

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, approve, or censor them. Descriptions of events and titles are those of the organizers, not the Society.

SYMPOSIUM ABSTRACTS

[1] Forum · PRESIDENT'S FORUM: WHAT WE HAVE LEARNED

What have we learned through the lens of the archaeological record that is really useful for society today? Why do we continue to do archaeology, and why is it important? Archaeologists with diverse perspectives, experiences, and situations answer this question for themselves, and for you.

[2] General Session · PRECONTACT ARCHAEOLOGY IN SOUTH AMERICA

[3] General Session · CENTRAL ASIAN ARCHAEOLOGY

[4] General Session · SOUTHWEST ASIA: MESOLITHIC, CHALCOLITHIC AND NEOLITHIC

[5] General Session · SURVEYS AND SETTLEMENT PATTERNS IN NORTH AMERICA

[6] Poster Session · LITHIC ANALYSIS IN SOUTH AND CENTRAL AMERICA

[7] Poster Session · ZOOARCHAEOLOGY: MESOAMERICA & SOUTH AMERICA

[8] Poster Session · CAVES & ROCKSHELTERS

[9] Poster Session · ARCHAEOOMETRY I

[10] Poster Session · ZOOARCHAEOLOGY: THE WEST COAST

[11] Poster Session · ARCHAEOLOGICAL APPROACHES IN GIS: CENTRAL AMERICA

[12] Poster Session · ARCHAEOLOGICAL APPROACHES IN GIS: OLD WORLD

[13] Poster Session · THE PACIFIC ISLANDS

[14] Poster Session · ARCHAEOLOGY OF COLONIALISM

[15] Poster Session · MUSEUMS & COLLECTIONS

[16] General Session · ARCTIC NORTH AMERICA

[17] General Session · ANDEAN ARCHAEOLOGY: FORMATIVE AND MIDDLE HORIZONS

[18] General Session · SURVEY, REMOTE SENSING AND SITE FORMATION IN MAYA ARCHAEOLOGY

[19] General Session · MESOAMERICA: ARCHAEOLOGY OF THE GULF AND PACIFIC COASTS

- [20] General Session · RESEARCH FROM OCEANIA AND THE AUSTRALIAN CONTINENT
- [21] General Session · MIGRATION, TRADE AND MOBILITY IN NORTH AMERICAN PREHISTORY
- [22] General Session · MATERIAL CULTURE ANALYSIS IN THE NORTHEAST
- [23] General Session · HISTORIC ARCHAEOLOGY IN THE OLD WORLD
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- [25] General Session · IDENTITY, GENDER AND ETHNICITY
- [26] General Session · MIDWESTERN NORTH AMERICA: VILLAGE FARMERS
- [27] General Session · THE ANCESTRAL PUEBLO PERIOD
- [28] General Session · CLASSIC MESOAMERICA: LANDSCAPE, MONUMENTALITY AND HOUSEHOLD ARCHAEOLOGY
- [29] General Session · PREHISTORIC AND PROTOHISTORIC RESEARCH FROM EUROPE
- [30] General Session · SOCIOPOLITICAL ORGANIZATION AND ARCHITECTURE IN MAYA ARCHAEOLOGY
- [31] General Session · HIGHLAND MESOAMERICA
- [32] General Session · AFRICAN ARCHAEOLOGY
- [33] General Session · ICONOGRAPHY, SYMBOLISM AND IDENTITY IN MESOAMERICA
- [34] General Session · COASTAL AND ISLAND ARCHAEOLOGY
- [35] General Session · LANDSCAPE AND ECOLOGY IN THE SOUTHEASTERN UNITED STATES
- [36] General Session · CONTACT PERIOD ARCHAEOLOGY
- [37] General Session · PRECLASSIC, CLASSIC AND POSTCLASSIC MAYA
- [38] General Session · THE ARCHAEOLOGY OF THE GREAT BASIN AND CALIFORNIA
- [39] General Session · HISTORIC ARCHAEOLOGY IN THE NEW WORLD
- [40] General Session · DIGITAL LANDSCAPES I—APPLICATIONS IN GIS
- [41] General Session · OLD WORLD PALAEOLITHIC

[42] General Session · CULTURAL RESOURCES AND HERITAGE MANAGEMENT IN THE AMERICAS**[43] General Session · ZOOARCHAEOLOGY AND SUBSISTENCE****[44] General Session · NORTH AMERICAN HUNTER-GATHERERS****[45] General Session · EAST ASIA: THE JOMON AND NEOLITHIC PERIODS****[46] General Session · MATERIALS ANALYSIS AND ARCHAEOMETRY IN ANDEAN ARCHAELOGY****[47] Poster Session · PALEOINDIAN ARCHAELOGY****[48] Poster Session · SETTLEMENT & MIGRATION****[49] Poster Session · ICONOGRAPHY AND EPIGRAPHY****[50] Poster Session · ARCTIC AND SUBARCTIC ARCHAELOGY****[51] Poster Session · THE CARIBBEAN****[52] Poster Session · NORTH AMERICAN ARCHAIC****[53] Poster Session · FIGHTING ANTI-SCIENCE HYSTERIA THROUGH PUBLIC ARCHAELOGY**

Today, the political environment is characterized by individuals that embrace an anti-science hysteria, and are indifferent or hostile to the preservation of cultural heritage. We need to convince the general public that archaeology is not simply an esoteric exploration of a past that holds no real meaning to the problems that beset society today. Rather, we must communicate to the general public and politicians of all persuasions that archaeology can offer solutions to the present determined through our study of the past. This session explores ways of reaching a skeptical and sometimes hostile public about archaeology, using old and new techniques alike.

