaxaca: Investigations and Implications of Agricultural Terracing at Monte Albán*

The use of GIS to determine the spatial boundaries between terracing and the ceremonial center at Late Classic Monte Albán (250-700 C.E.), will validate or falsify current Late Classic population estimates. The determinants for what defines agricultural versus residential terracing and whether both types are present at Monte Albán has been highly contested. Archaeological investigations yielding residential debris, does not indicate the total sum use of an individual terrace, nor does it indicate a totally unilateral application of agricultural and residential space. However, agricultural terracing can be positively identified through the spatial determinations employed by digital mapping software. The successful identification of agricultural terracing is a step towards the calculation of potential carrying capacity and a look into urban sustainability within an ancient city. This study investigates the interplay between terracing and population density within a confined urban space and also validates the existence of agricultural terracing at Late Classic Monte Albán.

Trigg, Heather (Univ Massachusetts Boston) and Stephanie Hallinan (University of Massachusetts Boston)

[311] *Investigating Activities in Spanish Colonial Ranches in 17th-Century New Mexico*

In 17th-century New Mexico, Spanish colonists' households were an important location for ethnogenesis as colonists and indigenous Pueblo peoples together labored at basic subsistence activities. LA 20,000, a Spanish ranch located about 12 mi southwest of Santa Fe, has the potential to shed light on colonists' activities and their interactions with indigenous Pueblo and Plains peoples. This site is the most complex rural ranch of the period, with extensive architecture and material culture. Using GIS, we explore the distribution of various artifacts, imported Mexican majolica and Pueblo ceramics, lithic tools and debitage, and other material remains, within the domestic structure and associated buildings to explore the nature and types of activities that occurred in this multi-ethnic household. This sort of analysis is key to understanding the incorporation of Spanish, Pueblo and perhaps Plains peoples' knowledge into the new cultural frontier that such households represented.

Trimble, Lauren [6] see Bender, Shilo

Tringham, Ruth (Univ of California-Berkeley)

[117] *Discussant*

Trionzi, Nicholas, Henry Towbin (American Museum of Natural History) and Glen Keeton (American Museum of Natural History)

[327] *More than a Rusty Nail: Archaeometric Analysis of Wrought Iron Nails from Fallen Tree, St. Catherines Island, Georgia*

Computed Tomography (CT) scanning empowers researchers to analyze the physical properties of archaeological materials beyond their superficial qualities. Micro CT enables one to non-destructively observe and measure interior features of an artifact with high precision. It also allows one to segment conjoined materials by their relative densities. The processed images can be exported as 3-dimensional models and analyzed in an array of open-source software applications. In this case study we use CT scanning to analyze a collection of wrought iron nails from the Fallen Tree site (9Li8), a 16th-17th century Indian pueblo situated just south of Spanish Mission Santa Catalina de Guale on St. Catherines Island, Georgia (USA). CT scans of rusty iron nails were virtually filtered to remove obscuring oxidized concretions. Although a lack of standardization in their production makes

fine dating wrought iron nails difficult, our case study demonstrates how information derived from CT scans can contribute contextual details that may otherwise be obscured by preservation factors.

Troncoso, Andres

[318] *Período Formativo como Ontología: una discusión desde los Andes Septentrionales (30° Lat. S)*

Para el centro norte de Chile (valle de Limarí, 30° lat. S.) se ha propuesto un período Formativo anclado en la noción de progreso y domesticación de plantas y animales, el que marcaba un salto evolutivo dentro de la secuencia histórica de los grupos prehispánicos de la región, evidenciado en la aparición de la alfarería. Aunque en los últimos años se ha discutido la relevancia de la incorporación de la alfarería en la vida de estas comunidades, lo cierto es que se continúa entendiendo este momento como un tiempo esencial en los procesos de complejización social de la región. En este trabajo discutimos la noción de Formativo aplicada a la región, evaluando los cambios acaecidos en el registro material y espacial de la localidad (asentamientos, arte rupestre, cultura material), los que no coinciden con los ritmos temporales tradicionalmente propuestos, proponiendo entender a este tiempo más bien como un momento de transformación ontológica que fusiona elementos del animismo y analogismo sobre el que se reconstruye la red de relaciones sobre las cuales se establece la articulación entre humanos (vivos y ancestros), objetos y paisaje.

[180] *Chair*

Troncoso, Andrés [180] see Hayashida, Frances

Trout, Lukas (University of Nevada, Reno)

[386] *Prehistoric High Elevation Seasonal Use in Wyoming: Results of Flaked Stone Analysis from High Rise Village*

The analysis of flaked stone procured from 10 of High Rise Village's 52 habitation features provided a unique glimpse into high-elevation prehistoric hunter-gatherer behaviors in western Wyoming, including occupational intensity, and settlement and subsistence behaviors. Rather than a hunting-focused and/or intensive logistical-residential settlement-subsistence strategy described throughout the Rocky Mountains and Intermountain West, High Rise Village was evidently targeted for specific resource patch(es) by small residually mobile family groups, who foraged for predictable resources for short periods of time. This pattern thereby conforms to previous models for seasonal transhumance-based adaptations in the Rocky Mountains. Furthermore, this research provides evidence for the integral importance of high elevations to prehistoric hunter-gatherers in western Wyoming's Late Prehistoric period.

Trowbridge, Meaghan (Statistical Research, Inc.) and Lori Stephens Reed (Aztec Ruins National Monument)

[324] *Looking through the Local Lens: Recognizing Southern Chuska Valley Production of Mesa Verde Style Pottery*

Recent analyses of ceramics from the Southern Chuska Valley (SCV) have suggested that vessels commonly identified as imports from the Mesa Verde region in fact largely represent locally-produced variants of Mesa Verde White Ware rather than actual imported vessels. Data collected from the US 491 Highway mitigation project (SRI) and the El Paso Pipeline project (WCRM) provide a baseline from which we plan to further investigate the presence of locally-manufactured Mesa Verde variant types in the SCV. Types such as McElmo and Mesa Verde Black-on-white have been used for decades to classify ceramics in this region based on stylistic elements, paint composition, and surface treatments; however, a review of the literature and results of these recent analyses indicate that definitions of these well-known and oft-recorded types commonly disregard discrepancies in paste and temper that suggest production loci in the SCV rather than the Northern San Juan region. This presentation will explore the issue of Mesa Verde style white ware classification across the San Juan Basin, including a review of existing literature and a preliminary proposal for upcoming research targeting the investigation and description of southern variants of Mesa Verde white ware.

[324] *Chair*

Trudel, Stephanie [360] see Lewarch, Evan

Truex, Lise (University of Chicago)

[237] *Chair*

Truex, Lise [237] see Pacifico, David

Trumbo, Aaron and Allen Denoyer (Archaeology Southwest)

[278] *Experimental Archaeology: Insights from the Construction of an Adobe Room*

Experimental archaeology is a useful tool for improving our understanding of prehistoric technologies and testing archaeological interpretations. The “Hands On Archaeology” project at the 2014 Archaeology Southwest / University of Arizona Upper Gila Preservation Archaeology Field School focused on the experimental construction of a single-story adobe pueblo room in the style of the Cliff phase (A.D. 1300-1450+). This project was done in conjunction with limited excavation in three Cliff phase rooms at the Dinwiddie site, which provided information on building materials and construction styles. Experimental studies during construction of the adobe room improved our understanding of both labor effort and the construction techniques required to produce the types of walls and features observed in the excavated rooms. A full-scale adobe room and a portable small-scale model allow us to share what we learned with the public in different venues. This ongoing project will continue to generate data on the durability and maintenance required for this type of structure.

Trut, Lyudmila [28] see Kukekova, Anna

Tsoraki, Christina (Leiden University)

[16] *Ritual Consumption? Exploring the Staging of Ritual Acts through the Deposition of Ground Stone Tools in Building 77 at Neolithic Çatalhöyük*

The destruction of buildings by fire, either deliberately as a ritual act or accidentally, is among the most interesting elements of Neolithic Çatalhöyük, in central Anatolia, not least for the patterns of deposition of material culture at the time of destruction. Burnt Building 77, a well-preserved structure excavated by the current project, stands out in many respects, but one of its intriguing features is the large number of clustered grinding tools and other stone objects that seem to have been left or placed just before the abandonment and burning event. Particularities of this assemblage in terms of number, size, type of tools and preservation raise questions about what these clusters represent. In this paper I argue that the deposition of large quantities of often rare stone objects prior to the abandonment of the building should be seen as a deliberate act, a socio-ritual mechanism, which in tandem with other larger-scale ritualized acts was aimed at maintaining and reinforcing group cohesion and establishing social memory. The sheer quantity of material amassed in Building 77 seems to represent a powerful statement, an act of conspicuous consumption involving larger social groups beyond a single household.

Tsukamoto, Kenichiro (School of Anthropology, University of Arizona)

[103] *The Preliminary Results of Topographic Mapping at El Palmar*

El Palmar is known as one of the major Classic Maya polities in the central Maya lowland, but the nature of its spatial configuration has remained underexplored. This paper presents the preliminary results of topographic mapping carried out from the 2007 through 2014 field seasons. Using two total stations, our topographic mapping has covered a total of 100 hectares, including the site core and three outlying groups. In the field we documented not only architectural features and carved monuments but also reservoirs and caves. By integrating these natural and cultural features into GIS-based analysis, this paper attempts to identify the spatial organization of the El Palmar polity.

Tsuneki, Akira [205] see Dougherty, Sean

Tubbs, Ryan Maureen (Michigan State University), Jodie A. O'Gorman (Michigan State University), Jeffrey M. Painter (Illinois State University) and Terrance J. Martin (Illinois State Museum)

[365] *Negotiating Identity through Food Choice in the Precolumbian Mid-Continent*

Recent research has deepened our understanding of intergroup interactions in the Mid-continent of North America during the late prehistoric period, and archaeological investigations have revealed evidence not only for conflict, but also for cohabitation and cooperation between the migrant Oneota people and local, maize-reliant Middle Mississippian groups. This poster utilizes the broadly defined framework of foodways and explores dietary changes in this interaction through time along with post-migration shifts in Oneota serving vessels. Information gathered from the analysis of stable isotopes in human remains from Norris Farms 36, a mortuary site associated with Morton Village (11F1), is used to shed light on how food choice was used to manipulate ethnic identity. Several years of excavation at the Morton Village site continues to enhance the faunal assemblage, demonstrating the diverse faunal resource base that was available to the Mississippian and Oneota population at the Morton site. The data produced by these investigations suggest that social boundaries between the two groups were permeable and actively manipulated. The evidence for the creation of hybrid ceramic types and diet suggest the development of a new ethnic group in the region, incorporating aspects of both Oneota and Middle Mississippian identity.

Tudor, Jessica and Brendon Greenaway (California Office of Historic Preservation)

[392] *Archaeological Landscapes and Districts and Section 106 of the NHPA - Examples from California*

Archaeological sites have traditionally been considered only as potentially eligible for listing on the National Register of Historic Places under Criterion D (data potential) of the NRHP, but professionals in the field of Cultural Resources Management have begun to push for archaeological sites to be considered under Criteria A (significant events), B (significant people), and C (artistic value or method of construction) as well. Furthermore, archaeological sites are increasingly considered using a landscape approach, often incorporating multiple sites into a district. This approach breaks the traditional boundaries of archaeological site analysis to incorporate cultural importance to Native Americans and the general public, as well as highlighting how archaeological sites may represent important people and major events of the past. This poses an interesting challenge when archaeological districts or landscapes fall within the Area of Potential Effects for a federal undertaking that may alter or destroy portions of the constituent sites. This presentation uses examples from the California Office of Historic Preservation's Section 106 review units to discuss practical applications of landscape archaeology approaches to prehistoric and historic period archaeological sites in the Section 106 process.

Tune, Jesse W. [8] see De Smet, Timothy

Tune, Jesse (Texas A&M University)

[150] *Defining Cumberland Lithic Technology: A Study of Biface Technological Variation and Land Use Patterns*

Cumberland fluted-bifaces are recognized as being lanceolate, full fluted points that immediately post-date Clovis in the Mid-south United States. A review of the existing literature reveals brief descriptions of morphology, preliminary explanations of production technology, and speculation about regional fluted point chronologies. This study examines Cumberland fluted point technology and regional land use patterns to develop a greater understanding of human adaptive behaviors during the Younger Dryas. Cumberland biface technology is characterized here based on data collected throughout the entire Mid-south region. Additionally, a model of Cumberland regional land use was constructed and is compared to Clovis and Dalton land use patterns. The results of this research help to formally define Cumberland fluted bifaces as a distinct late Pleistocene technological complex based on aspects of point morphology and land use patterns.

Tung, Tiffany (Vanderbilt University, Department of Anthropology), Molly Shea (Hillsboro High School, Nashville) and Larisa DeSantis (Vanderbilt University, Department of Earth & Envir)

[202] *Stable Isotope Analysis of African Slave Burials from the Grassmere Plantation, Nashville, Tennessee*

Carbon and oxygen isotope analyses of dental apatite from a captive slave population (ca. 1840s) from the Grassmere Plantation (now the Nashville Zoo) in Tennessee is examined to reconstruct childhood diet and determine whether individuals were local to the Middle Tennessee region or forcefully moved from another locale. Among the 19 burials recovered, enamel apatite was obtained from 11 individuals, representing 3 juveniles and 8 adults (3 males, 4 females, and 1 unsexed). At least two teeth per individual were sampled to examine dietary changes through childhood. Preliminary results show that the $\delta^{13}\text{C}$ values range from -9.8 to -1.7; mean $\delta^{13}\text{C}$ = -4.18. Agricultural census data for the Grassmere Plantation in 1850 shows that maize, a C4 plant, was the primary crop (2,590 bushels), followed by oats (600 bushels) and potatoes (150 bushels). The $\delta^{13}\text{C}$ data suggest that while most of the captive slave individuals had access to maize, it was not equitably distributed. The $\delta^{18}\text{O}$ values range from -5.4 to -3.4; the mean $\delta^{18}\text{O}$ = 4.15. This suggests a shared water source that was likely of local origin.

Turck, John (Geoarcheology Research Associates) and Joseph Schuldenrein (Geoarcheology Research Associates)

[155] *The Geoarchaeology of Two Riverine Sites in New Jersey*

In dynamic environmental settings, various ecological processes can affect the landscape, the people living on those landscapes, and the subsequent archaeological record. Further confounding the situation is human-induced landscape change, which evidence indicates has occurred recently, historically, and prehistorically. Our efforts at two riverine locations in northern and central New Jersey reveal the efficacy of a geoarchaeological approach to understanding the archaeological record. Through remote sensing, coring, and sediment analysis, synthesized within a GIS, we were able to determine the location of intact landforms, as well as areas of disturbance, targeting specific areas for further study. Our findings suggest that an efficient, cost-effective, investigation begins with a geoarchaeological approach.

Turkon, Paula (Ithaca College), Sturt Manning (Cornell University), Carol Griggs (Cornell University) and Alexandra Jiggetts-O'Neill (Ithaca College)

[21] *Dendro-14C-Wiggle-Match Contributions to Northwestern Mesoamerican Chronology*

This paper reports on the progress of the Dendro-14C wiggle-matching project begun in 2013. Initial work established the feasibility of the methods and availability of the data. This paper will report on the ways in which the data can aid in cultural interpretation in northwestern Mesoamerican regions. A focus will be on dating the construction of high status areas at the sites of La Quemada and Los Pilarillos in the Malpaso Valley, Zacatecas, and their chronological relationship to construction in public areas at both La Quemada and at the site of Alta Vista, a culturally related and roughly contemporaneous site about 150 miles northwest of the Malpaso Valley, located in Chalchihuites, Zacatecas. Though this project is initially geographically narrow, because the methods used here are cumulative, additional data and research can provide great advances in our knowledge of Mesoamerican culture-history in larger-scale regional interactions.

Turnbow, Christopher (New Mexico Gas Company)

[273] *Projectile Point Temporal Trends During the Mimbres Georgetown Phase*

Past excavations of Mimbres Georgetown phase occupations at the Diablo Village and Cuchillo sites produced assemblages critical to the refinement of the Mimbres projectile point chronology. Derived from structures and tightly dated contexts ranging between the late A.D. 500s and the 600s, these assemblages reveal evidence of diachronic technological and morphological changes not clearly represented in currently established Mimbres typologies. Of particular interest, a new arrow type called the Diablo Corner Notched is believed to be diagnostic of the phase.

Turner, Andrew (University of California, Riverside)**[88]** *Religion, Ritual, and Ideology in Epiclassic Highland Mexico*

Studies of the visual systems of the major sites of Epiclassic Highland Mexico have tended to focus on their common writing system and similarity in art styles. There is much to be gained from these lines of inquiry, but relatively few works have investigated the shared religious content conveyed in Epiclassic artwork. This paper evaluates preexisting theories concerning Epiclassic pan-Mesoamerican cults and argues that religious and ideological beliefs concerning Flower World, a solar paradise inhabited by the souls of deceased warriors, were widespread, as represented in Epiclassic art and iconography. Imagery related to Flower World is prevalent in the artwork of Cacaxtla, Xochicalco, and Teotenango, but beliefs concerning the flowery paradise also spread along routes of exchange to more distant parts of Mesoamerica. This set of beliefs was inherited from Teotihuacan, but was adapted to suit the needs of the smaller Epiclassic polities. The Flower World complex valorized warfare and linked elites through shared ritual practice, identity, and exchange of exotic prestige goods. Investigation of the development of the Flower World complex is crucial for understanding broad-scale interactions during the Epiclassic.

[88] *Chair***Turner, B****[295]** *The Role of Environment in the Collapse of the Ancient Maya*

Understanding the socioeconomic demise and depopulation of much of the Maya lowlands from the eighth to tenth centuries has been influenced historically by environmental evidence and human-environment frameworks emanating from beyond archaeology. Climate change was involved as early as 1917, but subsequently muted by the excesses of environmental determinism. The role of environment was subsequently reinstated in the latter parts of the 20th century, especially influenced by compelling evidence from paleoecology. More recently, this role has been amplified as attention turns to past analogues of human-environment "tipping points" to inform sustainability science. The weight of the evidence increasingly indicates that the Maya collapse coincided with prolonged aridity and profound landscape changes, the feedbacks of which affected temperature, precipitation, and soil nutrient conditions, seriously challenging human-environment relationships in the Maya lowlands. It is a simplification, however, to invoke environment alone or primarily as the source of the collapse. Research attention must begin to address the collapse-period human-environment conditions relative to those in other periods of Maya hiatuses, raising the question why previous stress points were successfully tackled by the Maya as well as the extended paucity of occupation of much of the Maya lowlands.

[350] *Discussant*

Turner, Elaine [396] see Garcia-Moreno, Alejandro

Turner, Michelle (Binghamton University)**[418]** *The Appropriation of Native American Cultural Property: Comparing the U.S. and French Contexts*

When Native American sacred objects were recently auctioned off as art in Paris, many Americans were shocked by the headlines. American institutions and archaeologists continue to face their own histories of appropriation of Native American culture and objects, but many in the U.S. still seem surprised by the extent to which European institutions resist calls for more sensitive handling of cultural property. Others see a disparity between a widespread acknowledgement of the need to repatriate Holocaust-looted objects, while similar issues are not always acknowledged when it comes to objects that originated from indigenous groups. But are there genuine differences between American and European responses to appropriations of cultural property? If so, is Europe just catching up, or are there significant legal and cultural factors that account for the differences? This paper will explore understandings of cultural property in the U.S. and in France and compare relevant aspects of the legal frameworks in each country. It will discuss how these frameworks protect, or fail to protect, Native American interests in what happens to cultural property and will also

consider how we can move forward towards increased, and more just, protection for sacred objects and other cultural property.

[418] *Chair*

Turner, Daniel [118] see Meredith, Steven

Turner-Livermore, Bethany [203] see Gadison, Davette

Turney, Kathryn (University of Arizona)

[364] *Pot Hunting, Artifact Collection and Site Destruction: A Study of a Multi-Generational Pot Hunting Family on the Colorado Plateau*

Both historic and prehistoric archaeologists rely on oral history as a powerful tool for understanding archaeological context. Although traditional archaeological research can provide useful information about the past, gathering information from ethnographic or historical sources can shed light on past uses of material culture. Oral history can also provide useful information about traditions, belief systems and origin stories. The focus of this project has been to interview people with ties to the archaeology of the Petrified Forest National Park and the surrounding areas. By documenting these oral histories archaeologists and future generations may be able to better understand the interaction between the archaeology in and around Petrified Forest National Park and the local community and how this relationship has changed through time. One family interviewed for this project gave detailed accounts of artifact collection on private land over a period of four generations. The focus of this study is to interpret the collection strategy of one family over generations. By understanding the "who, what, where, when and why" of one family's approach to prehistoric material culture researchers can begin to solve the problem of looting on both public and private land through the process of education and engagement.

Turq, Alain [35] see Goldberg, Paul

Tushingham, Shannon (Washington State University)

[65] *The Evolution of Sociopolitical Organization in Northwestern California*

Northwestern California has long been recognized as a unique area at the margin of both the Pacific Northwest Coast and California. Recent excavations at sites along the Smith River in Tolowa ancestral territory can help us elucidate long-term evolutionary trends among affluent foragers in the region. This paper will examine some of the profound alterations in human organization that occur at Red Elderberry (CA-DNO-26), a site located along a portion of the Smith River known as a highly productive salmon procurement location. Included is a review of recent analyses of Red Elderberry site materials and comparisons to recent excavations at a series of coastal sites along the Del Norte and Humboldt County coast. Together these investigations provide new insights into settlement and subsistence, in particular a better understanding of the evolution of sociopolitical organization during the Late Holocene after the rise of sedentary plank houses villages.

[65] *Discussant*

Tushingham, Shannon [302] see Anderson, Shelby

Tutchener, David (Flinders University, Australia)

[50] *Far Northern Queensland: Cape York and Aboriginal Historical Archaeology.*

This poster outlines the initial findings of the first phase of fieldwork conducted in the central Cape York region of Queensland. The Cape York region of far northern Queensland has been the focus of intercultural interaction on the Australian continent for many years. It was not until the mid-19th century that colonial expansion in this area flowed up from the south and was the cause of major conflict between Europeans and Indigenous Australians. This history of invasion, genocide, mining and pastoralism has been explored by a number of Australian historians. Very little archaeological work has been conducted in the area of central Cape York, none of which has focused on the Aboriginal inhabitants of the area. The Kuuku I'yu (northern Kaanju) people of Cape York have provided the impetus for this research. The themes that will be explored in this study are: the European settlement in Cape York, frontiers and conflict, contact and colonialism, Aboriginal resistance and labor. These themes will be examined through the lens of Aboriginal historical archaeology. The three potential sites under investigation include the Wenlock (Batavia) Goldfields, a Native Police Camp at Clayhole Creek and the remains of the Mien Telegraph Station.

Tuttle, Christopher [8] see Ernenwein, Eileen

Tweten, Lisa [121] see Gardner, Chelsea

Twiss, Katheryn (Stony Brook University)

[406] *Ecology, Ceremony, and Animal Bones from Southern Mesopotamia*

Diane Gifford-Gonzalez has written numerous zooarchaeological papers that wonderfully balance attention to both the ecosystemic and the cultural influences that shape how humans interact with animals. In a 2008 essay exploring zooarchaeology's potential contributions to the study of daily life, she wrote that pastoralists' herd management strategies are constructed in the contexts not only of regional ecosystems and animal biologies, but also of human economies, ideologies and politics. At the same time, Gifford-Gonzalez has never discounted the importance of ecology and ethology in shaping human-animal interactions: her widely-read papers address topics from cattle diseases to fur seal ecology. This paper honors Diane Gifford-Gonzalez's demonstrations of the impacts that both nature and culture have on zooarchaeological assemblages. It discusses ecosystemic and ideological factors that shaped the patterning of animal remains from the 2nd millennium B.C. site of Tell Sakhariya in southern Iraq.

Tykot, Robert (U. of South Florida)

[411] *Long Distance Material Movement in the Mediterranean: Obsidian Transport, Trade, and Technology*

In the Mediterranean Neolithic, obsidian often traveled over 100 kilometers from the geological island sources. The capabilities of interregional maritime transport of many foreign materials by the late 7th millennium B.C. is demonstrated by the settlement of these islands and with the neolithic package of animals brought from the mainland. The quantity, quality, accessibility, and physical and visual features of obsidian from each source has been well studied, and chemical analysis distinguishes not just each island, but specific subsources, while some primary production areas have been identified. Extensive analyses of obsidian artifacts from many archaeological sites in Italy, France, Croatia, Malta, and Tunisia has enabled interpretations about the chaîne opératoire, and how production, transport, and use changed over thousands of years. Results of my research on the geological sources and subsources, and chemical analysis of more than 6000 obsidian artifacts, show that obsidian was used in clearly discriminatory patterns, with selected use of certain subsources; there was inter-regional and intra-site variation in source utilization and frequency of transport; and there were likely socioeconomic changes over the course of the Neolithic which affected access to the sources, the scale of production, and the parallel movement of knowledge, ceramics, and other materials.

Tykot, Robert [412] see Freund, Kyle

Uberseder, Alexa [53] see Egeland, Charles

Ueda, Kaoru [238] see Koller, Jared

Ueki, Takeyuki [53] see Izuho, Masami

Uemine, Atsushi (Doshisha University)

[145] *Settlement Expansions during the Yayoi Period, Japan*

This paper intends to explain how a small number of small-scale Jomon societies in western Japan evolved to large-scale agricultural societies that characterized the Yayoi Period. Traditionally, Japanese archaeologists have approached this issue from the standpoint of settlement archaeology. This paper contributes to understanding this phenomenon based on lithics and their contexts of discoveries. By analyzing the assemblages of chipped stone tools and debitage, it becomes possible to approach the procurement of raw material rocks, their transportation, their use at settlements, and ultimately relationships among human groups. The results of author's analyses of data in the central Osaka Prefecture suggest that ties among settlements became clear in the late phase of the Final Jomon Period (ca. tenth to sixth centuries B.C.), and these ties were maintained in the Early Yayoi Period (ca. fourth to third centuries B.C.). In the Middle Yayoi Period (second and first centuries B.C.), ties formed among settlements close to one another. It is possible to interpret that a cluster of several units of settlements tied one another seemed to be a large-scale agricultural society. In other words, the large-scale Yayoi settlements were a "descendant" of evolving Jomon society.

Ugan, Andrew [296] see Simms, Steven

Ullah, Isaac (Arizona State University) and C. Michael Barton (Arizona State University)

[84] *Complexity in Space and Time: Spatio-Temporal Variability and Scale in Simulations of Social-Ecological Systems*

Over the last decade, the Mediterranean Landscape Dynamics Project has integrated complex systems concepts with computer simulation and empirical data in research on early farming systems. We have developed a computational laboratory, composed of multiple interacting models that are dynamically and recursively linked. to study how small-holder Social-Ecological Systems (SES) grow and change over time, how they react to major system state change, and how specific system variables affect the trajectories of these SES over space and time. Here, we apply this approach to questions of temporal and spatial scale related to the drivers and consequences of long-term change in SES. In particular, we examine how spatio-temporal "misalignment" between sub-systems can generate social-environmental variability and feedbacks in early SES. We present a theoretical framework for the development and consequences of these mismatches over the long term, with particular attention paid to the development of early farming SES. Related to this, we also consider how the scale of observation affects our interpretation of apparent change in these SES. We use examples from experiments conducted in our modeling laboratory to illustrate these concepts.

Ulloa Hung, Jorge [199] see Sonnemann, Till

Ulloa-Montemayor, Ximena (Instituto De Investigaciones Antropológicas, UNAM), Joaquín Arroyo-Cabrales (Subdirección de Laboratorios y Apoyo Académico, IN), Eduardo Corona-M. (Centro INAH Morelos, INAH), José Alberto Cruz (Posgrado en Ciencias Biológicas, UNAM) and Diana Karina Blancas (Escuela Nacional de Antropología e Historia)

[141] *Estudio Arqueozoológico del sitio precerámico de San Gregorio, Xochimilco, México*

Uno de los sitios del Precerámico tardío más explorados en los últimos 25 años es San Gregorio Atlapulco, Xochimilco, Distrito Federal, México. En el mismo se han realizado varias temporadas de excavación por diversos grupos de investigadores, y entre los materiales que se han estudiado están los arqueozoológicos. La más reciente excavación no fue la excepción, se obtuvo una

colección de animales que nos permiten tener una idea más clara de lo que fue el paisaje y el paleoambiente hace 6200 años a. p. y hasta temporalidades más recientes, ya que existe una mezcla de animales silvestres y domésticos, incluidos los europeos. Entre los primeros, hay una gran diversidad al tener mamíferos como venados, mapaches y tuzas, así como anfibios, particularmente ajolotes, reptiles (tortugas) y aves, acuáticas principalmente como distintos anátidos. El estudio de restos permite dimensionar el aprovechamiento animal en la escala temporal que tiene el sitio y compararlo con otros similares, y además nos permitirá reconocer las relaciones de los humanos con el medio ambiente en que vivieron.

Umberger, Emily (University of Arizona)

[194] *Warrior Regalia and Questions of Inalienable Possessions in the Aztec World*

A fascinating aspect of Frances Berdan's new text, *Aztec Archaeology and Ethnohistory* (2014), is the section in Chapter 8 on warrior regalia as inalienable possessions. This topic is explored by Berdan in a rich discussion that merges Annette Weiner's framework with Berdan's own exhaustive knowledge of written and pictorial manuscript sources on the Aztecs. I would like to take this exploration into the realm of material evidence, by examining particular sculpted examples in the Aztec World. The examples are depictions of shields: rock art depictions representing the Aztec Empire in conquered areas and relief depictions representing the Matlatzinco polity (the Toluca area) before Aztec conquest. How were these shields to be understood locally in both pre-and post-Aztec times, and how did they function in inter-ethnic relations between the two groups?

Underhill, Anne (Yale University)

[335] *Urbanization and Ceramic Change: An Exploration of the Relationship*

Previous studies about the production, distribution, and consumption of craft goods in complex societies emphasize social relations at the household, site, and regional scales. An often neglected component is the nature of economic organization within different neighborhoods of large settlements. This paper argues that we should attempt to understand neighborhoods as meaningful communities for inhabitants of urban centers. These smaller communities can have a major impact on the nature of social demand for different kinds of craft goods, methods of circulating items, and the organization of labor to produce goods. This presentation describes an assessment of social demand for especially valued ceramics and patterns of access to these goods in different neighborhoods of the late prehistoric regional center of Liangchengzhen in southeastern Shandong province, China. It then describes an analysis of the degree of standardization for different kinds of ceramic vessels. It is argued that investigations about the strategies of potters in urban centers to produce different kinds of vessels should consider the nature in which such centers are organized and grow over time.

Uomini, Natalie (University of Liverpool)

[33] *Chair*

Uomini, Natalie [33] see Morgan, Thomas

Upton-Taboas, Charity (Indiana University)

[162] *Changing Foodways in Precolumbian Illinois*

Precolumbian Native Americans of Illinois have had a long history of plant production from foraging to cultivation via horticulture to domestication via agriculture. Isotopic analysis has been used as a standard for comparing diet from different sites and isotopic ratios are given as parts-per-mil (‰), and reflect the consumption of types of food. Carbon isotopes ($\delta^{13}\text{C}$) can indicate the types of plants eaten and nitrogen isotopes ($\delta^{15}\text{N}$) indicate the trophic level of protein sources in the diet. The Archaic people of Illinois are viewed as being highly mobile hunter and gatherers, but with the advent of horticulture, their mobility began to decrease as they centered their movements around seasonally based camps. During the Woodland time period, horticulture was intensified and the people became semi-sedentary with permanent settlements. Mississippian people were considered sedentary with

the arrival of agriculture and the formation of towns. Hunting and fishing continued to be a regular activity. Regional variance does exist, but overall, through the history of the Precolumbian Native Americans of Illinois, there is a general trend in increased $\delta^{13}\text{C}$ levels as maize is adopted as a staple diet. Nitrogen levels did not change drastically over time, indicating a consistency in protein intake.

Upton, Andrew [365] see Bengtson, Jennifer

Upton, Andrew (Michigan State University), Jodie O'Gorman (Michigan State University), Michael Conner (Illinois State Museum) and Terrance Martin (Illinois State Museum)

[365] *The Role of Public Space in Identity Making at Morton Village (11F2)*

The circa 1300 A.D. Morton Village site in west-central Illinois lies at the intersection of Mississippian and Oneota worlds. High levels of violence and social stress witnessed in the site's nearby Norris Farms #36 cemetery suggests that regional social interaction was marred by internecine conflict and raiding. The multi-ethnic nature of cohabitation at the site, on the other hand, suggests that ritual and cultural convention were creatively modified to reflect a new multi-cultural reality. This is reflected in novel uses of public space and unique public structure architecture. Morton Village lacks the typical public buildings and spaces seen in Mississippian contexts elsewhere such as a plaza, large chiefly structure, or rectangular council house. It is instead marked by a large, repeatedly rebuilt circular wall trench structure, a large single post public structure, and an open village layout. The novelty of these public spaces and structures will be contextualized via comparisons to similar spaces and structures at two other Late Prehistoric sites in west-central Illinois: Crable and Orendorf.

Urban, Thomas (University of Oxford), Ian Buvit (Central Washington University), Steven Hackenberger (Central Washington University), Robert Jacob (Bucknell University) and Jeffrey Rasic (National Park Service)

[8] *Geophysical Investigation of the Slaven's Roadhouse Site, Yukon-Charley National Preserve, Alaska*

The Slaven's Roadhouse Site in the Yukon-Charley National Preserve, Alaska, is a multi-component archaeological site with historic-age buildings and a prehistoric record dating to at least 4,000 B.P. The site is located on a deep, stratified river terrace along the Yukon River. Work conducted in 2008 revealed a mid-Holocene age cultural component at a depth of 0.5 m, however, the stratified deposits extend as deep as 6 m and have good potential to contain significant archaeological deposits dating to as early as 14,000 B.P. Locating cultural deposits at such depths posed a challenge for conventional invasive testing, which we attempted to surmount with the use of a battery of geophysical methods. The 2014 investigation included ground-penetrating radar, electromagnetic induction methods at two transmitter-receiver offsets, magnetic gradiometry, and DC resistivity. Preliminary results, presented here, revealed a number of potential archaeological features, some of which are deeper than 4 m.

Urban, Patricia [314] see Ausec, Marne

Urban, Patricia (Kenyon College)

[314] *Variations in Late and Terminal Classic Ceramic Firing Facilities within Southeastern Mesoamerica*

Research conducted in the adjoining Naco and Middle Chamelecon and Cacaupala River (MCC) valleys of northwestern Honduras has revealed a wide array of ceramic firing facilities and implements used in fabricating pottery vessels during the Late (A.D. 600-800) and Terminal Classic (A.D. 800-1000). The diversity of manufacturing processes is especially well represented at two major workshops, one located at the Naco valley center of La Sierra and the other at the site of Las Canoas in the MCC. The presentation illustrates and describes the variation observed among these ancient firing structures, highlighting the ways in which differences in production scale and complexity might have been implicated in the area's Terminal Classic political economy.

Urcid, Javier (Brandeis University)**[39]** *Teotihuacan and Post-Teotihuacan Writing in the Central Highlands as seen from NW Oaxaca and Southern Puebla*

The Ñuiñe script from NW Oaxaca and Southern Puebla was an eclectic writing tradition that spanned the 5th through the 9th centuries A.D. Its users shared scribal practices with Zapotec, Teotihuacan, and post-Teotihuacan Highland urban centers, deploying them in novel ways. In this paper the script is used as a proxy to ascertain its shared features with Zapotec and Teotihuacan writing, as well as the extent to which Central Highland polities that thrived politically and economically after the balkanization of Teotihuacan, related to it. In doing so, several societal implications of writing practices are highlighted to better understand the dynamic stage of ancient Mesoamerican history that straddles the political demise of Teotihuacan.

Uribe, Mauricio**[184]** *Cabuza y Maytas (Norte de Chile): ¿Tiwanaku, Post-Tiwanaku o No-Tiwanaku en Arica?*

A partir de nuestros estudios de la cerámica de Arica en la década de 1990, propusimos la existencia de dos tradiciones de producción local que se desarrollaron a lo largo del período Medio, en mayor o menor grado, por el impacto de Tiwanaku en los Valles Occidentales. En aquella oportunidad, definimos una Tradición Altiplánica tecnológica, estilística y contextualmente integrada a Tiwanaku, por lo que llegó a desaparecer junto con esa entidad. En gran medida paralela, aunque un poco más tardía, diferenciamos luego una tradición de Valles Occidentales, la que se impuso a fines del período Medio y evolucionó durante el Intermedio Tardío. Esto lo entendimos como expresión de una reacción a la influencia altiplánica de parte de la población local, dentro de un proceso generalizado en el extremo sur del Perú y norte de Chile que involucró a valles y costa. Resultado de lo anterior, sería el surgimiento de la Cultura Arica en los valles septentrionales chilenos. A casi 15 años de esta propuesta y en homenaje a Oscar Espouey, acogemos la invitación a este simposio para revisar nuestros datos cerámicos y retomar la discusión originalmente planteada por Dauelsberg, Lumbreras y Núñez sobre la problemática Tiwanaku y Post-Tiwanaku en Arica.

[318] *Chair*

Uribe, Mauricio [378] see Santana Sagredo, Francisca

Urquhart, Kyle, Christopher Fisher (Colorado State University) and Stephen Leisz (Colorado State University)**[21]** *Ireta and Vapatzequa – Applications of the Alteptl Model to the prehispanic P'urépecha*

At the time of Spanish contact, Michoacan was under the control of a large empire centered at the capital of Tzintzuntzan in the Lake Pátzcuaro Basin. Prior to the rise of the Postclassic empire, the P'urepecha were organized into a series of small- to mid-scale polities known as ireta, which could be considered roughly analogous to the Nahuatl altepetl. These polities consisted of a series of nested territorial divisions composed first of named barrio-level units called vapatzequa followed by smaller complejos formed from groupings of individual households. This paper outlines the historical basis for this model of government and explores its archaeological applications and implications for the formation of the empire in the Late Postclassic.

Urton, Gary (Harvard University)**[78]** *"Hierarchy, Power, Identity and Time: Building a Khipu Simulacrum of Chachapoya Society at Laguna de los Cóndores"*

In 2005, the author published a study of a large khipu found in the plundered remains at the rock overhang site at Laguna de los Cóndores. That publication focused on the calendrical features of this khipu, showing that it was composed of cord groupings that constituted a two-year calendar. Subsequent study of the large sample and other, smaller khipus also found at the site show evidence of a process of the collection of information from several smaller cord records (perhaps from subordinate khipukamayus in the region) and their synthesis, perhaps by a head khipu-keeper residing at the lake, into the large khipu. This paper explores the evidence in these materials for a

process of constructing a khipu model – a simulacrum – of the hierarchical Chacha/Inka society that was emerging in the area at the time.

Uruñuela, Gabriela (Universidad de las Americas Puebla) and Patricia Plunket (Universidad de las Américas Puebla)

[303] *The Virtual Reconstruction of “Los Bebedores Mural” from Cholula, Puebla, México*

Almost half a century has gone by since the discovery of Los Bebedores (The Drinkers) in 1969, and it still has not received the attention that one of the most extensive large format murals in Mesoamerica deserves. Poor preservation, a hasty recording because the Cholula Project was ending, an unfortunate later restoration, and the repetitive selection of the more obvious personages to illustrate the few publications on the theme, are just some of the factors responsible for the scarce attention paid to this more than 50 m long by 2.5 m high work of art painted in the third century A.D. Using high definition images and over-contrasting them allow us to appreciate not only details but even whole figures that are almost invisible to the naked eye, and thus to make the drawings to reconstruct a scene much more sophisticated and realistic than the cartoon-like images that have been published. The data revealed by this process offer the opportunity to make a new reading of this neglected work of art and to use it as another window to enhance our view of Early Classic Cholula.

Vacca, Kirsten (University of California, Berkeley)

[113] *Social Interaction through Structured Use of Space in the Early Hawaiian Household*

Archaeological investigations of pre-European contact Hawai'i rarely consider gendered space within the household—specifically, female spaces. Some scholarship addresses male spaces, yet few researchers currently attempt to understand the household and the landscape in terms of complex gendered interactions. In addition to this lack of household research, issues of androcentrism and historical linearity plague many Hawaiian ethnohistories, leaving fundamental gaps in knowledge that can be filled through concentrative archaeological research. This paper presents research from Nu'u, Kaupō, Maui in the Hawaiian archipelago, focusing on a gendered analysis of the archaeological record through engagement with oral traditions and gender and feminist theory. The central question to be addressed is the formal organization of space and how this structured social interaction within late pre-European contact Hawaiian house complexes. The research privileges archaeological remains, analyzing placement and construction of residential architecture as well as artifacts and ecofacts recovered from residential landscapes. The integration of feminist theory and oral traditions with the carefully collected archaeological data paints a more nuanced picture of gendered social relations and the use of space in the household.

Vadala, Jeffrey (University of Florida)

[316] *Using VR Phenomenological Landscape Analysis to Explore Diachronic Ritual Space at Cerros, Belize*

The Oculus Rift virtual reality headset used alongside 3D site reconstructions provides a huge potential for a phenomenologically based landscape analysis. This presentation explores the methods and results of a study using these technologies that focuses on understanding the diachronic changes in the construction of ritual space at the Maya site of Cerros, Belize. Site maps were modeled in 3D according to each historic phase and converted for use in a highly immersive and interactive video game engine compatible with the Oculus Rift. When combined with virtual reality, Cerro's 3D recreated monumental site core creates a sense of spatial immersion that virtual reality specialists call “presence,” a sense of being in another place. Phenomenological considerations of embodied movement in space could thus be analyzed in tandem with the active generation of visual fields. With this capability, the built and unbuilt landscapes were diachronically analyzed, focusing on how changing spatial orientations affected embodied movement, emerging visual fields, and the experiential capacities of public and private ritual events.

[316] *Chair*

Vadillo, Margarita [155] see Aura Tortosa, J. Emili

Vaesen, Krist (Eindhoven University of Technology) and Wybo Houkes (Eindhoven University of Technology)

[191] *No Strength in Numbers After All? Demographic Explanations of Cumulative Culture Re-Examined*

Cultural-evolutionary models of scientific and technological change enjoy growing popularity. This family of mathematical and agent-based models purportedly explains how cultural change results from a 'demographic' effect: complex traits accumulate in large groups, and disappear in smaller groups. We use agent-based modelling to reveal hidden contingencies in these findings. We show that the demographic effect is sensitive to assumptions regarding social learning mechanisms and skill distributions, and particular definitions of complexity, for which there are empirically plausible alternatives. Further, we examine in what sense demographic models of cumulative culture, even if exhibiting robust results, can be said to explain particular transitions, e.g., the loss of culture in Holocene Tasmania, the Upper Paleolithic transition, or the growth of scientific knowledge since the Industrial Revolution. We consider various proposals offered in the philosophy of science, and demonstrate that none of them is satisfactory. From this we conclude that either we need a new account of explanation, geared specifically to cultural evolutionary models, or we need to let go of the idea that these models can do much explanatory work.

Vail, Gabrielle [158] see Duncan, William

Vail, Gabrielle (New College of Florida)

[303] *Gender Ideologies in Zapatista Maya Murals and Postclassic Mural Programs from the Eastern Maya Seaboard*

Zapatista murals focusing on the autonomy of Maya women and their connections with the earth have strong ties to prehispanic iconographic programs that emphasize the role of female supernaturals and ancestors in nourishing and sustaining the cosmos. This presentation examines ideologies of the Zapatista movement, particularly those related to gender, as represented in the artwork associated with the movement, and draws comparisons to ideologies represented in mural programs such as those from Postclassic Tulum, as well as the Maya codices, which evidence strong notions of gender complementarity. Sculptural representations from Classic period sites in the Usumacinta region will also be examined, as they appear to form a particularly potent symbol for contemporary Zapatista artists, as do polychrome ceramic vessels featuring birthing scenes.

Valcarce, Ramon

[353] *Riders on the Stone*

Horse riding scenes are arguably about the most emblematic representations within post-paleolithic open air rock art in Galicia (NW Iberia). They have been used as a controversial chronological milestone, setting them somewhere between the Final Neolithic and the Iron Age. Such an iconography may be related to a shift in the Human/Nature relationship that we see in later prehistory. While not discarding that they are showing real activities, we believe the riding scenes could be emphasizing a new interventionist attitude of the human groups on the environment. Such an empowering stance would be well reflected in the otherwise bizarre representations of deer riding. Moreover, horse riding images - together with the carvings of metallic weapons - seem to underline the rise of the male warrior in the framework of an increasingly divided society.

[137] *Chair*

Valdez, Lidio (MacEwan University)

[411] *Cultural Interaction and Cultural Change in the Peruvian Central Highland Valley of Ayacucho*

Human societies are not isolated islands; instead, they are part of a complex web that links them with distant communities who are not only culturally different, but also inhabit different environmental settings. In the distant past, cultural interaction was a window that enabled the exposure to previously unknown cultural customs and the flow of ideas, in addition to access to foreign exotic

goods and the establishment of new kinship ties. Contact with more complex societies and important locations likely also resulted in the enhancement of status and prestige of specific individuals. Archaeological evidence coming from the Peruvian central highland valley of Ayacucho indicates that as early as the late Early Intermediate Period (ca. 450 – 550 C.E.), the ancient inhabitants of the region were already part of a large network that linked them with their neighbors of the eastern tropical rain forest region as well with the inhabitants of the dry Pacific coast region. Interaction among members of different cultures precipitated not only the acceptance of previously unknown products and associated cultural practices, such as the use of coca leaves, but also significant cultural transformation in the Ayacucho Valley that ultimately culminated in the establishment of the Wari State.

Valdez, Jr. , Fred [248] see Sweeney, Angelina

Valentin, Norma (Instituto Nacional de Antropología e Historia)

[346] *The Art of Preserving Skins in the Great Temple of Tenochtitlan*

The use of animal fur in ancient Mesoamerica is well known due to the historical records, sculpture and painting. Archaeologically, it has been inferred by some evidence, as the presence and absence of certain animal bones and the cultural traces they present (abrasions, cuts and perforations, for example). In the offerings of the Sacred Precinct of Tenochtitlan, Mexico, there has been found a large number of skeletal remains of four classes of vertebrates (fishes, reptiles, birds and mammals) which traces allow us to tell that these are vestiges of preserving hides. Detailed analyses of the bird bones has allowed to find a group with strong similarities in their manufacturing traces, that can be proposed to pertain to a tenocha style, in contrast to others that are thought to be of foreign origin.