[54] Poster Session · A MEDITERRANEAN WORLD, 6000 BC–AD 2000: ARCHAELOGY AND HISTORY OF BOVA MARINA, ITALY

Southern Aspromonte (Calabria, Italy) represents a Mediterranean landscape of coastline and high mountains; between the Neolithic and today, humans have inhabited it in many different ways. Through excavation, field survey, history and ethnography, the Bova Marina Archaeological Project (1997 —) has investigated both long-term continuities and historical diversity, focusing upon its ecology, politics, and communities. The posters presented here highlight the project's diverse findings and provide a composite that together give a complex portrait of how humans have created a social world in this rugged Mediterranean world.

[55] Poster Session · NEW RESEARCH IN SOUTH CENTRAL MICHOACÁN MÉXICO

In the last five years there has been a new effort to understand the archaeology of the South Central Michoacan region. This particular area had previously only been studied by a few archaeological projects focused in specific archaeological zones. In recent years, the Instituto Nacional de Antropología e Historia has set up a large regional project that covers a portion of the Balsas river basin in the state of Michoacan. A large number of students from different Mexican and American Universities have participated; this group features archaeologists and researchers with diverse specialties. In this poster session we will present the ongoing studies of this multidisciplinary approach.

[56] General Session · SOUTHEAST AND SOUTH ASIAN ARCHAELOGY**[57] Symposium · ARCHAEOLOGICAL RESEARCH IN THE HISPANIC CARIBBEAN**

Historically archaeological research in the Caribbean has been mostly focused on human activity of the indigenous populations. In the last decades, there has been a considerable increase of investigations concentrating on the colonial period, especially to explain the dynamics related to the colonization and conquest processes, the coffee and sugar estates, government institutions, and slavery. This symposium will address research currently being conducted in Puerto Rico and Cuba. Case studies will showcase the types of documents that can be included in archaeological projects to further expand our understanding of land use, building modifications and commercial activities in rural and urban areas. The presentations will concentrate on intra and

extramural areas in San Juan de Puerto Rico during the 19th and early 20th centuries, and a sugar estate in Cuba.

[58] General Session · ETHNOARCHAEOLOGICAL APPROACHES

[59] Electronic Symposium · RECENT DEVELOPMENTS IN MEXICAN AND CENTRAL AMERICAN PRECERAMIC RESEARCH

Preceramic investigations in Mexico and nearby Central America have enjoyed some resurgence in recent years, with new projects and laboratory analyses conducted in both lowland and highland settings from West Mexico to Honduras. This research is targeting Archaic and Paleoindian periods, and increasingly exploiting the complementarity of rockshelter and open-air sites, while also incorporating information from off-site settings. This resurgence is helping to define a new era in preceramic research, one that moves beyond the primary themes of First Americans and agricultural origins to look more broadly at how early regional traditions developed. Growing regional databases and comparisons between these, including through provenience studies, are shedding light on several anthropological topics, many of which are presented in this electronic session. Discussions are organized around certain key themes: confidently identifying and dating earliest records; defining the emergence of the earliest "Archaic" adaptations; identifying early patterns of mobility and exchange; exploring environmental connections that contributed to important patterned, regional adaptations; and documenting the early appearance of key social innovations that intensify over time and are closely associated with post-Archaic Mesoamerica.

[60] Forum · CHALLENGES IN TEACHING NAGPRA

The teaching and learning of ethical practice is a central concern to all disciplines, and archaeologists have an ethical obligation to recognize how their studies of material cultures impact descendant communities and present-day stakeholders. The Native American Graves Protection and Repatriation Act (NAGPRA) was passed in 1990 to protect the rights of tribal and Native Hawaiian communities to control their heritage and create a process for federal agencies, museum professionals, archaeologists, and tribal representatives to work together. NAGPRA's mandate of consultation has been echoed by a growing body of national and international policies and instruments. A generation after the law was passed, however, there continues to be confusion about how and hesitancy about why to teach about NAGPRA. There is a need for qualified professionals who appreciate both scientific and tribal interests to implement NAGPRA projects and participatory research. But what knowledge, practical skills, and ethical considerations are needed and how can they be imparted by educators and mentors in the classroom as well as in field or museum settings? In this forum we invite the SAA membership to share their experiences with NAGPRA as educators and professionals in order to explore successes and challenges in repatriation education.

[61] Forum · ARCHAEOLOGY AND INNOVATIVE OUTREACH: BEYOND THE LECTURE

At a time when science funding is hard to come by, making science relevant in the eyes of the public is extremely important. While go-to forms of archaeology outreach, such as lectures, are still valuable, the number of places, real and digital, open to talk about archaeological information has increased the ways that we can interact with the public. This can involve expanding the presence of archaeologists on things like social media, through Twitter and Instagram, as well as embracing the myriad ways that people get information through blogs, podcasts, twitch, video games, and by attending non-academic gatherings. All of these avenues allow the public to interact directly with archaeologists quickly and regularly, keeping them abreast of new discoveries and informing them of what archaeology is really like. However, a common critique of technology based outreach is that it tends to be an archaeological echo chamber, with archaeologists following one another rather than getting non-archaeologists, and non-scientists involved. This forum is interested in discussing those outreach possibilities that go beyond the lecture and museum event to better fulfill our duties to the public and discuss the efficacy of these methods at building audiences.