Valentina, Mandakovic [318] see Vidal Elgueta, Alejandra

Valentino, Claudia (Editor in Chief Archaeology Magazine)

[222] *Discussant*

Vallebuena, Miguel (LANGE BIO), Jose Luis Punzo Díaz (Instituto Nacional de Antropología e Historia), Brenda Álvarez-Sandoval (Laboratorio Nacional de Genómica para la Biodivers), Sara García (Laboratorio Nacional de Genómica para la Biodivers) and Rafael Montiel (Laboratorio Nacional de Genómica para la Biodivers)

[231] *Paleogenomic Perspectives of Archaeological Human Samples from Durango, Mexico*

Despite the great number of methodological obstacles, the molecular biology applied to the field of Archaeology has proven to be an important complementary tool to interpret the population dynamics of ancient populations. The mitochondrial DNA, as it is inherited in a matrilineal way, has information about the relationships of the human groups under a population context. In collaboration with LANGE BIO, several archaeological human samples from Durango Mexico have been subjected to ancient DNA analysis, identifying the mitochondrial haplogroup of eight individuals from the valley and mountains regions. The new challenge of this data is to infer the genetic relationship between different groups of samples, related with the archaeological hypothesis about them, and the analysis of more samples in order to gain statistical power for population analyses. The main focus of this talk is to present our current results and the perspectives regarding ancient DNA analyses in Durango, and discuss the future population analysis.

Vallejo-Caliz, Daniel [183] see Lemonnier, Eva

Vallejo-Cáliz, Daniel [24] see Kidder, Barry

Valtierra Vega, Daniel, Emiliano Ricardo Melgar Tisoc and Reyna Beatriz Solís Ciriaco

[217] *Local or Foreign? The Technological Styles of the Lapidary from Tamtoc*

At Tamtoc, an archaeological site located at the Huastec region in San Luis Potosi, the archaeologists found hundreds of lapidary objects in the offerings and burials. Some of them were crafted in raw materials that were available locally, like the calcite, while others came from distant areas, like the jadeite. But, was their provenance the same of their production? The purpose of this paper is to show how the technological analysis with Experimental Archaeology and the characterization of the manufacturing traces with SEM, allowed us to identify and distinguish at least two lapidary styles, one local and the other foreign. Finally, we compare the results with other lapidary collections to appreciate the relationships with other regions and cultures.

Valtierra Vega, Daniel [231] see Castillejos González, Giovanni

Van Alstyne, Benjamin (UNLV) and Karen Harry (UNLV)

[48] *Using Building Information Modeling Programs to Understand the Built Environment of the Virgin Branch Puebloan Culture*

Architecture has always been a key focus in archaeological research. This is because it dominates the context where the investigation takes place. However, there is a dearth of research concerning the vernacular architecture within the built environment of the Virgin Branch Puebloan (VBP) people on the Shivwits Plateau. This stems from the sediments of the area, which have obliterated most floor features and thus have limited the amount of architectural information that can be recovered. To compensate for this lack of structural evidence, this research utilizes architectural Building Information Modeling (BIM) programs, in conjunction with ethnographic and archaeological data, to model the construction of a VBP pueblo digitally. The BIM model, however, goes beyond visual imagery. Once constructed, the model makes it possible to carry out a variety of architectural, structural, thermal, and solar analyses. In this study, the BIM model is used to obtain information on the type of construction materials used, the labor requirements needed to construct the pueblo, and the thermal dynamics of each room. This case study demonstrates the potential of BIM programs to substantially contribute to our understanding of prehistoric lifeways.

Van Der Leeuw, Sander (SHESC)

[288] *Learning from the Past about the Present and for the Future*

This paper argues that we would massively increase the value of our archaeological understanding of the past for the present if we cast it differently. Rather than use a reductionist, 'ex-post' approach (which explains the present by invoking the past, looking for origins), we should be using an "ex ante" approach that looks at the emergence of change, allowing us to learn from the past about the present and for the future. The paper first briefly summarizes some of the difficulties encountered in implementing such a different approach, at the level of our cognition, our scientific practices, and our paradigms, and then illustrates some of the changes in perspective such a shift would bring about. In particular, rather than see the Maya world as a unit, and look at regional differences within it, this would create a perspective in which different, initially more or less independent, rural regional developments converge in a long-term socio-environmental co-evolution to create an urbanized Maya world. As part of that co-evolution, new 'tools for thought' are conceptualized, and new values are discovered which enable new adaptations.

[218] *Discussant*

Van Der Reijden, A. Jay (IoA, University College London)

[132] *A Global Classification System for Cultural Dental Modification: Created and Assessed*

Culturally modified teeth are one of the few personal identity markers to survive into the archaeological record, have modern comparatives, and exist as a global deep-time behavior. Typology and description, however, have suffered from a multitude of, often misinterpreted, classification systems usually restricted to specialized geographical areas and local publication. With the high variation of designs, a lack of consistent codified definitions makes cohesive discussion frustratingly difficult, highlighting that a new, clear global classification system is overdue. Expanding on the frequently-used works of Romero (1958-1986), a renewed classification model is presented, supplying continuity between past and future work. It provides an integrated system synthesizing

previously temporally and spatially scattered examples, located via the literature and online museum collections. Pursuing a logical structure, modifications are integrated by more precise, defined descriptions and clear drawings. Usability and successfulness were assessed via both standardized participant evaluations and examples held at the Natural History Museum, London; results were adjusted and improved the classification. This classification system provides a functional tool for global comparisons, supplying a framework to discuss designs in clear, unified codes rather than confusing or imprecise descriptions, while also removing the necessity to access scattered, rarely reprinted classifications.

Van Der Voort, Madeline (University of Nevada, Reno)

[92] *An Analysis of an Early-to-Mid Holocene Projectile Point Assemblage from Little Steamboat Point Rockshelter, Warner Valley, Oregon*

Little Steamboat Point 1 (LSP-1) is a small stratified rockshelter in Warner Valley, Oregon. It contained an early-to-mid Holocene component consisting of faunal remains, lithic tools, and debitage. My use-wear analysis of 20 Great Basin Stemmed and Cascade projectile points examines how those tools were used via macroscopic and low-power microscopic techniques. Since the shelter seems to represent a short-occupation activity site, this analysis provides insight into the hunting and processing practices employed in the area. The use-wear results are compared with XRF data for the specimens to explore toolstone procurement and use at the shelter. These results contribute to reconstructing broader mobility and technological organization strategies of prehistoric groups in the region.

Van der Woort, Madeline [35] see Smith, Geoffrey

Van Dyke, Ruth [348] see McGuire, Randall

Van Dyke, Ruth (Binghamton University), R. Kyle Bocinsky (Washington State University) and Tucker Robinson (Woods Canyon Archaeological Consultants)

[354] *Friends in High Places: Windes, Shrines, and Lines of Sight*

In the 1970s, Tom Windes began documenting shrines and stone circles around Chaco Canyon. Decades before landscape archaeologists spoke of viewsheds, Tom recognized the significance of visibility at Chaco. He observed that J-shaped Windes' shrines create intervisible connections among great houses, and he pointed out that stone circles in Chaco are always within sight of one or more great kivas. Today, GIS is a useful tool for examining intervisibility across large areas. Inspired by Tom, and utilizing data he collected and graciously shared, we employ GIS line of sight and viewshed analyses to assess intervisibility among great houses, shrines, stone circles, herraduras, and high places across the Chacoan world. As Tom originally postulated, we demonstrate that shrines on high places create a network of intervisible connections linking outlier communities and landforms. It is possible that the boundaries of Chaco are defined in some sense by intervisibility.

Van Galder, Sarah [152] see Jolivet, Stephanie

Van Gijn, Annelou (Leiden University)

[17] *Investigating the Toolkit for Building a Neolithic House: Microwear and the Missing Majority*

Many microwear studies focus on one material category. Instead we explored the technological and functional interconnectivity of different tools used in one chaîne opératoire. During the experimental reconstruction of a Late Neolithic houseplan excavated in the Dutch wetlands, we made use of a variety of implements: stone axes and adzes, bone and antler objects, and tools of wood. In total 120 tools were used for almost 20,000 minutes during the four week construction period. We recorded the entire biography of each tool, making Provil casts each time the object switched function. Relevant attributes of the contact material as well as of the tool user were noted. All of the tools were studied for traces of wear, the Provil casts allowing us to follow the history of wear development. Some tasks are well represented in the identifiable weartraces, whereas other phases of the building

process are not reflected. Some tools, notably those of wood, are not likely to survive at all, yet they constituted 25% of the total worked time. In this paper the results of the microwear analysis will be discussed in the light of behavioral and taphonomical perspectives related to the chaîne opératoire of house construction.

Van Gijseghem, Hendrik (Université De Montréal), Giacomo Gaggio (University of California, San Diego) and Kevin Vaughn (Purdue University)

[347] *To Feed the Miner and to Feed the Mine: Some Thoughts on the Macrobotanical Assemblage from Mina Primavera, Nasca Region, Peru*

Mina Primavera was a hematite mine exploited during the first part of the Early Intermediate Period by members of Nasca society. Its exceptional preservation conditions have led to the recovery of a large assemblage of botanical remains. Recent analysis of the ubiquity and diversity of botanical species allow us to reconstruct consumption practices that took place as part of mining activities. However, observation of taphonomic processes and stratigraphic distribution of the hundreds of maize cobs recovered open possibilities for different interpretations of the activities that occurred within the mine during and after the peak phase of exploitation. We outline different hypotheses to explain the state of the maize remains and the contexts in which they were encountered.

Van Hoose, Jonathan (US Army Corps of Engineers / University of New Mexico) and Connie Constan (University of New Mexico / USDA Forest Service)

[239] *Time and Technology at Kwastiyukwa, a Large Classic-Period Pueblo in the Jemez Mountains, New Mexico*

This paper is part of an ongoing study associated with the FHiRE Project, which examines the interaction of fire, landscapes, and people in prehistory in the Jemez Mountains of New Mexico. Before we can examine higher-level questions of demography and interaction through time, it is necessary to firmly establish time with as much precision as possible. This paper represents the first step toward building and anchoring a detailed chronological framework for occupation at Kwastiyukwa, a large Classic-period pueblo in the Jemez Mountains. Technological analysis of the two most abundant kinds of ceramics in the Jemez region, the ubiquitous utility wares and Jemez Black-on-white, provides a data set from which many questions can be addressed. A large sample of the approximately 20,000 sherds obtained through systematic surface collection at Kwastiyukwa allows us to seriate these ceramics according to multiple technological attributes, both in isolation and in combination, achieving a finer-grained understanding of temporal change. This analysis provides insight into the occupation of the pueblo, as well as temporal patterns and technological change in ceramics. This ceramic analysis will be replicated at several other large pueblos targeted by the FHiRE Project, expanding this temporal framework to the broader Jemez region.

Van Kolfschoten, Thijs, Anastasia K. Markova (Institute of Geography RAS, Moscow, Russia), Andrey Y. Puzachenko (Institute of Geography RAS, Moscow, Russia), Alexei N. Tikhonov (Zoological Institute RAS, St.-Petersburg, Russia) and Pavel A. Kosintsev (Institute of plant and animal ecology UB RAS, Yeka)

[74] *Expansion and Extinction: the Collapse of the Mammoth Steppe Fauna*

The fossil record shows how extensive the impact of climate change on the natural environment can be. The woolly mammoth, a prominent member of the animal kingdom during the Late Pleistocene, dominated the fauna of Eurasia for thousands of years. However, rather recently in human history, the woolly mammoth, together with the woolly rhinoceros and the giant deer, became extinct. Other species flourished due to the latest changes in climate and expanded their territories to more northern latitudes of Eurasia. This was a dynamic and fascinating process of species contraction and expansion that was driven by climate change. During this time, humans followed their own path, expanding to the east and crossing Beringia on their way to the Americas. Russian scientists, in close cooperation with Dutch scientists from Leiden University, studied the natural changes in the fossil record during the past 40,000 years. The results of the joint research projects illustrate the impact of changes on the environment in the past as well as in the future.

Van Pool, Todd (University of Missouri)

[245] *Discussant*

Van Vlack, Hannah [163] see Jones, Emily Lena

Van Vlack, Hannah**[407]** *Khao Toh Chong Rockshelter, Krabi: A Reflection on Human Behavioral Adaptations Driven by Environmental Change during Prehistory*

Human behavioral adaptation to environmental change (i.e., sea level rise, monsoonal events) in Southern Thailand is an area of archaeology that has not yielded much study due to the preservation issues or sampling techniques. In a case study approach, geoscience and archaeological methods were utilized to trace environmental and cultural shifts at a rockshelter site occupied throughout the late-Pleistocene and Holocene. Results from this case study begin to answer questions about the foraging strategies employed by hunter-gatherer populations who occupied Khao Toh Chong Rockshelter (KTC). The eco-artifacts preserved at KTC reveal continuous occupation at the site and nuances of environmental and cultural change. Shifting foraging patterns, informed by the zooarchaeological remains deposited at KTC, marks cultural change at the site. Shifts in stable carbon isotopic ratios indicate that flowering plants were more available during the Holocene, when foraging practices shifted. Paleobotanical data suggests poor soil condition, and the need for further analyses of the phytolith assemblage. The articulation of these data sets suggest that foragers focused hunting and gathering around the availability of riparian resources in the estuary, an indication that the transition into wet-rice cultivation was a natural transition possibly adapted from experiential knowledge of the estuary environment.

[407] *Chair*

Van West, Carla [282] see Schelberg, John

Vance, Kelly [178] see Bishop, Gale

Vanderslice, Allison (San Francisco Planning Department) and Randall Dean (San Francisco Planning Department)**[416]** *Assessing Archaeological Sensitivity in San Francisco*

The San Francisco Planning Department archaeological staff reviews hundreds of projects for archaeological sensitivity each year as part of the California Environmental Quality Act review process. To aid this review, the Department has begun a long-term GIS project creating thematic maps and related datasets to inform archaeological site identification, to determine interrelationships between archaeological sites and historical land uses, and to direct research designs. Over the last 8 years the Department has created maps for Yerba Buena San Francisco, Hispanic Period San Francisco, San Francisco Chinese resources, San Francisco Maritime resources, and Prehistoric Period San Francisco. This paper uses the Department's Yerba Buena Period San Francisco (1836-1848) project to illustrate how this tool improves identification of archaeological site sensitivity and significance evaluation. The paper outlines the research undertaken to create the map, how that data is symbolized, and the problems encountered. The paper ends with a discussion of challenges faced by project-specific review and the need for additional thematic layers and historic-period archaeological districts in San Francisco.

VanDerwarker, Amber [172] see Alvarado, Jennifer

VanDerwarker, Amber (UCSB)**[226]** *Social Spaces between Diet and Foodways*

PEB practitioners are increasingly drawing from social perspectives which allow them to shift between concepts of diet and foodways. This increasingly social paleoethnobotany is bolstered by rigorous quantitative analyses of large datasets that facilitate the exploration of temporal and spatial nuances in ancient plant assemblages. This marriage between social theory, analytical rigor, and

large datasets is further strengthened by the trend towards integrating multiple proxies of food data (e.g., starch, phytoliths, macroremains, faunal remains). Ultimately, an integrated, multi-proxy analysis of large plant datasets informed by social archaeological approaches allows PEB to lead research in areas related to gender, identity, warfare, culture contact, and many more.

[334] *Chair*

Vandiver, Pamela (Materials Science and Engrg., University of Arizona)

[241] *Reverse Engineering Ancient Pyrotechnologies*

Technological change is driven by social context and perceived needs, but technological changes are also driven by seven other factors: materials constraints, especially composition and microstructure and availability and ease of processing raw materials, as well as the properties of the materials and the finished products, the nature and complexity of the materials transformations, the methods and sequences of processing, and the suitability to use and performance. Examples will be drawn from some extreme cases of unusual processes and properties that required development of an intimate knowledge of the possibilities and constraints of unusual materials and processes: ceramic farming tools from Iraq, Tibetan braziers, Kazakh drinking cups, decorative Corinthian Greek slips. Variability in the practice of a technology that is available for study on an archaeological site involves observing and reasoning through the errors in manipulation, transformation and use, much as a consultant would find, define and assess problems in a modern factory. To establish and develop an understanding of the behavior represented in craft and workshop evidence, the pace of excavation should slow to allow consideration of the microscopic evidence as intensively as the artifactual, contextual and stratigraphic evidence.

[101] *Discussant*

Vandiver, Pamela [115] see Iizuka, Fumie

VanPool, Christine [6] see Bender, Shilo

VanPool, Todd [6] see Bender, Shilo

VanValkenburg, Nathaniel [287] see Walker, Chester

VanValkenburgh, Nathaniel (University of Vermont)

[305] *Gardens and Forking Paths: A Genealogy of Landscape and Subject Formation in the Zaña Valley, Peru*

Recent archaeological research has called attention to the performative dimensions of imperial built environments, shedding new light on how regimes and subjects emerge (and persist) in acts of place-making, urban planning, and monumental construction. However, our focus on clarifying the semiotics of imperial architecture has drawn attention away from longer-term process of subjectification and elided the role that landscapes play within them. The study of landscapes in Peru's Zaña valley between the 11th and 18th centuries CE demonstrates that subject formation followed a forking path, taking shape not simply through overt acts of construction and domination but also unanticipated demographic and environmental transformations and halting engagements between subjects and imperial institutions.

Vargas, Benjamin [175] see Dietler, John

Varillas, Rosa Maria (Proyecto Arqueológico Cerro de Oro)

[134] *Technique and Style in Textiles from the Cerro de Oro Site*

This paper focuses on the analysis of textile material obtained in three areas (one funeral and two domestic) investigated within the archaeological site located in Cerro de Oro Cañete Valley. This research is embedded within the framework of the Cerro de Oro Archaeological Project, which has

been working on this archaeological site since 2012 and which has among its objectives to determine the cultural affiliation of the site, especially its relationship with the Wari phenomenon.

The material has been studied by analyzing manufacturing techniques and iconography. The objective of this study was to determine, first, what were the general characteristics of the textile material in this site and its relationship with Wari or other geographically closer societies such as Lima and Nazca. Second, we seek to establish whether these features were changing over time or if there are differences between the findings in the different units. Comparing these results with those of other sites studied, we expect to find similarities in the highland textiles associated with a foreign elite and variety in the coastal textiles, domestically produced according to the specific characteristics of each site.

Varney, R. (PaleoResearch Institute, Inc.), Linda Scott Cummings (PaleoResearch Institute, Inc.), Peter Kováčik (PaleoResearch Institute, Inc.) and Barbara Winsborough (Winsborough Consulting)

[62] *A Burial in the Bay: Evidence for Environment and Diet 7500 Years Ago*

Microscopic and macroscopic evaluation of samples associated with a 7570 CAL BP burial recovered on the west side of San Francisco Bay provides multiple proxy records representing the environment at the time this person was interred and possibly foods consumed by this individual. The pollen and macrofloral records indicate evidence of coastal or littoral plants, one of which, soaproot, also contributed abundantly to the macrofloral record. A wide variety of trees grew in the bay area, as did shrubby and herbaceous plants and cool season grasses. Plants that might have been part of this individual's diet include California huckleberry, elderberry, prickly pear cactus, members of the mustard and mint families, manzanita, mustards, and perhaps other plants. The most abundant diatoms in both samples are marine to brackish, epipelagic species, adapted to live primarily in tidal and supratidal mud flats and salt marshes that are frequently, perhaps diurnally, flooded. The diatom record provides direct evidence of conditions in the bay mud as it accumulated around the burial in the estuary. Together these proxies represent the local environment at 7570 CAL BP as well as for an indeterminate time after interment when the lower bay muds accumulated.

Varney, R. A [309] see Dalpra, Cody

Varoutsikos, Bastien (Harvard Univ.)

[241] *Lithic Technology Transfer and the Mesolithic-Neolithic Transition in the South Caucasus*

Recently, several discoveries in Armenia, Georgia, and Azerbaijan have shed new light on the processes involved in the development of food production economy in the South Caucasus. If a series of excavations using modern techniques have provided an improved chronological and cultural framework for this complex phenomenon, several interrogations remain. What is the role of the hunter-gatherer population in the domestication process? Is the presence of Neolithic cultures in this area the result of a demic diffusion from food producing societies? If so, how (if at all) have the two populations interacted in the South Caucasus? Some of these questions can be answered through the study of technological variability and raw material management in lithic assemblages. We will look at how technological behaviors in assemblages from four mesolithic, neolithic and endolithic sites can inform us about the mechanisms underlying these group interactions, as well as the location of those interactions in the socio-economic landscape. Comparison of patterns in technological behaviors in Mesolithic, Neolithic and Eneolithic groups can then help us determine models of group interaction and establish a diachronic picture of the transition toward a food production economy in the South Caucasus.

Vasconcelos, Mara [124] see Selden, Robert

Vasquez, J. Javi (New South Associates), Kaleb Taluban (New South Associates) and R.M McCoy (New South Associates)

[90] *Managing 50,000 Acres of Private Land in Texas: Results of a Recent 2,000 Acre*

Pedestrian, UAV, and Vegetation Survey in the Sierra Diablo Mountains

A comprehensive landscape survey covering 2,000 acres of private property was conducted this past May in the Sierra Diablo Mountains of far west Texas. The survey targeted a previously unsurveyed portion of the mountain range and surrounding alluvial fan environments adjacent to Sierra Diablo Cave with the goal of assessing the relationship between settlement and landform. The landforms included wooded juniper pine uplands at nearly 6,000 ft AMSL to the lower foothills and basin margins at 4800 ft AMSL. The results of the study identified a number of temporally sensitive occupations assigned to specific landforms, most notably middle to late archaic settlements aligned with upland locales. The results and findings of the study are discussed in relation to the regional prehistory and to the more local Sierra Diablo Cave project.

Vásquez, Augusto [232] see Christakos, Elena

Vásquez-Sanchez, Victor [347] see Duke, Guy

Vaughan, Andrew [201] see Love, Sarah

Vaughan, Andrew (Georgia State University), Dan Leonard (B.C.R Consulting, LLC) and Jeffrey Glover (Georgia State University)

[244] *A Multiproxy Investigation of Maya Socio-Political Territories: A Case Study from the Yalahau Region, Northern Quintana Roo, Mexico*

The Yalahau region in northern Quintana Roo, Mexico constitutes a unique physiographic landscape in the Maya area. The region is characterized by abundant freshwater wetlands, known locally as sabanas, which stand in marked contrast to the dry karstic plain of the northern Maya lowlands. The paper combines the results derived from surveys of the region's settlements and its wetlands along with remote sensing data (in particular LANDSAT and LIDAR platforms) to highlight how multiple methodological approaches must be employed if we are to understand the dynamic nature of Maya territories. Specifically, we address both the challenges and advantages inherent in integrating remotely sensed data sets with other survey methodologies. We also discuss the contradictory nature of varying datasets (i.e. ceramics and architectural styles) often used to define territories in the Maya area. While focused predominately on the Terminal Preclassic period, the changing nature of sociopolitical boundaries in the Yalahau region during the Terminal Classic and Postclassic periods will be addressed.

Vaughn, Kevin [31] see Gravalos, Marie

Vaughn, Kevin (Purdue University)

[31] *The 2014 Excavations at Cerro Tortolita, an Early Intermediate Period Ceremonial Center in the Upper Ica Valley*

This paper reports on the 2014 field season at Cerro Tortolita, a predominantly Early Intermediate Period (EIP) site in the Upper Ica Valley. While the site has been known archaeologically for at least four decades, no systematic investigation has ever been undertaken there. Our work documented the numerous sectors of the site and through vertical excavations established a preliminary chronology. We found that the site has an extensive ceremonial/ritual component including a U-shaped platform mound, several plazas, terraces with numerous activity areas, and a large residential sector. Chronologically, the site dates mostly to the EIP, and predominantly Early Nasca. Analysis of ceramics suggests that many appear to be a local derivation of the classic Nasca style. We hypothesize that Cerro Tortolita served as a secondary ceremonial/pilgrimage center, one that attracted residents primarily from the Ica Valley and aim to further test this hypothesis with future work.

[31] *Chair*

Vawser, Anne (National Park Service)

[29] *Where the Buffalo Still Roam: Archaeology of a Buffalo Jump and Prehistoric Village Site at Wind Cave National Park*

In 2011 Wind Cave National Park acquired new lands that include an important prehistoric site where American Indians once made their homes and practiced communal hunting. Two seasons of work at the site have resulted in the discovery of drive lines, rock cairns, processing areas, stone circles, ceremonial features and much more. What has been found at the site is equally as important as the way the work has been conducted, including the involvement of tribal monitors and volunteers, tribal consultation in development of park interpretive plans, and outreach to the local community about the importance of archaeological site preservation and respect for cultural traditions. While our research is important to the advancement of archaeological understanding of prehistoric use of the Black Hills of South Dakota it also provides us with the information to tell the story of plains tribal history to National Park visitors.

[29] *Chair*

Vazquez Campa, Violeta (UNAM)

[242] *The Roles of the Figurines of Oaxaca*

Figurines were an essential part of prehistoric people in Mesoamerica. In Oaxaca, these figurines were essential for daily and religious life in the village stages of cultural evolution. Figurines have been subject to several hypotheses in their role and significance in life due to their same range and presence in most places in the Oaxaca region. However, we were unable to determine their specific role for each stage of cultural evolution in the valley or for a decisive site because we need to carry out further excavations in contexts that include them. In this presentation the objective is the review and comparison of figurines of the Preclassic and Classic periods in the Southern Isthmus and central Valleys of Oaxaca demonstrating the possible roles that these have in the region. In addition, this presentation will introduce a new vision in the role and use of the classic figurines in the South Isthmus, such as a female representation of ballplayers.

Vázquez De Ágredos Pascual, Marisa (Universidad de Valencia)

[242] *Las Fragancias Rituales del Preclásico en Tak´Alik Ab´Aj*

La arqueología, la iconografía y la epigrafía maya han identificado desde hace décadas la importancia que tuvo el aroma entre los antiguos mayas, en especial como parte de la escenografía simbólica que envolvió distintos acontecimientos políticos y religiosos de profunda significancia en la cosmovisión de esta antigua cultura prehispánica. Más recientemente, la arqueometría ha empezado a caracterizar algunas de estas antiguas y simbólicas fragancias, lo que nos permite entender con mayor acierto las prácticas socio-culturales y el significado ritual que tuvo el uso de unas fragancias u otras en el seno de estos acontecimientos y escenarios. En esta comunicación se analizarán los resultados que se han obtenido al examinar con LM, SEM/EDX, TEM, FTIR, Pyr-GC/MS y HPLC las ofrendas rituales de pigmento y aroma halladas en el entierro nº2 de Tak´Alik Ab´aj, hecho que dará la posibilidad de remontarnos a la tecnología de estas antiguas fragancias desde tiempos del Preclásico.

[24] *Discussant*

Vazquez De Arthur, Andrea (Columbia University)

[187] *The Expression of Human Identity on Wari Faceneck Vessels*

For the Wari civilization of the ancient Andes, the production and distribution of prestigious ceramics painted with religious and secular iconography likely functioned as a type of materialized ideology that contributed to the Wari agenda of imperial expansion. One particular ceramic form favored by the Wari was the faceneck vessel: a tall-necked globular vessel with a human face sculpted onto the base of the neck. These anthropomorphic vessels have been found in elite tombs and offering deposits across the greater Wari region, and careful study of these objects can offer insight into the practice of human representation in Wari society. This paper examines how human identity is expressed on faceneck vessels through differences in facial markings and hairstyles, as well as through the iconography presented on the vessel's body. Variance in facial markings and hairstyles,

paired with the vessels' provenience, may point to regional subdivisions of Wari society. Groups of identical faceneck vessels excavated from Wari sites invite investigations into the relevance of individual versus group identity among the types of people represented on faceneck forms. A better understanding of how the Wari expressed their own identities could potentially revise how we view and define the Wari as a society.

Vega-Centeno, Rafael

[227] *Ethnic Interaction and Settlement Composition at Huacramarca*

The Late Intermediate Period (LIP) is usually considered as the time of ethnic diversity in the Central Andes and representations of ethnic boundaries in maps illustrate this scenario. However, these representations offer a synchronic perspective of ethnic configuration as a consequence of their reliance on XVI Century sources. Nevertheless, Andean chronologies demonstrate that the LIP covers more than 500 years (from A.D. 900 to 1450) in which several dynamic phenomena, including expansion, migration, alliances, warfare and constant ethnogenesis, should be expected. Evidence from Huacramarca, a LIP settlement of the Yanamayo Basin, enables us to approach these dynamics. Excavations in Huacramarca revealed a settlement composed of a dozen patio groups that were built gradually following households' growth. In one patio group, two distinct wares were recovered (Wares A and B), also corresponding to different vessels' repertoires. XRD and XRF analyses support the distinction between wares, also revealing differences in temper and clay sources. Ware A seems to be local, while Ware B appears to have been brought to the site. If Ware B was coming to the site with their owners, it might point towards migration processes and a multi-ethnic composition for Huacramarca's population.

Veit, Richard, Sean McHugh (Monmouth University) and Adam Heinrich (Monmouth University)

[405] *A Forgotten Town on a Forgotten Road: The Archaeology of Pine Barrens Heritage at the Storied Cedar Bridge Tavern*

New Jersey's Pinelands (aka the Pine Barrens) is the largest preserved natural space in the Boston-Washington megalopolis. Fabled as the home of the Jersey Devil, endless pine forests, lost ghost towns, cranberry bogs, and "Pineys," the region has long drawn the attention of writers, researchers, and folklorists. Many of these authors have emphasized the distinctive way of life present in the region. This paper brings the archaeological lens to bear on the Pinelands. Have the Pinelands long been home to a distinctive regional culture, or are the regional distinctions so heavily emphasized by 20th-century authors a literary device used to create rather than describe a place? Here these questions are examined through a collaborative, interdisciplinary, public archaeological project. This work draws upon the rich archaeological deposits found at the Cedar Bridge Tavern in Barnegat Township. The intersection of history, geography, folklore, and archaeology is explored in order to better understand the region's heritage and the importance of that heritage for researchers and residents, both past and present.

Velasquez, Veronica (The University of Sheffield/ Instituto Campechano)

[76] *Potters' Signatures and Changes in the Maiolica Craft from Colonial Mexico as an Expression of the Doctrine of Blood Purity*

The aim of this paper is to explore the potential that the potters' signatures on maiolica vessels have to gain insights to the shifts in the craft industry from the mid-seventeenth century and onwards. It will be argued that the modifications that are observable on the personal imprints of the potters may have been related to changing attitudes towards their cultural identities. The analysis of archaeological samples from different sites in Mexico City enabled the identification of a variety of potters' signatures. This allowed the identification of several workshops that were active during the seventeenth and eighteenth centuries. These intriguing elements were then correlated with different ceramic types in order to obtain glimpses into the complexity of the production, distribution and consumption of different table sets. The analysis of this kind of material culture in conjunction with data obtained from documentary sources enabled exploration of shifts in the craft industry. It will be argued that these shifts were related to the reorganization of the guild and the reaffirmation of cultural identities and social status within the context of miscegenation and blood purity.

Velásquez, Héctor [2] see Méndez, César

Velasquez Lopez, Antolin (Universidad de San Carlos de Guatemala)

[183] *La Vida alrededor del Río Holmul: Patrón de Asentamiento de Cival y la Región de Holmul*
Las investigaciones sobre el patrón de asentamiento en la región arqueológica de Holmul analizan el relieve terrestre y los cambios en el paisaje observados en el registro arqueológico, a través de la comparación de los emplazamientos, de los distintos tipos de grupos arquitectónicos y la relación entre sus distintos componentes naturales y culturales. La topografía de la región es de naturaleza caliza con abundancia de fenómenos kársticos, localizada en un amplio terreno de bajos rodeada por secciones elevadas del terreno y ambientes variables con sus propios nichos ecológicos. El rasgo geográfico dominante de la región es el Río Holmul, determinando la organización del territorio y condicionando su ordenación y ocupación variando en tamaño y período de ocupación, distribuidos a una distancia entre 3 y 7 km, siendo Cival el primer gran centro rector de la región con una ocupación desde 850 a.C. hasta el 200 d.C. mientras que Holmul fue el más tardío de una serie de centros primarios de la región.

Velazquez, Adrian

[346] *Crafting the Tenochca Imperial Identity through Manufacturing Shell Objects*
Recent investigations about the Tenochca objects have shown that the mexica produced many of the pieces that they deposited inside of the offerings they buried in their Great Temple and its surrounding buildings. It seems that it was during the reigned of Axayacatl (1469-1481 A.D.) that the mexica decided to create their own imperial style not only in terms of forms and decorations but also in the technological aspect. In the present paper it is presented new data that supports this hypothesis with respect to the mollusk shell objects that have been found in the Tenochca offerings.

[298] *Discussant*

[346] *Chair*

Velemínska, Jana [207] see Velemínský, Petr

Velemínská, Jana (Dep. of Anthropology and Hum. Gen., Charles University in Prague, Czech Republic), Lucie Bigoni (Dep. of Anthropology and Hum. Gen., Charles Univer), Jan Dupej (Dep. of Anthropology and Hum. Gen., Charles Univer), Petra Fenclová (Dep. of Anthropology and Hum. Gen., Charles Univer) and Petr Velemínský (Department of Anthropology, National Museum, Pragu)

[207] *Fluctuating Asymmetry, Developmental Stress and the Socioeconomic Structure of a Great Moravian Early Medieval Society*

Fluctuating asymmetry (FA) is thought to reflect the ability of an organism to cope with genetic and environmental stress during its development. As there is substantial literature discussing this property of FA, we evaluated additional stress indicators (enamel hypoplasia, cribra orbitalia, Harris lines) in non-adult individuals of the Middle Ages. The socioeconomic structure of an early medieval society from the Mikulčice settlement (Czech Republic) was studied by applying the FA methodology to skulls. We expected to find Mikulčice castle specimens to exhibit the greatest FA among higher socioeconomic groups. The material comprises 170 adult and non-adult crania from what is presumed to be a higher socioeconomic class (Mikulčice castle) and 71 crania from middle and lower socioeconomic classes (Mikulčice sub-castle). As a comparative sample, lower socioeconomic classes (Pachner Collection) were evaluated. The three-dimensional coordinates of 68 landmarks were analyzed using shape asymmetry analysis (Bigoni et al., 2013). In males, no differences in FA were detected between Mikulčice castle and sub-castle, whereas in females the differences were significant, as the Mikulčice castle females tended to have higher values. Their FA values were similar to the highly stressed Pachner Collection sample. Supported by the project GACR 14-22823S.

Veleminsky, Petr (Department of Anthropology, National Museum, Prague), Petra Havelkova (Department of Anthropology, National Museum, Prague), Jan Dupej (Department of Anthropology and Human Genetics, Fac), Jana Veleminska (Department of Anthropology and Human Genetics, Fac) and Dominique Castex (Laboratoire PACEA – UMR 5199, CNRS, Université de)

[207] *Sexual Dimorphism and Morphological Variability with Regard to the Socio-Economic Structure of the Early Medieval European Population (6th–9th Century)*

The socio-economic conditions of past societies can be studied with the help of the biological characteristics of human skeletons. We intend to focus on the early medieval Central and Western European populations. The subject of our contribution is a study of sexual dimorphism and biological diversity on the basis of non-metric and metric traits in relation to socio-economic conditions. We focused primarily on the traits associated with the locomotor apparatus. The aims were to establish: (1) morphological variability, (2) the sexual differences of trait incidence, and (3) verification of the assumption that sexual dimorphism is more pronounced in groups living in optimal living conditions. We evaluated skeletons from (1) Great Moravian and (2) Merovingian burial-grounds. Approximately fifty non-metric and twenty metric traits have been evaluated. Marked differences were found between the medieval populations of Central and Western Europe. The least pronounced differences were found among the individuals within the territories. The individuals with a higher social standing are evidently different from other, socially lower groups in the lower incidence of traits associated with physical loads. Our conclusions confirm the biological heterogeneity of the early medieval European inhabitants. Supported: GACR 14-22823S, Barrande – Mobility/7AMB13FR012, DKRVO 2014/18, 00023272.

Velemínský, Petr [207] see Velemínská, Jana

Vellanoweth, Rene [32] see Whistler, Emily

Venables, Barney [121] see Barker, Andrew

Venegas de la Torre, Luis J. [58] see Leal Hernandez, Edgar

Venegas De La Torre, Luis Joaquin (Universidad Autónoma de Yucatán), Mashelli A. Contreras Hernández (Universidad Autónoma de Yucatán) and Héctor A. Hernández Álvarez (Universidad Autónoma de Yucatán)

[376] *Patrones de desecho en los grupos domésticos de la Hacienda San Pedro Cholul*

A partir de 2009 la Universidad Autónoma de Yucatán ha realizado exploraciones arqueológicas al interior de la hacienda henequenera San Pedro Cholul, teniendo como principal enfoque el estudio de la vida cotidiana de los antiguos pobladores. Como parte del proyecto, hasta el momento se han intervenido 3 solares habitacionales y sus respectivas viviendas. Mediante la recolección de superficie y la excavación de dichos espacios se han recuperado diversos elementos materiales que nos han permitido identificar algunas actividades domésticas, aspectos económicos, modos de alimentación y las distintas estrategias de subsistencia que llevaron a cabo los trabajadores y sus familias hacia la primera mitad del siglo XX.

El presente trabajo tiene como objetivo llegar a conocer los patrones de desecho a partir de la cultura material dejada por las familias de trabajadores que habitaron en la hacienda. De igual manera se busca identificar las respectivas áreas de deposición y las conductas con respecto al desecho de la cultura material dentro de los espacios habitacionales de los trabajadores henequeneros.

Venter, Marcie (University of Kentucky)

[144] *Introduction to the Matacanela Archaeological Project: Collapse and Political Reorganization in a Lowland Mesoamerican Society*

The Matacanela Archaeological Project is a two season effort to more fully understand the transformation of lowland Mesoamerican society at the end of the Classic period. Our particular

focus is Classic collapse and Postclassic reorganization in the Tuxtla Mountains of the southern Gulf lowlands. Like other lowland regions (e.g., the southern Maya lowlands) that experienced political decentralization, demographic upheaval, environmental, and climatic change, collapse was not complete or uniformly experienced. This project interrogates differential cultural response to collapse and the creative adaptations that characterized transformations in this lowland society. In this opening presentation, I highlight some of the challenges to understanding this period of transformation in the southern Gulf lowlands, layout the interpretive framework that informs the study, discuss the hypotheses that our work is testing, and consider what we have learned from this first season of fieldwork. I conclude by anticipating what we hope to learn from subsequent research at the site.

[144] *Chair*

Venter, Jan [356] see Fisher, Erich

Ventresca Miller, Alicia (Christian-Albrechts-Universität zu Kiel)

[403] *Modeling Bronze Age Isoscapes in the Eurasian Steppe: Identifying Subtle Variation in Pastoral Diet and Mobility*

Isotopic investigations of ancient materials often lack the robust isotopic baselines necessary for comparative analyses. A paucity of isotopic data for baseline ecology creates gaps in our knowledge and allows for multiple interpretations of prehistoric practices. This is especially true for the Eurasian steppe, where isotopic values have been used to consider long-distance human migrations without sufficient baselines. Therefore, the aim of this paper is to use an innovative approach in ecological modeling to create comprehensive isotopic reference maps, or isoscapes, for two local zones. Isoscapes model patterned variation in isotopic ratios of landscapes by linking environmental variables through predictive modeling. To create isoscapes, comparative baselines were built using $\delta^{18}\text{O}$, $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ ratios of modern biosphere samples for two archaeological sites in northern Kazakhstan. These included spot testing of modern water, plant, and animal samples in a 15km zone surrounding each site. Isoscapes were used to link modern environmental variables with isotopic change which was then compared with isotopic ratios of prehistoric animal and human samples to investigate subsistence and mobility practices. Through the compilation of robust ecological data can we identify subtle variation in pastoral lifeways; particularly subsistence practices, herding strategies, and movement within the landscape.

[403] *Chair*

Ventura, Beatriz (CONICET-UBA)

[46] *Goods That Moved between the Forest and the Highland Andes in the Inca state. The Eastern Valleys of North Argentina*

The eastern valleys of the Cordillera Oriental, in north Salta, Argentina, were a sector of the eastern frontier of Tawantinsuyu. We propose that the Inca created a state enclave with mining and metallurgical goals in that sector. To accomplish this, populations (*mitmaquna*) were moved from other parts of the empire, which required the implementation of a significant agrarian system to support them. These valleys may have been producing goods of great value that might have comprised a single system of macro-regional interaction. The exotic materials found in funerary contexts in these valleys were analyzed, and it was inferred that they may have been the result of the reciprocity and redistribution structures, as well as the systems of gifts and contra-gifts imposed by the Inca state.

Verdugo, Cristina (University of California, Santa Cruz)

[355] *Sinking Archaeological Teeth into the Dental Modification Issue: An Examination of Midnight Terror Cave*

Evidence for dental modification practices have been found throughout Mesoamerica since the Early Preclassic Period and were noted by Diego de Landa in the 16th century. Examples for these practices have been found not only among human remains, but also in iconography and in architecture. Investigations into the aesthetic or ritual purpose for dental modification have yielded a

number of possibilities. These possibilities include its use as an indication of social status, defining local family organization, as a rite of passage or as having religious connotations. The recovery of eighty five examples of modified teeth from Midnight Terror Cave provides a sufficiently large sample to allow for me to draw some tentative conclusions on varied hypothesizes regarding social status, social organization, and ritual of passage thought to attribute function to the practice of dental modification.

Vernon, Kenneth (University of Utah Department of Philosophy), Kate Magargal (University of Utah), Ashley Grimes (University of Utah), Will Rath (University of Utah) and Brian Coddington (University of Utah)

[362] *Numic Fire: Modeling the Effects of Anthropogenic Fire on Foraging Decisions in the Great Basin*

Ethnohistoric accounts suggest that fire played a significant role in Great Basin foraging strategies; however, there is little quantitative data on why, where, or when people burned. To begin to fill this gap, we develop a behavioral ecological model designed to test predictions about the impact of anthropogenic fires on hunter-gatherer diet breadth. We conduct an ethnographic test of the model using historic band-level variation in prey choice coupled with ecological data on variation in the abundance of high ranking resources across the region. The results of our study will help to explain the evolution of anthropogenic landscapes and lay the foundations for future archaeological studies examining the dynamics of anthropogenic fire regimes in the Great Basin.

Vesteinsson, Orri (University of Iceland)

[18] *Environment and Identity in the Viking Age North Atlantic*

The cultures that arose in the North Atlantic during the Viking Age - the Scottish Isles, Faroes, Iceland and Greenland - were emphatically Norse in their ethnic signaling. Yet the environments of these islands, especially the more westerly ones, were significantly different from Scandinavia or Britain and supported quite different lifeways, different economic strategies, settlement patterns and material cultures. Focusing on Iceland and Greenland the paper aims to highlight the tension between environment and cultural identity asking whether there is a point at which a peripheral environment becomes so different from that of the core that it cannot sustain the same culture. Based on the study of settlement patterns the paper suggests ways in which archaeological data can be used to assess cultural divergence.

Veth, Peter (The University of Western Australia)

[152] *Pleistocene Maritime Economies of Northwest Australia*

This paper will critically assess new evidence for the antiquity of maritime economies from North West Australia. Northwest Australia has evidence for hunter-gatherer occupation from 50,000 years ago from sites now located in the interior. The evidence for antiquity of coastal resource use extends back to over 41,000 cal BP; however, this is soon expected to approach the earliest dates from these interior sites. Recent research on continental islands of the Northwest Shelf illustrates rich early Holocene middens with records extending back to the low sea stands of the Last Glacial Maximum. There is now clear evidence for economic reliance on coastal resources procured from procumbent shorelines through the marine transgression from 17,000 BP to the Present from the Carnarvon Bioregion of North West Australia. Shellfish assemblages and hearth charcoals provide direct evidence for use of estuarine and mangrove communities. It is not clear whether the oldest marine remains are dietary, however. Current propositions about delayed maritime adaptations due to precipitous and depauperate coastlines and the early depletion of high-ranked coastal resources by colonizing groups are examined with this new data from North West Australia.

Vianello, Andrea [412] see Freund, Kyle

Victoria Lona, Naoli (MARCHSc. Naoli Victoria Lona)

[346] *Copal Offering Objects: Manufactured in Tenochtitlan*

There is an abundance of archaeological literature that highlights the amazing ritual offerings made by the mexica people in the late Postclassic period. The studies show a high diversity of both organic and inorganic material used in offerings. Some materials are local, while some were brought from foreign lands, like the copal case resin. The use of this resin was verified by historical documents and ethnographic studies that document its import as a raw material. The resin was brought to Tenochtitlan where it was transformed into different objects like bars, spheres, conglomerates, knives bases of sacrifice, anthropomorphic figurines and diverse amorphous fragments, and these objects would be their gifts to their gods. Thanks to the macroscopic and microscopic study of more than 300 objects of copal from the offerings of the Archaeological Zone the Great Temple ("Templo Mayor"), it was possible to establish a constant in the processes of manufacture of each formal group; that was corroborated by the Axial Computed Tomography (TAC), a non-invasive radiological technique.

Vidal, Cinthya (Centro INAH Sinaloa)

[231] *Between Life and Death. The Burial Systems at the Guadiana Valley, Durango*

During the prehispanic era, La Ferrería was the most important settlement at Guadiana valley; indeed it was a place where both people and nature were linked. In this paper I make a review of burials collected at the Guadiana valley, considering that their incidence reflects certain aspects of cosmology which were shared with coastal dwellers.