[62] Forum · FORENSIC ARCHAEOLOGY

This session aims to discuss recent developments in the field of forensic archaeology in the United States. How can forensic archaeology work alongside, yet differentiate itself from forensic anthropology? What current issues does the field face? What sort of employment opportunities are there at the local, state, and federal levels? What sort of cases have recently utilized our colleagues? This forum brings together forensic archaeologists from across the country to discuss these topics and how our knowledge of site formation processes, scavenging behaviors, and artifact deposition contribute to analysis and site behavior interpretations. We hope to pool our collective experience with that of the forum attendees to strengthen this budding community.

[63] General Session · GLOBAL ISSUES IN PUBLIC ARCHAEOLOGY AND CULTURAL HERITAGE

[64] Symposium · NEW RESEARCH ON LATE PRECERAMIC PERU: PERSPECTIVES FOR AN INTEGRATED VIEW

Recent research on Late Preceramic Period (ca. 5800–3600) of the Peruvian Andes is showing a diverse scenario for the development of coastal and highland communities associated with the construction of monumental architecture during this period. New data shows a broader scenario for the origin of such social development and it is showing the importance of regional studies to understand the context in which those sites originated and how they transformed over time. Nevertheless, current archaeological theory about this topic needs to include this new data in order to gain a more integrated understanding of key social transformation of this period. This session aims to expose this new data discussing local scenarios under a more regional perspective.

[65] General Session · ANDEAN ARCHAEOLOGY: LATE AND LATE INTERMEDIATE HORIZONS

[66] General Session · MORTUARY ARCHAEOLOGY IN THE AMERICAS**[67] General Session · GLOBAL STUDIES ON SLAVERY****[68] General Session · DIGITAL LANDSCAPES II—PHOTOGRAMMETRY, REMOTE SENSING AND DRONES****[69] General Session · CERAMIC ANALYSIS****[70] General Session · CONSERVATION AND MUSEUM STUDIES****[71] General Session · SOUTHWEST ASIA: BRONZE, IRON AND HISTORIC PERIODS****[72] Symposium · RESEARCH AND MANAGEMENT OF TRADITIONAL CULTURAL PROPERTIES IN THE SOUTHWEST**

In this symposium, we critically assess how traditional cultural properties are identified and managed in the southwestern United States, focusing on the benefits and challenges for traditional communities, researchers, and historic preservation officials. More than twenty-five years have passed since traditional cultural properties were first defined in National Register Bulletin 38 in 1990. Since then, there has been substantial effort in the southwestern United States to develop protocols for identification and management of historic properties whose significance comes from the role they play in the retention and transmission of traditional beliefs and practices. As Patricia L. Parker emphasized, "It is necessary to try to understand traditional places through the eyes of those who value them." Doing this requires collaborative efforts between researchers and traditional communities, and it necessitates new approaches to management and mitigation of adverse effects by federal agencies. Perspectives on current issues in the research and management of traditional cultural properties are presented from people working for tribal, federal, and state agencies, and in the private sector.

[73] General Session · ICONOGRAPHY AND ROCK ART**[74] General Session · DATING TECHNIQUES****[75] Symposium · LANDSCAPES OF WARFARE: A COMPARATIVE PERSPECTIVE**

This session is an effort to put together different theoretical perspectives on the relationship between warfare and built landscapes. Through the comparison of cases from different parts of the world we aim to analyze and compare the following topics: How did violence between groups influence the ways people are distributed in the landscape? How were ritual landscapes affected and modified by warfare? How were economic activities allocated during violent times? How were collectivities and identities transformed by war? How did warfare influence the allocation of resources and labor? How did the built landscapes of warfare become a legacy that affect the life of their descents? How did past episodes of warfare were part of the political territory and fixed in toponymy?

[76] Symposium · EMERGING FROM THE SHADOW OF THE CEIBA: RECENT RESEARCH IN MAYA PALEOETHNOBOTANY

Paleoethnobotany has been employed in Maya archaeology for several decades, but remains underutilized. From early pollen analysis to the extensive wetland agricultural research in northern Belize, and most recently starch and phytolith studies, past research programs have shown that plant material can and does preserve in the tropical environs of the Maya lowlands. Today, Maya archaeology benefits from an increasing number of specialists who examine issues related to past plant use by looking at carbonized plant parts, microbotanical remains, and chemical residues. These studies continue to contribute to our understanding of Maya agricultural production and subsistence. However, paleoethnobotany is also beginning to enter scholarly debates on ritual, politics, power, and many other avenues. Despite making strides, most botanical research remains relatively isolated and few archaeologists understand the potential that botanical datasets can contribute to Maya archaeology. This symposium seeks to set the foundation for increased communication between Mesoamerican paleoethnobotanists and to create a more integrated work sphere. By acknowledging common grounds and research interests, as a group we can strengthen our field's outward projection. As part of the session, we will address current methodological innovations, theoretical directions, and issues that impact the field.