[231] *Chair*

Vidal, Estefanía [318] see Ballester, Benjamín

Vidal Elgueta, Alejandra (Universidad SEK), Magdalena García (Catolica del Norte - Universidad Tarapacá-CIDHE), Jorge Razeto (Universidad de Chile), Pablo Mendez-Quirós (Colegio Arqueólogos de Chile) and Mandakovic Valentina (Universidad de Chile)

[318] *Agriculturas formativas del desierto tarapaqueño*

Se discuten los nociones de progreso y complejidad social arraigados en la concepción del Formativo, a partir de la evidencia de antiguos campos de cultivo, hoy en desuso, asociados a las aldeas formativas (sensu. 1000 a.C- 1000 d.C) de Caserones, Pircas, Ramaditas y Guatacondo, localizadas en la región de Tarapacá, Chile. Se presentan la coexistencia de al menos dos sistemas agrícolas diferenciados, uno que denominamos continuo o anual y otro discontinuo o estacional que requirieron del manejo de complejos sistemas irrigación y variadas tipologías constructivas. Los asentamientos de Pircas y Caserones, evidencian una ocupación doméstica continua, asociada a una agricultura diversificada con manejo de melgas que se ubican sobre terrazas fluviales y en pampas abiertas, con riego permanente garantizando una producción agrícola continua o anual. En cambio, en la quebrada de Guatacondo se evidencian ocupaciones muy acotadas asociada a melgas emplazadas junto a conos aluvionales en la pampa desértica, aprovechando las aguas superficiales por escurrimientos estivales y las napas, mediante el desarrollo de norias, permitiendo una producción agrícola discontinua o estacional. Ambas estrategias agrícolas probaron ser efectivas produciendo una interesante cantidad de recursos agrícolas y demostrando el manejo de los espacios desérticos por parte de las comunidades tarapaqueñas.

Vidal Lorenzo , Cristina [242] see Vázquez De Ágredos Pascual, Marisa

Vidal Montero, Estefania (Fulbright-CONICYT Chile, Department of Anthropology, University of Chicago) and Uribe Rodriguez Mauricio (Departamento de Antropología, Universidad de Chile)

[318] *The Formative Process as Discourses of Nature and Culture: The Case of Tarapacá, Atacama Desert (Northern Chile)*

The purpose of this paper is to contribute to a critical review of the concept of Formative (ca. 2800-1000 AP) and its ontological and epistemological assumptions through our studies in Tarapacá, in the Atacama Desert (Chile). Through this case, our purpose is to complicate the notions or radical distinctions between nature and culture, farming and gathering, mobility and sedentism, among other

categorizations upon which the Formative period as Neolithic Revolution has been defined. The materiality that we have studied so far indicates that such divisions are not efficacious to fully grasp the complexity of this phenomenon, often imposing Western logics to non-Western historicities. As a sociohistorical process, the Formative did not represent an ideal of progress or of technological development, often explained through economic transformations that presumed an "efficient" use of resources. We propose, instead, a view that underlines the inherent contradictions between individuals, society and culture, in the hopes of contributing to an alternate view of these transformations.

[318] *Chair*

Vidal-Solano, Jesús R. [257] see Hinojo-Hinojo, Adriana

Vigil, Francis [239] see Welch, John

Vigne, Jean-Denis (CNRS-MNHN, Paris, France)

[339] *Islands and Invasives: The Archaeology of Plant and Animal Translocations*

This presentation discusses how the progress of biological knowledge allows archaeology to take advantage of paleontological and archaeozoological documentation accumulated during the last 40 years on islands. This information will be applied to indirectly understand early sea travel in the Mediterranean. It presents a brief review of the geographical and paleogeographical frameworks as well as the basics of island biogeography and focuses on the different ways in which mammals were able to colonize remote islands. The review of the extinctions and immigrations of mammals since the Late Glacial on the five larger Mediterranean islands, which have stayed isolated since that time, highlights the major role that human beings played in the construction of modern mammalian communities on these islands. In turn, this phenomenon is a remarkable source of information for investigating early seafaring in the Mediterranean.

[414] *Discussant*

Villagomez, Beatrice [327] see Stuck, Jennifer

Villalobos, César (UNAM/IIA) and Elisa Villalpando (INAH/Sonora)

[189] *Materiality of Death at Cerro de Trincheras, Sonora: A Comparison of Ceramic Urn Funerary Practice in a Macro Regional Scale*

Funerary vessel urns represent a unique variety among other manners of treatment of the dead in the North American Southwest (SW) and Northwest Mexico (NW). The ritual practice of packing human remains in ceramic vessels is considered as a well-defined cultural accomplishment. Particularly, the urn funerary practice, although with local variation in time and space, represents a wider social action that reflects a particular worldview in the conception of death. Depositing human remains in vessels has been recorded in different regions of the SW/NW. This paper is based on recent excavations at Cerro de Trincheras, Sonora, where a complex funerary practice in ceramic urns has been archaeologically recorded. A detailed analysis of funerary urns at Cerro de Trincheras has pointed out some aspects of materiality and symbolism. A broader framework is useful to compare the presence of funerary urns in other regions in the SW/NW. A macro regional analysis is made in order to comprehend the more essential aspects of the materiality of death. In this paper some archaeological sites in the SW/NW are analyzed in order to highlight the macro scale significance of this funerary practice.

Villalpando, Elisa (Instituto Nacional de Antropología e Historia, Sonora)

[189] *The Sound of Dancing in the Desert Northwest/Southwest. Copper Bells from Trincheras, and the Casas Grandes Connection*

Since the 1963 Sprague and Signori's tabulation on copper bells, to Vargas 1995 or Wilcox et al. 2008, there is no question that copper bells in the Southwest/Northwest were trade items produced

in West Mexico. Different kinds of exchange networks were responsible for the distributional patterns of the very “rare” items (copper bells and macaws) as opposed to those exhibited by the more common shell and turquoise. Few central communities exchanged copper bells and macaws; being macaws (*Ara militaris*) the most restricted in terms of numbers and associated settlements. I will explore the relation of copper bells and Ramos Polychrome in Sonoran Prehispanic settlements as an exchange network that connects West Mexico to the desert Southwest/Northwest through the Casas Grandes World.

Villalpando, Elisa [189] see Villalobos, César

Villaluenga, Aritza [396] see Garcia-Moreno, Alejandro

Villanueva, Juan

[184] *Diáspora y Etnogénesis durante el Tiwanaku Terminal en el la región de Cohoni, La Paz, Bolivia*

Esta ponencia se centra en las poblaciones del Tiwanaku Terminal – Intermedio Tardío Temprano (ap. 900 – 1200 d.C.) en la región de Cohoni, en los valles orientales del río La Paz, en Bolivia. Se resumen los antecedentes investigativos de la región, y especialmente las excavaciones realizadas por nosotros en contextos habitacionales del sitio de Chullpa Loma, uno de los más grandes y complejos de Cohoni. Consideramos datos sobre la arquitectura habitacional y funeraria del sitio, así como los patrones cerámicos detectados, en comparación con otras zonas de la influencia Tiwanaku. Mediante estos patrones, sugerimos que la región de Cohoni fue poblada consistentemente a partir de la desintegración de Tiwanaku en la cuenca del Titicaca, y que la motivación podría vincularse al potencial agrícola por irrigación de deshielo y a la microverticalidad ecológica de la zona. Asimismo, sugerimos que la población de Cohoni, originada en esta suerte de “diáspora” altiplánica, generó con el tiempo dinámicas de interacción con otras zonas de altiplano y yungas, y dio lugar a procesos de etnogénesis que, posiblemente, tengan un reflejo parcial en la situación étnico-política de la región en el siglo XVII.

Villanueva Ruiz, Denia Berenice

[217] *Zoomorphic Representations of Figurines in Tamtoc, SLP, Mexico*

From the beginning, man has always tried to understand nature. Mostly because their survival depended on it, the Prehispanic societies conceived it as one of their best allies. The perception of animals was always influenced by mysticism and the belief that every living thing belonged to an order, which at the same time harmonized a universal context. Tamtoc was not the exception. Along all the excavations that had been performed, various distinct representations of zoomorphic figurines were found, which will be mentioned in this following paper. In order to show the relation they held with the atmosphere, the possible species that are represented in each will be identified and interpreted, as well as their archaeological birth contexts, looking to create a close symbolic discourse to the one they probably have. This could represent an important document for the study and interpretation of the ancient scenery the Tamtoquian people used to lived in.

Villarreal, Margarita (CSULA), Lindsay Jacoby (CSULA) and Karimah Richardson (The Autry National Center of the American West)

[27] *An Exploration Into a New Method of Skeletal Inventory in a Curatorial Setting*

The Standards for Data Collection from Human Skeletal Remains has been the standard for inventorying skeletal collections around the country, as well as most recently adopted by the Autry National Center of the American West. In 2011, a new digital method of inventory was developed by the Smithsonian Institution, called Osteoware. Osteoware is intended to be a common set of core observations between different researchers and incorporates The Standards. This project looks over the merits and drawbacks of using each method and how Osteoware compares with The Standards as a replacement for inventorying curatorial collections. It also compares the usefulness of these methods in relation to the collections and curation departments, since each of these departments has different needs, as well as with the bigger question of whether Osteoware is useful institutionally

wide or is it specialized to osteologists and archaeologists. This exploration will utilize legacy collections from the American Southwest. The collection at the Autry National Center of the American West has been untouched, and with a new team of osteologists we will utilize both methods and see which is more beneficial.

Villeneuve, Suzanne [153] see Hayden, Brian

Villeneuve, Suzanne (University of Toronto) and Brian Hayden (Simon Fraser University)

[171] *Early Cultural Developments and Adaptations in Hunter/Gatherer Communities: A Case Study from Keatley Creek on the Canadian Plateau*

The emergence of socio-economically complex hunter/gatherer communities has been identified as one of the most critical theoretical issues in the study of early cultural evolution. In North America, one key geographical area for studying the emergence of complex hunter/gatherer societies has been the Northwest Coast and Plateau. The village site of Keatley Creek, one of the largest sites of complex hunter/gatherers in Western Canada, has featured prominently in understanding the emergence and evolution of socioeconomically complex hunter/gatherers. Research has been conducted at the site since 1986, representing one of the longest running research programs for any site in Canada. Models of population dynamics and the evolution of the village site are undergoing re-evaluation in the current research program. The specific timing and conditions surrounding the emergence, evolution and organization of early cultural developments have been the focus of some debate. This paper discusses key aspects of the updated methods and results as applied to specific complex and fine-grained stratigraphic contexts, and how this has advanced insights and understanding of the initial stages of village development, and the co-evolution of ritual structures and social complexity. The results have implications and utility for investigations of hunter/gatherer adaptations elsewhere in the world.

Vilsack, Laura (Texas State University)

[357] *Archaeological Investigation of the Stone Feature Located at Area 12, Gault Site Bell County, Texas*

A 2x2 meter fractured limestone cobble surface was excavated in February of 2001 through May of 2002 at the Gault Site in Bell County, Texas; the feature dates to either the Clovis or pre-Clovis period. Current research indicates two toss zones associated with the 10-centimeter thick stone floor. One toss zone is illustrated through the faunal assemblage as arcing around the southwestern corner of the feature and the second toss zone is associated with lithic artifacts concentrated around the northeastern corner. Research will further identify any activities that may be associated with the stone feature based on the technological, morphological and spatial analysis of the recovered archaeological materials. This research will also fine-tune the cultural association of the feature and its associated materials.

Viner, Mark [299] see Conlogue, Gerald

Vinogradov, Nikolai [345] see Hanks, Bryan

Vint, James [55] see Homburg, Jeffrey

Vint, James (Desert Archaeology, Inc.)

[55] *Refinement of Early Agricultural Site Chronology in the Tucson Basin*

A sample of 140 radiocarbon dates from 14 Early Agricultural sites was used to model the chronology of settlements in the Tucson Basin using OxCal v.4.2.3; one site in northern Sonora was also included in this analysis. The sites range in age from about 2100 B.C. to 700 B.C., spanning two phases of the Late Archaic/Early Agricultural period: the "Silverbell Interval" (ca. 2100-1200 B.C.) and the San Pedro Phase (ca. 1200-800 B.C.). Most dates are AMS assays of maize kernels, cupules, or cobs, other annuals, and only a few are on wood charcoal. Results of the analysis

provide a detailed site-specific chronology for the site of Las Capas, and places the 13 other sites in temporal space with each other that is not possible using simple calibrated ages alone. Significant patterns in site age and occupation duration are revealed that relate to changes in settlement patterns, the adoption and florescence of irrigation agriculture, and responses to change in environmental and riverine conditions that adversely affected irrigated farming along the Santa Cruz River during this time period.

Virga, Nicolena (Niki) (California State University), Norman Easton (Yukon College), Charles Moore (Golder and Associates), Andrew Mason (Golder and Associates) and Rob Field (Terra Archaeology)

[192] *The Montague Harbour Underwater Archaeology Project: Final Conclusions and Prospects for Future Research on the Northwest Coast*

Twenty-one years ago we completed our last of four field seasons excavating inter-tidal and sub-tidal sediments in Montague Harbour, Galiano Island, British Columbia. While a permit report describing basic results and several analytical publications ensued, a final summary concluding publication remained to be completed. Here we present the essential elements of this forthcoming publication, which will discuss methodology, provide a comprehensive database on recovered artifacts and ecofacts, present sedimentological and facies analyses, radio-carbon dates, and a set of conclusions and propositions arising from our findings. We will conclude our presentation with some thoughts on the future of practical prehistoric underwater archaeological fieldwork on the northwest coast within the context of contemporary research.

Viselman, Abby [143] see Wienhold, Michelle

Vitale, Adam

[248] *Putting Xultun on the Map*

This poster shall illustrate the several different mapping phases of the archaeological site of Xultun, Guatemala in order to demonstrate how the mapping process has significantly altered our understanding of the site. Xultun was first surveyed by Sylvanus Morely in the 1920's whose maps included a handful of structures and stelae. The site remained largely uninvestigated for the next 50 years until Von Euw expanded the map, through his epigraphic work for the Peabody Museum. Xultun's map did not undergo major changes until 2008 when an archaeological team led by William Saturno began to remap and digitize the previously documented structures. During this past field season, our survey team expanded the map by an additional 800m². Due to the survey work at Xultun, what was once considered a mere handful of ruins deep within the Petén is now viewed as a large, "traditional" Classic period site, with long king lists, ball courts, precise astronomical counts and even a colorful mural. This site is now thought to have supported a population into the thousands and could have had significant interactions with other major centers in the Maya lowlands.

Vivian, Richard

[354] *Windes Matters*

Chaco Matters because Windes Matters. There are few subjects in Chacoan prehistory for which Tom has not contributed thoughtful analysis - from ants to Zuni spotted chert. His insights regarding agriculture in the Chaco Core are basic to understanding the long history of farming in this area. Some of those insights are reviewed.

Vlaskamp, Roosmarie (Leiden University)

[246] *Ethnic Identities in Central Nicaragua: Perspectives from a Habitational Site*

Archaeological research in Central Nicaragua has traditionally focused on the recognition of different ethnic groups in prehispanic times and their interaction through the evidence of trade wares. However, a reconsideration of the available data has revealed that there is an absence of knowledge on the habitus of these groups, a central concept in the recent discussion on understanding ethnicity. Therefore, over the next four years a prehispanic habitational site in Central Nicaragua will be investigated in order to substantiate the discussion on ethnic identities in this region.

Vlemincq Mendieta, Tatiana**[250]** *Anura in Moche Iconography*

The topic of this work is the anura, i.e., frogs and toads, in Moche iconography. Its primary aim is to establish if the anura were, in Moche cosmovision, associated with rains and agricultural fertility. During the early stages of this project, I gathered data and interpretations about the anura, while at the later stage, I built upon these findings to establish a classification system for these amphibians. The objectives of the classification are: first, to create a comprehensive database of anura, and secondly to create a flexible framework that can be used for future research and developed further. In order to reach the objectives and, because of the lack of written sources, an adaptation of the Panofsky method was employed. The outcome of this research illuminates links between the anura, and specific characteristics and concepts underlying Moche culture, e.g., agricultural fertility. The different anura depictions, in particular the "sapo botánico", show a direct connection between these animals and plant growth, water, rain and fertility.

Voeller, Sarah (North Carolina State University) and Ann Ross (North Carolina State University)**[132]** *Using GIS to Re-Associate Commingled Skeletal Remains*

One problem forensic archaeologists have encountered during the investigation of mass graves is the commingling of human remains. Commingling can consist of disarticulated body parts, and can be more complex when remains are skeletonized or fragmented. Methods exist to address this problem; however, some are costly while others are time consuming. It has been shown that mapping the three dimensional location of body parts in a mass grave is useful for re-association based on proximity of the closest missing element. This study investigates a way to re-associate commingled skeletal remains in a controlled context using readily available GIS technology that is low cost and time efficient. A mass grave with skeletal commingling was re-created using domestic pigs. The provenience of skeletal elements was mapped with a total station. Spatial relationships were then analyzed using both ArcGIS and GRASS. Tools within these programs allow for statistical calculations such as spatial autocorrelation which can be used to identify groupings of associated small bones such as phalanges or fetal remains, as well as simple proximity queries for the closest missing element. The capabilities of GIS for analyzing dispersed remains as well as a detailed replicable methodology will be presented.

Vogel, Howard (Hamline Univ. Sch. of Law)**[30]** *The Clash of Stories at Sacred Sites: Reframing the Task of Protecting Indigenous Sites*

Efforts to recover and protect indigenous sacred sites in the United States by framing conflicts over them in adversarial terms that employ the vocabulary of conventional legal doctrine on religious liberty and property rights have failed to succeed despite the creative efforts of many advocates. One cannot understand these failed efforts and move toward the development of a more hopeful approach to these conflicts without taking seriously the contrast between Indigenous views of the land and the view of land embedded in the legal vocabulary of individual property rights. These different views of land are not susceptible to resolution in decision-making bodies shaped by the dominant conception of land found in the principles of property law. This paper describes these difficulties and offers a constructive proposal for addressing the conflict in a non-adversarial setting through collaborative dialogue that takes seriously the clash of master stories underlying these conflicts. Such an approach takes the narrative dimensions of these conflicts as of utmost importance and reframes these conflicts by asking the following questions: (1) "What is sacred?"; (2) "What is authentic knowledge for the purpose of determining what is sacred?"; and (3) "Who gets to decide these questions?"

Vogel, Melissa (Clemson University)**[104]** *Moderator*

Vola, Gabriele [399] see Jackson, Marie

Volkers, Lauren [124] see Means, Bernard

Volta, Beniamino (University of California, San Diego)

[24] *Household Activities, Status, and Social Organization at Uxul, Campeche, Mexico*

The physical remains of ancient buildings and activity areas provide an important archaeological window into the lives and practices of past households. In the Maya region, patio groups composed of multiple structures housing extended families have long been recognized as the fundamental units of settlement. At a very basic level, patio groups were both the primary locus and one of the most tangible material outcomes of household activities. Variations in their size and spatial configuration can therefore be analyzed as indices of inequality and differentiation within communities. This talk presents the results of recent research on status and social organization at Uxul, Campeche, Mexico. I analyze data from elite and non-elite architectural groups in the settlement in order to trace a broad outline of economic, political, and ritual activities carried out by the inhabitants of the site throughout its history. The incorporation of Uxul within the Calakmul regional state in the first half of the Late Classic (roughly A.D. 600–750) offers a convenient turning point for discussing possible strategies employed by different social actors in response to changing political circumstances.

Von Hagen, Adriana

[78] *Tracing Stylistic Influences in Chachapoya Art and Imagery*

The art style of the people who occupied the territory called “Chachapoyas” by sixteenth century chroniclers and modern scholars reflects the region’s location straddling the eastern slope of Peru’s northern Andes and Amazonia. At various times in Andean prehistory the Chachapoya interacted with cultures to the north, east and west of their territory, while at other times they seem to have flourished in relative isolation. Given Chachapoyas’ location and apparent sporadic contacts, especially with cultures to the west of the Marañón river, it is no surprise that its art style reveals an eclectic and anachronistic mixture of stylistic features and influences drawn from many cultures and periods. A trove of well-preserved burial offerings from Laguna de los Cóndores, including textiles and gourds, as well as artifacts from a handful of other burial sites, are helping researchers clarify the origins and pinpointing the geographical range of recurring Chachapoya imagery.

Von Holstein, Isabella (Christian Albrechts Universität, Kiel)

[403] *Geographical origin assignment of sheep wool textiles using light stable isotopes*

Identifying groups of material cultural objects that are non-local has long been part of artifact analysis in archaeology. Tracing the movement of objects and the movement of ideas about how to make and use objects is important to understanding physical and ideological links between sites. This work has relied on data from typological, technological and chemical analyses of object construction and use. Textiles made from sheep wool were a highly valuable commodity traded long-distance in the Middle Ages in Europe. This presentation will demonstrate the use of light stable isotopic analysis (carbon, nitrogen, and hydrogen) to identify the origin of textile samples (n=92 from 5 locations in Northern Europe), by comparison with a baseline isoscape constructed from samples of modern sheep wool (n= 171 from 16 flocks) and archaeological sheep bone collagen (n=62 from 5 sites) isotope data. The presentation will discuss how to integrate isotopic data with existing typological understanding of the artifacts, and sources of uncertainty deriving from farming practice variability (both past and present), keratin diagenesis, and site type. The application of the method to textiles from other regions and in other raw materials will be explored.

[403] *Discussant*

Von Holstein, Isabella [403] see Laws, Kaitlyn

Von Petzinger, Genevieve (Dept. of Anthropology, University of Victoria)

[353] *Following the Signs: Tracking Geometric Rock Art across the Landscape of Upper Paleolithic Europe*

Geometric signs are found at nearly all Upper Paleolithic rock art sites in Europe. Created between 10,000 and 40,000 BP, the signs are one of the major thematic categories of art from this era, however, they are often not as well-documented as their figurative counterparts. While there are some sites (e.g., Grotte Chauvet) where detailed inventories have been created for all of the imagery, there are many other sites where this has yet to be carried out. The geometric signs have the potential to offer new insights into the development of symbolic thinking and the beginnings of graphic communication during this time period, but more accurate data is required before any large-scale studies can be successfully undertaken. The goal of the project discussed in this paper was to begin rectifying this lack of data by doing on-site inventorying and visual documentation at fifty-two sites in France, Spain, Portugal and Italy over the course of two field seasons. These sites were selected specifically because of the limited information currently available about the non-figurative imagery present. This paper will present the results of this study and will discuss some of the challenges faced when completing a project of this size and scope.

Von Schwerin, Jennifer (German Archaeological Institute)

[100] *Show Me the Data!: Structuring the MayaArch3D Digital Collections for Research Queries in a 3DWebGIS*

Archaeological projects are increasingly acquiring 3D data sets of individual finds, as well as whole cities. The archaeologist receives the model as a 3D PDF, video, point cloud or object file. Views of the model are published in a journal, shown in an exhibition and the pipeline usually ends here. Typically, archaeologists do not use the 3D model for much more than visualization purposes. The MayaArch3D project is building a 3DWebGIS to enable archaeologists to do more with these models –to store, share and analyze their 3D models online in the context of geographically referenced archaeological data within an online, virtual research environment (VRE). To do this, we use the models as visual storage containers and link them to spatially-referenced archaeological data. As the archaeological partner in the project, our challenge at the German Archaeological Institute (DAI) is to not only to determine for which objects 3D models should be made, but then to conceptually segment and structure the 3D models as well as their associated archaeological data so that they can be linked together in our 3DWebGIS for both visualization and analysis. This paper introduces the MayaArch3D collections and explains the data structuring pipeline.

[100] *Chair*

von Schwerin, Jennifer [100] see Reindel, Markus

Voorhies, Barbara [91] see George, Richard

Voorhies, Barbara (University of California, Santa Barbara)

[182] *Ethnographer Stewart Culin and "Games of the North American Indians"*

This talk appraises the contribution of Stewart Culin, a self-taught ethnographer, to the study of games of indigenous North Americans. His exhaustive survey, published in 1907 by the Bureau of American Ethnology, remains the single comprehensive resource for archaeologists seeking to examine games in the prehistoric record and as such is well exemplified by the presentations in this symposium. Culin's study, initiated in collaboration with Frank Hamilton Cushing, began in 1891 in connection with the 1893 World's Fair in Chicago and eventually led to the encyclopedic publication *Games of the North American Indians*. This invaluable publication can easily be viewed as a paragon of the meticulous research methodology typical of the peak period of ethnological collecting and museum exhibition.

[182] *Chair*

Vorsanger, Andrew (Environmental Planning Group) and Steve Swanson (Arizona State University)

[137] *Sacred vs Secular: Prehispanic Village Landscapes in Southwest New Mexico*

In the prehispanic Southwest, it is well known that certain places on the regional landscape were considered sacred or ritually charged, such as summits, springs, and caves. Less understood is the way that sacred and secular spaces were partitioned within prehistoric villages. In this paper we examine the relationship among secular and sacred spaces during the PIII/PIV periods at two villages along the Rio Grande. Each village includes roomblocks, agricultural features, resource processing areas, shrines, and petroglyphs. One village is the previously recorded Yarborough Site, on Tierra Blanca Creek, in the eastern Mimbres region. The second village, the newly recorded Sato Pueblo, is located just northeast of Socorro. Despite having only distant social connections, we find remarkable similarities in the organization of sacred and secular spaces. This suggests that there was a regionally shared cosmology that guided local village planning.

Voss, Hans-Ullrich [47] see Davis, Stephen

Voss, Barbara (Stanford University)

[305] *Subjectification and the Archaeology of Violence: The 19th-Century Anti-Chinese Movement in San Jose, California*

Communal violence is often central to subjectification and the process of creating and sustaining social difference. Preliminary results of archival studies and archaeological research trace the relationship between violence and subject formation among participants of the anti-Chinese movement in 19th century San Jose, which enacted campaigns of harassment and direct violence against Chinese immigrant and Chinese American residents of the city. What material practices and social performances transform neighbors into enemies? What rhetorics and materialities legitimize and rationalize the use of force? What archaeological traces can aid in reconstructing victims' responses and persistence in the midst of routinized violence? Overall, this investigation seeks to forge connections between anthropological theories of communal violence and what Paul Mullins has termed the "archaeology of the color line" in North America.

[269] *Discussant*

Voytek, Barbara

[297] *From Russia with Love: Ruth Tringham and the Early Days of Microwear*

It was the early 1970s and a time when the Cold War directed the geopolitical scene worldwide. It was also a time when a young British archaeologist brought to the USA a new approach to the study of material culture. Professor Ruth Tringham landed at Harvard in 1971 together with the technique of microscopic analysis of traces of use on chipped stone tools, a technique which she had studied in the USSR. There were other scholars pursuing this scientific approach to lithic study but Ruth clinched it, developing a solid program of experimentation, observation, documentation, and dissemination that is a cornerstone of subsequent advancements. This paper revisits those early years of microwear analysis at Harvard. The author was an undergraduate then and provides a firsthand look at a time of discovery, fun, and to some extent, revolution in archaeological research.

Vrydaghs, Luc [309] see Ball, Terry

Vrydaghs, Luc, Yannick Devos (1. Center de Recherches en Archéologie et Patrimoi) and Jean-louis Slachmuylders (2. Research Team in Archaeo- and Palaeosciences, A)

[309] *Does Phytolith Analysis of Archaeological Soil Thin Sections Account for Archaeobotanical Data?*

Whilst phytoliths are plant microfossils, due to their formation process they differ markedly from any other plant remains. Consequently, their incorporation within archaeological deposits relies on specific taphonomical processes. It is here assumed the phytolith analysis of archaeological soil thin

sections allows to document these processes and as such to discriminate between in- and exsitu phytoliths. However and accordingly to the context you consider, as such analysis do not involve any concentration of the phytoliths, one needs to question how far such analysis are reliable in terms of spectra composition. Present contribution intends to explore this issue.

Waber, Nicholas (UB.C.)

[122] *3D Photogrammetry and GIS for Tracking Edge Wear Accumulation in Lithic Experiments*

Digital photogrammetry is fast becoming a popular method for 3D landscape, feature, and object modelling. The ease with which photogrammetrically-derived models may be analyzed with conventional GIS software has streamlined archaeological landscape analysis. These same tools are eminently scaleable, facilitating comparable analyses of much smaller surfaces: those of lithic artifacts. Using 3D digital photogrammetry and GIS software, I propose a method to locate, define, and quantify edge damage on experimental lithic tools. By periodically recording each artifact throughout its experimental use, it becomes possible to determine the rate of wear for an edge engaged in a specific task. This will provide a useful technique for lithic analysts to establish comparative benchmarks and characteristics for application to archaeological lithic artifacts around the world, enabling a better understanding of tool curation and discard practices, as well as artifact use lives.

Waber, Nicholas [151] see Blake, Michael

Wadley, Lyn [7] see Phillips, Cassidy

Wagner, Friedrich [9] see Wagner, Ursel

Wagner, Ursel (TU-Muenchen), Benilde Costa (University of Coimbra), Werner Häusler (TU-Muenchen), A. Silva (University of Coimbra) and Friedrich Wagner (TU-Muenchen)

[9] *Mössbauer, XRD and XRF Study of Roman Amphorae and Amphora Kilns from the Roman Provinces of Baetica and Lusitania and Clays*

Roman Haltern 70 type amphorae found at Castro do Vieito, an archaeological site in the north of Portugal, in the former Roman province of Lusitania, were studied by 57-Fe Mössbauer spectroscopy, X ray diffraction and X ray fluorescence with the aim of elucidating their firing conditions and their site of production. For comparison, sherds found at eight kiln sites in the south of Spain, in the former Roman provinces of Baetica and Lusitania, were studied. Moreover, clays collected near the kiln sites were fired in the laboratory for comparison with the amphora material. The amphorae from Castro do Vieito as well as the sherds from the kiln sites were found to have been fired at temperatures around 800 oC in atmospheres that changed between reducing and oxidizing at least once during the firing cycle. Oxidation during the final stage of firing often lead to sherds with more divalent iron in the core than on the surface. The amphorae found at Castro do Vieito appear to have been produced in southern Spain and used to transport agricultural produce to the north, but a definite location for their production cannot yet be given.

Wagner, Stephen

[289] *Manufacturing the Gap: Discrete Data, Archaeological Sites, and Cultural Resource Management*

Archaeology in cultural resource management uses methods designed to cover large areas of land, however the results are rarely interpreted as part of a landscape. Instead, the focus is usually on the densest areas of artifacts, without consideration for the types of data that might lie within the less-dense areas. This is primarily a problem of interpretation, although it is exasperated through the use of discontinuous sampling units and through the continued requirements of out-dated methods through contracting requirements. Alternative methods can be implemented to help mitigate these interpretive issues, both immediately and over the long term.

Wagner, Mark, Kayeleigh Sharp (Southern Illinois University), Go Matsumoto (Southern Illinois University), Mary McCorvie (Shawnee National Forest) and Heather Carey (Shawnee National Forest)

[353] *Islands in the Stream: A GIS Study of Prehistoric Ritual Landscapes within Southern Illinois*
Native Americans recognized unique natural features as representing parts of ritual landscapes imbued with power that also contained cultural elements including rock art and mortuary sites. One such landscape within Illinois consists of a three mile long isolated bluff segment located on the now-drained Mississippi River floodplain that prehistorically was surrounded by a mosaic of lakes, ponds, and swamps. In this paper we use GIS, LIDAR, and archaeological data to reconstruct the ancient lacustrine environment and the relation of prehistoric rock art, mortuary, and habitation sites to each other, the bluff, and the now-vanished natural landscape in which they once were contained. In combination these data indicate that the bluff, which would have appeared as a mound-like landform extending skyward out of the Mississippi River during periods of intense flooding, represented a loci of ritual activities in southwestern Illinois for over 2,000 years from the Middle Woodland to Mississippian periods.

Waguespack, Nicole

[87] *When Charismatic Megafauna Meet: The Relationship between Archaeologists and Proboscideans in North America*

Archaeologists have a unique relationship with the faunal record of proboscideans. The interpretative histories associated with mammoths and mastodons, particularly in North America, are wholly unlike those of other zooarchaeological species both extinct and extant. Distinctively divisive, consequential, and enduring, the interpretive attention and rhetoric focused on proboscideans has proceeded largely independent of the known inventory of sites and assemblages in Pleistocene North America. Tracking temporal trends in proboscidean site discovery and subsequent professional attention in the literature reveals the disjuncture between the faunal record of extinct charismatic megafauna and the charismatic megafauna who study them.

Wahl, David (USGS), Lysanna Anderson (USGS) and Francisco Estrada-Belli (Tulane University)

[350] *A Late Holocene Environmental Reconstruction from a Wetland in the Northern Holmul Region: Preliminary Results from Laguna Ek'Naab, Peten, Guatemala*

Environmental change, caused by either human activity or climate variability, has been posited as a contributing factor in causing widespread demographic shifts in the southern Maya lowlands at the end of the Preclassic and Classic periods. Here we present preliminary results of analyses examining environmental change during and after the period of Precolumbian Maya settlement. Environmental reconstructions are based on a multi-proxy approach, including pollen, macroscopic charcoal, stable isotopes, and loss-on-ignition. Analyses were performed on a 7 meter sediment core from Laguna Ek'Naab, a relatively small wetland associated with the Holmul River. Laguna Ek'Naab is near two major Maya settlements, the Preclassic period center Cival and the Late Classic site Witzna'. Extensive archaeological mapping around the study site provides a basis for interpreting the results in the context of local settlement history. Coupling the local archaeological record of settlement and land use with limnological reconstructions of environmental change enables us to test models suggesting that anthropogenic and/or natural (i.e., climate) impacts played a role in shifting Precolumbian demographic patterns. Results from ongoing analyses will provide a foundation for drawing broader conclusions about the dynamic human/environment relationship in the Laguna Ek'Naab watershed during the Maya period.

Wahl, David [408] see Schreiner, Thomas

Wakabayashi, Kunihiro (Doshisha University)

[145] *Wars and Battles as Cultural Phenomena in Bronze and Early Iron Age of Japan*

Several lines of archaeological evidence indicate that numerous battles took place during the Yayoi Period or Japanese Bronze and Early Iron Age. So far, Japanese archaeologists have argued that

these battles occurred as results of competition for agricultural lands or taking initiatives over exchange system. Many of the Japanese archaeologists have speculated that wars were a part of the social process for evolving toward an early state society. However, archaeological evidence for wars, such as injured skeletal remains, weapons, and settlements at defensive locations, are all dated to the fourth to third centuries, B.C. contemporaneous to the Warring States Period China. This suggests to me that widespread warfare in Japan was a part of many cultural influences from China. I would argue that wars took place not as a factor for social evolution but as a cultural phenomenon.

Wake, Thomas [79] see Lawrence, John

Wake, Thomas (Cotsen Institute of Archaeology at UCLA)

[170] *Trade, Exchange, Production and Consumption at Sitio Drago, Bocas del Toro, Panama*
Sitio Drago is a large (18 ha) precolumbian settlement strategically located on the NW corner of Isla Colon, Bocas del Toro, Panama. Prior to the 21st Century Bocas del Toro had been characterized as recently colonized, poorly populated, having a relatively low degree of sociopolitical elaboration and isolated. Continuing research over the last 10 years on Isla Colon, focusing on Sitio Drago, illustrates that the site and by extension, the region, has a much longer population history, a broader resource base, greater socio-political complexity and more extensive connections to lower Central America (Panama, Costa Rica and Nicaragua) than previously believed. Evidence pertaining to colonization, diet, and external connections is presented and discussed in relation to other "culture areas" of lower Central America.

[170] *Chair*

Walden, John (University of Pittsburgh)

[182] *Ritual and Divination in Ancient Maya Dice Games*

In this presentation I examine the dice games played by the ancient Maya and investigate the interpretation proposed by several Mayanists that these games were used primarily for divinatory purposes. I examine the archaeological contexts of these 'patolli' boards and review the substantial body of ethno-historical and ethnographic material from broader Mesoamerican contexts in order to scrutinize the interpretation that these games served as divinatory devices and to offer other interpretations and possibilities. This body of evidence is then compared with both ethno-historic and ethnographic accounts of Maya shamanistic divination in order to further query the claim that these dice games were used in divinatory rituals in the ancient Maya world

Walder, Heather (University of Wisconsin-Madison)

[140] *"A Thousand Beads to Each Nation:" A Social Interpretation of Glass Trade Bead Distribution in the Upper Great Lakes Region of North America*

Through LA-ICP-MS elemental analyses of 874 glass trade beads from 31 early colonial-era archaeological sites in the Upper Great Lakes region of North America, and from late 17th century contexts historically associated with French exploration of the Gulf Coast of Texas, I identify patterning in the spatial and temporal distribution of European glass-bead recipe groups. Trading relationships among Indigenous peoples and outsiders in this French "Upper Country" took place on a complex "middle ground" organized and navigated by an "Infinity of Nations" (White 1991; Witgen 2012), who maintained social and political autonomy through gift-giving and forging fictive kinships. Therefore, patterning of glass recipe groups may reflect: socially-structured exchange networks circulating goods across a diverse ethnic landscape, dynamic population movements, and groups' changing access to materials over time. In this case study, archaeometric analysis of glass beads supplements standard archaeological methods, like stylistic analyses of ceramics and other "Native-made" artifacts, to clarify ethnic groups' interactions and boundaries as reflected in material culture. This regional examination of glass bead exchange highlights the usefulness of investigating archaeological glass recipes beyond simple chronology-building or clarifying historical manufacturing processes, demonstrating potential for illuminating social connections of ethnic groups interacting on a dynamic past landscape.

[140] *Chair*

Wales, Nathan (Center for GeoGenetics, University of Copenhagen), Jazmín Ramos Madrigal (Center for GeoGenetics, University of Copenhagen) and M. Thomas P. Gilbert (Center for GeoGenetics, University of Copenhagen)

[229] *New Genetic Perspectives on Early Maize Cultivation in the American Southwest*

Following the initial domestication of maize (*Zea mays* ssp. *mays*) from a teosinte grass in Mexico, human populations dispersed the cultivar through trade and migration. Despite a long history of archaeology in the American Southwest, many questions about maize remain, including how the crop was dispersed northward from Mexico and how maize was acclimated to new environments. These unresolved questions can be explored in new ways, thanks to next-generation DNA sequencing technology and targeted enrichment of important genetic loci. By testing genetic markers in archaeological specimens, it is possible to determine genetic relationships between ancient samples and extant landraces, as well as tracing the routes by which maize was spread in North America. Furthermore, ancient DNA evidence can be used to explore what genes have undergone selective pressures, providing insights into past agricultural preferences and adaptations to local environmental settings. Here, we report findings from multiple maize samples from different archaeological sites, and in the process obtain a more nuanced understanding of the prehistoric use of maize in the American Southwest.

Walker, Chester [4] see Houk, Brett

Walker, Karen (Florida Museum of Natural History), William Marquardt (Florida Museum of Natural History), Arianne Boileau (Florida Museum of Natural History), Ann Cordell (Florida Museum of Natural History) and Donna Ruhl (Florida Museum of Natural History)

[166] *Episodic Habitation in an Eolian Environment, 1350 B.C. - A.D. 900, Useppa Island, Coastal Southwest Florida*

Excavations (2012) on southwest Florida's subtropical Useppa Island revealed a stratigraphic sequence of alternating eolian-sand and shell-midden layers, mostly dating from 1350 to 1000 B.C., with the highest midden dating to A.D. 900. Predictably, the Late Archaic artifact assemblages (pottery, shell artifacts, etc.) differ greatly from the younger Caloosahatchee IIB one. However, surprisingly the invertebrate faunal assemblages also differ. And there is a general dearth of fish remains in the five earliest middens. Among the sparse vertebrate remains, scattered within those Late Archaic middens, were 31 specimens (NISP) of domestic dog, *Canis lupus familiaris*, the first record of dog for the Calusa heartland. Findings suggest that much of the sequence represents a record of people who may have faced difficult subsistence conditions in the context of changing environments.

Walker, Sarah (Oregon State University), Leah Minc (Oregon State University) and Christina Elson (Science Visualization CEO)

[216] *Zapotec Economy in Late Classic Jalieza: Through the Lens of Ceramic Analysis*

The site of Jalieza, during the Late Classic, was the second largest community in the Valley of Oaxaca. But in spite of its position in the regional settlement hierarchy, the position of this site in the regional economic system is largely unknown. To ascertain this, we have examined patterns of ceramic consumption and exchange utilizing three contexts of an elite house, a semi- elite house, and a systematic surface survey to obtain 250 samples of ceramics from household and ritual vessels. Additionally, 10 samples of figurines were also analyzed. Using trace element analysis, we determined the ceramic provenance and utilized this information to identify the trade partners associating with Jalieza. The results of this provenance testing have also been combined with GIS using a travel time-cost analysis to show whether the trade patterns resulted from least cost considerations or political connections or conflicts. Taken as a whole, this study shows a snapshot of the economic and possible political realities influencing trade with Jalieza during the Late Classic.

Walker, Chester (Archaeo-Geophysical Associates, LLC), Nathaniel VanValkenburg

(University of Vermont) and Mark Willis (Archaeo-Geophysical Associates, LLC)**[287]** *Architecture in Negative: Mapping Social Space at Carrizales, Peru, Using Low Altitude Aerial Photography and Photogrammetry*

In the late 16th century CE, Spanish administrators and clergy sought to reconstitute indigenous Peruvian subjects by forcibly resettling them into planned towns called reducciones. Mapping domestic space in these new settlements (and those that preceded them) has been a crucial element of archaeological research that seeks to understand reduccion's impact on native households. However, on the Peruvian coast, where both late prehispanic and early colonial period domestic structures are dominated by highly perishable quincha (unburnt wattle and daub) constructions, the absence of standing architecture presents significant challenges to efficient mapping of settlement and household structure. Our research at the site of Carrizales has addressed these issues by employing several modes of data collection (pole- and kite-aerial-photography, as well as fixed wing UAVs) to generate microtopographic models of quincha wall foundation trenches and other "negative" impressions of architectural elements, allowing for robust reconstructions of how indigenous domestic space was reconfigured following the reducci3n process.

Walker, Debra (University of Florida)**[306]** *Branching Out: Cerro Maya as a Strategic Link in a Preclassic Maya Exchange Network*

Ours is the first generation of Maya archaeologists to be fully rooted in Maya history. Thanks to our mentors, and especially cooperation between epigraphers and archaeologists, we have come to know the faces, names and life stories of important figures in our own New World history, epics that rival those of the Old World. The telling of these stories is a work in progress, however, our mentors, Linda Schele and David Freidel, provided a courageous and insightful first effort at embodying the color and complexity of Maya history in prose through the publication of *A Forest of Kings* in 1990. While our understanding of Cerro Maya (Cerro) has evolved since the volume was produced, the site remains an early royal tree in the Maya forest. Rather than inventing kingship de novo from a prospering fishing and trade economy, recent research suggests Cerro Maya, the place, was strategically selected to co-opt an existing trade network. In short, the site was probably founded as a branch of a larger Preclassic polity with a substantial capital investment from that site. Material evidence points to Quintana Roo as the root of that royal tree.

Walker, William (New Mexico State University)**[343]** *Discussant***Walker, John (UCF Department of Anthropology)****[350]** *Forest Islands and Raised Fields in the 2nd Millennium B.C.E. Amazon*

Precolumbian earthworks in the Llanos de Mojos show discrete spatial patterns, at different scales. For example, large mounds and causeways are found in the southeast, causeways and raised fields in the south, and large raised fields in the center and to the north. Recent excavations in forest islands associated with raised fields in Central Mojos identify occupations dating to the second millennium B.C.E. This raises the question of how to integrate different elements into histories of landscapes. Flood regime and climate can be shown to vary considerably over time, and on the flat landscapes of Mojos, such changes are reflected across many thousands of square kilometers. Spatial patterns are the result, not of stable feedback cycles of rainfall, vegetation and soils, but of flexible and sustained ways of life, organized at the scale of the community. Differences between forest islands and raised fields within the large raised field area suggest that decision making about the landscape was organized at several scales, but that the scale of the community, represented by individual forest islands and ring ditches was more important over the long term than any smaller or larger scale.

Walker, Mark (Anthropological Studies Center-SSU) and Whitney McClellan (Anthropological Studies Center-SSU)**[416]** *Maritime Households in San Francisco*

In its work in the neighborhoods in the South of Market area of San Francisco the Anthropological Studies Center of Sonoma State University acquired a database of 14 assemblages from households associated with the maritime sector of San Francisco's economy. Because of this sector's centrality within the city's economy, maritime workers are a dominant element in social and labor histories of the city. They are not, however, so visible in the archaeological record. In this paper, we present recent work at a sea-captain's household, and then a comparative neighborhood-level analysis of the maritime households. This work indicates the complexity of the organization of labor in the maritime sector and some of the large gaps in the archaeological record that we confront in dealing with certain kinds of labor.

Wall, Bridget [341] see Basgall, Mark E.

Wallace, Ryan [80] see Martindale, Andrew

Wallace, Henry (Desert Archaeology Inc)

[304] *Discussant*

Waller, Kyle (University of Missouri)

[245] *New Perspectives on Casas Grandes Mortuary Practices*

The diversity of Casas Grandes mortuary practices has often been cited as strong evidence for hierarchy and political centralization at Paquimé. Initial mortuary analyses argued that variability in grave furniture, corpse treatment, and burial location represented the social identity of the deceased. A central finding of these analyses was that mortuary variability cross-cut age and sex categories, supporting inferences of ascribed vertical status differentiation. In this study, we use recent theoretical perspectives emphasizing the performative aspect of mortuary practices, and new bioarchaeological techniques for age and sex estimation to re-examine the Casas Grandes burial dataset. We also expand upon these analyses by incorporating paleoepidemiological datasets to examine the influence of individual well-being in burial practices. Our results suggest that mortuary practices at Paquime may map onto several social dimensions, including graveside social negotiations by the living and lived identities of the deceased. We discuss the implications of these results for Casas Grandes identity, ritual practices, and social organization.

[245] *Chair*

Waller, Kyle [245] see Krug, Andrew

Waller, Jr., Joseph N. [281] see Beamer, Dawn

Wallis, Lynley [3] see Hauser, Neil

Wallis, Neill (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)

[328] *Assessing Mobility and Social Interactions through Integrated Analyses of Complicated Stamped Pottery in the American Southeast*

In the Deep South of the American Southeast, regional scale social interactions burgeoned alongside the growth of nucleated villages, widespread mound-building projects, and conspicuous mortuary ceremonialism during the Middle and Late Woodland period (ca. A.D. 100 to 800). A premier material for understanding the significance of social interactions across the southern landscape comes from Swift Creek Complicated Stamped pottery, a ubiquitous class of material culture that provides direct evidence of connections between specific sites at a multitude of scales and in myriad contexts. The impressions of wooden paddles carved with an array of unique designs serve like maker's marks in documenting vessels finished with an individual identifiable tool. By combining design data, patterns of vessel form and use, determinations of vessel provenance through NAA and petrography, and absolute dating, this research ascertains types of social

interaction and their predominant directions and levels of intensity across multiple ecological, social and cultural contexts. The results are considered in terms of the efficacy of models of migration, residential mobility, post-marital residence, and exchange, and their implications for better understanding major regional trends in village aggregation and ritual practice.