[77] General Session · ARCHAOMETRY AND MATERIALS ANALYSIS**[78] Symposium · MARINE ARCHAEOLOGY: RETROSPECTIVE/PROSPECTIVE**

Marine Archaeology is the interdisciplinary study of past human life, behaviors and cultures and their associated activities in, on, around and under the sea, estuaries and rivers. Originally focused on the study of shipwrecks, the field is transforming in response to current and emerging challenges. This session will explore the present and future contributions of Marine Archaeology in terms of techniques and technologies, analytical and interpretative methods and theoretical approaches. Drawing

on the experiences of practitioners from around the world, topics to be discussed will include the integration of different scales of analysis when seeking to understand the past, the need for gathering reliable and accessible data to enable the effective management of underwater cultural heritage resources and how to better understand the range of people's relationships to the sea in the past.

[79] Symposium · PAPERS IN HONOR OF DENNIS STANFORD

Contributed papers relating to the life and career of Dr. Dennis Stanford and his contributions to the Paleoindian archaeology of the Americas.

[80] Symposium · THE FLEXIBLE MAYA CITY: ATTRACTION, CONTRACTION, AND PLANNING IN CLASSIC URBAN DYNAMICS

Lowland Maya cities have witnessed intense scholarly debate concerning their "urban" nature. Recently, debate has shifted from largely demographic factors to the design and planning behind Maya urban layouts. While a welcome advance for the field, design theory in the Maya lowlands has often emphasized top-down processes of dynastic intent and meaning within monumental cores, to the near exclusion of bottom-up local, regional, and hinterland processes of settlement and community adaptation, mobility, and interaction in creating the broader low-density urban forms recorded by archaeologists. Maya towns and cities were not only central places resulting from "place-making" regal policies, but also, and even primarily, were urban entities with their own internal dynamics in relation to their hinterlands.

This session will offer a broadened perspective of Maya urban design and planning, viewing bottom-up and self-organizing processes, such as household decision-making and neighborhood clustering, dispersal/contraction as integral to the development and dissolution of Classic lowland cities. These approaches highlight the flexibility of lowland urban settlements over time and emphasize applying both household and hinterland perspectives to study Classic urban society, including its eventual failure. These approaches will improve interpretations of lowland Maya culture history, and simultaneously contribute to discussions of low-density urbanism world-wide.

[81] General Session · SOUTHEASTERN NORTH AMERICA FROM PREHISTORY TO THE CONTACT PERIOD

[82] Symposium · SOCIOPOLITICAL INTEGRATION IN PREHISPANIC NEIGHBORHOODS: COMPARATIVE PERSPECTIVES

(SPONSORED BY CENTER FOR COMPARATIVE ARCHAEOLOGY—UNIVERSITY OF PITTSBURGH)

In the last decade the neighborhood has seen a renewed use becoming a fruitful unit of analysis in the archaeology of complex societies. By applying this concept scholars have started to answer distinct questions, and at the same time new line of inquiry have been set. The neighborhood, as a methodological tool, allows for comparison to different kinds of urban forms such as compact and dispersed patterns. It also allows for comparison in different scales, such as within cities as well as local communities within regions. The Andes and Mesoamerica present rich and diverse examples of neighborhood organization. Our session explores the variability in ways that the Prehispanic communities of the New World were integrated socio-politically. We explore the neighborhood as the primary methodological unit of analysis in this exercise, as it formed the constituent units of many ancient cities. The primary question in our analysis is how well were neighborhoods integrated into ancient cities and/or polities in the Andes and Mesoamerica?

[83] Symposium · BEYOND CENTRALITY: BRIDGING NETWORK APPROACHES THROUGH ARCHAEOLOGICAL NARRATIVES

Network-based approaches have increased in popularity in archaeology, largely for their ability to quantify interactions across space and through time that otherwise are difficult to parse. As methods in network analysis advance, the greatest promise for answering questions about the past lies in the ability to bridge approaches and analyze data from micro- to macro-scales. In this session researchers are encouraged to use network-based approaches to examine archaeological systems through multiple lenses and/or multiple scales, moving beyond reporting statistics such as centrality to interpreting their meaning in light of varied approaches. How can combining social and ecological approaches to networks help illuminate past systems? How do empirical and experimental networks differ, and what does this tell us about the past? How does looking at multiple kinds of networks in the same area help to interpret social changes? How can researchers today use quantitative output from network analysis to interpret the past and produce compelling narratives? Ultimately each of these approaches will return to advancing archaeological narratives, helping to interpret long-standing questions in accessible terms, and even using the archaeological record to calibrate our understanding of present and future networks.

[84] Symposium · SHELL MIDDENS: FORMATION, FUNCTION, SURVEY, AND ENDANGERED CULTURAL/PALEOENVIRONMENTAL HERITAGE

(SPONSORED BY GIG)

Shell middens are widely distributed coastal archaeological features that contain a unique record of cultural and paleoenvironmental change. These aboriginal accumulations contain centimeters to meters of mollusk shells and frequently include artifacts and other faunal remains. As a result, they record past lifeways, terrestrial and marine species distributions/seasonality, and environmental conditions. The buffering effect of the decomposition of carbonate shells yields preservation of organic artifacts that are often not preserved in other settings. Additionally, climate-change driven sea-level rise threatens many of these valuable cultural and paleoenvironmental archives. This session invites presentations that describe various aspects of shell midden investigations; shell midden formational processes, potential functions of shell middens, interpretations of shell midden contents, noninvasive remote sensing techniques applied to shell middens, and monitoring and rescue strategies that seek to protect the valuable information contained in these important archaeological features.