Walsh, Megan [155] see Thompson, Jessica

Walsh, Matthew

[312] *Variation in Animal Predation and Processing Strategies at the Bridge River Winter Pithouse Village (EeRI4) Thru Time: A Zooarchaeological Analysis of Subsistence Change*

Late Holocene occupants of Housepit 54 at Bridge River participated in complex strategies of food acquisition that were much more varied than the oft-cited reliance on storable anadromous fish resources practiced throughout much of the Pacific and inland/riverine Northwest of North America. While acquisition and storage of fish, particularly salmon, was (and is) a vital part of aboriginal subsistence, permeating many aspects of indigenous lifeways, seasonal and spatial variations in animal procurement were common and increased through time as environmental conditions and village demographics changed. Indigenous people inhabiting the Bridge River Village sought a variety of terrestrial mammals as food sources, as well as birds, ubiquitous fish, and an extensive array of wild plants. The faunal assemblage from Housepit 54 suggests strong evidence for widespread utilization of a variety of animals, including canids (most probably domesticated dogs), whose consumption is apparent in the earliest occupation floors of the house and continues throughout the life of the house. This study emphasizes the zooarchaeological assemblage as a whole, as well as by discrete living floors and activity areas, in order to assess how subsistence changes played out on a near-generational scale in response to various conditions, including village demographics and ecological change.

Walters, Michael (University of Oklahoma) and Rebecca Storey (University of Houston)

[206] *Juvenile Death and Ancestor Veneration: Comparing Child Burials of the Preclassic Maya at K'axob and Cuello, Belize*

Recently, children have been a growing focus of mortuary analysis as archaeologists have been interested in how past societies responded to childhood mortality. This study is a comparative analysis of two Preclassic Maya sites, K'axob and Cuello, and the child burials, 25 and 19 burials respectively. The age ranges of the individuals are infant, child, and adolescent. Placement of the burial, burial offerings, type of grave, and other variables are analyzed to determine how children were incorporated into ancestor veneration and a part of ensouling the house among the Early Maya, perhaps as a precursor to the practice in Classic Maya mortuary ritual. The study contrasts patterns between children inside domiciles and children buried with an adult versus children buried outside residences and not with adults. It is hypothesized that children buried with adults and inside domiciles provide evidence that children were part of ancestor veneration during the Preclassic.

Walth, Cherie (SWCA Environmental Consultants)

[52] *Mortuary Practices of the Pre-Latte and Latte People of Guam Based on Data from the Naton Beach Site*

The large sample of Pre-Latte and Latte period burials from the Naton Beach Site on Guam offers an opportunity to examine the differences and similarities in the mortuary practices. This poster examines several research questions: What is the pattern of burials in terms of location within the site? Do the patterns relate to potential residence areas? What is the pattern of internment in terms of orientation, position, placement, age, gender, and grave goods? A cluster analysis was completed by affiliation to identify spatial units using a k-means algorithm in the ArcGIS program. The results indicate that both groups had some cohesive clusters that likely represented burial beneath or adjacent to a structure. There were similarities in the body position and orientation, suggesting a similar world view. In terms of horizontal social positioning, both groups are primarily kin based with the Latte having some residence based groups. Vertical social positioning based on the presence and quantity of grave goods, indicate that both have some individuals of a higher social position than

others. For both groups, there are a number of individuals that were not in or near a cluster. Further research on the social organization and ethnicity is underway.

Walton, Marc [101] see Ganio, Monica

Walton, David (Boston University)

[249] *Lithic Production and Consumption at Tzintzuntzan, Mexico*

Tzintzuntzan was the political capital of the Tarascan Empire and home to the royal uacúsecha dynasty during the Late Postclassic period (A.D. 1350-1525). This study presents the technological analysis of 1,155 lithic artifacts recovered during excavations at Tzintzuntzan from 1977 to 1978 and places these findings in context with prior lithic studies based on survey data. The excavation contexts include a palace, storehouse, residential structures, and the five ceremonial Yácatas located on the Grand Platform and a lower elite residence and chapel located to the southeast. The consumption pattern of the Grand Platform is characterized by a high proportion of obsidian blades used for ceremonial display and burial offerings and lower proportions of obsidian scrapers and lapidary objects. The consumption pattern of the lower elite residence is characterized by a higher percentage of green obsidian and greater technological variety. The scales of production in both locations are very low, which indicate that earlier models of lithic production at Tzintzuntzan may require revisions. Finally, the spatial distributions of lapidary tools, preforms, and highly polished fragments in this assemblage suggest that lapidary production was conducted on or nearby the Grand Platform by lower elite members of Tarascan society.

Walz, Jonathan (Rollins College)

[340] *Healing Archaeology*

In this paper, I discuss alternative interpretations of findings from an interdisciplinary archaeology project in East Africa. I share the way in which my experiences as an archaeologist among people and on landscapes enriched and altered my original understanding of communities and the region's history. Interactions with Zigua healer-historians alerted me to indigenous concepts of time and space and the role and significance of ancestors and healing, which inevitably offered more robust and ethical explanations for emergent material signatures. I draw on items, landscapes, oral sources, and community healing practices through which people in Tanzania understand their pasts and forge new futures. In a sense, my original approach - less aware of local practices and ways of knowing - was healed by my experiences with healer-historians.

Wandsnider, LuAnn (University of Nebraska)

[228] *Big House on the Prairie? Signal Quality across Multi-ethnic Homesteading Contexts in the Central Plains (USA)*

Homesteaders colonizing central Nebraska (Central Plains, USA) in the late 1800s constructed communities that varied in terms of ethnic heterogeneity as well as across other dimensions. Costly signaling tenets explored to date suggest that for multi-lingual and multi-ethnic communities, we expect material culture, in this case, homestead size and ornateness, to index family capacities; in linguistically and ethnically homogenous communities, such a material signal may have had less saliency. Relying on lidar data and historic documents, I evaluate this proposition and also consider confounding factors, such as the rapidly unfolding nature of the homesteading experience, homesteader mode of production and the homesteading exit strategies implemented by some homesteaders.

[228] *Chair*

Wandsnider, LuAnn [361] see Day, Zachary

Wang, Yanxi (University of Georgia)

[26] *The Landscape and Regional Integration of the Guan River Valley in the Eastern Zhou Period (770-221 B.C.)*

The regional full-coverage survey at the Guan River Valley, China, reveals a highly integrated, hierarchical and structured settlement system in the first millennium B.C. This settlement system centered on a walled city on the broad alluvial plain of the middle stream. However, a supra-settlement, which was more than twice as large as the city, located at the mountainous area more than 25 km to the upper stream. The nature of this supra-settlement and its relation to the middle stream settlement system is difficult to interpret. Neutron activation analysis (NNA) shows that the chemical signature of ceramics, which includes both domestic pottery and architectural material, are similar between settlements in the upper and middle stream. This suggests that despite the landscape obstruction and occupation vacuum between the upper and middle stream, a regional economic network, as manifested by the production and distribution of ceramics, connected these two areas closely. The regional settlement pattern and historic background implies that this regional integration was caused by a reorganization of political and economic landscapes of a macro-region.

Wang, Hua (Institute of Cultural Heritage, Shandong University), Ruilin Mao (Gansu Provincial Institute, China) and Hui Wang (Gansu Provincial Institute, China)

[37] *Ritual animal use of "Qijia Cultural", evidence from Mogou Cemetery, Lintan County, Gansu Province, China*

Animal bones were frequently recovered from burials at the Mogou site. Researchers commonly assumed that they were related to specific ritual or sacrificial activities. With application of different zooarchaeological methods and approaches to the animal bones recovered from burials at Mogou, this study attempt to understand human behavior patterns behind this phenomenon, and how they change through times. Pig mandibles were recovered in large quantities from Mogou cemetery. With detailed analyze of these bones, the following issues will be address in detail: Did humans have any preference, e.g., specific age or sex of pigs? Whether this specific cultural phenomenon has influenced pig husbandry strategies at the site? Whether these pigs came from one or two populations? Other issues, such as how these mandibles have been processed and their taphonomic history, are also questioned. Whether these pigs were obtained for mass killing before the ritual activities will also be considered.

Wang, Hui [37] see Wang, Hua

WANG, Hui (Gansu Provincial Institute of Archaeology and Cultural Relics)

[37] *The Evolution of the Qijia Culture and Its Contacts with Other Cultures*

The Qijia culture originated in Loess Plateau of East Gansu and rose to a dominant culture in the vast region of present Gansu and Qinghai with its territory stretching as far as Huanghe hetao area, Guanzhong Plain and NW Sichuan. Its continuity in material culture offers great scope for archaeological research into its varying material manifestations. This article takes a comparative approach to enhance our understanding of the evolution of the Qijia culture and its contacts with other cultures. First, the development of the Qijia culture is reviewed and outlined. The early phase of Qijia culture derived from the Lower Changshan culture with a contribution from the Majiyao culture. Then it exchanged with neighboring cultures, i.e. Banshan and Machang cultures during its middle phase. While at the late period, the Qijia culture interacted with distant cultures, i.e. the Eurasian pastoralist groups and the Erlitou sedentary society; at the end it divided into four Bronze cultures as Siwa, Xindian, Siba and Kayue. Second, the centers of the Qijia culture are explored as westward extension from Tao River, Daxia River, upper Wei River, east Qinghai and Hexi corridor.

Wang, Chunxue, Yinmin Yang (Key Laboratory of Vertebrate Evolution and Human O), Chunxue Wang (Research Center of Chinese Frontier Archaeology of), Xing Gao (Key Laboratory of Vertebrate Evolution and Human O) and Ning Wang (Key Laboratory of Vertebrate Evolution and Human)

[179] *Experimental Research Concerning the Production of Early Holocene Ostrich Shell Beads at the Shui Donggou Site, Ningxia, China*

The appearance of art is an important development in behavioral modernity. In this paper we address the production of early Holocene ostrich eggshell beads. Such beads have been found in many Chinese late Paleolithic sites and also the early Holocene site of Shui Donggou. The study of

these ancient beads will help us to better understand early craft production and the role art played in the development of society. In this paper, we present the results of our experimental ostrich shell bead replication analysis. In order to obtain the use-wear signatures, Synchrotron Radiation Micro CAT Scans were used to document the use-wear formed on modern beads produced by two drilling methods. The results indicate that 1) the perforation shape and drilling marks are distinct between the different methods; 2) the outer and inside surface of the shell could be non-destructively identified and drilling direction could be determined and 3) Ostrich species distinction could be determined. Similar methods were then employed to examine the early Holocene beads from the Shui Donggou site. We propose that by the early Holocene China a couple of different drilling techniques were occurring and our methods can be applied to other areas.

Wang, Qiang

[179] *Ancient Human Herbivorous Diet Reflected by the Analysis of Starch Grains from the Xijincheng Site, Bo'ai county, Henan province, China*

The analysis of starch grains from the Xijincheng site showed that most of the starch was from barley (*Hordeum* spp.) which accounted for about 70% of the total starch grains. Other starches included foxtail millet (*Setaria italica*), broomcorn millet (*Panicum miliaceum*), sorghum (*Sorghum* spp.) and a small amount of starch grains from Leguminosae and root tuber plants. Combined with the analytical results of carbonized remains, we conclude that ancient Xijincheng people adopted the pattern of utilizing a combination of mixed crop farming along with some gathering. The discovery of abundant *Hordeum* spp. starch grains demonstrates that the ancient occupants of the Central Plains began to use this kind of plant beginning as early as 4000 B.P. during the Longshan Culture period. This is of great significance to ongoing research concerning the origin, evolution and diffusion of *Hordeum* spp. in China. In summary, we found that the results of the starch (microfossil) results differed from carbonized (macrofossil) results and we present explanations as to why these two methods can cause different results.

[179] *Chair*

Wang, Shuzhi, Zenglin Wang, Xuelian Zhang, Maolin Ye and Linhai Cai

[345] *The Use of Inner Bark as Food in Prehistory: A Case Study Based on Roll Carbonized Remains Unearthed from Hulijia site, Qinghai Province, Western China*

Hulijia site is located in Minhe County, Qinghai Province, western China and is the earliest Neolithic site (5000 BP) in Qinghai Province. Two pieces of carbonized roll remains similar to steamed twisted rolls made of wheat were unearthed from this site. The remains were analyzed by means of stable carbon isotope analysis and showed that the value of $\delta^{13}\text{C}$ was -25.1‰, suggesting that the "roll" remains were actually tree-derived. The anatomic structure of the remains, observed by microscope and scanning electron microscope, suggests that they were inner bark. Through comparison to those of archaeological sites in northern Sweden around the town of Arjeplog, as well as a consideration of the climatic conditions at the time, it is inferred that peeling tree bark might have been a subsistence strategy unique to Hulijia site and its long winters.

Wang, Youping

[407] *The Late Pleistocene Environment and Lithic Technology in South China*

During the last two decades an increasing number of Paleolithic sites have been found in South China. Those provide much more new information on Pleistocene human adaptations in this region, especially Late Pleistocene sites in the Valley of Changjiang River to Lingnan region. New studies on those excavations indicate that pebble tool industries had been dominated this huge region before the MIS3. However, small flake tool assemblages emerged suddenly during the MIS2 time period. The pebble tools with polished tool together came back to this area again by the end of Pleistocene. This paper will briefly introduce some new excavations and discuss the environment changes and developments of the lithic technology in Late Pleistocene South China.

Ward, Diane [164] see Hendrix, Jillian

Warden, Robert [310] see Everett, Mark

Warinner, Christina (University of Oklahoma), Jessica Hendy (University of York), Camilla Speller (University of York) and Matthew Collins (University of York)

[332] *Direct Evidence of Milk Consumption from Ancient Human Dental Calculus*

Humans have exploited animal milk as a food resource for at least 8,500 years, but the origins, spread, and scale of prehistoric and historic dairying remain poorly understood. Indirect lines of evidence, such as lipid isotopic ratios of pottery residues, faunal mortality profiles, and LP allele frequencies, imply a complex history of dairying at the level of populations. However, in order to understand how, where, and when humans consumed milk products, it is necessary to link evidence of consumption directly to individuals and their dairy livestock. Here we report the first direct evidence of milk consumption, the whey protein β -lactoglobulin (BLG), preserved in human dental calculus from the Bronze Age (ca. 5000 BP) to the present day. Using protein tandem mass spectrometry, we demonstrate that BLG is a species-specific biomarker of dairy consumption, and we identify individuals consuming cattle, sheep, and goat milk products in the archaeological record.

Warmlander, Sebastian (Cotsen Institute of Archaeology, UCLA), Vanessa Muros (Cotsen Institute of Archaeology, UCLA), Ellen Pearlstein (Cotsen Institute of Archaeology, UCLA), Kym Faull (David Geffen School of Medicine, UCLA) and David Scott (Cotsen Institute of Archaeology, UCLA)

[121] *Corrosion Concerns and Metal Soap Formation in Shea Butter-Containing Forowa Brass Vessels from Ghana*

Twenty-three forowa metal vessels from Ghana, housed in the Fowler Museum at UCLA, were investigated with regard to manufacture and deterioration. Technical examination revealed that all vessels were manufactured from skillfully hammered brass sheets, and purpose-built for storing shea butter, a multi-purpose substance derived from shea nuts. Most vessels contain remnants of shea butter, which has become discolored: while shea butter extracted using native methods is off-white to yellow, the current vessel remains display different shades of green. Typically, such discoloration is caused by diffusion of metal ions into the organic substance. Spectroscopic analysis of the discolored material using XRD, FTIR, and GC/MS techniques indicated formation of metal soaps, i.e. metallo-organic complexes formed between shea butter fatty acids and copper and zinc from the brass vessels. In order to investigate possible corrosion concerns, the interactions between shea butter and test coupons of copper, zinc, brass, and tin were monitored. Furthermore, the GC/MS data quantified the chemical compositions of shea butter from various sources, allowing us to evaluate the usefulness of such data for geographic shea butter provenancing. Together with the technical metal examination, these results increase our understanding of the uses, manufacturing, and other properties of forowa vessels.

Wärmländer, Sebastian [207] see Tichinin, Alina

Warner, John

[66] *Rethinking and Refining the Activities Associated with the Monumental Compounds of Jatanca, Peru*

The Late Formative Period site of Jatanca is located in the southern sector of the Jequetepeque Valley, Peru. The five architecturally intricate monumental compounds that make up the core of this site housed sociopolitical, economic, and ritual activities that operated at a variety of interdependent scales. Recent excavations in 2014 within Compound I have further refined our knowledge of the relationships between the complex multiscale activities that took place within these important spaces. This paper will discuss how our interpretation of compound-specific activities has developed over the last ten years of continuous research at this important North Coast site.

[104] *Discussant*

Warren, Daniel [4] see Damour, Melanie

Warren, Matthew (University of Texas at San Antonio), Sergio Calla (Universidad Mayor de San Andrés) and Sonia Alconini (University of Texas at San Antonio)

[247] *Breaking Down the East-West Dichotomy: Toward an Understanding of Intercultural Interactions in the Saipurú Region under the Inkas*

In the last decades prior to the Spanish conquest, the Inka Empire expanded its frontiers into the ethnically and culturally diverse region of the Bolivian Chaco, ushering in a brief period of limited colonial control over its indigenous inhabitants. In a geographically isolated area far from the imperial heartland, the Inkas and their imperial allies established settlements in the vicinity of Saipurú; in this context, several disparate highland and lowland cultures met, interacted, and created a unique, multiethnic colonial space. This poster will address complementary and often contrasting forms of archaeological and ethnohistoric evidence for (1) the possible cultural affiliations of the various groups that came together at Saipurú, including lowland Arawak- and Guaraní-speaking groups, the Inkas, and at least one altiplano population; (2) the creation of hybrid ceramic styles, and the socioeconomic factors involved in such processes; and (3) the artificial dichotomy between the highland Andean west and the lowland east that was consciously formulated and reproduced by the Inkas. While ethnohistoric sources attest to this enforced ideology of difference and its implications for the structure of colonial relations between the Inkas and lowland groups, archaeological evidence from the Saipurú region supporting such claims appears somewhat tenuous.

Warren, Kea (Arizona State University)

[253] *3,065 Sherd Disks and their Potential Uses in Calixtlahuaca in the Toluca Valley*

Among the artifacts found at the site of Calixtlahuaca, excavations recovered an unusually large quantity of sherd disks. Calixtlahuaca is an Aztec Postclassic (A.D. 1130-1530) site located in the Toluca Valley of Central Mexico. These sherd disks, or tejos, were created from bowls and pots broken during antiquity. The potsherds were worked until they were circular in shape. Other researchers have suggested potential uses for these worked sherds, including gaming tokens (for the game patolli), net weights, and spindle whorls. This poster describes the sherd disks found at Calixtlahuaca and addresses the suggested uses by analyzing the size distribution, morphology and contexts of recovery of these artifacts.

Waselkov, Gregory A. [152] see Hadden, Carla

Wasiolek, Maryann (Hydroscience Assoc., Inc.)

[180] *A Better Understanding of Ancient Farming through Hydrology*

Physical evidence that ancient people manipulated their environment in order to better manage water resources for the purpose of facilitating agriculture has long been recognized. Remnants of canal systems indicate diversion of the flow of streams and springs and the direct application of surface water to irrigated fields. Terraces and check dams provide evidence of the diversion of overland runoff, while mulched fields, pumice patches, and dune fields imply that early farmers sited fields so as to take advantage of retained soil moisture. Excavated pits and possibly augmented karst features suggest use of shallow groundwater in conjunction with captured runoff. The probable operation of these systems has been noted by many investigators, and the types of cultivation techniques have been described and classified. However, relatively little quantitative assessment has been done to determine how the systems actually worked to move and distribute water, or what effect they had on the availability of water to crops. Physical measurements of surface and sub-surface flow using standard hydrologic instrumentation could provide answers to these questions. Understanding the engineering of the systems could determine under what hydrologic conditions the systems were effective, and might also identify unique, spatially or temporally traceable engineering techniques.

Watanabe, Yoichi [31] see Sakai, Masato

Watchman, Alan [3] see Hauser, Neil

Waterman, Anna (Mount Mercy University), Jonathan Thomas (The University of Iowa), James Enloe (The University of Iowa) and David Peate (The University of Iowa)

[53] *The Influence of Prey Availability on Ice Age Hunting Strategies: Tracing Magdalenian Reindeer Migratory Patterns Using Strontium Isotope ($87\text{Sr}/86\text{Sr}$) Analysis of Reindeer Teeth from Verberie (Oise, France)*

The Magdalenian (18-11kya) marked a time of dramatic climate instability in western and central Europe, ushering in changes in the predation strategies of late Paleolithic groups who hunted migratory reindeer herds. For Magdalenian populations, a clear understanding of migratory patterns was crucial for survival, particularly when Epipleistocene climate fluctuations were causing previously unseen types of resource distribution. Here we present the results of strontium isotope ($87\text{Sr}/86\text{Sr}$) analyses of teeth from 34 reindeer from the Magdalenian hunting camp at Verberie, located in the Paris Basin near the Oise River. The goal of this analysis was to better understand how Magdalenian peoples exploited reindeer populations and to ascertain if changes in hunting strategies related to reindeer migratory patterns are reflected in the stratigraphic record at Verberie. The results of this study found that reindeer from younger stratigraphic levels often exhibit more wide-ranging $87\text{Sr}/86\text{Sr}$ isotope ratios that may correspond to the Cretaceous and Jurassic age formations east of the Paris basin or of the northwest coast. This may indicate that during later times hunters were relying more on farther-ranging migratory animals. Further mapping of $87\text{Sr}/86\text{Sr}$ isotope ratios in the Paris Basin will help to clarify these results.

Waters, Jenny and Janet Griffiths (Statistical Research, Incorporated)

[55] *Vertebrate Faunal Assemblages and Bone Tool Use in the Early Agricultural Period*

Researchers have recovered large faunal assemblages containing several hundred bone artifacts at Las Capas, a San Pedro phase site in Tucson, Arizona. Artifacts include utilitarian and non-utilitarian objects with a variety of technical and symbolic uses. Excavations at Los Pozos, a large Cienega phase site in the Tucson Basin, yielded a very large collection of animal bone with a rich bone artifact assemblage. Bone technologies were often used to make items from plant fibers, wood, animal hides, or other perishable materials. These less durable artifacts often decay and disappear from archaeological sites, but the bone tools remain. The collected assemblages provide exceptional information not only on the extent to which pre-ceramic era peoples relied on bone, but clues to other activities and the availability of resources. Comparisons between the two assemblages show many similarities in the animal taxa used for bone tools. However, there are important differences that reflect variability in the use of available resources and economy of manufacture through time. The correspondence between the bone tool assemblage and the greater faunal assemblage at large provides insights into life in the floodplain during the Early Agricultural period in southern Arizona.

Waters, Michael (Texas A&M University)

[80] *Building a Meaningful First Americans Radiocarbon Chronology*

Chronology is key to understanding the story of the First Americans. Accurate and precise ages from sites are necessary to develop chronological relationships and overlaps among different Paleoindian complexes. Proper dating of any Paleoindian horizon requires an understanding of the geological context, geochemical environment and potential contamination factors, material and chemical fraction dated, number of ages obtained, and many other variables. Without understanding these factors of radiocarbon dating, the age of sites can be inaccurately dated and result in overestimates or underestimates of the true age of a site. Several examples will be used to illustrate these points.

Waters, Michael [119] see Perrotti, Angelina

Waters-Rist, Dr. Andrea L. [410] see Alfaro, Martha

Watkins, Joe (National Park Service)

[34] *Discussant*

Watkins, Christopher (Arizona State University)

[304] *Hohokam Fieldhouses and Agricultural Labor*

Construction, operation, and maintenance of the extensive prehistoric irrigation systems of the Phoenix Basin required a significant input of labor. The ethnographic record suggests that the organization of agricultural labor among smallholder irrigation farmers can be varied and complex. Hohokam householders had a variety of labor arrangements at their disposal, and were flexible in their application of different strategies to meet changing environmental and cultural conditions. Hohokam agricultural labor was operationalized in fieldhouses, and I look to these features for evidence of variation in labor strategies.

Watling, Jennifer (University of Exeter), José Iriarte (University of Exeter), Francis Mayle (University of Edinburgh), Denise Schaan (Universidade Federal do Pará) and Alceu Ranzi (Universidade Federal do Acre)

[157] *Scales and Visibility of Human-Environment Interactions in Western Amazonia: The Case of the Geoglyph Builders*

A debate that has received much attention in recent years is the nature and scale of precolumbian impact in the Amazon lowlands. While the notion that Amazonia is a “pristine wilderness” has long been rejected, several papers have proposed that human impact in western regions was more sporadic and on a smaller scale than impacts in central and eastern regions, and that western Amazonia supported sparse precolumbian populations. The discovery of over 400 geometrically-patterned earthworks in Acre (western Brazilian Amazon), which until recently lay under in-tact tropical forest, has raised important questions about the kind of societies that built them and their impact on the terra firme, and offers an ideal case study to test this hypothesis. This paper presents results from the first investigations into human-environment interactions in the geoglyph region, and offers insights into the mechanisms and spatial and temporal scales of landscape transformations associated with the earthwork-building cultures. The data call for a re-appraisal of what we mean by “scales” of human impact in Amazonia, and propose that an understanding of the diversity of human-environment interactions must be considered through studies that closely combine archaeological and paleoecological proxies.

Watrall, Ethan (Michigan State University)

[235] *MBRIA: A Platform to Build, Serve, and Manage Mobile Public Heritage Experiences*

The spaces we inhabit and interact with on a daily basis are made up of layers of cultural activity that are, quite literally, built up over time. While museum exhibits, archaeological narratives, and public archaeology programs communicate this heritage, they do not generally allow for interactive, place-based, and individually driven exploration by the public. In recent years, mobile and augmented reality applications have offered both platforms and models for mobile heritage experiences that partially address these issues. Unfortunately, the bar for developing mobile heritage applications is getting increasingly more difficult to reach for many heritage institutions and projects. Quite simply, building robust mobile applications is too technically complicated and specialized for many in the heritage community. It is within this context that this paper will introduce and explore mbira. Currently being developed at Michigan State University, mbira is an open source platform that empowers cultural heritage institutions, archaeological projects, and heritage landscapes to create, serve, manage, and sustain engaging mobile heritage experiences. Special attention will be paid to the design metaphor of “space and place as museum” that is woven into the fabric of mbira. In addition, the paper will explore mbira’s features that support multivocality and public discourse.

[200] *Discussant*

[235] *Chair*

Watson, James (University of Arizona) and Rachael Byrd (University of Arizona)

[55] *Bioarchaeology at Las Capas: Uniformity and Continuity within the Early Agricultural Period*

Investment in cultigens and early irrigation in the Sonoran Desert (circa 3600 BP) signal a major shift in subsistence strategy identified as the Early Agricultural Period (EAP). The EAP is also recognized as a period of significant social transformation, and Las Capas (LCA) has played a critical part in our redefinition of this period. We examine how biocultural signatures from the LCA mortuary sample compare over the site's occupation and within broader patterns of the EAP. Our results indicate broad-scale uniformity between the early and late components at LCA, and across the entire temporal and spatial distribution of the EAP. Burials are often placed in domestic space, in close proximity to others. Mortuary features are dominated by primary, flexed, inhumation burial; however, body treatment is variable and the placement of funerary objects infrequent. Biological signatures vary in a few cases, likely reflecting subtle difference in behaviors or circumstances at specific sites. Taken as a whole, biocultural signatures at LCA mirror larger trends within, and throughout, the EAP and represent the culmination of significant changes in subsistence strategies and the foundation of technological and social systems of subsequent Formative period societies in the area.

Watson, Jessica, Nathan Hamilton (University of Southern Maine) and Robin Hadlock Seeley (Cornell University)

[61] *Historic Use of Native Avifauna during the Hotel Era (1847-1914) on the Isles of Shoals, Maine*

Interactions between traditional European culinary practices and North American fauna have been the focus of several archaeological studies during the past few decades, but have not been explicitly examined in northern New England, especially during later colonial occupation (ca. 1800-1900). The Lighton hotel on Smuttynose Island (Isles of Shoals, ME), site of nineteenth- and twentieth-century activity, reveals how domestic practices were changed during the later hotel era (1847-1914). Preliminary examination of bird remains from Smuttynose Island reveals that visitors to the hotel were fed a mixture of local and domesticated birds in addition to ungulates and fish. The taphonomic study of the assemblage includes calculation of NISP and MNE for each taxon in addition to the recording of surface modifications, such as fracture patterns, skeletal element patterns, cutmarks, and gunshot holes. The presence of several pelagic or extinct species, including the Great Auk (*Pinguinus impennis*), suggests that residents of these islands utilized a wide range of resources to thrive during the later hotel era.

[61] *Chair*

Watson, James [155] see Cajigas, Rachel

Watson, Rachel (Louisiana State University) and Heather McKillop (Louisiana State University)

[243] *In Too Deep: Excavations of a Partially Inundated Ancient Maya Salt Works at Witz Naab, Paynes Creek National Park, Belize*

Underwater survey and excavation in a large salt water lagoon between 2004 and 2013 revealed ancient Maya wooden buildings with briquetage—the broken pots from evaporating brine in pots over fires to make salt. Unexpected in the tropical landscape of Belize, the wooden buildings were preserved below the sea floor in mangrove peat, which created an anaerobic matrix. Elsewhere, historically and in modern times, the salt content of the brine was enriched by pouring it through salty soil—reducing fuel needs. The Paynes Creek salt works are underwater, so that any mounds of soil at the underwater sites would have been deflated by wave action. In 2012, excavations were carried out in an earthen mound at the Witz Naab site in the mangroves. The purpose was to determine if the mound resulted from the leaching process—perhaps providing an analog for the now submerged salt works. Trenching revealed the lower levels of Witz Naab mound were inundated, but that most of the mound was above water, providing evidence for its use. We evaluate whether the stratigraphic evidence within the mound is discarded soil from brine enrichment, remains of a residence, or a non-residential structure.

Watson, Adam (American Museum of Natural History), Samantha Fladd (University of Arizona), Katelyn Bishop (University of California, Los Angeles), Megan Conger (University of Georgia) and Sara Morrow (University of Notre Dame)

[273] *In the Footsteps of Frank H. H. Roberts: Continued Explorations at Roberts Great House, Chaco Canyon, New Mexico*

During the 2014 field season, investigations continued at Roberts Great House, a Late Bonito Subphase (1100-1140 CE) site in Chaco Canyon, New Mexico. Severely threatened by erosion, the site was originally explored by Frank H. H. Roberts in 1926. The aims of the 2014 season of fieldwork were to assess the pace of erosional processes and resolve questions concerning the duration of the site's occupation and the nature of its abandonment. After thoroughly mapping and imaging arroyo down-cutting, exploration targeted two areas of the site for excavation. These excavated areas contained deeply-buried architecture, the remains of trenches excavated by Frank Roberts, and a striking absence of occupational surfaces and intramural or plaza features. The data continues to strongly support Roberts's interpretation that this structure was not completed and that the site witnessed, at most, a short period of use. Soil stratigraphy visible in the test units indicates a highly dynamic fluvial environment and enables researchers to formulate a testable model of landscape development in the surrounding Rincon and thus a possible explanation for the lack of occupation at the site.

Watts, Christopher (University of Waterloo)

[108] *Mutable Materials and Gathering Worlds*

Owing to a plethora of recent and ever more divergent scholarship on materiality, the lens through which we view the ontological status of things has become increasingly opaque. New thinking about the ways in which materials are always and already in flux compels us to consider how seemingly obdurate things can, paradoxically, transcend their own solidity. To this we may add a budding concern with the immaterial – regimes of light and sound, for example, and their mutability – and the extent to which such phenomena imbue and inform wider material meshworks. In this paper, I think through these themes with reference to the earthen enclosures of the central Great Lakes, which I argue were intended to gather together particular topographies, celestial objects, and materials as part of a broader commitment to place.

Watts, Joshua (Center for Social Dynamics and Complexity, Arizona State University)

[304] *Pots, Middlemen, and the "Shopkeeper" Hypothesis in the Hohokam Sedentary Period*

While ceramic analysts now report with some confidence where most Phoenix Basin Hohokam pottery was manufactured and where it was eventually discarded, we simply cannot use those two data points on their own to describe the exchange rules and distribution networks that moved pottery from specialist producers to consumers throughout the region. Agent-based modeling methods provide a powerful toolkit for interpreting complex spatial and distributional patterns in the archaeological record, and for identifying hypotheses to test with empirical data. To that end, I implemented a relatively simple agent-based model of pottery exchange informed by the Hohokam case and compared the output from many simulations to ceramic data from 39 sites in the Phoenix Basin occupied during the Middle Sacaton. Unexpectedly, the model configurations most consistent with the actual archaeological record relied on market-based rulesets for trade and village-based middlemen retailers who acquired pottery wholesale from producers and distributed it to nearby households. Current interpretations of the Middle Sacaton economy hypothesize periodic marketplaces linked to Hohokam ball courts. The modeling approach adopted for this research instead encourages investigating the middleman retailer hypothesis. What would a Hohokam "shopkeeper" look like, and what archaeological evidence would be needed to assess that hypothesis?

Watts, Philip [358] see Hronec, Laura

Watts-Malouchos, Elizabeth (Indiana University) and Zarko Tankosic (Norwegian Institute at Athens/Indiana University)

[289] *Sighting Sites: Viewshed Analysis and Site Boundaries in Archaeological Survey*

The identification, designation, and definition of the ubiquitous archaeological "site" are foundational to archaeological survey. These standard classificatory practices frequently emplace rigid spatial and

temporal boundaries around human activities and portray past landscapes as simply consisting of “sites” and the unoccupied spaces outside of “sites”. However, the people, places, and material things that constitute physical and social landscapes are dynamic, and the boundaries between them are fluid and permeable. Utilizing data from the Norwegian Archaeological Survey of the Karystia (NASK) Project in southern Euboea, Greece, we investigate the utility of employing visibility analysis, specifically GIS viewshed analysis, as an analytical tool to mitigate the arbitrary boundaries between site and non-site that are often the result of conventional survey methods. Although certain aspects, or rather shortcomings, of visibility analysis have remained unsatisfactory, we suggest that viewshed analysis can be a productive means for shifting focus to the everyday sensory experiences at sites and, importantly here, resituating sites and their human and nonhuman constituents back within their larger social, spatial, and temporal landscapes.

Weaver, Brendan (Vanderbilt University)

[31] *Connecting the Precolumbian Past to the Present in South Coastal Peru: The Archaeology of the Colonial and Republican Haciendas of Nasca*

The fertile desert middle-valleys of South Coastal Peru's Grande Basin offered resources for great productive potential which supported a large population since the Formative Period and attracted intense agro-industrial interests during Spanish colonization. Historical archaeology offers tools for understanding regional processes of population replacement, highland/coastal exchange and migration, and the radical transformation of social processes during the last five centuries of intense manipulation by Western power, connecting the precolumbian past to the ethnographic present. Although indigenous populations in the basin, and particularly in the Ingenio and Grande Valleys, were replaced by mestizos and afro-Andeans, prehispanic sacred sites, settlements, and irrigation technologies continued to be used and modified. This paper makes the case that a better understanding of both prehispanic and historical contexts in the region must consider an integrated diachronic approach which takes into account the early and later use histories of sites and technological apparatus.

Weaver, Wendy [243] see Caulk, Grady

Webb, Kyra (Colby College)

[232] *The Organization of the Lower Lurin Valley During the Late Intermediate and Late Horizon Periods*

The rank size analysis of the archaeological sites inhabited during the Late Intermediate and Late Horizon periods located in the Lower Lurin Valley of the Peruvian Central Coast presents a comparison of power politics and the possibility of a hierarchical organization among the different inhabitants of the respective sites. The Lurin Valley is located on the Peruvian Central Coast, and the mouth of the Lurin River is located in close proximity to the site of Pachacamac. This site is an important religious center according to historical accounts. Of all the sites along the Lurin Valley, Pachacamac is the most well-studied. However, there is little knowledge of the remainder of the hierarchical relation among the sites in the valley. Based on a rank size analysis of the areas of each site along the valley, the political and social organization of the Lower Lurin Valley during the Late Intermediate and Late Horizon periods will become clearer. The rank size analysis is based upon the comparison of satellite imagery and site maps compiled to compare the area and therefore relative power based upon geographical territory of each respective site.

Weber, Andrzej [131] see Schulting, Rick

Weber, Sadie (Harvard University)

[162] *Analysis of Microbotanical Remains from Chavín de Huántar*

Chavín de Huántar is well-known for its ritual significance in the Andean world, however the nature of both subsistence and temple offerings remain unclear. Though previous research has been carried out on the Chavín de Huántar botanical assemblages, much remains a mystery due to poor overall preservation of carbonized remains. In order to obtain a more complete understanding of Formative

Period subsistence, residues extracted from potsherds from sealed Chavín contexts were analyzed for starch granules and phytoliths. This analysis reveals previously unidentified food resources including manioc (*Maniot esculenta*) and yam (*Dioscorea ssp.*), as well as maize (*Zea mays*) which is uncommon in the Chavín de Huántar macrobotanical record. These results demonstrate the necessity of multiple types of archaeobotanical techniques.

Weber Darnell, Liesl [30] see Hoffman, Brian

Webster, Laurie (University of Arizona)

[85] *The Art of Footwear, Footwear as Art: Thirteen Hundred Years of Twined Sandal Production in the Northern Southwest*

Finely woven yucca cordage sandals appeared in the northern Southwest 2000 years ago as a fully formed craft tradition and continued in use until the early A.D. 1200s. Their complex, labor-intensive weave structures, ornate toe finishes, and elaborate iconography suggest that these sandals played important social and symbolic roles in communities of the San Juan region for more than a millennium before disappearing from the archaeological record in the mid-thirteenth century. In this diachronic synthesis, I explore changes in the form, technology, and use contexts of these sandals and changing roles of this elaborate footwear in the ancient northern Southwest.

Webster, David (Penn State University)

[86] *Discussant*

Webster, Christopher [90] see Isensee, Theron

Webster, Andrew (University of Maryland)

[315] *Irish Immigration and Urban Transformation in a Boston City Neighborhood*

When working class European immigrants first arrived on American shores, they had a profound effect on American cities. Throughout the nineteenth century, the processes of industrialization coupled with Boston's position as a shipping hub created an influx of low-income laborers in need of housing. The Clough House, a colonial home built around 1715, functioned as a single-family residence for a century before being converted into a tenement for the working class. This poster explores the impact Irish, Irish-American, and other groups had on the development of Boston's North End neighborhood. It combines historical, archival, and archaeological approaches to analyze the changes that took place on both a household and community level, focusing on: 1) demographic changes, 2) architectural changes, and 3) changes in ceramic consumption.

Webster, Chris

[322] *The CRM Archaeology Podcast: Podcasting the Profession and Educating the Public*

Since the first podcasts were available on Apple's iTunes in June of 2005, podcasting has become a powerful way for anyone to deliver information to the world from the comfort of their home. Podcasts can be informal conversations to expensive productions from major networks. Archaeology podcasting has seen shows come and go and has had a rocky past. The only podcast focused on issues related to CRM Archaeology has been recording since February of 2013 and has tackled everything from ethics on the job to issues specific to women in archaeology and in the workplace. We've found that podcasting is a great way to engage with thousands of professionals and the public alike. We don't run conversations, we start them. Podcasting is a medium that is here to stay and the archaeological community should recognize it as a valuable and useful resource.

[322] *Chair*

Wechsler, Suzanne [409] see Lee, Christopher

Wedding, Jeffrey [311] see Edwards, Susan

Weerasinghe, Jagath (Postgraduate Institute of Archaeology)**[340]** *Conserving the Buddhist Stupas and Religious Nationalism in Sri Lanka*

Surveying, excavating, and conserving Buddhist stupas have been major activities undertaken by Sri Lankan archaeologists since colonial times. Conservation of Buddhist stupas holds an important place in the archaeological agenda of the national institutions in Sri Lanka. I present the elusive concept of 'authenticity', treated as the most important criterion in conserving architectural heritage and examine the crisis that emerged when this centerpiece of the Authorized Heritage Discourse was applied to conserving Buddhist stupas. The crisis took a political dimension when the ceremonial reopening of the recently conserved Abhayagiriya Stupa had to be postponed when custodian monks lodged a petition with the President of Sri Lanka maintaining that the stupa should be restored by complete rebuilding and white washing. This action contradicts the World Heritage Convention regarding the integrity and authenticity of heritage and it departs from a 30 year old agreement that included the religious community. Today the religious nationalist rhetoric that dominates Sri Lanka is being used to challenge theories of conservation and restoration based on the idea of "authenticity", suggesting that concept of 'authenticity' needs to be revised and reconfigured if it's going to be of utility in a context like Sri Lanka, where religious nationalism prevails.

Wegener, Corine (Smithsonian Institution)**[254]** *Smithsonian's Role in Cultural Heritage Disasters*

The environment for cultural heritage disaster management has grown increasingly complex; destruction of heritage during ethnic and sectarian violence is on the rise and global climate change threatens to increase extreme weather events. Few organizations are positioned to help our colleagues with disaster response and recovery efforts. The Smithsonian Institution proposes to establish the Cultural Crisis Recovery Center (CCRC), an operational organization to provide emergency response for cultural heritage disasters along with a multidisciplinary approach to training, scholarly research, and long-term preservation strategies. The Smithsonian CCRC will help reduce the risk of permanent loss of humanity's cultural heritage by: 1) serving as a principal resource for endangered cultural heritage information, research and policy; 2) educating and training public, private, and non-profit professionals and volunteers to prepare for and respond to cultural crises; 3) developing and deploying professionally-trained disaster response teams that can execute independent or coordinated efforts both at in the U.S. and internationally; and 4) keeping recovery efforts at the forefront by advising partners on long-term strategies, undertaking specific preservation projects, and offering training on special exhibitions and programs.

Wegter, Bruce [10] see Rubinstein, Emily

Weiland, Andrew (The Ohio State University)**[373]** *Practical and Social Storage among the Ohio Hopewell: Archaeobotanical and Ethnoarchaeological Evidence for Delayed Return of Pre-Maize Crops*

Social storage and social complexity indicated in the scale of Hopewell earthwork building, craft specialization and mortuary goods, suggest surplus created through subsistence intensification. However, artifacts and features associated with practical storage of such a surplus are uncommon at most Ohio Hopewell habitation sites. This study takes a step toward resolving this apparent contradiction by developing a predictive model from descriptive and quantitative characteristics of storage facilities archaeologically and ethnographically documented in eastern North America. These predictions are then compared with a newly analyzed botanical assemblage from features at a Hopewell habitation site (Overly Tract near Hopeton earthworks). Results indicate that traces of storage features may remain as palimpsests that require detailed analysis, and feature morphology may not always be a reliable indicator of storage function. Comparison of features suggests a dichotomy in Hopewell culture between social storage at earthworks and immediate surrounds, and practical storage at habitation sites. Organization of various forms of storage in Hopewell societies provides insight to land management, settlement patterns, and social organization at large.

Weinberg, Camille (University of California, Los Angeles), Benjamin Nigra (Cotsen Institute of Archaeology, University of Cal), Maria Cecilia Lozada (The University of Chicago), Charles Stanish (Cotsen Institute of Archaeology, University of Cal) and Henry Tantaleán (Cotsen Institute of Archaeology, University of Cal)

[169] *Demographic Analysis of a Looted Late Intermediate Period Tomb, Chincha Valley, Peru*
Ethnohistorical and archaeological sources establish that the Chincha Valley on Peru's south coast hosted a populous and economically complex polity during the Late Intermediate Period (1200-1470 CE). A 2013 survey of the middle valley revealed more than 40 cemeteries containing over five hundred highly visible, above-ground collective tombs resembling highland chullpas. To establish a baseline demographic profile for this mortuary tradition, we conducted an osteological analysis of one looted commingled tomb. Analyses indicate that the tomb was a primary burial with a minimum of 63 occupants and nearly equal proportions of male and female individuals ranging from infants to adults. Juvenile remains comprised more than half of the collection, suggesting that in death children shared a community identity with adults. Cribra orbitalia, cranial modification, and red pigment application were also observed in the collection. This preliminary study revealed the potential for further research on coastal Chincha collective tombs to explore osteological and mortuary ritual patterns.

Weinstein, Richard [43] see Barrett, Jason

Weinstein, Richard (Coastal Environments, Inc.), Charles Pearson (Coastal Environments, Inc.) and Amanda Evans (Tesla Offshore, LLC)

[192] *Identification and Assessment of Subsided and Drowned Prehistoric Archaeological Sites, Lakes Borgne and Pontchartrain, Southeastern Louisiana*

From 2010 to 2014, archaeologists from Coastal Environments, Inc., conducted several remote-sensing surveys within Lakes Borgne and Pontchartrain in an effort to locate the remains of drowned prehistoric terrestrial sites that once existed prior to subsidence and shoreline transgression. In this effort, it has been critical to interpret the remote-sensing data within the established geologic and geomorphic contexts of the region. Several submerged and buried high-probability landforms and potential shell middens have been identified, with one site in particular, 16SB153 in St. Bernard Parish, examined through a program of offshore probing and vibracoring. Subsequent geophysical survey at 16SB153 resulted in further delineation of the offshore portion of the shell midden as recorded on subbottom profiles. When coupled with research on the small part of the site still extant onshore, it was possible to piece together a hypothetical sequence of site deterioration and movement resulting from both natural and human causes.

Weisberg, Bethany [410] see Joyce, Arthur

Weisler, Marshall (University of Queensland)

[77] *Determining Geochemical Variability of Fine-Grained Basalt Sources/Quarries for Facilitating Prehistoric Interaction Studies in Polynesia*

William "Bill" Dickinson has long been interested in tracking interaction between Pacific Island societies by comparing temper sands of prehistoric ceramics and, more recently, thin section descriptions of basalt adzes. Fine grained basalt sources or quarries anchor ancient interaction spheres, yet few of the dozens of adze quarries found throughout Polynesia are known in sufficient detail to understand intra-source variability. This fundamental data is essential for confidently assigning transported artifacts to quarries. Using a geologically informed protocol in concert with statistical applications, we document the intra-quarry geochemical variability of oxides, trace elements, and isotopes for the large fine-grained basalt source on Eiao, Marquesas Islands, East Polynesia. Incorporating this methodology with sourcing studies at the geographic scale of island, archipelago, and region will provide more credible artifact source assignments and thus enhance our understanding of prehistoric interaction networks throughout Polynesia.