[85] General Session · GLOBAL APPROACHES TO LANDSCAPE ARCHAEOLOGY**[86] General Session · GLOBAL APPROACHES TO PALEOETHNOBOTANY****[87] Symposium · THE ARCHAEOLOGY OF CHILDCARE***(SPONSORED BY SOCIETY FOR THE STUDY OF CHILDHOOD IN THE PAST)*

This session will examine the archaeological evidence for the myriad ways in which children were cared for in past societies, incorporating case-studies from both prehistory and historical periods. The contributors discuss aspects of social, cultural and physical care, exploring both the behaviour of adults and the social practice of children themselves. Care for the child commences with maternal health and the birth process and continues through infancy and childhood until social independence and adulthood are reached. It requires their physical, cultural and social needs to be met, and for children to become, through their own practice, social agents. The papers in this session will address each of these stages of childcare, drawing on evidence from biological anthropology, material culture, the built environment, ritual contexts and experimental approaches. The papers will enable us to explore the similarities and culturally constructed differences in the ways in which communities and families care for their children, and provide opportunities for them to become social actors. Whether deliberately or accidentally, care for children was sometimes deleterious to their well-being, and the session will also confront the realities of this in past societies. In sum, the session asks of children in the past—who cares?

[88] General Session · BIOARCHAEOLOGY AND FORENSIC ANTHROPOLOGY**[89] General Session · EXPERIMENTAL ARCHAEOLOGY****[90] Symposium · DISCS, FISH, SQUIRRELS AND SCAT: PAPERS IN HONOR OF WALTER KLIPPEL**

This symposium honors the career of Dr. Walter Klippel and his scholarly contributions to the studies of taphonomy, environmental change in the Southeastern United States, and subsistence practices in North America, the Caribbean Islands and Crete. Klippel began his career working in rock shelters in Missouri, and went on to run large field projects in Middle Tennessee and to create a world-class zooarchaeological comparative collection. Former and current students and colleagues cover a broad range of topics inspired by Klippel's interests in zooarchaeology and archaeology, including animal induced taphonomy, subsistence practices, morphological and range changes in species over time, species identifications, and allometry. These papers come from diverse temporal and geographic contexts and represent the broad impact Dr. Klippel has had on the careers of so many archaeologists and zooarchaeologists.

[91] Poster Session · STRONG CURRENTS IN GILA BASIN RESEARCH

The Gila River drainage crosscuts the Mimbres Mogollon, Hohokam, and Salado archaeological culture areas, providing an excellent perspective for examining social and environmental variation in the past. This session focuses on the upper Gila in southwest New Mexico, a poorly documented region that has recently witnessed a surge in archaeological research. Here Mogollon and some Hohokam influences are clearly visible until about AD 1300. During the fourteenth century, settlements characterized as Cliff phase Salado combined elements of earlier cultural patterns with new influences from the Kayenta region and beyond. Results from recent fieldwork in the area and new research on ceramics, ground stone, fauna, and other materials provide insights into local and regional patterns and variability. Additional research projects from the Middle Gila and Chaco allow regional comparisons, placing upper Gila research in a larger context within the U.S. Southwest.

[92] Poster Session · THE GREAT BASIN BEFORE 9000 BP

Despite accelerating research, the fundamental nature of Great Basin adaptations predating 9000 BP remains the center of debate. Researchers question whether hunter-gatherers of the Pleistocene-Holocene Transition followed lifeways that were fundamentally distinct from or similar to subsequent Archaic, broad-spectrum patterns. Sometimes sparse evidence regarding diet breadth, land use patterns, mobility and sedentism, and technological organization are interpreted in conflicting ways. This poster session convenes researchers at various career stages working across the region to evaluate the state of knowledge on Prearchaic subsistence, mobility, and technology to better synthesize this important period of North American archaeology.

[93] Poster Session · DESARROLLO POBLACIONAL, PRODUCCIÓN, APROVECHAMIENTO Y COSMOVISIÓN EN LAS ZONAS VOLCÁNICAS DE LA COSTA DEL GOLFO

La Costa del Golfo Mesoamericano fue un área que se caracterizó por la variedad y riqueza de nichos ecológicos y culturales. Las regiones volcánicas de Veracruz fueron escenarios de explotación y aprovechamiento de recursos comerciados a lo largo de Mesoamérica en diferentes temporalidades. Asimismo, sirvieron como referentes geográficos, ideológicos y sagrados en el paisaje prehispánico. Este simposio tiene como objetivo exponer y discutir resultados de investigaciones arqueológicas recientes que se llevan a cabo en las diversas zonas volcánicas que se encuentran en la Costa del Golfo mesoamericano.

[94] Poster Session · ARCHAEOLOGY AND ACTIVE LEARNING: THERE'S NO NEED TO REINVENT THE WHEEL*(SPONSORED BY SAA COMMITTEE ON CURRICULUM)*

Archaeology continues to be a misunderstood discipline among college students and the general public, young and old. Student/public learning remains a key goal of the discipline for reasons that range from preservation of the archaeological record to looking to the future for bettering society. Available pedagogical strategies range widely but discussions of teaching are sparse

in our discipline. Currently, pedagogies that emphasize active learning represent a best practice. Importantly, active learning is not one-size-fits-all but can take a number of forms. Here, presenters explore active learning strategies they have implemented by describing a pedagogical case study and discussing evidence for its effectiveness. While rewarding, implementing new teaching strategies is never easy. Thus, presenters also discuss barriers, costs, and logistical considerations for employing particular forms of active learning with the goal of smoothing the road for interested professors to incorporate innovative activities in their own archaeology courses.