[77] *Chair*

Weisler, Marshall [152] see Lambrides, Ariana

Weismantel, Mary (Northwestern University)

[305] *Drinking Power: Moche Tombs as Sites of Subjectification*

In the ethnohistoric record of the Andes, the bodies of the dead feature as key material objects through which living rulers claimed power over people and territory, especially irrigated land. This was true for the highland Inka, and also for coastal societies such as Chimú. In the archaeological record for earlier societies such as Moche, we see evidence for a similar complex of practices involving tombs, entombed bodies, and associated artifacts and offerings. These mortuary assemblages were not just significant for religious reasons or to memorialize the past, but as sites where living elites consolidated control over labor and resources. The ceramic effigies of elite human bodies placed in tombs materialized this political-economic message. The affordances of these ceramics as vessels, together with evidence that the tombs were open for long periods of time and were re-entered periodically, suggest that important drinking rituals held at tombs linked members of elite corporate kin groups across time: the dead, ruling and rising generations. These rites reinforced emergent and existing systems of stratification, and embodied lessons about inequality and inheritance that shaped elite understandings of themselves and their own bodies, and of the North Coast ecosystem and their right to rule it.

Weiss, Elizabeth (San Jose State University)

[132] *Kneeling Difficulty and Osteoarthritis: What Data from the Osteoarthritis Initiative Can Tell Us about Prehistoric Californians*

An essential part of California hunter-gatherer diet was ground foods, such as acorns. Grinding food with the use of mortars and pestles likely required extensive kneeling. Most of the food grinding among prehistoric Californians was likely accomplished by females. In Ryan's Mound (CA-Ala-329; N = 284), for instance, 33% of females were buried with mortars or pestles whereas 14% of males were buried with mortars or pestles (Chi-square = 10.48, $P < 0.001$). A rich literature on kneeling effects on skeletal remains in past populations exists, but research concerning kneeling difficulties has been absent. This study examines kneeling difficulty in relation to body mass index (BMI), age, and osteoarthritic osteophytes using the OAI public use database (N = 3588). Knee osteoarthritis was based on osteophyte length on a four point scale for femora and tibiae. BMI was based on a height and weight ratio. Age and kneeling difficulty were self-reported. In females with osteoarthritis, kneeling difficulty increased in females with higher BMIs (F-ratios = 10.389, right; 7.962, left; P s < 0.01). These results imply that females in CA-Ala-329 were unlikely to have experienced difficulty kneeling and, thus, could engage without difficulty in food processing even with knee osteoarthritis.

[132] *Chair*

Weisskopf, Alison [77] see Jones, Sharyn

Weisskopf, Alison (University College London), Ling Qin (Peking University, Beijing) and Dorian Fuller (University College London)

[186] *The Trajectory of Early Rice Intensification and Cultural Change in the Lower Yangtze Valley Revealed by an Ecological Analysis of Archaeological Phytoliths*

Using data from modern and archaeological phytolith assemblages we follow the trajectory of wild rice cultivated on wetland margins at 5000 B.C. through early domestication and the first artificial arable systems in dug out fields at c. 4000 B.C. to fully developed irrigated paddy fields in the Lower Yangtze Valley. Using multivariate analysis with phytolith assemblages from ecological communities of rice weed flora across a range of arable systems, we create modern analogues of ancient systems which are used to interpret our archaeobotanical samples. In addition we interpret our data from ancient rice fields and archaeological sites using a physiologically-based wet versus dry model of grass morphotype silicification. These data reveal how rice cultivation changed alongside cultural development in the Lower Yangtze Valley, moving from wet to dry and back to wet systems. This sequence of changes in cultivation ecology inferred from phytoliths fits with available plant macro-

remains and can be understood as agricultural intensification alongside growing social complexity.

Weitzel, Elic (University of Utah)

[163] *Diet Breadth Narrowing at the Pleistocene/Holocene Transition: Faunal Evidence from Dust Cave, Alabama*

Paleoenvironmental data from the Younger Dryas and Early Holocene indicate that plant and animal communities in the southeastern United States changed substantially between these periods. These reconstructions indicate that during the Early Holocene, climatic amelioration and changes in forest composition may have led to increases in populations of large-bodied animals that were depressed during the Younger Dryas. Based on these data, I hypothesized that there would have been a narrowing of diet breadth during this transition as foraging efficiency increased in the Early Holocene and human foragers exploited increasingly abundant high-ranking prey items. I tested this prediction using the faunal dataset from Dust Cave, Alabama. This site was inhabited from 12,650 to 5,700 cal BP, spanning the Late Pleistocene, Early Holocene, and Middle Holocene periods. I applied abundance indices based upon prey body size as well as measures of richness, equitability, and diversity to quantify dietary changes that occurred during this time period. My analysis demonstrates that there was a general narrowing of diet breadth from the Late Pleistocene to the Early Holocene at Dust Cave, with later diets focusing on large-bodied taxa that were most likely to have provided the highest caloric return rates.

Welch, Jacob [24] see Kidder, Barry

Welch, Jacob (Yale University), Barry Kidder (University of Kentucky), Céline Lamb (University of Kentucky), Shannon Plank (University of Kentucky) and David Medina-Arona (Universidad Autónoma de Yucatán)

[183] *Understanding Residential Space through Soil Chemistry in the Northern Maya Lowlands*

Soil chemistry in the Northern Maya Lowlands has been an effective method at a variety of sites and in a range of contexts such as households, ball courts, causeways, and ceremonial plazas. Recent chemical analyses of the Ucí-Cansahcab Regional integration Project (UCRIP) also revealed that the soils of the Yucatán, México, are testable using the in-field Olsen bicarbonate method to measure levels of extractable inorganic phosphate. When supplemented with distributional analyses of artifacts on and off the residential platforms, phosphate tests prompt synchronic and diachronic observations of differential discard patterns and possible areas of food serving and preparation from Preclassic to Postclassic. From these observations, we compare similar and dissimilar residential contexts, consider the various functions platforms have over time, and discern trends related to broader changes in the social, political, and economic dynamics of Ucí and the construction of its associated 18km intersite causeway.

Welch, John (Simon Fraser University), Paul Tosa (Jemez Pueblo), Francis Vigil (Zia Pueblo and State Of New Mexico) and Rachael Loehman (United States Geological Survey)

[239] *Toward a Sovereignty-Driven Paradigm for Transdisciplinary Research on Social-Ecological Systems*

In addition to substantive findings about changing relations between Jemez communities and forest ecologies, our multidisciplinary project is suggesting some promising strategies for enhancing research engagements with American Indian tribes. In spite of due diligence in consulting with Jemez Pueblo leaders in the course of project planning and in engaging Jemez people and interests in project processes, we are concerned that the project's scientific contributions outweigh its beneficial effects on Jemez Pueblo and the forests it depends on. Because science seems less imperiled than Jemez Pueblo and Jemez forests, we are proposing a sovereignty-driven research paradigm as an alternative to science- or discipline-driven research. Investigative programs tailored to understand and fortify the five 'pillars' of sovereignty—self-sufficiency, self-determination, self-governance, self-representation, and peer-recognition—offer constructive and locally grounded complements to science in the extractive-consumptive colonialist tradition as well as to decolonizing reactions to that tradition. Sovereignty-driven research entails, first, the identification of a tribe's (or

other Native nation's) sovereignty interests and goals then the formulation of research questions, methods, practices, and outcomes crafted specifically to advance those goals. Sovereignty-driven initiatives to understand and perpetuate vital and definitive links among people, territory, and cultural traditions define and require transdisciplinary research programs.

Welker, Martin [162] see Haney, Jennifer

Welker, Martin (Penn State University), Jonathan Burns (Penn State University) and Sarah McClure (Penn State University)

[165] *Investigating Diet Variability at Early Fortifications in the American Colonies*

Variability in historic faunal assemblages is believed to be related to niche construction effects associated with the establishment and cultivation of Old World domesticated flora and fauna in the New World. Fort Shirley, a French and Indian War period fortification in Central Pennsylvania occupied during the mid 1750's, is an important case study in this picture as it was occupied during the introduction of domestic livestock to Central Pennsylvania. Published zooarchaeological analyses of historic fortifications elsewhere in the New World highlight significant contributions of locally abundant wild fauna to military diets. Statistical comparison of faunal assemblages from military installations dating to the French and Indian War (1754-1763), including that from Fort Shirley, the American Revolutionary War (1775-1783), and the War of 1812 (1812-1815) will test the hypothesis that diet breadth narrowed through time and was accompanied by increasing reliance on Old World domesticates.

Weller, Olivier (CNRS), Jérôme Dubouloz (CNRS) and Laurence Manolakis (CNRS)

[211] *From Materiality to Space: Monumental Enclosures, Exploited Mineral Resources and Territoriality during the Michelsberg Culture (Neolithic, 4200-3700 B.C., France and Germany)*

The Michelsberg Culture saw the onset of major economic, social, technological and cultural transformations in agricultural societies around 4200 B.C. Cal. The most striking feature is without doubt the appearance in the landscape of large sites enclosed by complex systems of ditches and palisades. On the other hand, different modes of production and the exploitation of flint and salt show not only networks of raw material procurement but also a new organization of territories and the role of specialized sites. The models produced and described at different scales show complex and structured networks, covering an extended area and suggesting that settlements are inter-dependent on one to the other at the regional and supra-regional scales.

Wellman, Hannah (Department of Anthropology, University of Oregon), Torben Rick (Program in Human Ecology and Archaeobiology, Smith), Antonia Rodrigues (Department of Archaeology, Simon Fraser University) and Dongya Yang (Department of Archaeology, Simon Fraser University)

[163] *Ancient DNA, Zooarchaeology, and the Case for Whale Hunting on the Northern Oregon Coast*

Pre-contact whaling on the northern Oregon coast is an issue that has received limited attention from archaeologists. The discovery of a humpback whale (*Megaptera novaeangliae*) phalanx with an embedded elk (*Cervus elaphus*) bone point from the Par-Tee Site (35CLT20) in Seaside, OR precipitated a discussion of ethnographic and archaeological evidence for whaling in the area. Previous genetic and archaeological research suggested that opportunistic whaling may have occurred in this region. We expanded on earlier work by inventorying and identifying previously unanalyzed whale elements from the Par-Tee faunal collections. We also used ancient DNA analysis to identify 28 additional whale bones to species. Here we present the species and the zooarchaeological data on skeletal element representation and butchery from the Par-Tee whales. While the species data align with those previously found in archaeological deposits from active whaling areas, the zooarchaeological analysis, butchery patterns, and element representation were inconclusive, and deviated from patterns at known whaling sites in the Washington/Vancouver Island region. We concur that incipient whaling potentially occurred at Par-Tee, but was likely supplemental to the scavenging and utilization of beached or drift whales.

Wells, Joshua (Indiana University South Bend)

- [200]** *Beyond Sharks and Laser Beams: Lessons on Informatics Needs, Open Behaviors, and Analytics Practices to Achieve Archaeological Big Data, as Learned from the Digital Index of North American Archaeology (DINAA)*

Demands for archaeological “big data” must move strategically beyond buzzwords. Sciences and humanities that are successfully augmenting their workflows with ubiquitous computing are necessarily dealing with issues of accessibility, interoperability, and fundamental questions about the intended utility of core collection strategies at massive scales. Fortunately for archaeology, solutions to these issues are achievable through emphases on existing research networks and readily “open” solutions. The Digital Index of North American Archaeology (DINAA) is the largest index of research descriptors on archaeological sites in the Americas that is completely public and open, covering almost two million square kilometers and over half a million archaeological sites in 15 US states. The construction and future of DINAA is only possible through workflows that emphasize openness (open source, open data, open science, and open government), because its function is to assist the research community in finding and organizing available information resources (not warehousing data, nor listing specific site locations). Each of these “open” philosophies affords the only realistic opportunities for archaeologists to begin analytical engagement with big data, including: emergent pattern recognition within the almost overwhelming variety of recovered information; massive qualitative and quantitative modeling; and successful integration of legacy, future-proofed, and non-anthropological information sources.

[5] *Moderator*

[68] *Discussant*

Wells, Joshua [125] see Anderson, David

Wells, E. Christian (University of South Florida), Christopher K. Waters and Georgia L. Fox

- [176]** *Integrated Anthrosol Prospection at Betty's Hope Historic Sugarcane Plantation, Antigua, British West Indies*

Multi-elemental geochemical prospection of soils and sediments has become a highly useful technique for understanding past activity areas and the behaviors that produced them. However, this technique has limited interpretive potential, because it can only identify possible locations of different classes of activities. More importantly, there has been little research to evaluate the processes and elemental loadings that characterize different types of spaces. By studying known contexts and integrating geochemical data with other kinds of information about soil properties, which often co-vary in informative ways, the interpretive potential of this approach can broaden significantly. In this paper, we compare the results of a multi-elemental analysis using ICP-MS with extractable inorganic phosphate, organic matter and carbonates, pH, particle size, and magnetic susceptibility from anthrosols collected in a horse stable from Betty's Hope, a former sugarcane plantation that operated continuously from 1651-1944. We use this case study to demonstrate how integrated anthrosol prospection from established behavioral contexts can provide evidence-based inferences for past human activities and land use in other settings.

Wendrich, Willeke (UCLA)

- [36]** *Concurrences and Discrepancies in Ancient Egypt*

Studying ancient Egypt, with its rich textual, iconographic and archaeological records, requires an interdisciplinary approach. Any research along these lines will at some point find both concurrences and discrepancies in the information. Especially the latter require further analysis, involvement of yet other sources and lead to the realization that we need to theorize the fundamentally different types of information, audiences, purposes, and sometimes cross-purposes, of the things we study. Examples are the discrepancy between written and iconographic sources that heavily stress the continuity of Egyptian religion and world view, and the sometimes quite radical change in meaning that particular symbols and tropes actually go through; the discrepancy between the iconographic presentation of foreigners, and the embedding of foreigners in Egyptian society; the discrepancy

between the textual prescriptions and the material reality, such as the required materials to be used for particular amulets; the discrepancy between the descriptions of the trade goods of Roman-Indian trade and the items that are actually retrieved archaeologically; the discrepancy between Egyptian and Foreign textual sources about the political prowess of particular rulers.

Rather than bemoan such discrepancies, the question of why they occur provides powerful heuristic social, political, religious, methodological and theoretical avenues.

[291] *Discussant*

Wendt, Carl (Cal State University - Fullerton)

[172] *Olmec Archaeology in the Arroyo Pesquero Region*

Studies on the Olmec frequently focus on the ostentatious nature of the society such as large centers and monumental works of art, often ignoring the important role of smaller sites in regional hierarchies. In order to remedy this bias, we initiated the Proyecto Arqueológico Arroyo Pesquero, which is investigating sites in the Eastern Olmec Heartland. This project is unique in Olmec studies in that it takes a bottom-up approach to the study of the Middle Formative Olmec by collecting household-level data from a range of domestic and ritual contexts to address questions and test hypotheses on Olmec domestic organization, subsistence patterning, ritual, and regional resource control. This research builds on the body of theory and method on domestic activities (e.g., production), ritual, and subsistence organization. Through this research we are beginning to generate a clearer picture of Middle Formative Olmec daily life, exchange networks and procurement systems, the organization domestic craft production, and how people adapted to and modified their tropical lowland environment. In this paper, I present an overview of the nine years of our field investigations.

[172] *Chair*

Wendt, Carl J. [172] see Henry, Edward

Werner, Roger [90] see Isensee, Theron

Werner, Roger and Val Dufeu (University of Stirling)

[155] *Micromorphological Studies from the Clear Lake Basin California*

Geoarchaeology has a wide range of applications for the understanding of the past. Since the 1980s micromorphological analysis has become a more common worldwide research tool for the study of soils from archaeological sites. This analytic tool can play an important role in understanding site formation through the research of human waste, occupation debris, fuel residues and animal waste. It can serve as an aid in the reconstruction of human occupation and help identify economic activities and dietary habits. Several environmental factors can affect soil structure and they must be considered in micromorphological analysis. For instance, soil fauna activities such as feeding, reproduction and protection (burrowing), affect both soil components and therefore soil structure arrangement. As part of the South Main Street Water Line Archaeological Project, soil profiles were made for five archaeological sites. Each site was sampled using Kubiena tins for soil micromorphological analyses. In this instance, samples were taken from paleosols identified from a soil coring project (Redmond 2009) with the goal of assessing whether any possessed evidence of prehistoric occupation. Results of this investigation will help guide Phase 2 studies.

Werner, Helen

[301] *Molecular Identification of Mycobacterium Tuberculosis in the Milwaukee County Institution Grounds Cemetery*

Whether or not the identification of Mycobacterium tuberculosis in skeletal remains is possible has been a debated topic for many years. In order to shed more light on the issue, a study has been carried out on the remains from the 1991 and 1992 excavations of the Milwaukee County Institution Grounds Cemetery, a collection of skeletons ranging from the mid-1800s to the mid-1900s, of

various ages and sexes. To show the utility of the previously discussed methods of osteological identification of tuberculosis, the collection has been analyzed for the IS6110 repetitive element marker using molecular biological techniques, including Polymerase Chain Reaction (PCR). Eighty-six skeletons from the collection were selected for analysis based on completeness of remains and identification of age and sex. Out of the analyzed remains, nine skeletons showed skeletal signs of tuberculosis infection. PCR was also carried out with the oxyR marker to rule out *Mycobacterium bovis* contamination. The goal of the study is to show whether or not osteological identification of *M. tuberculosis* is possible and whether it can be confirmed using molecular biological techniques.

Werness-Rude, Maline [133] see Spencer, Kaylee

Wernke, Steven (Vanderbilt University) and Teddy Abel Traslaviña (Universidad Nacional Mayor de San Marcos)

[81] *Ordering Buildings, Building Order: Place Production in a Planned Colonial Town in Highland Peru*

In the 1570s, the Viceroy of Peru Francisco de Toledo instituted one of the largest forced resettlement programs in world history: the Reducción General de Indios (General Resettlement of Indians). Some 1.4 million native Andeans were forcibly resettled into over 1,000 planned colonial reducción ("reduction") towns built on gridded street plans throughout the viceroyalty. Through the media of the built environment, the Reducción was to be a means of generating a new social order from the ground up. Despite the scale and pace of this program, its implementation and effects over such a vast and diverse area remain poorly documented and understood. This presentation begins to address a key question about the resettlement process itself: how were the reducciones built? Intensive mapping, architectural survey, lichenometric dating and systematic intensive surface artifact collections at a 40 ha reducción town in highland Peru demonstrate its intrusive placement on a major Inka center, and the recycling of that prior settlement's core ceremonial spaces. Analysis of relationships between the urban blocks of the settlement and domestic compounds indicates considerable local autonomy in the construction of internal domestic spaces. These insights point to the limits of microscopically-attuned viceregal panoptics boasted in official textual sources.

[237] *Discussant*

Wernke, Steven A. [249] see Alcantara, Keitlyn

Wescott, Konnie (Argonne National Laboratory), Angie Krall (U.S. Forest Service, Rio Grande National Forest) and Brian Fredericks (Bureau of Land Management, San Luis Field Office)

[110] *Cultural Landscape Assessment for the San Luis Valley-Taos Plateau*

In support of the Bureau of Land Management's (BLM's) recent shift toward a regional landscape-scale approach to resource management on public lands, Argonne National Laboratory is conducting a pilot cultural landscape assessment in the San Luis Valley-Taos Plateau region of Colorado and New Mexico. The cultural landscape assessment is a paradigm shift from looking at individual cultural resource locations on a project-by-project basis to a more holistic approach of land use patterns at a regional landscape scale. A landscape approach considers the connectivity among traditionally defined archaeological sites and culturally important places and will likely lead to development of a new suite of research questions, as well as new ways of approaching the protection and mitigation of these culturally important landscapes. The assessment will consider the current conditions and trends of these landscapes in light of several change agents, including human use and development, climate change, fire, and invasive species. The methodology follows closely with that for the Rapid Ecoregional Assessments BLM has been conducting throughout the Western United States. The cultural landscape assessment will be used to support development of Solar Regional Mitigation Strategies for the Colorado Solar Energy Zones, as well as other planning and development activities.

Wesler, Kit (Murray State University)

[103] *Taking High Tech Back to Basics: GIS and the Three Dimensions of Archaeology*

In many ways, Willey and Phillips's (1958) *Method and Theory in American Archaeology* still sets the parameters for how we conceptualize the units of North American archaeological classification. The authors defined three types of units, in theory independently based on time, space, and material content. Integrative units juggled the three dimensions to create local sequences, which then built into larger and larger constructs. Wide use of various dating mechanisms and detailed studies of material culture have developed our understanding of the temporal and material dimensions substantially, but substantive systematization of spatial units has lagged. GIS offers a rigorous technique for the definition of spatial parameters. This paper will consider Willey and Phillips' unit concepts, particularly at the area and regional level, with data from Mississippian and Medieval European case studies. The primary challenge at this point is obtaining the data.

Wesp, Julie (UC MEXUS)

[299] *Caring for Bodies or Simply Saving Souls: The Emergence of Institutional Care in Spanish Colonial America*

During the early 16th century, the recent appearance of institutions specializing in care in Europe spread to the Americas. Unlike our modern perceptions of these healthcare institutions where you can seek help for illnesses that affect the body, the colonial period institutions were primarily run by religious groups and may have been more preoccupied with providing spiritual care for the indigenous populations. While this divergence of caring for bodies to caring for the souls may seem contradictory from our modern perspective, it had important consequences for the broader social transformation that occurred during the early colonial years in which the local population was understood to be on an equal level with Europeans and therefore worthy of all kinds of care. This paper analyses this emergence of institutional care through examination of the Hospital Real San José de los Naturales, the first royally sponsored hospital for the indigenous population in New Spain. Utilizing both ethnohistorical sources and skeletal remains recovered from the within the architectural remains of the hospital, I will highlight how the idea of care and how adequate care is characterized at certain times and in certain places may in fact be disembodied.

Wesson, Cameron (Lehigh University)

[335] *More than a Matter of Scale: Exploring Relationships Between Households and Communities*

Increased use of remote sensing techniques in archaeology has afforded researchers unparalleled opportunities to examine the spatial dimensions of ancient settlements. At the same time, we have witnessed a dramatic increase in archaeological research directed toward the examination of households. Although both scales of inquiry are capable of producing meaningful archaeological insights, distinct theoretical perspectives have developed out of attempts to reconstruct past social relationships when starting at either end of this continuum. This paper examines the difficulties we face when bridging these scales, suggesting that new theoretical perspectives must be developed in examining relationships between households and communities.

[255] *Discussant*

[335] *Chair*

West, Benjamin and Maria Bruno (Dickinson College)

[162] *Macrobotanical Investigation of Sonaji, Taraco Peninsula, Bolivia*

This poster presents the results of a macrobotanical analysis from the site of Sonaji, Bolivia located on the Taraco Peninsula in the Lake Titicaca Basin of the Andes. Sonaji is a low mound built from generations of occupations through the Formative (1500B.C.-A.D. 500) and Tiwanaku (A.D. 500-1100) periods. We consider eleven macrobotanical samples from diverse contexts (middens, floors, pits). These data, when interpreted with ethnographic data and past paleoethnobotanical research from the region, shed light on the changes in and continuity of agricultural practices on the peninsula in the time before and during the rise of the Tiwanaku state.

West, Dixie [302] see Hatfield, Virginia

West, Catherine (Boston University), Courtney Hofman (University of Maryland; Smithsonian Institution) and Steven Ebbert (United States Fish and Wildlife Service)

[339] *Invasive or Endemic? Management Implications of Archaeological Data in the Alaska Maritime National Wildlife Refuge*

The Alaska Maritime National Wildlife Refuge maintains more than 2000 islands, where invasive species management and eradication are the focus of conservation and landscape reconstruction efforts. While written records from the Russian and American eras document the introduction of many species, including red fox (*Vulpes vulpes*), arctic fox (*Alopex lagopus*), and cattle (*Bos taurus*), little is known about the introduction and dispersal of the arctic ground squirrel (*Spermophilus paryii*) in this island region. The ground squirrel has, however, been the focus of eradication efforts in the Gulf of Alaska. Here, we move beyond written records by using AMS dating and ancient DNA analysis of archaeological faunal material to describe the long-term history of the ground squirrel on Chirikof Island, Alaska. The results suggest that rather than a being recent introduction, the ground squirrel has been on Chirikof for at least 2000 years. Furthermore, aDNA analysis demonstrates genetic continuity between archaeological and modern specimens, suggesting the population of squirrels on Chirikof arrived before Russian or European occupation. These data have altered the eradication plans for Chirikof and demonstrated the significance of archaeological data in the context of contemporary landscape management.

[339] *Chair*

Whalen, Verity (Purdue University), Corina Kellner (Northern Arizona University), Alejandra Figueroa Flores (Northern Arizona University) and Deborah Spivak (University of California, Santa Barbara)

[31] *A Second Room of the Posts? Ceremonialism at La Marcha during Late Nasca and the Middle Horizon*

Preliminary investigations of the La Marcha site have revealed a key residential, mortuary, and ceremonial locale in the Las Trancas Valley. While initial use of the site occurred during the late Formative, here we report on the considerable Late Nasca and Middle Horizon occupation. In addition to residential zones, we documented large plazas with huarango post features similar to those at Estaquería and Cahuachi. These include complexes of up to 9 posts, oriented in rectilinear clusters along the cardinal directions. Test excavations of huarango features revealed a ceremonial space constructed by Late Nasca people and ritually interred by Loro people during the Middle Horizon. These data illustrate a region-wide tradition associated with huarango posts that emerged during the cultural reformation at the end of the Early Intermediate Period and continued in local Middle Horizon culture. In addition to illuminating ceremonial practices during this important transition, these data also demonstrate that Loro traditions had deep roots in Late Nasca society.

Whalen, Kathryn (University at Buffalo)

[63] *Be Our Guest: Tablescapes in Early Modern Ulster*

The ethnic relationships found in colonial settings are complicated and varied negotiations that are hard to decipher in the present, much less in the past. Performance of ethnic allegiance may be influenced by oppressive legal structures, systemic racism, reformation or resistance movements, and personal taste. As archaeologists have adopted more nuanced readings of material culture and its relationship to ethnic performance, such as the use of Homi Bhabha's concept of the third space and hybridity, we have developed a new interpretation of life in a colonial setting. The area known as Ulster is one such region where complex ethnic relationships are evident in the past, as well as in the present. This paper presents some preliminary results of my dissertation which seeks to understand better the relationships between native Gaelic Irish residents, Plantation English colonists, and immigrant Scottish settlers in Northern Ireland through their use of tablescapes and ceramics as markers of ethnicity, economic class, and market opportunity. This study looks specifically at the trade of ceramics in Early Modern Ulster, to see if there are patterns that can be discerned and related to ethnic affiliations through XRF data about parent materials, and archival information about land ownership.

[63] *Chair*

Whalen, Jess (The University of Edinburgh)**[417] *Feasting, Shared Drinking, and Social Complexity in Early Bronze Age Anatolia***

The Early Bronze Age II-III in Anatolia (2700-2000 B.C.) is a period of intensifying personal distinction. New tin-bronze metallurgy yields exquisitely crafted jewelry, ceremonial weapons, and drinking vessels, sumptuary activities appropriate to an emerging elite class. Yet it is difficult to characterize the structure of EBA settlements; a lack of writing and sealing practices suggest that there was no central administration. This contrasts with contemporaneous sites in southeastern Turkey and in Mesopotamia, whose metallurgy, craft production, exchange, and other developments were overseen by temple and palace complexes. Drinking activities offer a unique window into the social lives of Anatolian community members. In the west, double-handled tankards are designed to share drink together with others in a setting in which drinking does not stop. On the north-central plateau, small cups and shallow bowls are balanced upon fingertips in a display of drinking prowess. Feasting contexts and the spread of drinking shapes in different regions provide insight into the activities that characterized drinking events. Together with settlement architecture and other indices, this evidence can be used to reconstruct different options for the role of elites within settlements and different possibilities for how settlements of the period were structured.

Wheeler, Ryan [93] see Randall, Lindsay

Wheeler, Sandra (University of Central Florida), Lana Williams (University of Central Florida) and Tosha Dupras (University of Central Florida)**[240] *Death at Birth: Changing Mortuary Practices from the Late Ptolemaic to the Romano-Christian Period in Egypt***

Human burials and mortuary practices are the result of cultural attitudes and ideological beliefs that have been selected and shaped by the living for the dead. These beliefs and concomitant mortuary practices have changed through time, thus the treatment, space, and place for the dead varies, particularly in the context of the very young. While it is likely that adults were given the opportunity to make decisions about their own place of burial, treatment of the body, or grave assemblage, in the context of infants and children, these decisions were made for them by adults. The changing mortuary practice of burying fetuses, infants and children in and around the Late Roman period village of ancient Kellis are examined. Fetuses and infants are severely underrepresented in the earlier, Ptolemaic period rock-cut tombs, while their numbers are abundant in the cemeteries during the later, early Christian periods, suggesting a shift in beliefs concerning the space and place of these burials. This paper emphasizes the need to explicitly address the mortuary treatment and context of fetuses, infants and children during the period of shifting ideological beliefs and practices from the ancient Egyptian to those recognizable as early Christian in Egypt.

Whelan, Carly (University of California, Davis)**[138] *Hunter-Gatherer Storage and Settlement: A View from the Central Sierra Nevada***

Though optimal foraging theory is useful for examining hunter-gatherer subsistence decisions, food storage falls outside the scope of traditional models, because it separates foraging effort from consumption. The time that foragers spend accumulating a surplus for storage has the potential to conflict with the time they need for other activities during seasons of abundance, creating opportunity costs to storage. Changes in settlement strategies can alter these opportunity costs and affect decisions about which foods to store. An examination of the Middle to Late Holocene archaeological record of the central Sierra Nevada indicates that a residentially mobile settlement strategy was replaced by a semi-sedentary one, prompting a shift in focus from gray pine nuts to acorns for storage. This suggests that the relationship between storage and sedentism is more complex than previously believed.

Whisenhunt, Mary E. [262] see Roney, John

Whistler, Emily (California State University Los Angeles), Amira Ainis (University of Oregon) and Rene Vellanoweth (California State University, Los Angeles)

[32] *Making Ancient Birds Sing: Avian Archaeology on the California Channel Islands*

Terrestrial and marine environments of the California Channel Islands harbor a wide array of residential birds and provide breeding grounds and layovers for migratory species. Avian remains have been uncovered in paleontological and archaeological contexts, providing a long and continuous record of their presence. Although some species have persisted, others have disappeared at various points in time due to extinctions or alterations in migratory pathways. Though avian remains contain abundant cultural and environmental information, few detailed studies have been conducted on archaeological assemblages from the Channel Islands. We discuss taxonomic distributions on the islands and focus on patterns that developed across the Holocene, including the extinction of a flightless bird, the general decline of migratory species, an increased reliance on local nesting birds, and the effects of historical ranching activities on the overall decline of terrestrial species. Ecological associations and human harvesting patterns will be used to reconstruct aspects of island paleoecology and paleoenvironment and investigate changes in human selection choices through time. Examining bird remains allows archaeologists to address a variety of issues regarding the perceived marginality of islands and their resources, human/environmental dynamics, and the roles birds played in the everyday, social, and spiritual lives of native islanders.

Whitaker, Jason

[113] *Hinterland Household Economy: A Preliminary Analysis of Data from the San Lorenzo Settlement Cluster*

This paper is a summary of recent archaeological investigations at the San Lorenzo settlement cluster in the Mopan River Valley of Western Belize. The primary objective of current research at this ancient hinterland settlement is to better understand the dynamics of ancient Maya household economic organization and integration during the Late and Terminal Classic periods (A.D. 670-890). Households are fundamental units of economic organization in both past and present societies. The examination of ancient household remains enables archaeologists to better understand micro-scale economic activities, and to situate those activities within larger societal contexts. Excavations in the 2014 field season focused on the investigation of the area south of structure group SL-22. This fieldwork documented numerous features associated with both the Preclassic and Classic occupations of San Lorenzo. Ongoing analysis of lithic macroartifacts suggests that the Classic period residents of SL-22 produced informal tools primarily with locally available raw materials. Examination of these materials further suggests that these ancient people also acquired chert from sources outside the San Lorenzo settlement cluster. This paper will also include a discussion of the relationship between macro and micro artifacts in the areas surrounding structure groups SL-22, SL-23, and SL-25.

Whitaker, Adrian (Far Western Anthropological Research Group, Inc.) and Brian Byrd (Far Western Anthropological Research Group, Inc.)

[293] *An Ideal Free Settlement Perspective on Residential Positioning in the San Francisco Bay Area*

We present an Ideal Free Distribution Model to explore the successful establishment and spread of hunter-gatherer residential settlements around the perimeter of San Francisco Bay, California. Our objective is to illuminate underlying ecological and social factors that best explain the spatial distribution of occupation in the region. Our model determines relative habitat suitability based on a series of environmental factors including drainage catchment size, rainfall, terrestrial productivity, and littoral productivity. In doing so, we also account for diachronic shifts in shoreline location and its impact on resource distribution. Then we test this model using a robust database of more than 500 prehistoric residential sites around the Bay (of which more than a third have produced chronological data), and ethnohistoric insights into settlement location by linguistic group. The talk concludes with consideration of the effect of social as well as ecological factors in structuring temporal trends in settlement configuration and subsistence strategies that formed the basis of this rich archaeological record.

Whitbread, Ian (University of Leicester, UK), Jeremy Taylor (University of Leicester, UK), Mark Williams (University of Leicester, UK), Ian Wilkinson (British Geological Survey, UK) and Ian Boomer (University of Birmingham, UK)

[25] *Microfossils and Micro-XRF: Sourcing Raw Materials for Iron Age to Romano-British Pottery Production at Burrough Hill Hillfort, UK*

Burrough Hill hillfort, east Leicestershire, United Kingdom, is an example of an Iron Age settlement of the Corieltauvi people who occupied the East Midlands in the millennium prior to the Roman occupation of Britain in A.D. 43. The hillfort is set in a sedimentary landscape with few distinctive rock types. Objectives of the current study are to determine signatures of the local sedimentary deposits, building materials and pottery using ceramic petrography, micropalaeontology, WDXRF and micro-XRF. To this end 100 samples were taken of scored ware, calcite-gritted ware and mixed-gritted ware from the site dating from mid- to late Iron Age through the transition into the Romano-British period. Shell and quartz rich pottery fabrics are present in each phase of occupation. There are, however, differences in composition, sorting and packing of inclusions that reflect the use of particular sources or methods of clay processing. The microfossil assemblage points to a raw materials source in glacial deposits of the Oadby Till, which crops out east of the hillfort. The pottery is compared with contemporary shell-tempered wares from the neighboring eastern region.

White, Devin (Oak Ridge National Laboratory)

[84] *Reconstructing Large-Area Ancient Transportation Networks to Support Complexity Research*

Understanding and explaining the flow of people across landscapes through time, and the transportation networks that flow creates, has long been of interest to archaeologists focused on the origin, development, and inner workings of complex societies. Reconstructing these networks is extremely challenging due to data scarcity. Existing desktop GIS tools allow you to generate point-to-point routes via least cost analysis, which can then be compared to documented routes (which are very rare), used to find undocumented ones (rarer still), or to suggest possible pathways when none are visible, but this approach is not scalable to large landscapes or large numbers of origins and destinations. More importantly, archaeologists rarely know all possible starting and ending points for travel within a transportation network, formal or otherwise. This paper will highlight ongoing projects that leverage a custom high performance geocomputing application, known as From Everywhere To Everywhere (FETE), which can generate theoretical flows across landscapes of any size, as well as suggest potential networks, without having to specify any origins or destinations. It will also discuss how these data are highly beneficial to researchers who are attempting to understand social complexity through the use of computational modeling and simulation techniques.

White, Andrew [123] see Kansa, Sarah

White, Chantel (University of Notre Dame), Demetri Brellas (Boston University) and Nathan Arrington (Princeton University)

[154] *Food from the Hinterlands: Integrated Faunal and Archaeobotanical Studies at a Classical Emporion, Thrace*

The movement of goods, information, and people across the Classical world has been a subject of intense archaeological investigation for over a century. Established trading outposts, known as Greek emporia, contained a multitude of cultural elements from indigenous communities, Classical Greece, the eastern Aegean, and beyond. The ongoing excavation of a coastal site in northern Greece as part of the Molyvoti Thrace Archaeological Project has revealed a Classical Greek settlement dating to the fourth century B.C. While this community may have supplied grain and possibly animals to the powerful island of Thasos, we concentrate here on identifying the seasonal foodways of local residents to better understand daily life at the site. Combined faunal and botanical evidence reveals a diverse seasonal diet, which included resources from the Rhodope mountains, Thracian plain, freshwater marshlands, and coastal sea. These results indicate that the routine activities of processing, cooking, and storing food were remarkably complex and that patterns of resource acquisition during the Classical period were substantially different from later Roman occupations of the site.

White, Randall (Center for the Study of Human Origins, New York U)

[181] *Paleoethnographic and Chronostratigraphic Perspectives on the Aurignacian of the Vézère Valley : Abri Castanet, Abri Blanchard, Abri Cellier*

New excavations at three historically important Vézère Valley sites provide insight into the spatial organization of Early Aurignacian campsites and the nature of the late Pleistocene landscapes surrounding them. These excavations provide new and robust data on fire-use, activity areas and the context of the production and use of symbolic materials (graphic imagery and personal ornaments) among early modern humans in SW Europe. Molecular filtration dates raise new questions about the chronology and variability of Early Aurignacian assemblages in the classic zone.

[181] *Discussant*

[181] *Chair*

White, Peter (University of Sydney)

[296] *Ethnoarchaeology: More than Cautionary Tales*

Rather than being just a set of warnings, ethnoarchaeology has made major contributions to a range of archaeological endeavors, especially in Papua New Guinea and Australia. These include broadening our view of stone and wood technologies, of site formation processes and of human-environment relations.

White, Samuel (PhD Program, Anthropology Department, The University of Montana)

[300] *Anzick Site Lithics: A Study of Concave Margin Scrapers as an Integral Part of the Clovis Tool Kit*

An assemblage of lithic and osseous artifacts, associated with the fragmentary remains of a child was discovered in Montana at the Anzick Site (24PA506). The remains and assemblage, all covered with red ochre, are thought to represent the only known burial from the Clovis Culture. Found on several lithic artifacts in the assemblage are unique flaking patterns which form "margin scrapers", possibly utilized as an integral part of an osseous tool crafting technology overlooked in western Clovis toolkits. These flaking patterns resemble those found on lithic artifacts from other known western Clovis sites. In this study, I compared the margin scrapers directly with ovoid bone rods, also from the Anzick assemblage. I propose that these margin-scrapers were drawn along the edges of bone shafts to create a predicted and uniform ovoid configuration required by design with variable margin scraper sizes shaping the "shoulders" and the "body" of the linear shafts. This consistency in shaft manufacture ability would allow for efficient replication of a specific and desired bone shaft tool size and shape as is found in multiple examples within the Anzick assemblage.

White, Carolyn (University of Nevada Reno), Elizabeth Bennett (University of Nevada Reno) and Laura Sechrist (University of Nevada Reno)

[394] *Granite Creek Station: Site of Massacre and Memory*

Granite Creek Station was one of several significant stopping places for emigrants, travelers, saddle trains, and stagecoaches passing through the Black Rock Desert region of Northern Nevada on their way to California in the mid-19th century. The site functioned as a campsite, trading post, ranch, stagecoach station, and military camp. As a site along the emigrant trail, it was the locus of extraordinary pain and suffering by travelers, described in their own words through diaries and letters. The site was also the location of several episodes of violence, including one described as "The Butchery at Granite Creek Station," between local Paiutes and western settlers. This paper will present the results of excavations of this site and will explicitly examine the role of the site as a place of hardship and conflict.

Whitehead, William (SWCA Environmental Consultants)

[162] *Prehistoric Plant Utilization in Southeastern New Mexico: A Unique Publication Merging Academic and Public Interests*

The investigation of plant use, in southeastern New Mexico, in prehistory has been widely covered.

This project continues this tradition by synthesizing and compiling all of the information to date in the region. The Carlsbad Field Office of the Bureau of Land Management, administrators of the Permian Basin Mitigation Program, is sponsoring the publication of a reference book on prehistoric plant use in Southeastern New Mexico. This free text will bring together recent work in radiocarbon dating, range plant community studies, testing and data recovery reports, academic sources and modern uses in one location on over 100 taxa. Images of whole plants, seeds, pollen, phytoliths and other plant parts will make this text a must for paleoethnobotanists, while information on culinary uses, landscaping, gardening, and summary data of the prehistory of each plant will be of interest to a more general audience. An emphasis will be placed on modern uses of native plants, and how each plant can fit into landscape management and habitat restoration.

Whitley, Tamara [103] see Martinez, Romina

Whitley, David (ASM Affiliates, Inc.)

[138] *Setting and Function of the Pahrnat Valley, NV, Petroglyphs: Archaeological and Ethnographic Perspectives*

Rock art is landscape art, but what may be inferred from its setting and associations? It is commonly believed that function directly follows from setting and locational association, but the assumptions underlying this inference are not examined. The Lincoln County Class III rock art inventory is partly directed at the landscape implications of the Pahrnat Valley, NV petroglyphs, providing an opportunity to consider this question. Associational inference, appropriately applied, combined with ethnographic accounts of the location, nature and use of Great Basin rock art demonstrates that many simplistic interpretations are unsupportable, with a more nuanced understanding required.

Whitley, Tamara (Bureau of Land Management)

[138] *Chair*

Whitney, Kristina (University of New Mexico)

[12] *Historic Pueblo Canteens: How were they made and how were they used?*

Historic Pueblo potters formed ceramic canteens that have one flat and one bulbous side. This form posed unique issues for construction. The form is symmetrical along only one axis, and while other Pueblo ceramic forms exhibit this feature, such as duck effigies, these flat-sided canteens are unique in that they were made to carry water. The shape suggests it was designed to be transported against a flat object. 19th century ethnographic research suggests transportation against a human back, with a tumpline attached to the handles. This research investigated the construction and use of flat-sided canteens in museum collections. The relationship of this form to canteen forms in other parts of the world is explored.

Whitney, Bronwen [226] see Iriarte, Jose

Whittaker, Joss [200] see Kretzler, Ian

Whittaker, John (Grinnell College)

[292] *Discussant*

Whitten, Ashley and David Chicoine (Louisiana State University)

[237] *Urban Planning, Neighborhoods, and the Organization of Residential Space at the Early Horizon Center of Caylán, Coastal Ancash, Peru*

This paper examines and compares the spatial organization of residential compounds in order to reconstruct patterns of neighborhood and urban life at the Early Horizon of Caylán (800-1 B.C.), Nepeña Valley, north-central coast of Peru. Systematic surface mapping combined with limited horizontal excavations indicate that the urban core of the ancient city was composed of more than 40

residential complexes articulated through a series of streets and corridors. Detailed first-hand mapping of streets and accessways indicate that each compound had an independent entrance linked to one of the dozen or more cross-cutting streets at the site. In this paper, we analyze the location, spatial organization, and architecture of the different residential compounds in order to evaluate intra-site variability and potential social differences between Caylán co-resident neighborhoods. Results from test units and block excavations from various compounds help in assessing the contemporaneity of the different sectors of the site and possible changes through time. Gamma analyses of the depth and complexity of residential complexes across the co-resident neighborhoods shed light on the heterogeneity of Early Horizon cityscapes in the Central Andes.

Whittle, Alasdair (Cardiff University)

[348] *The Long and Short of It: Timescales for Cultural Change and Transmission in the Vinca Complex of SE Europe*

The Times of Their Lives project has produced modelled date estimates for the major phases of the Vinca complex in SE Europe, spanning the later sixth to mid-fifth millennium cal B.C. That is a considerable advance in our understanding of the broad rate of cultural change. But site-specific date estimates within the complex also allow detailed comparisons of the timing of the introduction of novel material forms, especially in pottery, down to a much more precise scale. Examples from the beginning especially of the Vinca complex (Vinca A) will be discussed, drawing on our work at among other sites, over an area with a radius of some 100 km, Vinca-Belo Brdo, Serbia; Uivar, western Romania; and Szederkeny and Versend, south-west Hungary. Other possibilities for examining the further development and the end of the Vinca complex will also be briefly discussed, providing further reflection on how best to combine varying timescales.

[348] *Chair*

Whittle, Alasdair [348] see Banffy, Eszter

Wickler, Stephen (Tromsø University Museum)

[105] *The Centrality of Small Islands in Arctic Norway from the Iron Age to the Recent Historic Period*

The definition of island marginality in northern Norway was radically altered by the advent of motorized fishing vessels in the early 20th century. Prior to this development, small offshore islands were of central importance for settlement and marine related activity due to their proximity to fishing grounds. In this paper I discuss three settlements on small and 'marginal' islands in Arctic Norway from 68°19' to 71°05' N latitude that illustrate the centrality of such locations since the Early Iron Age (ca. 500 B.C.). From south to north, these include Borgvær (1.8 x 1 km) in the Lofoten Islands, Grimsholmen (1.4 x .7 km) in northern Troms, and coastal settlement on the larger island of Ingøy (18.6 sq km) near Norway's northernmost point. Although these islands are inhospitable, barren and exposed to the open ocean, they were the focus of intensive fishing related settlement by the Viking Age (A.D. 800-1000) with substantial settlement mounds from the medieval period (A.D. 1200-1500). The significance of these specialized island settlements viewed in relation to larger networks of interaction and exchange is critically examined and assessed.

Widga, Chris (Illinois State Museum, Landscape History Program) and Dennis Lawler (Illinois State Museum)

[28] *The Earliest Domesticated Dogs in the Midcontinent: Chronology, Morphology, and Paleopathology*

The Midwest has the earliest and possibly richest record of dog burials in North America. We use 2D and 3D geometric morphometrics to assess variability in the morphology of wild and domesticated Canidae from midwestern Archaic assemblages (10,000-6000 cal BP). Health and life history characteristics of these animals are also described on the basis of gross pathology, radiographs, and computed-tomography. Preliminary results indicate a strong geographic trend in the characteristics of archaeological dogs. A wide-variety of dog morphologies are found in the eastern Great Plains associated with bison hunting sites. These include large, wolf-sized dogs (>60 lbs), medium-sized

terrier-like dogs (40-60 lbs) and possible wild/domestic hybrids. Healed trauma is more common in these populations. Dogs from the central part of the Midwest, on the other hand, show a limited size range (40-60 lbs) and lower rates of trauma. We will explore how these emerging trends fit into the evolving picture of dog domestication in the eastern US.