[95] Poster Session · CERAMIC PETROGRAPHERS IN THE AMERICAS: PROMOTING THE ADVANCEMENT AND APPLICATION OF PETROGRAPHY IN ARCHAEOLOGY

A marked resurgence in the use of petrography to answer archaeological questions has resulted in the formation of Ceramic Petrographers in the Americas (CPA), a group that seeks to promote, discuss, and develop ceramic petrography in archaeology. While CPA members physically reside in the Americas, our research spans the globe both temporally and geographically as illustrated by the posters to be presented. The goal of this session is to provide a venue for the discussion and advancement of ceramic petrography and other characterization techniques among petrographers of all skill levels. In this session, ceramic petrography is used in a variety of archaeological cases to investigate social processes (i.e., cultural continuity, identity, migration, and mortuary behavior) by drawing on both qualitative and quantitative data related to raw material selection, ceramic technology, and provenance, as well as highlight additional sourcing techniques (e.g., SEM, EDX, XRF, and INAA) and tools (i.e., digital image analysis, ethnographic interviews, and experimental archaeology) currently used by petrographers.

[96] Forum · BEARS EARS, THE ANTIQUITIES ACT, AND THE STATUS OF OUR NATIONAL MONUMENTS

(SAA PRESIDENT-SPONSORED SESSION)

The Antiquities Act of 1906 has been an amazingly effective tool for the landscape-scale protection of cultural and natural resources in the United States. Crafted by archaeologist Edgar Lee Hewett, in consultation with Representative Lacy of Iowa, the bill was signed into law by President Theodore Roosevelt on June 8, 1906. Roosevelt immediately went to work. When he left office in 1909, he had made proclamations to establish 18 national monuments in 9 western states. In subsequent years 15 additional presidents, of both political parties, used the Antiquities Act to establish national monuments that number over 150 and total nearly 250 million acres. Until the Bears Ears National Monument proclamation by President Obama on December 28, 2016, there has never been a national monument effort where Native Americans took the lead. For Bears Ears, it was a coalition of five tribes that took the leadership role. Archaeologists were there as supporters as well. When Donald Trump was sworn in as the nation's 45th president, more than a century of preservation efforts under the Antiquities Act came under severe threat. This Forum brings together historical, tribal, government, and up-to-the-moment perspectives on the Antiquities Act through the case study of Bears Ears.

[97] Symposium · ADVANCES IN BIOMOLECULAR ARCHAEOLOGY

Biomolecular methods have become popular in answering a variety of archaeological questions because of the unique and complex information that can be derived from their application. This session is focused on methods that can analytically elucidate issues related to past populations' interactions. The emphasis of this session is ancient DNA, but will also include protein, lipid, and carbohydrate analyses. Ancient biomolecules are well suited to investigations of interaction and exchange between populations, in addition to understanding the patterns of past migrations and disease. Both human and faunal specimens will be addressed, as the molecular ecology of archaeofauna and other associated taxa is equally important in developing understandings of past environments, which are inherently essential to any robust archaeological analysis.

[98] Poster Session · EUROPEAN ARCHAEOLOGY: SCOTLAND AND IRELAND

[99] Poster Session · AFRICAN PALAEO-LITHIC STUDIES

[100] Poster Session · NEW DIRECTIONS IN INCA ARCHAEOLOGY

The Incas ruled the largest empire of the pre-Columbian Americas. With Cuzco as its capital, the Inca empire encompassed a multitude of peoples of diverse geographic origins and cultural traditions. At its onset, military campaigns extended power across a broad swath of the Andean region, bringing local societies into new relationships with colonists and state officials. This session is dedicated to revealing the origins, expansion and aftermath of this empire. It will explore the political economy and institutions that facilitated expansion, including case studies on provincial and frontier regions. At a finer scale, it will highlight the effects of state policies on the communities and individuals that made up the bulk of the population. Other papers will discuss religious power, and the special statuses that staffed the state religion, maintained records, served royal households, and produced fine state craft goods. The Incas did not disappear in 1532, and the session will also focus on the Colonial and later periods, exploring the effects of the Spanish conquest on the lives of the indigenous populations. Moving into the present, the session will provide an overview of the ways in which the image of the Inca is memorialized and reinterpreted by contemporary Andeans.

[101] Poster Session · A BEER IN THE HAND IS BETTER WITH AN OCULUS RIFT ON THE FACE: A MULTIMEDIA "POSTERS AFTER-HOURS" SESSION FEATURING HANDS-ON INTERACTIVE STATIONS AND IMMERSIVE VIRTUAL REALITY TECHNOLOGIES

(SPONSORED BY SAA DIGITAL DATA INTEREST GROUP [DDIG])

In the same way that GIS and Remote Sensing technologies quickly became indispensable components of the archaeologist's toolkit nearly two decades ago, 3D scanning, printing and modeling, digital photogrammetry, and immersive virtual reality represent new frontiers of tech that are rapidly becoming adopted for widespread use in archaeology. This symposium aims to take the traditional 2-dimensional poster session format to a new level commensurate with these fascinating and dynamic technologies. To that end, each presenter in the session is encouraged to transform their allotted poster space into a multimedia

“station,” which either presents the various tools of the trade that they are currently employing in the field, or includes a laptop, flat-screen TV, Oculus Rift headset (or any combination of all of these) in order to provide visitors with a hands-on, interactive experience.