Widmayer, Elise (Smithsonian Institution), Joseph Gingerich (Smithsonian Institution) and Harry Iceland (Smithsonian Institution)

[357] *A Paleoindian Heavy Stone Analysis at Shawnee-Minisink*

Cobbles, natural rock, and unflaked lithics are rarely subjects of study at Paleoindian sites. The lack of available literature on this topic may be due to an absence of these artifacts in Paleoindian levels, insufficient sample sizes, or an over emphasis on more aesthetic flaked stone. Within the Smithsonian's Shawnee-Minisink collection, there are a number of stones from the Paleoindian level that appear to be manuports. Considering these stones are isolated, not found in cobble clusters, and occur in loess sediments, it is unlikely they were brought into the site by natural causes. This site's spatial integrity and abundance of piece-plotted artifacts make it an ideal sample for heavy stone analysis. Each stone was examined for modifications and traces of use wear to deduce probable function. Additional attributes including weight and material type were also considered when relating spatial data in pre-existing GIS maps. This poster presents our efforts to explore the significance of heavy stone analysis in Paleoindian studies. This work also contributes to our understanding of Paleoindian activities and the spatial organization of sites.

Wieckowski, Wieslaw [227] see Giersz, Milosz

Wienhold, Michelle (University of Iowa), Alana Springer (Stanford University) and Abby Viselman (San Francisco State University)

[143] *Cache Cave in Context: 3D Scanning Complex Cave Environments for Mapping and In-Situ Documentation of Artifacts*

The spatial documentation at Cache Cave entailed the mapping of the cave's interconnecting passages and shelters, its taphonomic environment, and the archaeology present at the site. Due to its complex formation and small spaces, the overall cave structure could not be recorded by more traditional mapping methods. Through the use of three-dimensional (3D) scanning during the Spring and Summer of 2014, a multi-scalar, high resolution approach was used to capture both the interior structure and depositional environment of the cave and map artifacts both in context and in-situ. Scanning, therefore, took place during excavation to document archaeological assemblages and artifacts as they were uncovered. This paper discusses field methodology and procedures for scanning Cache Cave and its archaeology and outlines future analyses beyond simple 3D visualization. One of the main goals of the scanning project is to use the outputs to provide a more accurate, visual context for post-excavation analyses to inform research elsewhere. Finally, the data will provide the opportunity for in-depth spatial analysis to aid in the investigation of the archaeological remains, both in context and in-situ, to provide clues to Cache Cave's relevance to hunter-gatherer storage, use of space, and complexity.

Wiewall, Darcy (Antelope Valley College)

[38] *Peopling the Landscape: Scott Fedick and His Contributions to Household Subsistence Strategies*

Over the past several decades, Scott Fedick's pedagogical approach to understanding local-scale environmental and biological diversity has inspired and influenced numerous students and colleagues perspectives on Maya household subsistence strategies. The first part of my presentation will discuss my participation in the Yalahau Regional Human Ecology Project and how Scott's heterogeneous approach to resources management strategies influenced my later research on local subsistence strategies employed by Maya commoner households in the community of Lamanai, Belize. Scott Fedick continues to influence my current research moving beyond the boundaries of the Maya culture area and, interestingly, into research being conducted by community college students focused on hunter and gatherers in the Western Mojave Desert. As before, research is motivated by identifying the diverse strategies of resource use and management available to ancient people in a

heterogeneous landscape. Here I highlight how Scott's emphasis on collaborative, interdisciplinary research and his strong sense of mentorship is influencing a new generation of future archaeologists.

Wiewel, Adam [8] see Simon, Katie

Wiewel, Rebecca (Arkansas Tech University)

[109] *Protohistoric Social Dynamics in the Central Arkansas River Valley*

The Protohistoric period in the southeastern United States is known for being a time of social upheaval and transformation. Groups living in the Central Arkansas River Valley during the early seventeenth century had to contend with the aftermath of the De Soto entrada, severe drought conditions associated with the Little Ice Age, and perhaps widespread population movement accompanying the dissolution of chiefdoms in the Mississippi Valley. Societal coalescence is one strategy that many later Southeasterners adopted during times of social stress. This paper considers the possibility that the protohistoric Carden Bottoms community in Yell County, Arkansas is an early example of coalescence. I draw evidence from recent excavations of complete households at site 3YE25 and a newly completed compositional analysis of ceramics from the Carden Bottoms locality and comparative collections from surrounding regions in Arkansas. Given the similarities in artifact assemblages among nearby Carden Bottoms phase and Menard Complex sites, these findings may have widespread implications for Protohistoric studies across the region.

Wiewel, Adam

[230] *Remote Sensing Investigations at Midipadi Butte (32DU2) and Nightwalker's Butte (32ML39), North Dakota*

As part of a flood assessment effort in collaboration with the US Army Corps of Engineers and the South Dakota State Historical Society, archaeo-geophysicists from the Center for Advanced Spatial Technologies at the University of Arkansas performed remote sensing investigations in 2014 at fifteen sites along the Missouri River in North and South Dakota. Among these are Midipadi and Nightwalker, two related late eighteenth to early nineteenth century Hidatsa sites located on opposite sides of Lake Sakakawea. We performed magnetic gradiometry, electromagnetic induction (yielding conductivity and magnetic susceptibility), and UAV-based aerial surveys at the sites. The integrated datasets provide contrasting results. At Nightwalker's Butte the imagery clearly indicates the extent of Smithsonian Institution River Basin Surveys excavations as well as the presence of unexcavated features. The impact of erosion is made apparent at Midipadi. However, our geophysical surveys reveal many previously unknown features, including numerous lodges as well as a possible palisade, significantly changing our understanding of the site. Remote sensing efforts such as this one demonstrate how spatial technologies may be implemented in large-scale resource management and research contexts.

[230] *Chair*

Wigley, Sarah (University of Texas at San Antonio), Antonia Figueroa (University of Texas at San Antonio) and Laura Levi (University of Texas at San Antonio)

[66] *Space, Ritual, and Production at Wari Camp*

This paper examines the construction of residential and ritual space at the prehispanic Maya site of Wari Camp, located in northwestern Belize in the Rio Bravo Conservation and Management Area. We explore the productive activities of temple and pair groups at the site through examination of lithic and ceramic material recovered from excavations conducted at the northern satellite of the site in 2012. In addition, environmental and soil data from the site provides insight into the relationships between the natural landscape and residential groups. This variety of data assists in creating a broader understanding of the Wari Camp landscape through exploration of connections between architecture and cultural material of residential groups and the environment in which they are situated. By exploring the association of residential architecture and the natural environment we can gain a better understanding between space, ritual and production and their connection to place and landscape.

Wigley, Sarah [276] see Eiring, Melissa

Wilcox, David (Itinerant Scholar)

[26] *Cumulative Survey: Defining Coalescent Communities in the American Southwest*

The fundamental shift from artifacts to settlements as the basic units of archaeological inquiry required a rethinking of methodologies. Now the basic questions were about measuring interactions of people deployed differentially on cultural landscapes. At a more abstract level it required adoption of the logic of relations in preference to the typological logic of entities and their qualities. If settlements are portrayed as variously colored dots on a map, interactions can be expressed as what connects those dots. Full coverage survey of whole cultural landscapes on larger and larger spatial scales, in the end, is essential for mapping the relationships that provide the data for discovering and testing models of those interactions. Cumulative survey, however, the assembling of information on all known sites larger than farmsteads on macro-regional scales, while not an alternative to full coverage survey, does allow at least preliminary studies of coalescent communities in the late prehistoric American Southwest. Distance parameters of potential interactions can then be studied, and the addition of ceramic data from those sites opens the door to analyses based on network theory. In my professional lifetime, Stephen Kowalewski has been a friend, a sounding board, and an inspiration for many such studies.

Wilcox, Michael (Stanford University)

[178] *Cubism, History and Narrative in Archaeology: Shifting Borders and Disciplinary Boundaries from New Mexico to California*

Throughout his career David Hurst Thomas' work has stretched the disciplines of archaeology and history in novel and unexpected directions. Mr. Thomas' essay on cubism and archaeology is one such example. This essay traces the shifts in borderlands archaeology using Thomas' powerful metaphor, and demonstrates the unique creativity and flexibility that characterizes Thomas' approach to the past.

Wilczynski, Jaroslaw [87] see Wojtal, Piotr

Wildenhain, Anne [315] see Lash, Ryan

Wildt, Jennifer [93] see Belkin, Sara

Wildt, Jennifer (Boston University)

[193] *Public or Private: Adaptations in the Use of Public Space During the Maya Late Classic Period*

Are all open spaces public spaces? What factors influence how 'public' a space is? How did the population increase during the Late Classic period impact the use and design of open spaces in the Maya lowlands? To understand how the Maya adapted their built environment in response to high populations, I examine the architectural features of plazas and patios in a ritual-residential group at Xultun. In the Late Classic period, residents erected additional buildings within patios, reducing the amount of space available for quotidian activities. At the same time, two large open spaces were constructed adjacent to this group. This paper explores the possibility that the Maya adapted some open spaces for activities normally conducted within patios and that lowland plazas may exhibit greater diversity than we currently recognize.

Wiley, Kevin (SUNY Buffalo)

[289] *Networks through Time: Filling in the Gaps*

The Middle Neolithic circular ditched enclosure of Goseck in Central Germany was built and used during the Stichbandkeramik period. Subsequently, during the Gatersleben period, another ditched

feature was constructed, which intersected the earlier enclosure. However, between these two periods, in the intervening century, during the Rössen period, the site was not in use. This temporal gap has been glossed over in narratives of the site that stress continuity. This paper will examine the possibility that Goseck functioned as an intentional non-site, a forbidden place, during the Rössen period. Looking at sites in the region not as dots on a map but as networks of connected places, patterns of movement can be discerned. These patterns change diachronically and may indicate that during the Rössen period this place was intentionally avoided.

Wiley, Nancy "Anastasia" [310] see Garrison, Andrew

Wiley, Nancy and Rezenet Moges (Scientific Resource Surveys, Inc.)

[310] *Stone Geometrics: An Inclusive Typology Matrix for Californian and Chilean Cogged Stones*
Drawing on recent studies of cogged stones by Scientific Resource Surveys, Inc., comparisons can be made between the artifacts found along coastal Southern California and morphologically similar artifacts unearthed in the Coquimbo region of Chile. This poster will describe a new method of calibrating typological shapes for describing both Californian and Chilean cogged stone artifacts. Several caches containing unconventionally shaped cogged stones were discovered by SRSinc during archaeological investigations on the Bolsa Chica mesa. Instead of describing them with an arbitrary label, a matrix was developed to provide a standard descriptive typology incorporating any odd-shaped cogged stone into a new typology of Stone Geometrics. Borrowing an identification system from Paleontology, this matrix registers two-dimensional shapes [or plan views] by three levels of radiates based on the length of extensions from the body of the artifact. SRS studied approximately 1000 specimens from both Southern California and Chile, documenting them photographically and collecting appropriate data including number of cogs (or sides), diameter, thickness, and geometric shape. The model also provides a diagrammatic aid for basic three-dimensional shape descriptions.

Wilke, Detlef

[3] *Using Spiked, Fired Clay Samples for Developing Robust Quantification Algorithms for pXRF of Pottery*

Absolute concentrations rather than relative, instrument and setting specific values are requested as scientific standard in publishing provenancing results. Recent publications suggest that there is no reliable vendor software for elemental quantification of pottery with pXRF. It is unclear whether this is due to a lack of precision in the given trace element values of reference standards, or uncorrected matrix effects, or both. We faced similar problems when using >30 reference standards for quantification by direct comparison of counting rates. To get a better understanding we prepared fired clay samples spiked with Ti, Fe, Ga, Rb, Sr, Y, Zr and Nb. Using different commercial clays we recognized a strong impact by Fe absorption/enhancement, which needs correction if a meaningful comparison of pottery from different production sites is intended. Furthermore we were able to use the concentration range of the spiked samples to improve the deconvolution software provided by the vendor for spectral interference, which we did not even recognize before. To underline the necessity of a diligent calibration of pXRF instruments we present data with and without the established correction algorithms for separating medieval waster assemblages which have partially overlapping trace element patterns, but differ in its Fe content.

Wilkie, Laurie

[15] *Discussant*

Wilkins, Cory

[30] *Archaeological Preservation*

The Archaeological Conservancy (TAC) is the only national non-profit organization dedicated to preserving archaeological sites across the United States. In the late 1970s the founders of TAC recognized the threat and lack of protections to archaeological sites on private lands. In response,

TAC was organized and incorporated. Often, TAC is contacted by archaeology firms, state agencies, and landowners with requests to explore the possibility of preserving a specific site. Many landowners find their sites to be sacred and feel obligated to preserve them. Some, feeling it is their duty to respect significant cultural places, avoid disturbing archaeological sites for generations. State laws are trending toward preserving archaeological sites on private lands. In many cases, landowners and developers are required to mitigate for the loss of a cultural resource and turn to TAC to preserve their archaeological site in situ, thus avoiding destruction of sites. The Archaeological Conservancy has over 480 archaeological preserves across the United States. Many of these sacred sites would have been completely destroyed, if not for the preservation efforts of this effective organization.

Wilkins, Jayne [294] see Atwater, Chloe

Wilkins, Jayne (Arizona State University), Kyle S. Brown (Department of Archaeology, University of Cape Town), Simen Oestmo (Institute of Human Origins, School of Human Evolution), Telmo Pereira (Interdisciplinary Center for Archaeology and Evolu) and Kathryn L. Ranhorn (Center for the Advanced Study of Hominid Paleobiology)

[356] *A High-Resolution ~110,000 Year Middle Stone Age Lithic Technological Sequence from Pinnacle Point, South Africa*

The Pinnacle Point sites on the south coast of South Africa preserve a long, high-resolution sequence of human occupation spanning 162-51 ka. The lithic assemblages provide a unique opportunity for examining Pleistocene technological change because they are linked to robust age estimates and multiple proxies for paleoenvironmental change. Recent lithic technological investigations aim to standardize analytical procedures across the complex of Pinnacle Point sites, and maximize comparability to other Middle Stone Age (MSA) sequences. The Pinnacle Point sites show both similarities and differences to other long MSA sequences, and add to what is becoming an increasingly complex picture of MSA technological change and continuity. At Pinnacle Point, major technological shifts occurred at ~90 ka and ~74 ka. Some aspects of technology show surprisingly continuity across these periods of pronounced change. Diverse core reduction strategies were used throughout the sequence with little temporally-vectored patterning. Some technological shifts appear correlated with drastic paleoenvironmental change, but not all. Overall, the Pinnacle Point record is consistent with human patterns of adaptability to new and fluctuating environmental conditions, as well as stylistic choice independent of environment, and in those respects is similar in nature to more recent records of hunter-gatherer adaptation in South Africa.

Wilkinson, Toby

[14] *Synchronizing Highland and Lowland Rhythms of Material Exchange*

From an archaeological point of view, interconnectivity between highlands and lowlands of the ancient Near East is undeniable. The differential distribution of natural resources (particularly metals and precious stones which are sourced predominantly in highland regions), and the evidence for circulation of these resources from at least the Neolithic, is the most obvious sign of this interdependence. Too often, however, our models of this interdependence have tended to create abstract zones – consuming ‘centers’ and producing ‘peripheries’ – with highland regions normally characterized as ‘periphery’, perhaps unsurprising given the urban perspective of academic enquiry. These models are also a result, in part, of our techniques of visualization: the trusty black-and-white line map has its place, but it also constricts our understanding of landscape (including topography, climate and seasonality) and the human movements which took place across them. Using case-studies from the highland area(s) north of Mesopotamia in the 4th and 3rd millennia B.C., this paper sets out to examine how rethinking the visibility of maps can start to break down the ‘zonal model’ into a more rhizomic picture of highland-lowland interdependence as well as incorporating important factors such as cultural rhythms and seasonality into our models of ancient trade.

Wilkinson, Ian [25] see Whitbread, Ian

Wilkinson, Darryl (University of Wisconsin-Madison)**[142]** *Theorizing Infrastructure*

Accounts of ancient infrastructure are very common. Almost every archaeologist who deals with complex polities regularly encounters infrastructure in some form - including roads, irrigation canals, bridges, harbors, aqueducts, recording systems and forts - just to name a few of the most common varieties. That said, the concept is rarely explicitly theorized or defined within the discipline - and is usually identified on the basis of "we know it when we see it". In contrast, this paper seeks to reflect on infrastructure as a theoretically rich category. Thus infrastructures will be elaborated upon as, 1) networks where political and technological projects are fused and 2) as material apparatus that mediate relations between political subjects and states.

[142] *Chair***Wilkinson, Patrick (University of California, Merced)****[153]** *Cave Vodou in Haiti: An Ethnoarchaeological Approach*

Haitian Vodou is a syncretic religion that combines elements of West African beliefs and indigenous Taino culture overlaid onto a rigid framework of forced Catholicism. One aspect of the religion that has not been investigated is the modern use of caves as a specialized local for various types of rituals, each having a specific purpose. This paper will discuss the use of both ethnographic and archaeological investigative techniques to differentiate the various purposes of cave ceremonies and attempt to determine whether different spaces within the caves are associated with specific aspects of the religion, with emphasis on the ephemeral material remains left behind by Vodou Houngans or Mambos (Vodou priests or priestess). These material remains include cave iconography, ritual deposits, and ceremonial paraphernalia belonging to both practitioners and adherents. This paper reflects the results of the 2014 Summer field season in northern Haiti.

Willerslev, Eske [337] see Raghavan, Maanasa

Willett, Alyssa (University of Alaska Anchorage) and Ryan Harrod (University of Alaska Anchorage)**[299]** *Cared for or Outcasts? The Bioarchaeological Analysis of Two Individuals with Potential Disabilities from Aztec Ruins*

This project focuses on the assessment of individuals who appear to have held a lower status, worked harder, and been at more risk for trauma than other members of the same community. The West Ruin site of Aztec Ruins is an important site in the U.S. Southwest that came into prominence after the decline of Pueblo Bonito in Chaco Canyon. Within this site there are two individuals who appear to have suffered significant traumatic injuries that healed. Both individuals were young adults; one appears to be a female while the other is likely a developing male. The question we had is what if any care in the form of treatment and provisioning was provided for these individuals. Using standard osteological methods and archaeological context the individuals were entered into the newly created web-based instrument known as the Index of Care. The data generated allowed us to assess if the injuries these individuals suffered during their lifetime were sufficient enough that they would have needed caregiving by other members of the community.

Williams, Mark [25] see Whitbread, Ian

Williams, Justin (Washington State University)**[99]** *Teaching Archaeology through Games: Bringing Interactive Lessons into the Classroom*

When teaching archaeology, it may sometimes be challenging to incorporate group work and interactive lesson plans. Due to the sensitive and time consuming nature of archaeological field and lab work, it is difficult to provide a true archaeological experience during allotted class periods. One way in which archaeological lesson plans can become more interactive is through the use of board games. Board games provide an interactive activity which causes students to work together, and the

rules can be adapted to solve archaeological themed problems. This poster demonstrates methods for encouraging interactive learning and engagement via the use of board games.

Williams, Lana (University of Central Florida) and Jane Masségia (Center for the Study of Ancient Documents, Ioannou)

[205] *Tending the Vines: Biomechanical Evidence of Laterality and Gendered Labor Division in Viticulture at Pessinus, Turkey*

Skeletal remains from Sankuş Mevkiinde Tomb (Late Roman, A.D. 200–300) at Pessinus, Turkey included 12 adult males with asymmetrical, robust definition of the peroneal trochlea extending outward (>1 cm) from the lateral calcaneus and situated between the peroneus longus and brevis tendons, nine of which are on the right calcaneus. Adult females did not exhibit this variation. Asymmetrical variation suggests repeated biomechanical eversion of the foot and plantar flexion of the ankle on the side affected when recovering from crouching and kneeling on one knee. Biomechanical stress laterality is also reflected in knee, wrist, and elbow joints of the same individuals, but not in shoulder joints. Right-preference laterality (90-92%) in humans indicates primary use of the right hand-right leg for a specific kneeling task. Roman tombstones for local males depict vine-hooks and handpicks but weaving apparatus for females. Intensive use of these tools in tending vines is consistent with stresses in male wrists and elbows within the sample. Enduring local practices of tending untrained vines at ground-level account for indications of repetitive kneeling in the same individuals. This holistic view of biomechanical stress and ancient iconography reconstructs ancient viticultural practices and the gendered division of labor.

Williams, Sloan (University of Illinois At Chicago), Lindsey Proctor (UIC), Chapurukha Kusimba (American University), Janet Monge (University of Pennsylvania) and Alan Morris (University of Cape Town, South Africa)

[264] *Decoding the Swahili: Ancient DNA Studies on the Kenyan Coast*

Our project examines the role of migration in the development of the large autonomous Swahili towns and city-states that grew out of small fishing, agrarian, and pastoral settlements on the East African coast in the late first millennium CE. Our sample is comprised of 97 individuals from three sites on the Kenya coast: Mtwapa (N=72; 900-1732 B.C.E.) near Mombasa, and two sites in the Lamu archipelago, Manda (N=16; 800-1400 B.C.E.), and Shanga (N=9; 800-1400 B.C.E.). The teeth were well preserved and about 80% of the samples yield genetic material. We sequenced the HVRI of the mitochondrial control region. We found that, while early Swahili populations were primarily of African origin and consisted of haplogroups commonly found throughout East Africa and in Bantu speaking groups in sub-Saharan Africa, but the Swahili were much more diverse than has been commonly supposed and included haplotypes less commonly found in the area today.

Williams, James (Renmin University of China)

[283] *Local and Regional Economics in Northeast China*

Food production and other forms of economic activity manifest at both local and regional scales. In some instances population density within one community may lead to stress at the local scale. The region can, however, mitigate local stresses through regional exchange between small polities. In the same way that household exchange mitigates the risk of a single community, inter-community exchange mitigates risk for many communities regionally. This paper will explore both regional and local subsistence strategies in Northeastern China and the degree to which inter-community exchange may have been necessary. Population density and carrying capacity are two essential variables in understanding the role in which exchange would have been a necessary element in the subsistence economy. This paper will focus on a region of roughly 200 km² and the subsistence shift theorized to have taken place at about 1200 B.C.E. The paper will outline the shifts in population density and carrying capacity in this region with respect to a variety of economies. This research is in contrast to the macro-regional exchange and pan-continental networks most often associated with Bronze Age Archaeology in Northeast China. This paper attempts to demonstrate the variability in the subsistence strategies of Bronze Age communities.

[283] *Chair*

Williams, Hope (SHESC, IHO, Arizona State University), Curtis Marean (IHO, SHESC, Arizona State University), Thalassa Matthews (Natural History Dept, Iziko Museums South Africa) and Andy I.R. Herries (TAAL, Dept of Archaeology, La Trobe University)

[294] *Paleoenvironmental Implications of Stable Isotope Analyses of Micromammal Teeth from Pinnacle Point (Mossel Bay, South Africa)*

Paleoenvironmental proxies sample past environments at a number of geographic scales including regional, sub-regional, and local. Given species' small home ranges and often-specific habitat requirements, isotopic data from micromammal fossil teeth are increasingly recognized as abundant potential reservoirs of local-scale paleoenvironmental proxy data. Elucidating differences between local and regional vegetation provides a context for understanding landscape-scale environmental variation, which is important for modeling a number of aspects of the behavioral ecology of past human populations. We present an overview of the results of LA-GC-IRMS sampling of fossil micromammal teeth recovered from three localities at Pinnacle Point (PP) South Africa (PP30, PP9C, PP13B) spanning 380-90 ka. Analysis of the $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ data suggests some interspecific differences in the isotopic ecology of the small mammal taxa. Taxon-specific analysis of the isotopic composition of the micromammal data set over time is suggestive of small but probably significant changes in the composition of vegetation immediately local to the sites. Comparison of the micromammal stable isotope data with other proxy records suggests that, although there are small differences in the environments different proxies sample, there is concordance between these data sets that capture local (speleothem, micromammal) and regional (large fauna) environmental signals.

Williams, Patrick Ryan (Chicago Field Museum)

[335] *Andean Irrigation Communities: A Comparative Study of Household and Society in Ancient Peru*

Households and community structures in ancient Peru were key to developing irrigation systems and reproducing a social order. Tensions between communities and within them are often written on the landscape in the form of water distribution structures and community placement. Household level strategies may also be evident in the material structure of the house and its belongings. I undertake a cross-temporal and cross-cultural study of household and community level interfaces around agricultural production from the sixth to sixteenth century Peru within a single valley. I examine changing patterns of integration through two imperial regimes (Wari and Inka) and two periods of local autonomy (Huaracane and Estuquina) to evaluate how household and community interdigitate as social circumstances change. I argue that the relationship between households, communities, and landesque capital increases in complexity as regional forces enter the stage. The picture is complicated, though, by ecological circumstances and contingency on historical precedents in the study area.

Williams, Courtney (University of Massachusetts Boston)

[397] *Changing Environments and Economies: A Zooarchaeological Study of the Eastern Pequot*

This zooarchaeological study examines the recovered faunal remains from a mid- to late-18th century household site on the Eastern Pequot reservation in North Stonington, Connecticut. The results of this study indicate the residents' incorporations of European-introduced practices and resources with traditional subsistence practices. The site yielded a mixture of faunal remains from domesticated and wild species. Over the course of the 18th century, the residents came to rely on European-introduced domesticated animals, off-reservation employment, their connections to the coast, and local trade for English goods. The selection and combination of foodways practices allowed residents to maximize their resources and persist throughout the challenges and hardships that resulted from European colonization.

Williams, Veronica (CONICET- UBA)

[411] *Wares in Moving: People, Technology and Political Issues in Northwest Argentina*

Results obtained from fabric analysis using thin-section microscopy (TSM) and various other analytical strategies (e.g. Raman micro spectroscopy, FTIR, XRD –microX ray diffraction- XRF,

SEM-EDAX, and INAA) provide insights into production technology and the provenance of selected pottery sample from Prehispanic archaeological sites in Northwestern (NW) Argentina, North of Chile, and Bolivia (A.D. 900-1530). Iconographic and morphological analyses sustain the idea of interregional contacts that reflect hybrid ceramic styles like La Paya and Yavi Chico polychrome also. Those analyses helped us to know how the Inca state managed raw material sources and pottery manufacturing along Southern Andes according to the idea of interregional contacts, regional production, consumption, and distribution of local, non-local or foreign styles (e.g., Pacajes) and products, and Inca styles.

Williams-Beck, Lorraine (Universidad Autonoma de Campeche)

[338] *The Center as Cosmos in Early Colonial-Period Campeche*

The center, as the Maya universe's fifth direction, is a little understood component of the Colonial-period Maya cosmos. This paper will explore a diachronic notion of function and form for center as umbilicus, placing particular emphasis on prehispanic Canpech and Chakanputun provinces, and Early Colonial contexts at Dzaptun/Ceiba Cabecera, Campeche. Prehispanic Dzaptun, renamed "la Zeiba" and Ceiba Cabecera in later Colonial sources, had served as central cog in a hypothesized regional ritual religious pilgrimage circuit prior to European contact. As one of the earliest "pueblos de indios" in the Champoton and Campeche Missions region, Ceiba Cabecera's congregational town layout and its more prominent architectural features follow prehispanic directional primacy. Two churches, a diminutive sixteenth-century open "visita" chapel and later eighteenth-century massive "iglesia mayor", and unknown period water well, are central points of orientation placed strategically adjacent to "Main Street", whose westerly limit ends in the town's cemetery. Iglesia Mayor's architectural components and secular iconographic contents reiterate its place as umbilicus for Campeche's Early Colonial Mayas' ritual religious universe. Ceiba Cabecera's reign as a Colonial religious center ceased around 1795 and the town was later abandoned by 1860.

Williamson, Ronald (Archaeological Services Inc.) and Martin Cooper

[182] *"He Must Die Unless the Whole Country Shall Play Crosse:" The Role of Gaming in Great Lakes Indigenous Societies*

Lacrosse, Canada's national sport, originated with the pre-contact racket and ball games of the Iroquoian and Anishinaabeg peoples of northeastern North America. Like many traditional Indigenous games, racket and snow snake events represented much more than sport, involving aspects of physical prowess, warfare, prestige, gambling, dreaming, curing, mourning and shamanism. Gambling, in particular, was an important cultural activity that according to seventeenth century accounts, resulted in some participants returning to their villages naked, having wagered and lost all their possessions, including their clothes. This paper examines the ethnohistoric and archaeological evidence for gaming in the Great Lakes Region and explores the roles these games played in people's lives.

Williamson, Ronald F. [372] see Pfeiffer, Susan

Willis, Mark [4] see Houk, Brett

Willis, William (University of Nevada Las Vegas) and Karen Harry (University of Nevada Las Vegas)

[324] *The Potential Role of Water Salinity in Limestone Tempered Logandale Gray Ware Ceramic Production in the Moapa Valley, Nevada: An Experimental Approach*

Limestone has been shown to be an advantageous temper to use in utility vessels due to its ability to affect factors that mitigate problems caused by heat expansion and thermal shock during the use cycle of ceramics. Specifically, limestone alters the characteristics of the clay, allowing for the manufacture of thinner walled vessels. Additionally, it has similar thermal expansion characteristics as clay itself. However, it has been noted that limestone temper has a propensity to spall, thus compromising the structural integrity of the vessel. It has been demonstrated that the use of salinized water in the manufacturing process precludes such spalling. Through experimental means, this

paper explores the potential use of salinized water sources in the production of Logandale wares that appear during the Basketmaker III period in Southern Nevada. The question of whether the Muddy River contains enough salt to counterbalance the spalling of limestone temper during firing is investigated, and the constraints around the necessary salinity of water needed for optimum results is explored.

Willis, Mark (Blanton & Associates, Inc.), Eleanor Harrison-Buck (University of New Hampshire) and Chester Walker (Archaeo-Geophysical Associates, LLC)

[409] *Rapid Survey, Salvage, and Mapping Using Drones in an Ancient Maya Landscape: New Settlement Revealed at the Crossroads of Saturday Creek, Belize*

Saturday Creek is a sizeable Maya site center with an elite residence, three large pyramids, and two ball courts. While much of the site core is in bush, most of the surrounding area has been cleared for agriculture. While the clearing makes for good visibility, the hinterland settlement has been subject to extensive bulldozing, repeated plowing, and removal of stone over the years, obscuring the smaller mounds and making it difficult to discern them on the ground. In less than two days, we flew two different drones more than 7km² around Saturday Creek. The drone imagery revealed hundreds of previously unrecorded mounds, particularly dense in the vicinity of a complex resembling an "E-Group" or Maya solar observatory. A systematic surface collection is planned for next season, but a cursory inspection of the mounds shows that many of these structures were continuously occupied with ceramics dating from Preclassic to Postclassic times, suggesting that Saturday Creek was a major focus of population aggregation throughout its long history. The drone results leave little doubt that this locale was a central node in the landscape, arguably because it marked an important crossroads between east-west and north-south trade and communication networks from Preclassic times onward.

Wills, Chip (University of New Mexico)

[354] *Chair*

Wilmsen, Edwin [79] see Killick, David

Wilshusen, Richard [82] see Throgmorton, Kellam

Wilshusen, Richard (History Colorado)

[354] *Tracing the Growth of Historic Preservation in the U.S. and the Arc of Tom Windes's Career*

The passage of the National Historic Preservation Act (NHPA) in 1966 and the conferring of Tom Windes's M.A. in Anthropology in 1967 appear to be causally independent, but thereafter the arc of historic preservation and Windes's archaeological career are intertwined. We distinguish three major stages in cultural resource management over the last 50 years, each of which tracks almost seamlessly with the changing focus of Windes's work. The challenges of defining the intent of the act, enforcing its legal mandate, and demonstrating the act's public benefit were central elements of federal preservation's first phase. Windes's early career in southeastern Utah demonstrates the enforcement challenges, and his work with the Chaco Project in the 1970s illustrates how archaeologists increasingly expanded the research potential of Section 106 work. By 1980 to 1985 it was clear that implementation of the NHPA would require multidisciplinary specialists and a wide-ranging set of skills available only through a large CRM firm, or Tom Windes. Federal agencies and SHPOs focused on management issues and CRM firms took over many of the research and publication duties. As the NHPA and Windes both matured, the emphasis has shifted to balancing research and management needs with limited funds and time.

[160] *Discussant*

Wilson, Wayne [3] see Hauser, Neil

Wilson, Wayne (OMEGA2A) and Neil Hauser (ATSAA)

[185] *Lithic Sourcing Using Laser Induced Breakdown Spectroscopy*

Laser Induced Breakdown Spectrometry (LIBS) has been used in Colorado and Wyoming for identifying and sourcing lithic materials for the last ten years. These have primarily focused on chert and silicified sandstone materials and quarry-derived artifacts. During 2012-2013 the LIBS was used to assess whether Bridger chert from sources in northwestern Colorado and southwestern Wyoming could be distinguished from each other. It was found that with greater than 80% accuracy, chert from these areas were distinguishable from each other. To enhance the LIBS capability a new field portable LIBS system has been developed with better spectroscopic resolution, broader wavelength coverage and an ability to reliably sample small inclusions in material down to a 0.1 mm spatial resolution for more detailed analysis. The analysis of collected samples can be done in the field within minutes/hours of collection. Quarry samples from the Bridger assessment and from other quarries on the Colorado Western Slope have been resampled with the new LIBS system. The results have demonstrated an increased ability to source lithic materials from quarries; even from ones only a few hundred meters apart. The results suggest that LIBS can be considered a candidate for field analysis and sourcing of lithic materials.

Wilson, Katherine**[275]** *Examining the Ceramic Assemblage from Washington Mounds: An Early to Middle Caddo Site in Southwestern Arkansas*

The Washington Mounds site is an Early to Middle Caddo period (A.D. 800-1300) mound site with 11 mounds, some of which contain burials; two village areas are associated with the site surrounding the mounds. It is located in southwest Arkansas between the Red River and Little Missouri River Basins. Some level of ritual activity occurred at the site, but what types or scale of ritual is unknown. Two excavations have been done at the site: one in the early 20th century by M. R. Harrington, and a second in 1981 by the Arkansas Archaeological Society and the Arkansas Archaeological Survey. Whole pots and potsherds from both documented excavations are considered in the analysis. This study is a thorough analysis of the ceramic assemblage through the theoretical perspective of ceramic ecology. As this is the first ceramic analysis done on artifacts from this site, the goals of the research include establishing information on life, status, and ritual activities of the people who occupied this site as well as contextualizing these findings within the broader geographical and cultural regions.

Wilson, Nathan (Arizona State University)**[277]** *Data Recording Strategies for Nuvakwewtaqa Repatriation*

This poster presents a discussion of the various data recording methods implemented in the NAGPRA Repatriation of materials from Nuvakwewtaqa, Chavez Pass, Arizona. A number of different artifact types were analyzed in processing this collection, and artifact analysis associated with this project used a multi-stage approach. As this analysis required data recording following each stage, a well-organized, comprehensive multi-stage data recording strategy was constructed. This strategy, including extensive photography and comprehensive data entry, necessitated a continuous interplay with artifact analysis. Protocols for each stage of data recording will be presented, discussed, and evaluated.

Wilson, Andrew (University of Bradford), Keith Manchester (University of Bradford), Jo Buckberry (University of Bradford), Rebecca Storm (University of Bradford) and Karina Croucher (University of Bradford)**[299]** *Digitised Diseases: Seeing beyond the Specimen, Understanding Disease and Disability in the Past*

Digitised Diseases is a major web-based 3D resource of chronic disease conditions that manifest change to the human skeleton. The resource was established through funds from Jisc, the University of Bradford and Bradford Visualisation. The multidisciplinary team involving project partners MOLA (Museum of London Archaeology) and the Royal College of Surgeons of England undertook a program of mass digitization of pathological type specimens from world-renowned archaeological, historic and medical collections at the University of Bradford, in London and York. We continue to

augment this resource through ingestion of new content. The resource was always envisaged as needing to appeal to a diverse user community, having impact not just among academic and clinical beneficiaries, but also enriching the wider understanding of public health in the past. From the outset, our focus was on making sure that the digitized paleopathological exemplars were represented and understood within a broader clinical context. In essence we wanted to emphasize the impact of living with disease and disability in an era before modern therapies were available and the significance of care provision that would have been required at a societal level, given the longevity of many of these conditions.

Wilson, Suzi

[396] *Homo Cognitive Development (Contextualized in Middle Paleolithic Burials)*

The cognitive developments that occurred in the Homo genus over 100,000 years ago enabled expansive forms of consciousness, facilitated increased creative capacities, and in so doing allowed hominins to consider concepts that were previously unimaginable. These developments are rooted in social origins, possibly extending back to the Australopithecines, and their emergence is expressed through the first burials of the dead – both by Neanderthal and Homo sapiens. However, these burials from Europe and the Near East do not necessarily indicate the provenance of spirituality or the belief in an afterlife or after-person. These burials only indicate a shift in thinking with respect to the corpse – one that I have termed “postmortemism”. Postmortemism is a concept or sentiment that transforms the corpse into something other than waste. By affording special treatment to the corpse, it becomes imbued with agency regardless of the underlying motivation for this treatment. In its simplest form, postmortemism might prompt burial as a means to honor and/or mourn the dead, or perpetuate the dead’s existence as part of the community. It is from the sentiment of postmortemism that burial practice developed, and it was only after postmortemism that spiritual beliefs grew from these embodied mortuary practices.

[396] *Chair*

Wilson, Douglas (Portland State University/National Park Service)

[405] *Beyond the Four-Letter Word: Heritage Management and Public Archaeology at Fort Vancouver*

Heritage managers of complex archaeological sites are more highly successful when there is a commitment to on-going public involvement and the integration of multiple communities in the site’s archaeological research and site interpretation. The public archaeology program at Fort Vancouver is highlighted as a model for integrating traditional archaeology education activities with site-specific archaeological research, the development of archaeology-influenced interpretation, and the development of new heritage assets that interpret, respect, and explore archaeology. Archaeology at Fort Vancouver is recognized as an important asset that ties the multicomponent historical archaeological site to numerous communities. Building connections between different sectors of the public is crucial to ensure the long-term protection of heritage sites and to revitalize the cultural meanings tied to historical significance of these special places.

Winchell, Frank

[307] *The Butana Group in Comparison with the Predynastic and Late Neolithic Groups in the Nile Valley and Adjacent Areas of the Sahel and Sahara: A Look at How Ceramics Can be Used to Differentiate Socioeconomic, Ethnic, and Political Differences*

Various ceramic-bearing groups occupied and settled in the Nile Valley during the end of the 5th millennium B.C. and through the 4th millennium B.C., ranging from hunter-gatherers, agro-pastoralists, agriculturalists, and finally to state level societies. Some of these groups appear to have been involved with intergroup trade and cooperation at various levels, while others were not. This paper will look into the characteristic traits associated with these groups in northeast Africa and how their corresponding ceramic assemblages can tell much about their origins, way of life, social and ethnic orientations, and how they interacted with each other and with other societies outside the region.

Winemiller, Terance (Auburn University at Montgomery)

[213] *Chair*

Winemiller, Terance L. [213] see Folan, William

Wingard, John [392] see Dowdall, Katherine

Winsborough, Barbara [62] see Varney, R.

Winstead, Christy (University of North Texas), Amy Hoffman (University of North Texas), Laura Ellyson (University of North Texas) and Steve Wolverton (University of North Texas)

[85] *Turkey Domestication and Utilization in an Ancestral Puebloan Community*

The archaeofaunal remains left by the Ancestral Puebloan people who lived in the Goodman Point community provide a chronological record of their interaction with turkey (*Meleagris gallopavo*). Domestication can be regarded as a co-evolutionary relationship between a plant or animal species and humans that varies in the intensity of mutual dependence. We examine how the Goodman Point residents' relationship with turkey evolved from the late A.D. 900s to the 1280's. Our research involves the analysis of temporal fluctuations in relative abundance of turkey remains in diet, shifts in turkey mortality patterns, and changes in the context of turkey utilization and consumption. Our results demonstrate that a complex relationship existed that was shaped by growth of the community over time and by human adaptation to environmental change. An extended temporal examination of this community's relationship with turkey enhances the narrative for the larger Northern San Juan region regarding cultural change leading up to regional abandonment.

Winter, Marcus (Centro INAH Oaxaca), Robert Markens (Instituto de Investigaciones Estéticas, UNAM) and Cira Martínez López (Centro INAH Oaxaca)

[39] *The Epiclassic in Oaxaca (600-900 C.E.)*

The centuries from 600 to 900 CE were unusually dynamic times in prehispanic Oaxaca. In the Valley of Oaxaca, population increased and elite Zapotec culture flourished as city-states formed at Monte Albán, Cerro de la Campana, Macuilxóchtli, Lambityeco and Jalieza, and then suddenly collapsed. Surprising connections with the Maya area appear such as Fine Orange and Plumbate pottery as well as possible iconographic and architectural elements, some of these channeled through Southern Isthmus sites like Paso Aguascalientes. While the term Epiclassic is not used in Oaxaca archaeology, changes and innovations in Oaxaca are related to characteristics of the Epiclassic elsewhere in Mesoamerica, and presage in part the subsequent Postclassic period.

Winter, Jacob (Washington University in St. Louis), Michael Frachetti (Washington University in St. Louis) and T.R. Kidder (Washington University in St. Louis)

[155] *Using Geoarchaeological Methods to Evaluate Site Integrity at Dali, Kazakhstan*

Dali, a site located in the Bayan-Zherek Valley in Semirech'ye, Southeastern Kazakhstan, is a multi-phase Bronze Age pastoralist settlement (3rd-2nd millennia B.C.). Recovered artifacts include combustion features, bones, ceramics, lithics, bronze metals, and potentially in situ wall constructions. Radiocarbon dates cannot conclusively suggest that the stratigraphic sequence is in situ due to geological unconformities and high energy colluvial system. Thus geoarchaeological methods were employed to distinguish between anthropogenic and geogenic deposition. This research integrates micromorphology, geochemistry, sedimentology and site stratigraphy to identify timing and tempo of depositional history, landscape stability, and site formation processes. These data allow us to evaluate the integrity of the site and its archaeological contexts to provide a more secure interpretation of cultural activities.

[155] *Chair*

Winter, Marcus [216] see Markens, Robert

Winterhalder, Bruce [28] see Pacheco-Cobos, Luis

Wismer-Lanoe, Meredith (University of Iowa) and Zachary Nelson (Cardno ENTRIX)

[136] *Faked But Not Forgotten: The Enduring Appeal of the Crystal Skulls*

Supposedly originating from precolumbian Mesoamerican sites, the crystal skulls are one of the most iconic sets of fake artifacts which have graced museum shelves and the public's imagination. The first crystal skulls appeared in collections during the late 1800's, and well-known specimens are housed today as modern fakes at the Smithsonian and British Museums. Most media coverage of the skulls has revolved around the privately owned, so-called "Skull of Doom", claimed to be of Mayan origin and possessing psychic powers. A recent surge in media coverage of the crystal skulls occurred surrounding the 2008 movie release of "Indiana Jones and the Kingdom of the Crystal Skull" which included ancient Peruvian artifacts with extraterrestrial ties. That same year the Quai Branly Museum in Paris announced that tests conducted on their crystal skull revealed it to be a forgery likely made in the late 19th century. News articles at this time focus on the known skulls as fraudulent artifacts; yet sensationalized television shows and cinema reiterate the appeal of the objects as psychic connectors to ancient knowledge. Despite the best known artifacts being thoroughly debunked, the mystery of the crystal skulls still provides enduring fodder for new-age spiritualists and science-fiction writers alike.

Wissler, Amanda (Arizona State University)

[240] *Shaping Health: An Examination of Health, Social Identity and Burial Practices in the Egyptian Predynastic*

Patterns of disease manifestation in individuals and within a community reveal how health is affected by social and economic identity. Differences in wealth and social status can lead to disparities in diet, living conditions and healthcare. This interaction is explored using data from skeletal remains and grave architecture from the Predynastic Cemetery N7000 at Naga-ed-Der, located in Upper Egypt. In his Ph.D. dissertation, Stephen Savage (1995) organized individuals into six spatial clusters or "descent groups" he believes represent discrete competing social groups and categorized them by additional mortuary elements such as grave structure type and grave materials.

If health is affected by social identity in the Naga-ed-Der sample, one expects differences in disease frequencies among the six descent groups. The presence of porotic hyperostosis, cribra orbitalia and osteomyelitis was examined in 143 individuals and compared across descent groups and grave styles. Results show a much higher proportion of disease in sub-rectangular graves versus other types. Furthermore, a higher percentage of individuals from descent group 6 exhibit stress indicators, especially compared to descent group 1. These results suggest health status in Cemetery N7000 was affected by differences in political, ideological or economic power between the competing social groups.

Withrow, Michael [225] see Fertelmes, Craig

Witt, David [63] see Heath, Joshua

Witt, David (SUNY Buffalo)

[382] *The Nature and Extent of Chacoan Hegemony in the Middle San Juan Region*

The Chacoan polity of northwestern New Mexico exercised hegemony throughout the San Juan Basin and surrounding highlands during the Pueblo II (A.D. 900 – 1140) period. Hegemony is defined as the predominant influence in ideological, political, military, and/or economic matters exercised by one culture over another. Furthermore, it is an historical process, and as such is theorized as "eventful," along the lines of Sewell (2005) and Beck et al. (2007). The extent and nature of this hegemony on thirteen sites comprising nine communities within the Middle San Juan Region is discussed, illustrating multiple ways local and migrant communities influenced and interacted with the expanding hegemony during the late Pueblo II. This interaction between

communities and Chaco includes instances of trade, emulation, migration, and coercion. The incorporation of these events allow for further refinement of Paul Reed's (2011) cultural history of the Middle San Juan Region. This paper is the result of dissertation research on the nature of Chacoan hegemony in the Middle San Juan Region, New Mexico, as well as associated research on borders and boundaries in the area.