[102] Poster Session · NEW APPROACHES IN SOUTHEASTERN ARCHAEOLOGY: RESEARCH FROM THE RENEWED FSU DEPARTMENT OF ANTHROPOLOGY

(SPONSORED BY FLORIDA STATE UNIVERSITY DEPARTMENT OF ANTHROPOLOGY)

The Southeastern United States has some of the oldest archaeological sites in the Americas, some of the densest concentrations of archaeological materials, and some of the earliest evidence for complex societies in the Americas. At the same time, Southeastern archaeology is challenging due to poor organic preservation, poor separation of components, poor site visibility, and modern site destruction from looting, development, and sea level rise. Further, much of the early cultural record was submerged offshore by the more than 130m of sea level rise from ca. 21,000–5,000 years ago, meaning that we know little about how early people may have used the coasts. Therefore, new methods of modeling and analysis hold great promise for mitigating these challenges and providing insight about how past Southeasterners lived and adapted to their changing worlds. The archaeologists in this session ask new questions of curated assemblages, analyze and interpret materials from recent excavations, and use new methods and techniques to shed light on some of Southeastern archaeology's most enduring problems.

[103] Poster Session · QUANTITATIVE MODELING OF ARCHAEOLOGICAL DATA

(SPONSORED BY SAA QUANTITATIVE METHODS AND STATISTICAL COMPUTING IN ARCHAEOLOGY INTEREST GROUP [QUANTARCH])

Quantitative data modeling is fundamental to archaeological inquiry. This type of modeling transcends material types, cultural phases, methodological approaches, and research questions to evaluate how well archaeological observations support theoretical expectations. The Quantitative Methods and Statistical Computing in Archaeology Interest Group (QUANTARCH) is sponsoring this symposium to exhibit the range of analytical techniques currently used to model data and evaluate archaeological hypotheses and theories. Symposium participants share an interest in testing archaeological hypotheses regarding cultural variability by harnessing a wide range of analytical modeling methods derived from computational, mathematical, spatial, statistical, and graphical approaches. In their presentations, they address archaeological questions across diverse sub-disciplines, geographical regions, and temporal ranges. We hope the broad nature of this symposium will appeal to a wide variety of participants of the Society for American Archaeology meeting.

[104] Poster Session · INVESTIGATIONS OF ETHNOGENESIS AT LA 20,000, A 17TH-CENTURY SPANISH RANCH IN NEW MEXICO

Ethnogenesis in colonial situations relies, in part, on the exchange and transmission of cultural practices between colonial actors and indigenous peoples. Missions are frequently identified as the most powerful venue for Spanish colonialism and the prime context for ethnogenesis during the first years of Spanish occupation in the American Southwest. However, the goals of the missionaries and their skewed demography made for distinct relationships with the Pueblo peoples among whom they lived. In New Mexico, colonists' households were another important location of cultural interaction, one that came with different goals, demography, and power relations. Exchanges of information between Spanish colonists and indigenous groups were critical to the survival of the colony as indigenous peoples' labor and knowledge were useful for basic subsistence activities. This session explores one such household at the Sanchez Site (LA 20,000), a 17th-century Spanish ranch in northern New Mexico. Here Spanish colonizers, Pueblo people, and most likely enslaved Plains people toiled in a household that produced livestock, crops, and textiles in a politicized atmosphere of information exchange. The posters in this session bring together a broad range of analyses to investigate activities at the ranch and the influence of all peoples who labored there.

[105] Poster Session · PEOPLE 3K: INVESTIGATING POTENTIAL TIPPING POINTS GENERATED BY THE CLIMATE-POPULATION-RESOURCE MANAGEMENT NEXUS OVER THE LAST 3,000 YEARS

(SPONSORED BY PAST GLOBAL CHANGES)

One of the least understood aspects of paleoscience is the role of climate in driving long-term human population change, and, in turn, how changes in population size and structure influence the strategies that individuals use to manage resources. The papers in this poster session will investigate long-term changes in the climate-human population-resource management nexus during the late Holocene (3000 years BP to present). Two broad questions drive the research: (1) Under what environmental conditions do small and medium scale human societies begin to grow and appropriate more energy from ecosystems, and (2) Why did societies undergo major reorganizations and experience population change during the last 3000 years (e.g., during the Medieval Warm Period to Little Ice Age transition)? This session is part of a long-term project sponsored by Past Global Changes called PEOPLE 3000. By analyzing case studies and developing formal mathematical frameworks and frames of reference for comparing cases, our session will advance theories of long-term human demography and more nuanced views of sustainability grounded in the long-term dynamics of the climate-human population-resource management nexus.

[106] Poster Session · STRATEGIES FOR MANAGING CULTURAL RESOURCES IN WILDERNESS AREAS OF THE UNITED STATES FOREST SERVICE

The United States Forest Service manages over 36 million acres of congressionally designated wilderness in 37 states from Alaska to Florida and from Maine to California. Cultural resource management within a wilderness setting can be challenging, but preservation for some of our nation's most important archaeological and historic sites is worth the effort. This poster symposium explores a wide array of strategies employed by Forest Service heritage program managers and archaeologists to manage, protect, preserve and interpret wilderness cultural resources for the public benefit.