Witt, Brian (SOAS, University of London) and Nadia Johnson (Pennsylvania State University)

[393] *Us vs. Them: Identity Formation in Prehispanic Tlaxcala*

Tlaxcala occupies a unique position in the history of New Spain, due both to its alliance with Cortés against the Aztec and to its mid-16th century flourishing as a model *republica de Indios*. Spanish and indigenous chroniclers throughout the colonial period spoke of the *tlaxcaltequidad*—the strong regional identity and patriotism that characterized the state. We believe that this is not merely the product of Spanish favoritism and elite opportunism post-Conquest, but rather, the development of a robust Tlaxcaltecan identity occurred over the course of their long and successful resistance to Aztec domination. Drawing from political psychology and group dynamics, we hope to showcase how the Tlaxcaltecan elite used the omnipresent threat of the Aztec “Other” to create a form of inclusive civic nationalism, focused on military success, that overcame linguistic and class barriers and allowed the small Tlaxcaltecan state to survive decades of warfare against a much more powerful foe. We also present comparative examples from other political entities – contemporaneous and modern – which experienced similar processes of identity formation.

Wohlgemuth, Eric

[41] *Environmental Constraints and Plant Food Intensification in the Sacramento Valley*

The Sacramento Valley bottom is a rich environment for faunal resources, notably fish, but lacks staple nut crops found elsewhere in interior central California. The absence of key nut resources appears to be the key factor in intensified production of geophytes and the early intensification of small seeds, especially *Chenopodium* spp. These features are absent in other regions in the rich archaeobotanical record of central California.

[41] *Chair*

Wojtal, Piotr (Institute of Systematics and Evolution of Animals) and Jaroslaw Wilczynski (Institute of Systematics and Evolution of Animals)

[87] *Scenes of Spectacular Feasts: Gravettian Hunters' Sites in Central Europe*

The Gravettian technocomplex arose about 30,000 years ago and expanded into nearly all of Europe during the next millennia. The most distinctive features of the individual stages of Gravettian cultures are backed bladelets, shouldered points, and zoomorphic and anthropomorphic art objects. Complex early Gravettian sites are found in South Moravia (Czech Republic), dated about 27-25,000 BP.

Pavlov I and Dolní Věstonice I and II are long-term open-air campsites. Gravettian sites of a later phase are located in Poland, Slovakia, and the Czech Republic, dated 24-20,000 BP. In the older sites, the human diet was diversified, shown by the presence of bones of different animal groups. At these sites, prey that was small (birds, hares, foxes) and medium size (wolf, reindeer, wolverine) dominate the osteological material, but large mammals (bears, cave lion, horse, mammoth) are also present. Taxa representation is roughly equal, showing that the prey spectrum was wide. In contrast, faunas from the younger Gravettian phase are strongly dominated by woolly mammoth or reindeer, suggesting a specialization in hunting those animals. Gravettian people were efficient and skillful hunters, not afraid of confronting large and dangerous representatives of Pleistocene fauna. They also well utilized other resources of their environment.

Wolf, Marc (GC CUNY)

[183] *The Pivotal House: Individual, Community, and Environment Context at Cancuen, Verapaz, Guatemala*

An obvious foundation of archaeology is that of the often mundane-seeming house. Insights into any culture are most recognizable at the intimate house level. Simultaneously, this focused view is simply a snapshot into the multi-scalar chain that links the individual with an activity, an activity with a

house, the house as an integral component of an architectural compound, etc. These linkages continue into the neighborhood, community, regional and global scales. Other concepts become more relevant as the scales are cycled from close-up to landscape panoramas or greater. Artifacts are contextualized by a strata or feature, but it is as important to understand the associations between locations within that house as well as its relation to other architectural and natural landform features. Cancuen, located at the interface of the Northern Guatemalan Highlands and the Petén Southern Lowlands, is a Classic Maya archaeological site that reflects these multi-dimensional aspects of the house. Topographic setting is crucial; architecture cannot be disentangled from its environmental backdrop. Slope and aspect patterns, associations with other structures and compounds, and relations to the surrounding landscape of rivers, mountains, and other water bodies are only a few of these necessary frameworks.

Wolff, Sarah (University of Arizona) and Tracie Mayfield (University of Arizona)

[147] *Recent Historical-Archaeological Study of the Late-Colonial Period at Lamanai, Belize*

Very few studies have focused on eighteenth- and nineteenth-century Northwestern Belize, and to this end, the relationships between people, space, and objects operating within this region during the late colonial period are poorly understood. Previous archaeological investigations at Lamanai recovered data that clearly indicated the presence of materials associated with day-to-day behaviors generally linked to late-colonial industrial and residential activities, such as cooking and eating, building maintenance and construction, health and hygiene, and sugar agriculture and production. These data drove the most recent investigations into the material, social, and technological dialectics active at Lamanai, Belize during the nineteenth-century when British colonists established a short-lived sugar plantation at the site. This presentation will outline the overarching problem orientation, on-site work experience, and data recovered during the 2014 summer field season, which focused on late colonial residential lifeways at Lamanai, Belize.

Wolff, Christopher (SUNY-Plattsburgh)

[255] *Moderator*

Wolfinbarger, Susan (AAAS), Eric Ashcroft (AAAS), Jonathan Drake (AAAS) and Katharyn Hanson (AAAS)

[254] *High-Resolution Satellite Imagery for Comprehensive Monitoring of Cultural Heritage in Conflict: Syria and Iraq Methodology*

The growing availability of high-resolution commercial satellite imagery provides unprecedented capabilities for monitoring events in conflict zones- areas that are often inaccessible through traditional methods. This capability is particularly needed when conflict creates long-term inaccessibility and multiple actors overlap in space and time, leading to conflicting accounts, and incomplete or inaccurate information. Proactive monitoring of cultural heritage sites, coupled with time-series historical analysis, can bring much needed clarity to these situations. This presentation will discuss the methods and means by which the American Association for the Advancement of Science's (AAAS) Geospatial Technologies Project is monitoring sites across Syria and Iraq as a part of the National Science Foundation-funded project "Developing a Research Community and Capacity for the Study of Cultural Heritage in Conflict" in collaboration with the Penn Museum's Penn Cultural Heritage Center and the Smithsonian Institution. The systematic monitoring currently underway identifies damage to cultural heritage sites and also documents and quantifies risk to sites. The difficulties encountered while conducting large-scale satellite imagery analysis will be discussed, from data storage and organization, to coordinating analysis. This paper includes methods used for the verification of analysis results, both via peer review and compilation of corroborating data sets.

Wolin, Daniela (Yale University), Natasha Osing (University of Edinburgh), Jigen Tang (Institute of Archaeology, CASS), Yuyun Tang (Institute of Archaeology, CASS) and Lingling

Deng (Institute of Archaeology, CASS)**[67]** *Preliminary Results from the Bioarchaeological Investigation of Human Sacrificial Victims from China's Late Shang Dynasty*

Ongoing archaeological investigations at the Late Shang capital of Yinxu (ca. 1200 – 1050 B.C.E.) in China have resulted in the location and partial excavation of thousands of sacrificial pits with an estimated 10,000 individuals interred within. Evidence of human sacrifice during this period includes contemporaneous oracle bone inscriptions, mortuary contexts, weaponry, and the skeletal remains of these individuals. We are presenting our preliminary interpretation of the osteological analysis of over 60 individuals who were excavated from the Late Shang royal cemetery in the fall of 2013. Basic analyses such as age, sex, diet, health, trauma, and stature were carried out on this sample. Our results provide important insight into the lives of the victims themselves, thought to be war captives, and their post-mortem treatment by the Shang. Our study also highlights the importance of a bioarchaeological approach, which we hope to encourage through continuing collaborations with our Chinese colleagues.

Wollwage, Lance**[38]** *Scott's Snails: Freshwater and Wetland Gastropods as Indicators of Environmental Change in the Yalahau Region, Quintana Roo, Mexico*

Sediment cores from a cenote (sinkhole) at the center of T'isil, an archaeological site in the Yalahau region of Quintana Roo, Mexico, held a great abundance of well-preserved snail and clam shells in stratigraphic context. Many snail species are sensitive to water quality and depth, or otherwise inhabit specific environmental niches. Their shells are easy to identify and quantify, and where preserved may serve as sensitive paleoenvironmental proxies. At T'isil, variation in snail abundance curves and diversity indices from times before, during and after Postclassic Maya occupation reflects changing water levels, sediments, and water chemistry related to Maya land clearance and modification of the cenote environment.

Wolverton, Steve [85] see Winstead, Christy

Wolverton, Steve (University of North Texas), Andrew Barker (University of North Texas), Jonathan Dombrosky (University of North Texas), Barney Venables (University of North Texas) and Stanley Stevens (University of South Florida)**[166]** *Application of Protein Mass Spectrometry to Zooarchaeological Bone*

Protein residues were identified from zooarchaeological turkey (*Meleagris gallopavo*), rabbit (*Leporidae*), and squirrel (*Sciuridae*) remains from ancient pueblo archaeological sites in southwestern Colorado using a non-targeted LC-MS/MS approach. Results indicate that protein residues preserve well in tissues of origin, such as bone. Trace levels of protein residues from artifacts are more problematic to characterize because of poor preservation and due to several methodological challenges. Improvement of highly sensitive targeted LC-MS/MS approaches is an avenue for future method development related to study of protein residues from artifacts such as stone tools and pottery.

Wolynec, Renata (Edinboro University of Pennsylvania)**[136]** *Rock Art and Aliens*

Some archaeologists remember reading articles which link rock art with alien or extraterrestrial visitors to earth. However, an examination of English language newspapers suggests that although rock art is a popular topic, the extraterrestrial connection is less commonly made. The World Wide Web, however, is full of entries which eagerly make this connection. There appears to be a niche audience which will believe what it wants to believe.

Womack, Andrew [37] see Flad, Rowan

Womack, Andrew (Yale University)

[37] *The Cemetery at Qijiaping: New Insights into the Production and Use of Ceramics Vessels*
Excavated in 1975, the cemetery at the Qijia Culture type-site of Qijiaping in southern Gansu province, China, provides a wealth of data on life and death in Qijia society. Up to this point however, the production and use of the most common type of burial good, ceramic vessels, has never been fully researched. This paper will explore production organization and methods likely used to produce several classes of vessels through statistical analysis of vessel standardization. Ideas of what constitutes standardization and what that means for our understanding of the Qijia Culture will also be addressed. Possible functions and contents of these vessels will then be discussed based on the initial results of use-wear analysis. This will allow for new insights into production and consumption of vessels and their contents at Qijiaping.

[234] *Chair*

Wong, Jonathan (Department of Biology, University of California, San Diego), Andrew Somerville (Department of Anthropology, University of California) and Margaret J. Schoeninger (Department of Anthropology, University of California)

[166] *Environmental Reconstruction at Pueblo Grande, Arizona through Stable Isotope Analysis Of Leporid Bone*

Stable isotope analysis of faunal bone can provide valuable information about the environments in which the animals lived. Reconstructing paleoenvironments at archaeological sites permits a better understanding of the factors that influenced their social development and decline. In this poster we present results of stable isotopic analyses ($\delta^{13}\text{C}$ apatite, $\delta^{18}\text{O}$ apatite, $\delta^{13}\text{C}$ collagen and $\delta^{15}\text{N}$ collagen) of leporid bone apatite and collagen to investigate temporal changes in environmental conditions at Hohokam site of Pueblo Grande, Arizona, USA. We analyze bone samples from the Gila Butte (725-825 A.D.), Santa Cruz (825-1000 A.D.), Sacaton (1000-1100 A.D.), Soho (1100-1300 A.D.), Civano (1300-1350 A.D.), and Polvoron (1350-1450 A.D.) periods and examine differences between them. Our results demonstrate significant changes in the environmental landscape over time. This study improves our understanding of the culture history of Pueblo Grande, and furthers our knowledge on the social-environment dynamics across the North American Southwest.

Wood, M. Jared (Georgia Southern University)

[124] *Mi Datos Su Datos? Opportunities and Challenges Posed by Data Sharing*

Rapid technological advancements and increased availability of hardware and software are boons to archaeologists gathering and interpreting spatial data from anthropogenic landscapes. These datasets are increasingly unmatched in quality and quantity, allowing for visualization, analysis, and explication of built and modified environments reflecting human behavior. While these advancements are clearly well-received by individual archaeologists, the enduring question remains: When (and how) should data be shared? This poster explores this question with a focus on site documentation and interpretation through terrestrial LiDAR, and addresses potential opportunities and challenges posed by creating, curating, and sharing hard-won spatial data.

Wood, Marilee (Honorary research associate University of the Witwatersrand) and Laure Dussubieux (Field Museum, Chicago)

[140] *Chemical Analysis of Chinese and Other Lead Glass Beads from Songo Mnara, Tanzania*

A number of potash lead silicate glass beads have been recovered from excavations at the 14th to 16th century Tanzanian site of Songo Mnara, a small but wealthy stone town on an island just south of Kilwa Kisiwani. LA-ICP-MS analysis has shown that two groups of Chinese beads are present, one that dates to the early 15th century, when Zheng He's fleets visited the East Coast, and the other from around the turn of the 17th century when European glass beads began to be traded in that region. These beads will be compared to related assemblages from Southeast Asia and chemical and morphological characteristics that can be used to separate and identify these groups will be discussed. The analysis also identified several high lead beads that do not belong to these groups and that are probably modern intrusions.

Wood, Brian [415] see Buck, Laura

Woodfill, Brent [183] see Burgos, Walter

Woodfill, Brent (University of Minnesota)

[355] *The Ritual Reuse of Maya Cave Shrines after Abandonment*

Caves are among the most sacred geographic features in Mesoamerica and have been used throughout history as the setting for multiple ritual events. In this paper, the author looks at several shrines in central Guatemala that were rediscovered long after they were abandoned by the original ritual practitioners and regained importance. The renewed activity often reflects very different functions of the rituals performed there—in caves along a major trade route cutting through the region, for example, later ritual focuses on public performance and community cohesion instead of earlier petitions for safe passage. The ritual practitioners involved in the latter ceremonies do engage with the paraphernalia from earlier ceremonies, however, performing ceremonies and leaving dedicatory offerings adjacent to ancient caches and occasionally removing objects, likely to serve as heirlooms to be venerated.

Woods, Aaron (University of Nevada, Las Vegas), Barbara Roth (University of Nevada, Las Vegas) and Katelyn DiBenedetto (University of Nevada, Las Vegas)

[138] *Evaluating Land Use in the Mojave Sink: Survey Data from Afton Canyon, San Bernardino County, California*

The primary objective of this research project is to assess the function of sites located on the rim and plateau above Afton Canyon in the Mojave Desert to determine how they fit into regional patterns of subsistence and settlement defined during previous work in the area. Archaeological sites identified during a recent survey include multi-component artifact scatters, lithic reduction areas, and hunting blinds. These sites provide new information on prehistoric use of Afton Canyon. We present the survey results, discuss site locations and function, and reconstruct patterns of occupation in the canyon. The connection between sites in Afton Canyon and other sites in this portion of the Mojave Desert is explored as part of an on-going effort to better understand regional prehistoric land use in the Mojave Sink.

Woods, Aaron [273] see Kincaid, Meaghan

Woodson, Kyle [225] see Miles, Wesley

Woodson, Kyle (Gila River Indian Community)

[225] *Tribal Heritage Management in Action at the Gila River Indian Community, Arizona*

Many Native American communities have developed their own archaeology programs and taken over management of cultural resources from Federal agencies. The formation of Tribal Heritage Management programs has increased interactions between non-tribal archaeologists and members of native communities, and resulted in greater numbers of Native Americans becoming trained archaeologists. This synchronism has fostered new understandings of the past and has led to research that is scientifically valid while also reflecting tribal cultural concerns. Archaeologists have benefited from increased exposure to traditional knowledge and beliefs, and Tribes have developed new avenues for communicating their knowledge of the past in ways that will reach a broader audience. This paper provides an overview of the diverse investigations undertaken by the Gila River Indian Community's Cultural Resource Management Program and Tribal Historic Preservation Office in south-central Arizona. These two tribal departments developed out of a program that began 20 years ago under funding by the U.S. Bureau of Reclamation. Other papers in the symposium examine recent findings from archaeometry investigations, controlled experimental studies of traditional technology, wildland fire archaeology program deployments, rock art preservation efforts, and large-scale cultural resource management investigations.

[225] *Chair*

Worman, F. Scott (Missouri State University), Anastasia Steffen (Valles Caldera Trust and University of New Mexico) and Jeffrey W. Hall (University of New Mexico)

[319] *Fires, Landslides, and All Manner of Varmints: Site Formation Processes at High Elevations in the VCNP*

The Valles Caldera National Preserve in northern New Mexico encompasses a diverse landscape of grassy valleys, forested mountainsides, and rocky peaks, almost entirely more than 2600 m (8500 ft) above sea level. People have visited the area regularly for millennia to access large obsidian quarries and other resources. The long history of human activities has left us a rich archaeological record, but interpreting that record is complicated by the dynamism of the landscape; physical and biological as well as cultural processes have altered it in many ways, in some cases dramatically. We present the results of multiple seasons of investigations at two large sites where we focused on site formation processes. Combining standard techniques with detailed pedostratigraphic recording, clast size distribution analysis, and obsidian hydration dating, we have begun untangling the complicated history of human activity, erosion, deposition, turbation, and other processes that formed the archaeological record. Contrasts between the sites both illustrate the range of alterations present and provide preliminary indications of the effects of large-scale landscape factors such as slope and aspect. While broadly applicable, our research should be especially useful for archaeologists working in montane and high-elevation settings.

Worth, John (Univ. of West Florida)

[178] *Precursors of Missionization: Early European Contact on the Georgia Coast, 1514-1587*

Beginning not long after the Spanish discovery of the Florida peninsula in 1513, indigenous groups along the Georgia coast were increasingly subject to sporadic maritime visits by Spanish and later French ships. By the time Georgia's coastal chiefdoms were assimilated into the expanding Franciscan mission system of Spanish Florida after 1587, they had already experienced more than seven decades of occasional interaction with European slavers, colonists, soldiers, missionaries, traders, and shipwreck survivors. While direct evidence for such contact is limited and sometimes ambiguous, combined documentary and archaeological data provide an informative glimpse into the still poorly-known period between first contact and missionization along Georgia's coast and adjacent regions of the interior.

Woywitka, Robin [319] see Gilliland, Krista

Wragg Sykes, Rebecca [322] see Hassett, Brenna

Wren, Colin (McGill University)

[84] *Humanizing Wave of Advance Dispersal Models*

Since Ammerman and Cavalli-Sforza (1971) introduced Fisher's (1937) wave of advance equation to archaeology, it has been the most commonly used method to model the complex dynamics behind human dispersals in a variety of regional and global case studies. The standard form of the model involves an initial population growing and spreading randomly outwards from an origin. Studies use the model to calculate expected arrival dates and expansion velocities based on population growth rate, inter-generational dispersal distance, and carrying capacity, which are estimated from archaeological and ethnographic data. This paper outlines a primary limitation of the standard model, namely that it is not very human. Cognitive capacity is largely unaccounted for, as is the breadth of hunter-gatherer environmental knowledge. Using agent-based and numerical modelling, I demonstrate the effect of several modifications to the standard wave of advance model that highlight the complex relationship between expanding populations and their role within, and perception of, the social and physical environment. These modifications are more consistent with our understanding of hunter-gatherer mobility and foraging patterns, and with the archaeological record, than the standard model. The result is a humanized model of dispersal.

Wright, David (Seoul National University)

[80] *Accuracy vs. Precision: Understanding Potential Errors from Radiocarbon Dating on African Landscapes*

Primarily located in the tropical latitudes with a diverse array of unique flora and fauna, there are unique challenges for obtaining a reliable chronology for archaeological sites on the African subcontinent. Radiocarbon dating is the most frequently employed method for gaining age control on Late Quaternary sites. However, aspects affecting the accuracy of the method are rarely considered. Carbon recycling from reservoirs in old sedimentary structures may uptake into ostrich eggshell or mollusk aragonite. And much of Africa is hot and arid, which promotes bone collagen diagenesis. Cultural factors also affect the accuracy of radiocarbon dating. The use of shells and organic materials as currency throughout prehistory has ensured such items are transported long distances and recycled intergenerationally. In arid and heavily grazed regions, wood can be scarce and there is a tendency to use "old wood" for construction materials. Finally, wiggles in the radiocarbon calibration curve coincide with some of the major cultural transitions in Africa: the beginning of the Later Stone Age, the advent of agriculture, and migration of Bantu speakers into the southern regions of the continent. Given these issues, a multiproxy age control strategy is advocated to ensure a healthy blend of accuracy and precision.

[80] *Chair*

Wright, David [155] see Schilt, Flora

Wright, Alice (Appalachian State University)

[177] *Labor, Materials, and Ritual Knowledge: Erecting and Erasing Middle Woodland Enclosures in Southern Appalachia*

Middle Woodland geometric enclosures are among the most complex earthen monuments ever built in Eastern North America. Well-known 19th century maps have long provided archaeologists with a view of their shape, size, and scope in their final forms. However, because relatively few of these enclosures have been systematically excavated, their early life histories and the ways they may have evolved through time remain enigmatic. In this paper, I seek to document a more complete biography of enclosure by combining the results of geophysical survey and excavation of a pair of small geometric enclosures at the Garden Creek site in western North Carolina. There, in the first century A.D., raw materials, human labor, and specialized ritual knowledge were marshalled at different stages of these enclosures' life histories, from the earliest construction of ditches and possible embankments, to the emplacement of an associated post alignment, to the eventual dismantling of the earthwork and posts and the effective erasure of the monument from the landscape. Specifically, I consider the labor energetics of earth-moving and post-setting alongside the precise layout and possible astronomical alignments of the enclosures themselves to show the diverse ways in which Middle Woodland architects shaped these biographies of enclosure.

Wright, Joshua (Oberlin College), William Honeychurch (Yale University) and Amartuvshin Chunag (Institute of Archaeology of the Mongolian Academy)

[234] *Into the Distance: Initial Observations from the Dornod Mongol Survey*

We will report on the initial fieldwork of the Dornod Mongol Survey, an ongoing project in Southeastern Mongolia. This paper will discuss inhabitation, integration and construction of social landscapes through time based on the survey's recovery methods and analysis. The structure of our project allows us to challenge the frontier identity of this region in several time periods through chronological frameworks, scales of interaction and integration. Our focus will be particularly on two periods; the Bronze Age and its scalar and typological variations across a large area, and Medieval periods with integration and seeming homogeneity over even wider regions.

Wright, Holly (University of York) and Michael Charno (University of York)

[235] *Mobile App Development at the Archaeology Data Service*

The Archaeology Data Service (A.D.S) continually explores new ways to make the data we hold more useful and accessible. One of these avenues has been the development of a mobile app called

"Archaeology Britain", which we recently created in partnership with the British Library. This paper outlines the development of this partnership, and our attempt to create an iPad app with unique and interesting content from both organizations. The app presents antiquarian drawings, paintings and maps for some of Britain's most important archaeological sites, and provides rarely seen perspectives for a wide range of sites and periods, including castles, churches, megaliths, settlements, and the sites associated with the defense of Britain through the ages. The audience is the general public, and provides a window to content provided by The British Library from some of its most treasured collections, much of which is not publicly accessible. This has been combined with content from the A.D.S archives and other sources to provide greater context. This paper will also discuss the app development currently underway within the NEARCH project; an EU Culture Programme funded partnership, exploring new ways of working and interacting with archaeology, communities and the public.

Wright, Véronique (Instituto Francés de Estudios Andinos, Lima (UMIFRE 17 MAEDI/CNRS USR 3337))

[303] *Archaeometry and Mural Paintings in Ancient Peru: A Transdisciplinary Approach to Apprehend the Prehispanic Artisan Painters*

Mural art is an artistic expression common to most of the Prehispanic societies, and it was often investigated through an iconographic perspective. Nevertheless, recent research, particularly on Moche mural paintings (1st-8th century), has demonstrated archaeometry's contribution to the study of these polychromic vestiges. Indeed it constitutes a valuable tool to comprehend these ancient societies and to preserve their exceptional painting patrimony. In 2012, a new research project was developed within the program named "Origines, Héritages et Dynamiques" of the French Institute of Andean Studies in Lima. It aims to comprehend the origins of Prehispanic mural art and its spatiotemporal evolution up to the Spanish Conquest. Thanks to a transdisciplinary approach, the main objective is to characterize the pictorial technology in order to reconstitute the "chaîne opératoire" established by the painters through time. Through several studies from Ventarrón (2500-1600 B.C.) with the oldest murals in Peru, up to Tambo Colorado Inca fortress, it is possible to draw up a panorama of this artistic expression. The results obtained allow us to understand the significance and the interest of using such a protocol to investigate mural paintings, as well as patrimony conservation and technical and anthropological issues.

Wriston, Teresa (University of Nevada, Reno) and Gary Haynes (University of Nevada, Reno)

[87] *Environmental Conditions of Northwestern Zimbabwe during the Transition from Foraging to Farming: Using Isotopes, Sediments, and Soils to Reconstruct Late Holocene Climate Change in Hwange National Park*

Hunting-and-gathering in northwestern Zimbabwe was largely replaced by pastoralism and farming between ca. 2,000 and 1,200 years ago. In order to understand whether climate change influenced this transition, we collected environmental and archaeological data during a multi-year research program that included: rockshelter excavation, salvage excavation along eroding stream cuts, and geomorphological and soils analyses of various locales in Hwange National Park. The strontium, carbon, and oxygen isotope ratios for a sample of ostrich eggshell recovered from excavations were also analyzed and dated. Strontium isotope ratios were used to identify whether the samples were of local or non-local origin. Local sample's carbon and oxygen isotope values were then coupled with soils data to reconstruct Late Holocene environmental conditions. Comparison of this reconstruction with archaeological data examines how changing environmental conditions affected human landscape use throughout this culturally dynamic period.

Wroth, Kristen (Boston University), Dan Cabanes (Universitat de Barcelona), Paul Goldberg (Boston University), Vera Aldeias (Max Planck Institute for Evolutionary Anthropology) and Dennis Sandgathe (Simon Fraser University)

[53] *Phytolith Analysis and Micromorphology of Neandertal Combustion Features at Roc de Marsal, SW France*

Phytolith analysis can be used to investigate the relationship between hominins, plants, and environmental change. It has proven useful in understanding specific hominin behaviors (e.g., use of

fire and fuel composition), and diachronic changes in plant species for paleoenvironmental reconstructions. The integration of phytolith analysis with soil micromorphology allows for an identification of the ways phytoliths were deposited in archaeological sites, and addresses both site formation processes and diagenesis. This combination of analytical techniques can also be used to better relate phytolith assemblages to other archaeological datasets and to hominin behavior. This poster presents an integrated phytolith and geoarchaeological study of plant remains and sediments from Roc de Marsal, a Middle Paleolithic cave in southwest France. Phytoliths have been recovered from the site, recording changes in both plant species and environmental schemes. We specifically address how the analysis of phytoliths and micromorphological thin sections from fire features can be used to provide a more detailed understanding of Neandertal pyrotechnology and spatial differentiation. We also present samples from throughout the profile to compare diachronic change in both the environment and anthropogenic activities.

Wu, Xiaohong (Peking University)

[37] *Radiocarbon Dating of Qijiaping Site in Gansu Province, China*

Qijiaping site is one of the most important sites of Qijia culture. It was found by Swedish scholar J. G. Anderson in 1924 and excavated by Gan Su Museum in 1975. Few absolute dating results have been published since then. We collected more than 30 human bone and animal bone samples from the 1975 excavation. 25 radiocarbon dates were produced after the processes of sample pretreatment, preparation and AMS measurement. The result is that most of the dates give ages not older than 3900 BP.

Wu, Xiaohong [53] see Patania, Ilaria

Wu, Mandy Jui-man (Hanover College)

[234] *Contact and Exchange in Northern China: A Case Study on the Tomb of a Zoroastrian Priest, Kang Ye (512-571 C.E.)*

In 2004, the grave of Kang Ye was discovered in present day Xi'an, China. According to the epitaph, Kang Ye was a descendant of the kings of Kangju (Kang state, modern Samarkand) and a Zoroastrian priest living in the Northern Zhou kingdom. Inside the tomb were traces of ashes suggesting that Zoroastrian fire ritual had been performed. The skeletal remains were placed over a stone couch-shaped deathbed embellished with ten scenes in linear Chinese-style carvings. Currently, these individual scenes are being interpreted as representations of Kang Ye's travels and meetings with his visitors, but their sequential order is yet to be reconstructed. In this paper, I will argue that these scenes had illustrated the funerary rite, which was consistent with the Kang Ye's religious belief. I will reference both Chinese and Sogdian funerary depictions in archaeological and textual materials to explore the underlying factors that had led the Sogdians to selectively adopt Chinese artistic style to furnish the grave. I propose that the Chinese visual languages on Kang Ye's funerary furniture had provided settings for expressing Zoroastrian beliefs, using a distinct iconographic program to depict the continuous stages of the journey of the deceased's soul to afterlife.

Wulfkuhle, Virginia A. [98] see Ritterbush, Lauren

Wygal, Brian [72] see Seager-Boss, Fran

Wygal, Brian (Adelphi University)

[87] *Three Phases of Initial Human Colonization in Southern Alaska*

Once heavily glaciated during the Late Pleistocene, southern Alaska became ice-free just as the First Americans were entering the Bering Land Bridge. This makes the Susitna River in Southcentral Alaska a perfect laboratory for understanding how and why small-scale foraging societies spread throughout Beringia and ultimately the New World. While first explorers undoubtedly made decisions based on previous experience, initial occupants probably had different cultural expectations of their

environment and may have moved on to the next valley before becoming intimately familiar with any single place. It is this sense of wanderlust that is so intriguing about Late Pleistocene foragers. In unfamiliar places, especially high latitude locations, cultures adapted by mapping onto large terrestrial herbivores with frequent residential moves because specific knowledge of the landscape had not yet accumulated enough to inform more sedentary economies. Exploration of uncharted valleys must have been routine for these early Alaskans but it rarely left an archaeological trace. At the Trapper Creek Overlook site, three phases of the settlement process are represented archaeologically including exploration, pioneering, and finally colonization of southern Alaska.

Wylde, Michael (University of Florida)

[212] *The Faunal Assemblage from the Cañada Alamosa, New Mexico*

The Canada Alamosa Project in southwestern New Mexico has generated a faunal assemblage of over 24,000 elements that span 4000 years. The assemblage is the result of 13 years of excavations by Human Systems Research at four archaeological sites located on the privately owned Monticello Box Ranch. The bulk of the material was derived from pithouse and pueblo components at the Montoya Site (LA88891), the Kelly Canyon Site (LA1125), the 450 room Victorio Site (LA88889), and the Pinnacle Ruin (LA2292) but includes Archaic and Apache materials as well. Located on an ecotone and benefiting from the perennial waters of the Ojo Caliente, the location is also a frontier between Northern and Southern Pueblo cultures, with groups from both areas occupying the canyon over time. The discussion will focus on a general synthesis of the collected data and its implications to the temporal and cultural relationships between the four sites. Comparisons between key species will be used to discuss the effects of environmental and anthropogenic change in the Rio Alamosa.

[212] *Chair*

Wylde, Michael [250] see Lofaro, Ellen

Wyllie, Cherra

[303] *Classic Veracruz Mural Painting*

Mexican iconographer Sara Ladron de Guevara identified three distinct Classic Veracruz mural painting traditions centered at El Tajin, Las Higueras, and El Zapotal. In this paper I examine how canons of representation, color palette, and architectural planning reveal regional and inter-regional artistic preferences. Beyond aesthetic considerations I analyze these same attributes from the perspective of semiotics. I will focus on what the art and architecture at the three sites tells us about cosmology, social structure, historical change, and ethnic identity in Epiclassic period Veracruz.

Wynn, Thomas

[33] *The Handaxe Aesthetic*

Perhaps the most intractable puzzle of the Paleolithic is the Acheulean handaxe. Despite a century and a half of scrutiny by several generations of archaeologists, a comprehensive understanding of these enigmatic but ubiquitous artifacts remains out of reach. The typological approach that dominated Paleolithic studies for a century arguably generated more puzzles than it resolved ('stasis', the 'Movius line') and the functional/materialist approach simply confirmed that they were tools. Cognitive archaeologists have made some headway by treating handaxes as vehicles for studying issues in cognitive evolution, but many questions remain. One is the question of aesthetics. Though the term is avoided by many Paleolithic specialists, it is nevertheless possible to document the emergence and development of an aesthetic component to handaxes. The nascent field of neuroaesthetics and the perspective of embodied/extended cognition combine to suggest a scenario in which the manufacture of handaxes provided the primary scaffold by which aesthetic appreciation evolved.

Wynne, Clive (Arizona State University)

[28] *Insights into Dog Domestication from Psychological Studies on Dog and Wolf Behavior*

The nature of the cognitive similarities and differences between dogs and wolves is highly relevant to considerations of possible mechanisms for the origin of dogs. I shall present results which show that wolves possess the potential to match dogs' levels of responding adaptively to human actions if the wolves have been carefully hand-reared by people skilled in raising wild animals. Hand-reared wolves match pet dogs' ability to follow human points to a desired object and to interpret the implications of human gaze being occluded by objects. Thus it is unlikely that dogs' ability to perform well on human-guided tasks is a newly evolved aspect of canine cognition. However, there are important behavioral differences between dogs and wolves which make it unlikely that wolves served humans in the roles typical of dogs – such as hunters' assistants and peoples' pets. These differences include wolves' far more rapid behavioral development, making it very difficult for people to adopt wolf pups, and dogs' reduced effectiveness as hunters, making them more motivated than wolves to accept human assistance in capturing prey.

Xia, Yin [89] see Martinon-Torres, Marcos

Xie, Liye (University of Toronto), Leping Jiang (Zhejiang Provincial Institute of Cultural Heritage) and Weijin Huang (Hemudu Museum, China)

[179] *The Kuahuqiao and Hemudu Bone Spades: Use Contexts and Beyond*

Bone spades crafted from large mammal scapulae recovered from archaeological contexts have generally been assumed to be earth-working implements, based on analogies with ethnographic artifacts. On the Ningshan Plain in eastern China, hundreds of scapular spades have been discovered. The majority of these scapular spades belong to the early Hemudu culture (7,000-6,000 BP), with a few earlier examples dating to the last stage of the Kuahuqiao culture (7,200-7000 BP). To identify the use contexts of the implements, we conducted over 20 experiments in 11 fields so as to evaluate the implements' performance characteristics and collect use-wear samples. Our experimental fields included both modern and ancient sediments used for agriculture and residential constructions. In this paper, we report our experimental results of soil signatures on the scapular implements across soil types and the application of the results to identify the use contexts of the archaeological specimens. Based on these results, we discuss Kuahuqiao and Hemudu land-use strategies.

Yacubic, Matthew (University of California Riverside)

[219] *Postclassic to Contact Period Economic Patterns in the Central Peten: The View from Zacpeten*

The purpose of this paper is to examine how Zacpetén, an important center for the Kowoj, functioned to meet its economic needs while creating and sustaining a communal identity between the Late Postclassic (A.D. 1200 to 1525) and Early Contact (A.D. 1525 to 1700) periods. At this time, a complex political economy existed across the Central Petén. However, these connections varied across the Central Petén according to the degree of political integration. In this paper, it is argued that the acquisition, production, and distribution of stone tools at Zacpetén during the Late Postclassic and Early Contact periods were highly autonomous, community-based activities. Most of the stone tools at Zacpetén were produced and used by individual households, though several cottage industries in the community specialized in the production of obsidian blades, chert bifaces, and millstone tools. Through community interactions, the Kowoj at Zacpetén made clear attempts to maintain their own identity despite regional influences exerted by the Itzá during the Late Postclassic and the Spanish during the Early Contact Period.

Yadmaa, Terendagva [418] see Hadel, Patrick

Yaeger, Jason [306] see Brown, M. Kathryn

Yakal, Madeleine (SUNY College at Oneonta) and Jacy Moore (University of Leiden, Netherlands)

[238] *Global Connections: Beads and the Interaction Network of the Ifugao, Cordillera, Philippines*

Grave goods have been especially useful in the archaeological examination and determination of political economy and levels of inter-group interaction. Among the Ifugao of the northern highland Philippines, ethnohistoric and ethnographic datasets indicate that the group can be considered a ranked society. Dominant Philippine historical narratives also suggest that the Ifugao were in isolation during Spanish colonization. Our excavations at the Old Kiyangan Village provide material support for the presence of unequal access to resources (particularly, imported beads). The presences of these exotic materials, however, refute the idea of isolation. Our paper presents a preliminary examination of glass, clay, and stone beads found in the 2012 and 2013 field seasons of the Ifugao Archaeological Project. Our presentation deliberates on possible exchange networks connected to the village. Additionally, we explain the application of beads in neonatal burial practices and its cultural importance among the Ifugao.

Yang, Dongya [163] see Wellman, Hannah

Yang, Yuzhang (Dr.), Weiya Li (Postgraduate), Chenglong Yin (Postgraduate), Zhijie Cheng (Postgraduate) and Juzhong Zhang (Professor)

[179] *Plant Resource Utilization at the Shunshanji Site in Jiangsu Province Based on the Analysis of Plant Remains*

Shunshanji is an important Neolithic age archaeological site in Jiangsu province. However, until now hardly any paleo-ethnobotanical research has been accomplished. In this paper, microbotanical remains such as starch grains and phytoliths were used to investigate the ancient plant utilization at this site. In addition, carbonized seeds from portulacaceae, rumex, chenopodiaceae, asteraceae were recovered through flotation analysis. Both stone tools and pottery vessels yielded plentiful starch grains. The grains included oryza, triticeae, quercus, coix and the root of snakegourd. Phytolith analysis further verified that rice had been exploited by Shunshanjie people. All findings above indicate that the Shunshanji people had utilized rice as their food resource; however gathering was still an important way to gain plant foods. This research result is very significant for understanding ancient human diets, origin and development of prehistoric agriculture in the mid-low Huaihe River Valley during 8.5-7.0 kaBP.

Yanicki, Gabriel (Department of Anthropology, University of Alberta)

[182] *Reinventing the Wheel Game: Intergroup Trade on the Plains/Plateau Frontier*

In Piikáni oral tradition, the namesake of southern Alberta's Oldman River is a place in the Rocky Mountains where Napi, or Old Man, taught the various nations how to play itsewah (lit. 'wheel game') as a way of making peace. In the centuries since, travelers, adventurers, and scholars have recorded several accounts of Old Man's Playing Ground and of the hoop-and-arrow game that was played there; this gaming tradition is shared by peoples on either side of the continental divide, with gambling usually accompanying it. Stories of the wheel game being played as an alternative to warfare reaffirm the observation made by authors such as Bill Brunton and Marshall Sahlins that gambling games are associated with high social and kinship distance; they thus offered otherwise hostile groups a peaceful mechanism for intergroup trade. When oral tradition, history, ethnography, and an archaeological assessment of the playing ground's most probable location—a floodplain scoured and rebuilt by floodwaters of the Oldman—are brought together, the locale can be understood as a nexus for cultural interaction and trade, through the medium of gambling and games, on the natural frontier between peoples of the Interior Plateau and Northwest Plains.

Yanicki, Gabriel [182] see Ives, John

Yankowski, Andrea and Puangtip Kertsap (Lecturer, Kasetsart University, Bangkok; PhD Student)

[49] *Salt and Salt Fermented Fish in Northeast Thailand, Prehistory to the Present*

Using an ethnoarchaeological approach, this paper examines the production, processing, storage and consumption of salt and salt fermented fish products in the Mun River Valley of Northeast Thailand, and the greater Mekong Delta region. It highlights the regional specialization in these

products from prehistory to the present, and explores how the study of foodways can help us to understand the nature of the early-political economy, as well as aspects of cultural and social identity, both in the past and present.

Yann, Jessica, Jeff Painter (Michigan State University) and Michael Conner (ISM, Dickson Mounds Museum)

[365] *The Spatial Distribution of Domestic Facilities in the Multiethnic Morton Village Site*

With mounting evidence demonstrating cohabitation between Mississippian and Oneota groups at the Morton Village site, data regarding domestic facilities are crucial for examining how these two distinct groups interacted and influenced one another in their daily lives. The distribution of house types (wall trench versus single post) provides interesting evidence for some degree of segregation between the two, while data from features suggests a more complex and intermingled relationship. This poster will explore and compare these two distinct data sets, discussing several possible explanations for how these groups navigated the complex social atmosphere created by the Oneota migration into the central Illinois River valley.

Yano, Kenichi

[80] *Demographic Fluctuation in Jomon Period of Japan*

This paper surveys our recent studies on regional prehistoric population fluctuations during the Jomon or Japanese neolithic period. Historically, archaeological demographic reconstruction in Japan has been based on numbers of archaeological sites or structures such as pit dwellings. Our approach uses the Japanese pottery chronology, which has been established in detail. In recent years, many 14C dates of various pottery types from the Jomon period (14000B.C.-2800B.C.) have been acquired from carbonized residues on Jomon pots and vessels. As a result, we know the duration of time for each pottery type in detail, and also the number of sites in a local area per roughly every one hundred year time period. In this paper, we reconstruct observed demographic fluctuations based on numbers of archaeological sites in specific areas of Japan. And we compare them with each other to discover common tendencies and contradictory ones. If the population of all areas were declining, we can expect a common reason such as a decrease in food products of a broad area. We specify such events and conclude some events coincide with radical changes in subsistence and settlement style and/or in environmental change.

Yao, Ling [179] see Zhang, Juzhong

Yao, Alice (University of Chicago)

[349] *Grounding an Underground Survey: Paddy Fields and Monumental Bronze Age Shell-Scapes in the Dian Basin, Yunnan, China*

Regions under paddy cultivation often present limits on site detection. In addition to deep plowing and continuous flooding of the fields, which intensify erosion and weathering of cultural remains, paddy fields are constructed and managed through field leveling and canal dredging. These processes raze and displace sites, leaving behind a fragmentary settlement record consisting primarily of sites defined by raised mounds and/or standing architecture. Oft used survey techniques that seek to document sites through surface finds and distributions are not always suitable for subtropical zones such as Southeast Asia and southwest China where such regimes have existed continuously for millennia or longer. Focusing on the lake basin identified as the core of Bronze Age Dian polity, this paper assesses the possibility and limits of total coverage survey and explores complementary surface and subsurface applications used in our survey. The findings reveal a hierarchical Bronze Age settlement system but also highlight distinctive natural and artificial arrangements which transformed this wetland landscape into a politically contested space.

[283] *Discussant*

Yaremko, Jason (University of Winnipeg)

[313] *Indigenous Migration, Diaspora, and Transculturation in Colonial Cuba*

For nearly half a millennium, Cuba served as an outpost, key to the defense of the Spanish American empire, and one of the first centers for slavery in the colonial Americas. At the same time, Cuba also served the interests of various continental and isthmian American Amerindian groups and individuals, many who, from the sixteenth through nineteenth centuries, journeyed to the island colony voluntarily for trade, diplomacy, and refuge. At the same time, thousands were also transported involuntarily as victims of forced migrations. In both cases, many of these indigenous peoples settled in Cuba. The source territories of these journeys included Florida, New Spain/Mexico, and Central America. Evidence to date strongly suggests that the most continuous and substantial sources for Indigenous movement, migration, and settlement in Cuba originated in the Mesoamerican and isthmian regions, and included, for example, Maya and Nahua peoples. This study examines the diasporic and multicultural indigenous presence in Cuba, with particular emphasis on the early colonial period as, on one hand, suggestive of continuity with pre-colonial migration dynamics, and, on the other, as the springboard for mobility and extra-continental migrations of Amerindian peoples during the colonial period to the largest island in the Caribbean.

Yarnes, Christopher [302] see Anderson, Shelby

Yasui, Emma (University of Toronto)

[115] *Starch and Stone: Preliminary Evidence from Jomon Period Ground Stone in Southwestern Hokkaido*

Lithic assemblages from Jomon Period sites contain a wide variety of artifacts that were chipped or ground from a number of raw materials. Typological frameworks exist to aid interpretations about function and use, but many details are still unknown when it comes to how Jomon people incorporated this array of stone objects into their lives. The place of ground stone implements within Jomon lithic technology and society is particularly intriguing, as questions about the quantities and variations in form have not been highlighted in recent discussions. In terms of resource use and food production, ground stone has become an increasingly popular line of study at sites around the world. Microscopic analysis of residues and use-wear have the potential to explore the resources that were being processed by Jomon communities, but also to shed light on whether some tool forms were linked to particular tasks and the wider implications of processing activities. The results of a preliminary study of the starch and phytolith remains extracted from ground stone implements from the Yagi site will be presented here, and discussed within the wider setting of the Jomon Period in southwestern Hokkaido.

Yates, Donna (Scottish Center for Crime and Justice Research, University of Glasgow)

[279] *The Ruin of the Maya Heartland: Successes, Failures, and Consequences of Four Decades of Antiquities Trafficking Regulation*

For 40 years the trafficking of Maya antiquities has been at the forefront of debate over the most effective way to discourage the illicit antiquities trade. Images of mutilated Maya stela and jungle-covered temples pitted by looters' trenches epitomize the effects of the global demand for looted artifacts. National and international measures have been introduced to protect Maya sites on the ground, prevent looted artifacts from crossing borders, or effect the repatriation of stolen cultural property. Each of these measures has had successes, failures, and unforeseen consequences. I will discuss the on-the-ground effects of attempts to control the trade in Maya antiquities since 1970, particularly the contrasting effects of national and international regulation introduced outside of the UNESCO convention and regulation introduced under the convention framework. A move away from object-specific import restrictions towards country-specific bilateral agreements and repatriation has not substantially contributed to the on-the-ground security of Maya archaeological sites or to the prosecution of antiquities traffickers. By approaching antiquities trafficking as a criminal enterprise that is separate from other illicit activities and by attempting to control the flow of looted cultural property without addressing underlying structural failures (e.g. insecurity, poverty, conflict), current international regulation is inadequate.

[279] *Chair*

Ye, Maolin [37] see Fargo, David

Yellen, John (National Science Foundation)

[71] *Discussant*

Yerka, Stephen [123] see Kansa, Sarah

Yerka, Stephen (University of Tennessee)

[125] *Built to Last: The Paleoindian Database of the Americas (PIDBA) and Openly-shared Primary Data Meet the Digital Index of North American Archaeology (DINAA)*

The Paleoindian Database of the Americas (PIDBA) freely shares primary and detailed attribute data on tens of thousands of ancient lithic tools spanning the Paleoindian and early Archaic time periods. As technology has changed over the last 25 years, research team volunteers work diligently to continue providing access to data through ever-more accessible and stable formats. Additionally, efforts concentrate on delivering data in formats that other researchers can deploy easily in their own analyses. Data, when presented in visual form, is minimally transformed and high-resolution distribution maps are regularly updated and made available freely. As PIDBA gears up for its third decade as a research collective, the Digital Index of North American Archaeology (DINAA) provides an exciting new venue to share, link and visualize the PIDBA ancient stone tool database. DINAA provides the infrastructure to link primary research to a rich universe of archaeological information. Using stable URIs to provide persistent web identifiers, open-access and open-source protocols, PIDBA's new partnership with DINAA enters the realm of machine-readable sharing, APIs, and, hopefully, another 25 years of successful data sharing.

[125] *Chair*

Yerkes, Richard W. [47] see Gyucha, Attila

Yerkes, Richard (Ohio State University), William Parkinson (Field Museum, Chicago) and Attila Gyucha (Hungarian National Museum, Budapest)

[211] *A Tale of Two Tells: Variation in Neolithic Nucleated Settlements in Southeastern Europe*

Ongoing investigations by the Körös Regional Archaeological Project at two Hungarian tells located 7 km apart, Szeghalom-Kovácsalom (SzK50) and Vésztő-Mágor (V15), exposed different dimensions and settlement layouts. The 4.25 ha Vésztő-Mágor tell is 9 meters high, while the 0.5 ha Szeghalom-Kovácsalom tell rises 3.5 m above an old Körös River meander. The first settlers at both tells were Middle Neolithic groups (Szakálhát phase 5200 B.C., cal), but their growth and development diverged during the Late Neolithic (Tisza culture, 5000-4500 B.C. cal). Surface collections, geochemical and geophysical investigations and excavations at SzK50 exposed a 60 ha nucleated settlement complex surrounding a small tell that expanded rapidly at ca. 4800 B.C. (cal). The SzK50 tell also rose rapidly inside a "moat," but social differentiation between Neolithic families living on and off the tell was limited. Investigations at V15 revealed a different settlement layout at the larger tell. While it was enclosed by encircling ditches, there was no adjacent flat settlement. The 2.5 m of Tisza occupation levels at V15 show it was expanding at the same time as SzK50, however, occupations were confined within the ditches, and there is more evidence for ritual activities and emerging elites at that nucleated tell settlement.

Yesner, David [112] see Hutchinson, Vance

Yesner, David (University of Alaska Anchorage), Michael Farrell (University of Alaska Anchorage) and Daniel Monteith (University of Alaska Southeast)

[302] *Caribou Exploitation Dynamics and Antler Tool Production in Late Thule Occupation of the Kvichak River Drainage, SW Alaska*

Late Thule occupation of the Kvichak/Naknek River drainage systems has been attributed to northward migrating human populations deriving from the Kodiak archipelago region, assumed to be

salmon fishers and sea mammal hunters displaced by human population growth at the end of the Medieval Climatic Optimum and beginning of the Little Ice Age (LIA). However, caribou hunting seems also to have played an important role in some areas, particularly at the intersection of appropriate habitat and migration routes along the Kvichak drainage. Here, late Thule populations, representing ancestral groups to contemporary Yup'ik peoples, appear to have developed intensive hunting of all ages and sexes of caribou, following a classical catastrophic (non-attritional) pattern. Intensive antler and bone workshops for organic tool production may reflect centers of widespread trade networks, perhaps involving both Yup'ik and Athabascan groups in this cultural periphery zone. These patterns became attenuated with post-LIA climatic change.

Yin, Chenglong [179] see Yang, Yuzhang

Yoder, David (Utah Valley University)

[90] *Interpreting the Fifty-Year Rule: How A Simple Phrase Leads to a Complex Problem*

For over 40 years some archaeologists have labored under a distorted interpretation of the fifty-year rule in which anything over 50 years of age becomes "archaeological" and therefore must be recorded and evaluated for eligibility to the National Register of Historic Places. A re-examining of federal law shows that this is a mistaken interpretation. Data from the Intermountain Antiquities Computer System indicate that if this practice continues the number of featureless historical sites requiring documentation in the West will greatly increase at a large expense to the public, and that most of these costs will be associated with sites not considered significant in American history, architecture, archaeology, engineering, or culture. Solutions are presented that will give archaeologists greater flexibility in recording material culture over 50 years of age, allowing us to redirect our efforts to resources of greater interest while making the practice of archaeology more defensible to the public. These problems are symptomatic of a larger issue that relates to how cultural remains from the latter part of the 20th century and beyond will be valued. The discipline of archaeology must begin candid conversations about the relative importance of such recent material culture and its management implications.

Yoffee, Norman (U Michigan)

[36] *Discussant*

Yohe, Robert (Cal State Univ)

[240] *The Human Osteology of Tell El Hibeh: Preliminary Observations*

Considerable data regarding the human remains, both from human skeletal remains and mummies have been garnered from controlled excavation of Byzantine (Coptic) burials and surface collections of disturbed graves dating to as early as the Third Intermediate Period. This paper summarizes those data and compare with similar osteometric information from other areas of Middle Egypt.

Yonenobu, Hitoshi [115] see Takamiya, Hiroto

Yost, Chad (University of Arizona Department of Geosciences)

[55] *Phytolith Analysis of Sediments from Early Agricultural Fields at Las Capas, Arizona*

Phytolith analysis of field sediments at the Early Agricultural site of Las Capas document a rich microfossil record of the plant communities that grew in farmed irrigated soils and the local environment. Although irrigation water tapped from the Santa Cruz River carried a significant load of naturally derived phytoliths, the signature of cultivated and encouraged plants was clearly recognizable among the diverse identified genera and species. Maize is well-represented, but there is a strong indication of encouraged, if not cultivated, cool-season C3 grasses, likely *Hordeum* sp. (little barley); this suggests that these grasses were incorporated into the agricultural cycle, perhaps extending seasonal production of the field system. Other identified economically useful plants include sedges, common reed, composites (sunflower family), and bottle gourd. Species from the surrounding natural environment, ranging from the bajada to montane zones, include pine and

hackberry. One unusual indicator of the local stream environment is the identification of freshwater sponge spicules and gemmoscleres. These demonstrate that water in the Santa Cruz River flowed consistently and cleanly for extended periods of time in the reach that irrigated Las Capas fields. The phytolith record complements and expands other "conventional" environmental studies such as pollen and macrobotanical analyses.

Young, Michelle (Yale University)

[2] *An Early Horizon Temple in the Tierra del Mercurio: Preliminary Results from Atalla, Huancavelica, Peru*

This presentation will put forward the preliminary results of the first season of the Proyecto de Investigación Arqueológica Atalla. The project represents a first step in clarifying the role of the Early Horizon period site of Atalla, located in the district of Yauli, region of Huancavelica, in the south-central highlands of Peru. Atalla is of particular archaeological interest as the earliest recorded monumental ceremonial site in the region of Huancavelica. The site is also distinguished by its unprecedented size and the unusually high density of the archaeological materials visible on the surface, including ceramic styles that suggest connections to the south and central coasts as well as to Chavin. These factors, and its location 15km from the rich source of cinnabar known today as the Santa Barbara mine, suggest that the site played a prominent role and may have exerted far-reaching influence during the Early Horizon period. Recent findings from the 2014 season support the hypotheses of previous investigators who have proposed connections between Atalla and distant regions of the Central Andes. This research contributes to filling in gaps in our understanding of interregional interaction during the Early Horizon period in the virtually unknown region of Huancavelica.

Young, Allison [29] see Vawser, Anne

Young, Tatiana (Temple University)

[323] *Architecture and Its Reflection of State Organization and Settlement Pattern in the Cochuah Region during the Terminal Classic Period*

A change in architectural style is often a result of changes in power structures and political organization. During the Terminal Classic Period, the Cochuah region not only experienced a construction boom and increase in population, but also exhibited changes in settlement patterns, site layouts, and architectural components. During this period, when all of the registered sites in the Cochuah region were occupied, there were changes in the organization of space, as well as orientation, location, and architectural design of buildings. Through analyzing preliminary data, I examine how these changes relate to the dynamic nature of political organization in the Cochuah Region during the Terminal Classic Period.

Young, Lisa (University of Michigan)

[343] *Community Spaces at Pueblo III Pithouse Villages in Northeastern Arizona*

Southwestern archaeologists identify the pithouse-to-pueblo transition as a fundamental change in the social and economic organization of small-scale farming communities. This interpretation implies that pithouse villages were organized differently than pueblos. In northeastern Arizona, pithouses were used after this transition and were the preferred form of housing in certain areas, such as Homol'ovi during the A.D. 1100s. However, systematic research on these "out of phase" pithouse villages is limited. I analyze the design and layout of community spaces, especially plazas and public structures, from well-documented 12th century pithouse sites in northeastern Arizona to investigate the organization of Pueblo III pithouse villages.

Younie, Angela (Texas A & M University), Tom Gillispie and Ted Goebel (Texas A&M University)

[171] *Early Human Occupation at Healy Lake: A Study of Lithic Technological Organization at the Linda's Point and Healy Lake Village Sites*

Under the collective organization of the Healy Lake Working Group, renewed investigations into the

prehistory of the Healy Lake region over the past five years have allowed for new insights into terminal Pleistocene human activity in the Alaskan interior. This paper reports the detailed assessment of curated materials from the Village site, originally excavated in the 1960s and 1970s. Using original field notes, drawings, and photographs, the lowest component was stratigraphically separated from Holocene occupations, and found to correlate closely with the Chindadn occupation originally proposed by John Cook, with some exceptions. Lithic reduction patterns seen in the debitage, tools, and bifaces are comparable to recently excavated data from the nearby Linda's Point site, and reflect patterns of mobility, raw material usage, and lithic technologies throughout their 13,000-13,500 year history of occupation.

Yu, Pei-Lin (Boise State University)

[300] *Archaic Women in the High Country: an Ethnoarchaeological Framework*

All-male hunting parties of the Middle Holocene are an important concept in the archaeology of America's western mountains. The dichotomy of later high mountain family villages (repeat occupations of high density and diversity) versus specialized hunting sites and 'man caves' (sensu Thomas) are cited to argue that Archaic women never saw, or ventured into, remote high mountain landscapes. Yet the ethnographic literature of mobile foragers contains interesting evidence of women, usually young and without dependents, participating in a variety of hunting situations — some of them arduous. In these cases dense or diversified cultural deposits typical of a 'family group' would not be expected. This paper uses ethnoarchaeological and evolutionary frames of reference to develop expectations about ancient women travelling the high mountains for hunting and other activities, and establishes that absence of evidence for family groups in the archaeology of Archaic hunting camps does not constitute evidence for absence of women per se.

[159] *Discussant*

Yu, Pei-Lin [312] see Ryan, Ethan

Yue, Zhanwei [67] see Liu, Yu

Zacharias, Nikos [140] see Muros, Vanessa

Zahn, Rainer [294] see Braun, Kerstin

Zaman, Tim [58] see Snijders, Ludo

Zambrano, Raul (Proyecto Qhapaq Ñan - Ministerio de Cultura del Peru) and Camila Capriata (Proyecto Qhapaq Ñan - Ministerio de Cultura del Pe)

[46] *The Arrival of the Incas and Its Consequences in the Transformation of the Sociopolitical Landscape of the Lower Lurin Valley*

Lately, several research projects have been taking place in the Lurin valley, central coast of Peru, in archaeological sites dating to the Late Intermediate Period (s. XVII-XV) and the Late Horizon (s. XV-XVI). This work has been complemented with recent studies focused on the presence of a segment of the Qhapaq Ñan and its importance as an articulating axis between these settlements during the Late Horizon. Preliminary results of these research studies have allowed us to reevaluate hypothesis about the type of sociopolitical organization of these communities during the Late Intermediate Period and the transformations that may have occurred with the arrival of the Inca state. This paper presents the results of a series of surveys that took place in different settlements of the lower Lurin valley. The data is then compared with data obtained from excavations in some of these same settlements in order to establish in what way their sociopolitical organization would have changed during the Inca occupation.

Zan, Luca [201] see Shoup, Daniel

Zaneri, Taylor (New York University)**[154]** *Food and Identity In the Urban Landscape*

Landscapes and foodways are intrinsically connected. Food practices act as a frame of reference to impose social, historical, and cultural meanings on places and vice-versa; their materiality provides a sense of stability in shifting demographic settings. Culinary activities can help structure the experience of place and through repetition become involved in the creation and transmission of collective memory. However, memory is far from stagnant, it continues to be challenged and reworked in everyday life; material culture is an essential part of this process. This is exemplified by some neighborhoods in New York City, such as Little Italy in Manhattan and Arthur Avenue in the Bronx, areas that received an influx of immigration from Italy in the early twentieth century. After 1920, Italian immigration largely subsided, though, and new waves of Chinese, Hispanic, and Eastern European immigrants settled in these neighborhoods. Yet, both are still thought of as "Italian neighborhoods," due to the large number of Italian food establishments that remain. The paper uses an ethnohistorical approach to examine how food as artifact of the past, helps maintain a particular Italian identity in a social landscape where it is no longer a demographic reality.

Zangerle, Anne [350] see Renard, Delphine

Zanotto, Hannah [123] see Judd, Veronica

Zanotto, Hannah, Will Russell (School of Human Evolution & Social Change) and Jeffery Ferguson (University of Missouri)**[278]** *Reading between the Lines: Salado Polychrome and (In)organic Paint Variability*

During the late thirteenth century, the Salado Phenomenon swept across much of the U.S. Southwest, leaving its most indelible mark in the form of Salado Polychrome pottery. Chemical sourcing indicates that this pottery was produced in many of the areas in which it is found and many researchers now associate production areas with the settlement of Kayenta migrants. Archaeologists frequently use stylistic analyses to infer shared socio-cultural backgrounds. For example, some colleagues have noted similarities between earlier Kayenta pottery designs and those found on later Salado Polychromes. High-visibility attributes like motifs, however, are easily replicable. Low-visibility, technological attributes serve as better indicators of shared social backgrounds. In addition to decorative similarity, researchers suggest that black paint on Salado Polychrome vessels is almost exclusively organic in nature and thus consistent with earlier Kayenta production. Ongoing work at the Dinwiddie Site provides an opportunity to further explore this model. We use macroscopic and chemical analyses to characterize paint composition, thereafter exploring variability through space and time. Our results speak to the scale of integration among production communities and emphasize the role of cultural diversity within the Salado Phenomenon.

Zaragoza, Diana (INAH)**[198]** *Digging into Mesoamerican History in the Huastec Region*

La Huasteca en el noreste de México ha sido estudiada por muchos científicos, entre ellos lingüistas, arqueólogos, etnólogos y etnohistoriadores quienes la establecieron como un área cultural dentro de Mesoamérica; en esta presentación quiero hacer una síntesis de lo que sabemos sobre ella y aclarar ciertos aspectos. El conocimiento que tenemos de la Huasteca se basa principalmente en los datos recabados en una veintena de sitios arqueológicos y en sólo dos áreas mayores, por lo tanto aun cuando se han realizado investigaciones intensivas, estas aportan una visión parcial. En las exploraciones recientes los estudiosos de la Huasteca han tomado como dogma lo que se ha dicho sobre la existencia de una cultura Huasteca lo cual confunde su comprensión, ya que dentro de su amplio territorio se desarrollaron diversas manifestaciones que fueron expresadas a través de su cultura material, no siempre apegadas a las normas mesoamericanas. Es por ello que se requiere revisar, en forma crítica, el desarrollo de esta región.

Zarina, Gunita [207] see Tichinin, Alina

Zarrillo, Sonia (University of Calgary)

[186] *Clues to Cacao from the Ecuadorian Upper Amazon*

Genetic studies suggest a single domestication event for cacao (*Theobroma cacao* L.) in the Upper Amazon of southeastern Ecuador and northeastern Peru. Such studies suggest it was then transported by humans northwards to Central America and Mexico. In such a model we should expect to find the earliest archaeological evidence of cacao use in the tropical forests of South America. This paper presents starch granule evidence for the use of cacao dating to 3500-3300 Cal B.C. from the Santa Ana - La Florida site in the Upper Amazon of southeastern Ecuador.

[271] *Discussant*

Zavala, Bridget M. [76] see Fournier, Patricia

Zavala, Bridget (Universidad Juarez del Estado de Durango) and Selene Galindo Cumplido (Escuela Nacional de Antropología e Historia)

[231] *Seeds of Memory: A Long-Term Study of Life and Plant Use in the Sextin River Valley of Durango, Mexico*

The relationship between people and plants is basic to all of human existence. Many archaeologists have considered this relationship as primarily economic, yet ethnographic accounts reveal important social aspects of human-plant interactions. In this paper we consider the long-term relationship between certain plant species (both wild and domesticated- beyond the triad of corn, beans and squash), botanic knowledge and memory in the Sextin valley. Here we present macrobotanical, phytolith and pollen data from the excavation of the archaeological site of Corral de Piedra- an almost 1000 year old, 70 room hilltop village- and compare and contrast findings with information recorded through ethnographic interviews with local plant use experts. This analysis points at interesting continuities, as well as changes, brought on by both social processes and major environmental shifts. Furthermore, we show how the relationship people have with plants is linked inexorably and serves as an entry point to memory evoking the lived experiences of places thusly endowing them with meaning and often repopulating them with people from the past.

Zavaleta Lucido, Marco [21] see Flores Ramirez, Rosa

Zborover, Danny (USMEX, UCSD)

[188] *Moctezuma, King David, and a Gentile Meet on a Mountain: Religious Factionalism and Indigenous Perceptions of Archaeological Sites, Archaeology, and Archaeologists*

The state of Oaxaca in southern Mexico has long been famous for its archaeological tourism, aimed mostly towards urban-based national and international publics. But while this is also the state with the largest indigenous population in Mexico, the contemporary descendants of those archaeological and historical cultures present an important yet mostly unrecognized public whose perceptions of their own past remain poorly studied. Concomitantly, the complex relationships between cultural heritage and stewardship within this dynamic and multicultural landscape often transcend a simplistic dichotomy between 'academic' vis-à-vis 'public' audiences. This presentation will draw from a decade-long archaeological and ethnographic research in the Chontal highlands, where archaeological sites, archaeology, and archaeologists are perceived differently by diverse indigenous publics, even within the same community. These, in turn, directly shape archaeological research designs and outcomes. A particular emphasis will be placed on the role contemporary religious factionalism plays in these public perceptions of the past, and some of the community-wide outreach initiatives developed to overcome such factional tendencies.

Zborover, Danny [410] see Alfaro, Martha

Zeanah, David (California State University, Sacramento), Brian F. Coddling (University of

Utah), Douglas W. Bird (Stanford) and Rebecca Bliege Bird (Stanford)**[296] *OFT, BSR, and JOC: James O'Connell's Contributions to Understanding Broad Spectrum Economies Using Foraging Theory***

O'Connell (JOC) was among the first to recognize the potential of optimal foraging theory (OFT) as a research strategy for investigating the Broad Spectrum Revolution (BSR). His work in Australia carried profound implications for the BSR that stimulated research particularly in the Great Basin and Australia. Although testing predictions in the archaeological record has proved challenging, these studies revealed aspects of the BSR not anticipated by simple foraging models. Recently, the usefulness of OFT for understanding the BSR has been questioned. Ongoing work among Martu foragers demonstrates that OFT remains a productive research strategy.

Zeanah, David [296] see Coddling, Brian

Zechini, Mariana [124] see Killgrove, Kristina

Zedeno, Maria [300] see Ballenger, Jesse

Zedeño, Maria (University of Arizona), Jesse Ballenger (Statistical Research, Inc.), Matthew Pailes (University of Arizona) and Francois Lanoe (University of Arizona)**[178] *Coming-for-the-Bison, Going-to-the-Sun – Evolution and Significance of Staging Places on the Northern Rocky Mountain Front***

As early as the terminal Pleistocene, the northern Rockies witnessed human movement across mountain passes and high terraces overlooking expanses of boreal forest, tundra, and melting ice. Applying lessons learned from David H. Thomas' work in the central Great Basin, we combine the archaeology, geomorphology, and ethnohistory of the St. Mary River Bridge Site (24GL203) and other sites in the vicinity of east Glacier National Park to discuss how mobile groups colonized a landscape characterized by dramatic altitude gradients. Places at the junction of slope and valley and of forest and prairie were sought after for their year-round resource potential as well as their strategic location in long-distance travel networks. Whether to hunt, trade, seek visions, or make war, people of various cultures and ethnicities traversed remote mountain routes and paused at this ecotone, on and off for millennia, to stage their transitions. We further ponder the significance of staging places in the evolution of hunter-gatherer cultural landscapes.

Zeder, Melinda (Smithsonian Institution)**[414] *Feast or Famine: The Broad Spectrum Revolution Revisited***

Widely accepted models for the diversification of subsistence economies that preceded the domestication of plants and animals in the Near East frame this key transition in the context of demographically induced resource pressure following a diet breadth model of forager decision making. Many of the supporting arguments for this scenario are open to an alternative view that casts these developments within the context of resource abundance and enhanced predictability. Contrasting explanatory models based in Optimal Foraging Theory and Niche Construction theory are evaluated in light of emerging empirical data from the region.

[414] *Chair***Zeferjahn, Tanya (California State University, Long Beach), Michelle Baroldi (California State University, Long Beach), Chris Lee (California State University, Long Beach), Carl Lipo (California State University, Long Beach) and Matt Becker (California State University, Long Beach)****[52] *Rapa Nui: The influence of Freshwater Sources on Prehistoric Settlement Distribution***

One of the many mysteries of Rapa Nui (Easter Island, Chile) is how the ancient inhabitants survived with so few sources of freshwater. The scarcity of freshwater suggests that water resources may have been a constraining factor in settlement growth, patterning, and distribution. As a first step of addressing this hypothesis, we conducted field work to identify classes of terrestrial sources of

freshwater and compared them to early settlement distribution. From May-June, 2014, we generated field data on the prehistoric hydrology of Rapa Nui. These data consist of images and GPS locations for observable surface water features and field measurements of temperature and electrical conductivity to identify fresh versus saline water sources. Each identified water source was described in terms of source type, location, persistence, and accessibility. Using these water resource data and archaeological settlement evidence, we created a map to examine whether settlement patterns are spatially autocorrelated to island hydrology. Preliminary analysis suggests that coastal seeps and springs were a vital resource for ancient peoples as evidenced by the systematic co-occurrence of archaeological features such as statue platforms (ahu) with active groundwater seeps.

Zegarra, Michiel [31] see Vaughn, Kevin

Zeidler, James

[367] *Message in a Bottle: Assessing the Impacts of Looting on the Archaeological Record of the Jama River Valley, Coastal Ecuador*

Northern Manabí Province of coastal Ecuador has long been a center of archaeological looting and illicit trade in antiquities derived from successive cultural occupations of the Formative Period Valdivia and Chorrera cultures and the long Jama-Coaque cultural tradition, a sequence spanning some 3,500 years. The ceramic artifacts from this trade are some of the most complex and elaborate found anywhere in Ecuador. They grace the shelves of national and regional museums, and numerous private collections throughout the country, as well as private museums throughout the world, yet surprisingly little comparable material has been found in scientifically documented archaeological contexts. This paper assesses the negative impacts of this unabated looting on the regional archaeological record based on the results of systematic archaeological survey in the Jama River Valley, a major locus of Jama-Coaque culture. Special emphasis is placed on the use of these unprovenanced materials for interpretations of prehispanic iconography and religion. Finally, some suggestions for curtailing this illicit activity are also addressed.

[70] *Discussant*

Zeitlin, Judith [76] see Balasalle, Aileen

Zejdlik, Katie (Indiana University; JPAC-CIL ORISE Fellow)

[173] *Investigation of Biological Relationships at the Late Woodland/ Mississippian Transition in the Northern Mississippian Hinterlands*

The Mississippian period is exceptional for the fast and wide ranging influence it had on the mid-continent. Processes behind the Mississippianization of the Midwest are often derived from explanations of trade or religion as inferred from the presence of material culture and site organization. It is unknown to what level direct contact occurred. Biological distance investigation using odontometrics and dental discrete trait analysis was conducted on individuals from Late Woodland and Mississippian sites in three sub-regions of the Midwest at the northern periphery of the Mississippian cultural landscape. General results show each population in the analysis was significantly different from the others, including Late Woodland and Mississippian individuals within the same sub-region. The most northern sites are the most biologically distant from all other sites in the project. Results also show that there was more biological population variation in the Late Woodland period than the Mississippian period for the sub-regions examined. Reduced biological variability may be the result of geo-social boundaries established during Mississippianization of some areas. By comparing three, non-neighboring sub-regions across the northern landscape, a wider look at Late Woodland and Mississippian interaction is achieved.

Zetina-Gutiérrez, Guadalupe (Zona de Monumentos Arqueológicos El Tajín, INAH) and Armando Anaya-Hernández (Centro de Estudios Histórico-Sociales de la Univer)

[103] *Archaeological Survey through the use of Remote Sensing (LiDAR, Photogrammetry and Satelital Imagery) and GIS*

The aim of this paper is to show how remote sensing (LiDAR, photogrammetry and satellite imagery), along with GIS are changing the ways in which archaeological resources are being identified, recorded, and researched. Traditional methods and techniques are not enough to prevent the potential risks that these resources face due to the accelerated pace of growth of a globalized world. Thanks to the development of Information and communications technologies (ICT), archaeologists now have a technological tool that will assist them in the better management of these resources. How these technologies can transform not only archaeological practice but also public policies in Mexico is a matter of concern that should be addressed. In this paper we present a couple of case studies (Palenque's Signoury, El Tajín) in order to reach some conclusions about the use of these technologies in our discipline, their benefits, limitations, and recommendations.

Zhang, Xu [49] see Go, Matthew

Zhang, Wenjie

[67] *The Ritual System of the Zhongli King's Bronzes*

Since the Zhongli King's tomb in Anhui (China) was excavated in 2013, various types of bronze artifact were found which can be sourced to different regions in the Late-Chunqiu period. By examining these bronzes, this paper analyzes their origin, how they were arranged in the tomb and the kind of ritual system referenced by the Zhongli King, which accordingly would be helpful to get a better understanding of the exotic funeral structure of this tomb. It can be found out that the Zhongli state was creating its ritual system through the Jin and Chu states and mixing respectively two different bronze sets together to form a new bronze repertoire. Similar phenomenon was also seen in some other elite tombs, which showed shifts in ritual practices after Middle-Chunqiu period. By examining the ding-cauldron vessel in this tomb, this article is hoping to give some new insight about the Lie-Ding issue in the Zhou Dynasty, especially about the differences and similarities of Lie-Ding system between northern and southern China.

[67] *Chair*

Zhang, Xu (Research Center for Chinese Frontier Archaeology, Jilin University)

[67] *Gained Bioarchaeological Insight from the Skeletal Human Remains at Dabaoshan, South Central Inner Mongolia, China*

South central Inner Mongolia, China has been defined as an area where two economically diverse prehistoric cultures interacted: northern nomadic pastoralists and southern sedentary agriculturalists. Earlier archaeological work suggested that cultural exchanges between these two groups occurred prior to the early Iron Age. Dabaoshan cemetery was recently excavated in this area, and contains approximately 44 individuals. Human remains from this site represent one of the earlier settlements in this region, and analysis of this material may potentially illuminate the prehistoric lifeways and relationships of ancient peoples in East Asia. However, little attention has been given to this cemetery by way of archaeological research. This study takes a bioarchaeological approach to provide a better understanding of the ancient inhabitants at Dabaoshan. Three main tasks were set: (1) compare and contrast the morphological traits of Dabaoshan against other archaeological sites in northern China in order to gain insight into population affinities, (2) investigate the living and health conditions of communities residing in the Great Wall area of northern China during the Eastern Zhou period, and (3) clarify the internal relationships between the health, social distribution system, and special geographic environment of this early stratified society.

Zhang, Liangren

[102] *The Dispersion of Early Painted Pottery in Northwest China*

The dispersion of resource-based goods, such as obsidian and metals, has been a common subject in world archaeological literature and various mechanisms such as migration, gift exchange, and trade have been conjured up to explain it. The dispersion of painted pottery, by contrast, has been glaringly understudied. Although the raw materials for this product are less geographically constrained, its dispersion has not been well appreciated and explained. This paper aims to address the movement of the painted pottery of the Siba culture in the Hexi Corridor to the Tianshanbeilu

culture in Eastern Xinjiang, and the Qijia culture in eastern Gansu and Qinghai provinces. The dispersion to Tianshanbeilu has been well noticed but an explanation is wanting. This paper argues that a group of Siba migrants brought the painted pottery technology to Eastern Xinjiang. The painted pottery found in the Qijia culture, however, has been traditionally conceived as an integral element of a regional variant. Given the fact that Qijia has a tradition of making grey pottery, whereas the Siba culture has a tradition of making painted pottery, the motion of the Siba pottery is apparent and this paper will further entertain the ideas of gift exchange and trade.

[102] *Chair*

Zhang, Li (Zhengzhou University)

[115] *What Was Erlitou? Social Transformations from the Longshan Period to the Erlitou Period in a Network Perspective*

This article detaches Erlitou from the paradigm of “state formation”, and argues for an alternative approach: investigating the continuities and shifts in the multiple networks of politics, ideologies, and economics from the Longshan period to the Erlitou period. The development of political networks featured massive population relocations into the Luoyang basin to stabilize the new social order in the Erlitou polity. Transformed political and ethnographic patterns went hand in hand with changes in Erlitou’s funerary rituals, which bolstered the legitimacy and authority of the Erlitou polity. Moreover, societies participating in the exchange of elite assemblages shifted their networks as Erlitou rose to prominence, which fundamentally changed the patterns of economic activity.

Zhang, Juzhong (University of Science and Technology of China), Ling Yao (University of Science and Technology of China), Yuzhang Yang (University of Science and Technology of China) and Weiya Li (University of Science and Technology of China)

[179] *Analysis of Plant Micro-botanical Remains from the Jiahu, Peiligang and Tanghu Sites in the Upper Reaches of the Huaihe River*

Since 2010, we have extracted plentiful plant micro-remains from the surfaces of both stone artifacts and pottery recovered from the Jiahu (9000-7500 cal. yr BP), Peiligang (8500-7000 cal. yr BP) and Tanghu sites in central Henan Province, China. Through micro-morphological examination, starch grains and phytoliths from *Oryza*, *Triticeae* Dumort and millet were identified. These remains reflect the existence of mixed farming of rice and millet in the upper reaches of the Huaihe River 7000 years ago. We also found plentiful plant micro-remains from *Dioscorea*, *Vigna*, *Quercus*, *Coix*, *Trapa* and lotus root. However, the composition ratios of micro-botanical remains in these three sites are significantly different. This finding indicates that the geographical and climatic conditions were different in these three sites. These conditions have affected human’s selection and acquisition of the plant resources. In conclusion, we believe that a mixed farming agricultural pattern of rice and millet had formed in the upper reaches of the Huaihe River between 9000 to 7000 BP. However, this pattern was initial and in the primary stage and gathering activities still played an important role in the ancient subsistence practices.

Zhao, Kun [89] see Martinon-Torres, Marcos

Zhao, Shan (Michigan Technological University), Jaroslaw Drelich (Michigan Technological University) and Timothy James Scarlett (Michigan Technological University)

[126] *Revised Drying Conditions in Rehydroxylation (RHx) Technique for Dating Ceramic Artifacts*

The Fired Clay Ceramic Rehydroxylation Dating (RHx) technique shows potential for establishing date of manufacture for archaeological ceramics, however for certain samples, such as those recovered at Umbro Greek and Sant’ Ancieto sites, the calculated ages were outside of the expected range by many thousand years. The observation of this over-shooting issue suggested that either the non-refractory mass (M_{nrc}) or some strongly bonded physical water were left during the ordinary drying process at 105°C. XRD analysis of the samples eliminated the possibility that other minerals retained extra crystallized water. FTIR analysis of the samples between 100-700°C indicated that only water and CO₂ were lost from the samples, allowing researchers to rule out mass loss from carbonizing organic compounds. Combined FTIR and TG analysis indicated that overshooting age

calculations derived from the release of physical water. By retesting the samples using a dehydroxylation firing at 300 °C, all those less stable components were dried leaving only hydroxyl water contributing to the RHX mass. With the newly measured dehydroxylated mass, the RHX dating formula produced better dates. Calculated dates for two samples, 2,732 and 2,646 years) are now very close to their expected age ranges (2400-2300 and 3210-2850 years respectively).

Zhou, Jing [37] see Flad, Rowan

Ziegenbein, Linda (University of Massachusetts)

[307] *Turning a Blind Eye: Thoughts on an Archaeology of Disability*

Since the 1990s, archaeologists have increasingly become interested in teasing apart the varied experiences of the past. Feminist and critical race frameworks have forced a reconsideration of the stories that have been told and whose viewpoints have been privileged in historical interpretation. One area that remains undertheorized and poorly understood across the discipline is the role impairment has played and its effect on people and society. This paper considers what an archaeology of disability would look like. Moving beyond biomedical perspectives on impairment, it offers ways in which attending to ability can further research into material culture studies and the archaeology of war. Finally, it discusses the life of David Ruggles, a blind African American abolitionist, journalist and doctor, from a landscape perspective noting that central to understanding his experience of the western Massachusetts environment was his position as a visually impaired person. In closing, the paper offers thoughts on how a focus on disability can improve archaeological practice with fellow practitioners as well as the general public.

Ziesing, Grace [48] see Harris, Matthew

Zikmund, Tomáš [12] see Láznicková-Galetová, Martina

Zimansky, Paul (Stony Brook University)

[285] *Identity and Specialization in the Urartian Settlement at Ayanis*

From its beginning in the 9th century B.C. the infrastructure of kingdom of Urartu was built around fortresses. In the early 7th century, the fortress network was enhanced by the construction of a new group of massive fortified administrative centers associated with extramural settlements. Of the latter, Ayanis is the most extensively investigated. Survey and excavations conducted from 1997 to 2009 investigated the relationship between the inhabitants of this settlement and the controlling institutions in the fortress. The settlement appears to be diverse, constructed with a mixture of planned and agglutinated houses, with elements of material culture suggesting mixed traditions in different areas. The settlement existed solely to serve the fortress and was abandoned, without perceptible destruction levels, when the citadel was destroyed.

Zimmer-Dauphinee, James [230] see Wiewel, Adam

Zimmerman, Larry (IUPUI/Eiteljorg Museum)

[146] *On the Need for More "Gut Theory" in Academic Archaeology*

If we want archaeology to matter we need to get back to some basics. Processual archaeology got archaeologists drunk on theory. Post-Processual archaeology offered what appeared to be a hangover cure, but was really just the "hair-of-the-dog." In its theory addiction, the discipline seems to be hooked on a "philosophy du jour," stimulating in the classroom, a dissertation, or a monograph, but which quickly gets stale and unsatisfying. Academic archaeologists in particular seem to lose sight of what they have and its real power, material culture in its contexts. Artifacts don't lie; they are there or they are not. All we have to do is to figure out what they are, who put them there, when, possibly why, and maybe even how that information might be applied. Most of that is nothing fancy, requiring only some decent technology and common sense—gut theory—to figure out. Much of what we do relies on straightforward pattern recognition, not some philosophical perspective that even

philosophers argue about and have a tough time communicating. Several examples from activist archaeology demonstrate that archaeology's publics have little use for what they see as abstruse, ivory-tower silliness and how we might do things better.

[30] *Discussant*

Zimmermann, Mario [24] see Matos Llanes, Carlos

Zimmermann, Mario (Washington State University), Carlos Matos (Universidad Autonoma de Yucatan), Lilia Fernandez (Universidad Autonoma de Yucatan) and Rafael Cobos (Universidad Autonoma de Yucatan)

[130] *Games and Foodstuffs at Chichen Itza: Relating Patolli and Starch Grains at Structure 2D6*
Structure 2D6 is a gallery-patio type building situated within Chichen Itza's site core right north of the Temple of the Warriors and the Temple of the Big Tables. Its gallery was excavated in 2009 and discoveries included a C-shaped bench following the buildings walls with just one exception — an altar right next to the passage that leads to the patio — as well as several column caches and a possible sacrificial stone. The removal of roof debris also freed up a well-preserved stucco floor that covers the structure's interior. Detailed cleaning of the gallery's southern half unraveled the presence of three patolli or bul fields carved directly into the plaster surface. The same kinds of graffiti had already been identified in a series of other Mesoamerican sites and are usually interpreted as the result of male-exclusive gambling activities. Chemical residue analyses performed on floor samples from Structure 2D6 showed distinctive enrichment patterns in the patolli's immediate vicinity. Our paper reports on starch grains recovered from that area, linking what seems to be a specific activity with particular foodstuffs.

[130] *Chair*

Zimpel, Carlos (Departamento de Arqueologia - Fundação Universidade Federal de Rondônia), Francisco Pugliese (Laboratório de Arqueologia dos Trópicos - USP), Thiago Hermenegildo (Laboratório de Arqueologia dos Trópicos - USP), Gabriela Carneiro (Universidade Federal do Oeste do Pará-Brazil) and Myrtle Shock (Universidade Federal do Oeste do Pará)

[326] *Guaporé River: Shell Mounds, Earthworks and the Explanation of the Archaeological Record*
Localized in the southwest Amazon, the Guaporé River defines the border between Brazil and Bolívia, being a significant route for the movement of goods, values and ideas since ancient times. This is attested by the presence of different archaeological sites (shell mounds, geoglyphs, ceramics associated with terra preta, rock art) that occur from around 8,000 BP to colonial times, historical evidence from colonial documents, linguistic and ethnological information, and hypotheses raised by anthropology. In this presentation we intend to demonstrate the value of this information as well as find elements that demonstrate an ancient relationship between different actors, including adjacent regions, which help explain the archaeological variability that today is found.

Zimpel Neto, Carlos Augusto [326] see Pugliese, Francisco Antonio

Zinsious, Brandon (University of Louisville) and Jonathan Haws (University of Louisville)

[8] *Unmanned Aerial Vehicles in Archaeological Survey: Results from Portugal and Mozambique*

Any technological advance that can save archaeologists time, money and manpower should be explored thoroughly. This poster presents the use of Unmanned Aerial Vehicles (UAVs), or Drones, as a supplemental tool to traditional archaeological survey. Examples from Portugal and Mozambique are included to give visual representations of the possible uses of drone technologies. We used a commercially-available Phantom 2 quadcopter with a GoPro camera for coastal survey in Praia Ray Cortico, Portugal. Specifically, we used the drone-mounted camera to visually inspect largely inaccessible cliff deposits in order to evaluate their archaeological potential. In Mozambique, we used the drone to conduct aerial survey in advance of pedestrian survey teams in the roadless landscape of Ncuála Valley, in northern Mozambique. The drone enabled the inspection of potential

areas for rock shelters and other open-air site locations. The drone-mounted camera was instrumental in being able to target specific areas and eliminate others from further consideration thus saving valuable time. This poster also includes discussions on methodologies of specific uses of the drone and attached camera. Potential future uses include LiDAR and GPS mapping to create small-scale DEMs.

Zipf, Alexander [100] see Loos, Lukas

Zipkin, Andrew (The George Washington University), Alison Brooks (The George Washington University), John Hanchar (Memorial University of Newfoundland), Kathy Schick (Indiana University) and Nicholas Toth (Indiana University)

[215] *The Preferential Collection and Use of Ochre Pigments and Iron Ores at Twin Rivers Kopje, Zambia*

Twin Rivers Kopje, Zambia is a Middle and Later Stone Age site first excavated by J. Desmond Clark that has yielded extensive evidence of mineral pigment collection and use dating to as old as 300,000 years ago. In this study, we sampled pigment sources within 25 km of Twin Rivers for digital colorimetry and trace element fingerprinting using Laser Ablation - Inductively Coupled Plasma Mass Spectrometry. In addition, all pigment excavated from the site by Clark was analyzed for sourcing. Multiple ferruginous minerals are represented in the pigment assemblage; notably, the visually striking mineral specularite was found to have been preferentially abraded in contrast to hematite and other iron minerals which were predominantly flaked. We propose that this is due to the metallic reflective qualities of specularite and its red-purple streak which contrasts with the dull red-brown of hematite. Surveys identified a major source of vein mineralization specularite 19 km northwest of the site at Sanje Hill. Multivariate statistical analysis of trace element fingerprints assigned a number of pigment artifacts to this source with high confidence, suggesting that other iron oxide deposits closer to the site were ignored in favor of this prominent source of high quality pigment.

Zovar, Jennifer (Whatcom Community College)

[184] *Post-Collapse Change and Continuity in Bolivia's Desaguadero Valley*

There is often a discontinuity between studies of 'collapse' and studies of post-collapse periods. This can lead to the periods following collapse being defined by a "lack" of what came before. In the southern Titicaca basin, for example, the period following the collapse of the Tiwanaku state has been defined by a lack of monumental construction, raised fields, large-scale feasting events, or Tiwanaku-style iconography. Nevertheless, recent explorations have demonstrated that while "collapse" is generally understood as a relatively "rapid" sociopolitical shift, it does not necessarily lead to abrupt discontinuity in the lives of individuals or communities, especially in non-elite circles. In Bolivia's Desaguadero Valley, for example, significant continuities are noted in utilitarian ceramics and everyday domestic architecture at the same time that there were major changes in ceremonial patterns and larger-scale settlement organization. This paper interrogates the multifaceted nature of these changes and continuities through the process of collapse and subsequent post-collapse reorganization in the Desaguadero Valley.

Zovar, Joel (Louisiana Division of Archaeology)

[201] *Digital Solutions in an Imperfect World: Digital Asset Management, Outreach and the Crisis in Curation*

Difficult realities have set in for some cultural resource professionals. Space (and funding) to protect cultural materials is at a premium, causing some curators and archaeologists to think about heritage preservation and site conservation in new ways. Using the presenter's experiences developing an archaeology outreach website, this paper explores how digital asset management has become a useful addition to traditional methods of artifact and site conservation in Louisiana, a state with a rich but endangered archaeological heritage. Digital asset management may offer curators and site managers some assurance and enhanced opportunities for outreach, even if it is not an ideal solution to the existing crisis in conservation.

Zuckerman, Molly K. [220] see Mathena, Sarah

Zúñiga Arellano, Belem (Proyecto Templo Mayor)

[298] *Marine Mollusks as Evidence of Mexica Imperial Expansion*

Of the approximately 175 offerings uncovered in the Templo Mayor Project excavations (1978–present) of Tenochtitlan's sacred precinct led by Eduardo Matos Moctezuma, 60 reportedly contained marine mollusks. Among them, 47 offerings, dating from 1440 to 1521 CE, were explored between 1978 and 2006, while 13, dating from the reign of Ahuitzotl (1486–1502), were recovered between 2007 and 2013. In the first group, 180 species were identified, including 119 endemic to the Caribbean, 41 to the Pacific, and 5 to both areas. The second group added 71 new examples for a total of 251 taxa, including 130 Caribbean, 112 Pacific, and 5 endemic to both coasts. As one can see, these data reveal a notable increase of Pacific species coming to Tenochtitlan during Ahuitzotl's reign. This preponderance and the presence of species such as *Terebra brandi*, *Nassarius luteostomus*, and *Hipponix grayanus*, whose distribution includes the modern-day Mexican states of Colima, Jalisco, Nayarit, and Sinaloa, and others such as *Corbula chittyana* and *Noetia magna*, respectively from the Yucatan Peninsula and Nicaragua, would suggest Mexica imperial expansion to the north and south during this period.

Zurro, Débora [48] see Miguel Quesada, Francisco J.

Zurro, Debora (CaSEs. Dept Archaeology & Anthropology. IMF-CSIC)

[176] *An Ethnoarchaeological Study on Anthropic Markers from a Shell-Midden in Tierra del Fuego: Lanashuaia II*

Hunter-gatherer sites constitute often challenging research contexts within the discipline of archaeology; identifying and even defining whom Tierra del Fuego constitute an optimum arena for studying anthropic markers in hunter-gatherers sites for two reasons: a) good preservation of archaeological remains; b) a rich ethnographic record about hunter-fisher-gatherer societies who inhabited this region. The aim of this work is to present the first results of an intrasite spatial analysis, based on the distribution of different proxies and archaeological materials, carried out on a layer from the site Lanashuaia II, a shell midden located on the Beagle Channel coast (Tierra del Fuego, Argentina). Ethnoarchaeology is used as a methodological tool to give content to the concept of anthropic markers by means of formulating archaeological hypothesis on the basis of ethnological information. Geostatistical results are expected to be representative of the social uses of space, such as productive or consumption areas within the habitat and its surroundings.

[73] *Discussant*

[176] *Chair*

Zutter, Cynthia (MacEwan University)

[302] *Digging Deep or Just Scratching the Surface: Challenges and Successes with Labrador Inuit Archaeobotany*

Over past decade, I have assembled a reasonable variety of archaeobotanical data sets from 17th and 18th century Labrador Inuit sites, which includes both macro- (seeds, wood) and micro-botanicals (phytoliths and starches). The recovery and interpretation of these remains, however, has met with many challenges. I will discuss a number of these challenges along with the successes of this work and provide some guidelines to further archaeobotanical research and other work of this type in the Arctic.

Zych, Thomas (University of Toledo)

[182] *Rock and Roles: The Chunkey Experience in the Mississippian World*

Games have the ability to change the course of relationships between people, whether through direct engagement as participants or spectators. This paper explores the peripatetic nature of the pre-contact Chunkey game and its role in the initial and sustained spread of Middle Mississippian lifeways from the greater Cahokia region near modern day St. Louis, beginning around A.D. 1050.

While Middle Mississippian culture quickly spread throughout the midcontinent at this time, the Chunkey game itself became grounded in the movement of people and objects through meaningful physical and social landscapes, providing opportunities for individuals and communities to engage in the shared experiences of this sport. Stone discs used in the game survive in the archaeological record as remnants of this sport; objects of a material practice that facilitated the creation of new social memories and identities every time the game was played. Through these stones and the spread of Chunkey, spectators and players incorporated new collective (or perhaps diverging) mythic histories into this game tied to the distant place of Cahokia. Citing past events, these histories reconfigured and united communities within a common historical identity, while simultaneously constructing differences between opponents.