[107] Symposium · “ETHICAL” ENGAGEMENT WITH HISTORIC CEMETERIES: FROM “ISSUES” TO A MULTIPLE CONSCIOUSNESS

It has become de rigueur to mention ethics in reporting research, creating a paradox wherein archaeologists want to engage with ethical questions but have so diluted these concepts through perfunctory lip service as to render them nearly meaningless. From

this comfortable position, archaeologists have failed to challenge the Western cultural basis for these “issues.” Growing urbanization in the United States presents moral challenges as the exhumation of historic cemeteries becomes increasingly common. These challenges generate wide-ranging questions: Is this unavoidable? Who is ultimately responsible? Are some groups more deserving of analysis than others? What research is prioritized when money is scarce? Professional codes of ethics provide an insufficient framework for responding to these questions, resulting in inadvertent entrenchment that limits the scope of potential hypotheses and epistemic growth and overlooks the power of counter-narratives. The archaeology of historic cemeteries is uniquely placed for social engagement. We propose a redefinition of “ethics” that encompasses syncretism between divergent modern communities and judicious excavation. Building on the work of W.E.B. Du Bois and Alison Wylie, we seek to embrace a multiple consciousness as a component of an evolving practice. This session presents field narratives that address the current conflict between “ethic” and action.

[108] Symposium · REAL, RECENT, OR REPLICA? AMERINDIAN (AND NEO-AMERINDIAN) ICONOGRAPHY IN THE CARIBBEAN

Collectors of antiquities have long sought the ornate pottery and carved wood and stonework of the pre-Columbian Caribbean—a quick search for “Saladoid” or “Taino” on internet gallery/auction sites shows a thriving black market. Its scale has remained largely unexplored, to the detriment of regional and international archaeology and museology. In response to the increasingly growing market, various attempts have been made to discourage looting via replica workshops, community archaeology, and other interventions. Many efforts prove unsustainable, however, and in some cases participants were left with the skills to both identify Amerindian remains and create forgeries that eventually end up on display in museums. This symposium will examine the unintended consequences, cautionary tales, and lessons learned from an often overlooked—but highly prolific—region of the antiquities market. In the process, we will illuminate new understandings and strategies for both combating the global antiquities trade and encouraging sustainable economic impacts for those who make a living creating new art forms, inspired by the past yet reinterpreted for the present.

[109] Electronic Symposium · DEBT IN PRE-MODERN STATE ECONOMIES FROM AN ARCHAEOLOGICAL PERSPECTIVE

Contributors will consider recent arguments about ancient state economies in David Graeber’s book, *Debt: The First 5,000 Years*, from the perspective of archaeological and interdisciplinary research. What archaeological evidence exists in Mesoamerica (and comparative regions) for: the importance of debt before markets and money, regularly extended debt amnesties, the nonexistence of barter markets, the use of tokens or units of account without the need for actual/plentiful monetary units, debt peonage, slavery, the interdependent relationships of political, social and commercial institutions, and challenges to “primordial debt” theory that citizens owed unfathomable debt to their societies and/or gods that could only be fully repaid at death. How does archaeological data reflect evidence of debt’s importance in ways beyond traditional understandings of tribute and taxation, and what changes correlate with “heroic” regimes or especially militarized periods? What approaches are useful in other regions? How can we document “human economies,” in which inalienable possessions (including human beings) are transformed into systems where preciosities assume quantitative values, i.e., morality-governed economies are converted to “impersonal arithmetic” in practices ranging from bride exchange to war captives/slaves. How do theoretical paradigms such as “moral economy” and “collective action theory” intersect with the debt theories advanced by Graeber?

[110] Electronic Symposium · PRACTICING ARCHAEOLOGY IN THE CONTEMPORARY POLITICAL CLIMATE

(SPONSORED BY ARCHAEOLOGY DIVISION, AMERICAN ANTHROPOLOGICAL ASSOCIATION)

Denial of fact, revisionist history, “Alt-right” rallies, creationism, monument controversies, flat-earth revival, climate conspiracy—the last year has caused many to question their assumptions about the state of American discourse and national consensus on a variety of scientific, social and political issues. The misinterpretation and misuse of scientific research is not new to anthropologists, however, since the days of Franz Boas and his students, anthropology has also included responses to racism through public engagement and community outreach. This panel engages with these histories and futures of archaeology in the political sphere. Structured as a roundtable conversation growing out of an electronic symposium, this session includes participants working on questions such as scientific and historical literacy in public outreach; how archaeologists can learn from Indigenous perspectives on heritage and history; the instrumentation of historical and archaeological narratives and symbols; debates surrounding monuments and memory; and the role of archaeologists in the recent March for Science and climate change debates. This panel brings together scholars working at the crux of archaeology and the contemporary to reflect on these problematic trends and to provide critical perspectives on potential ways toward a more socially engaged archaeology.

[111] Electronic Symposium · ENVIRONMENTAL CHANGES AND THEIR IMPACT ON DIETARY ADAPTATION IN SUBTROPICAL CLIMATES

The environment of Florida is a classic example in which fluctuating coastlines, water levels, and the emergence of tree islands led to significant human adaptation to the landscape. When examining the impacts of these hydrological changes to plants and animals over a broad period of time, it is clear that human populations have continuously adapted to make use of the available resources. As environmental adaptations continue to occur due to climate change, the dietary variation recorded archaeologically, or through Tribal Member oral histories, will prove useful in determining how climate change has affected animal populations and how humans have adapted to new environments. This symposium will provide an opportunity to review a regional analysis of sites impacted by environmental change, and how this has affected human subsistence patterns over a broad period of time.

[112] Forum · MENTORING UNDERGRADUATE RESEARCH IN ARCHAEOLOGY: THE GOOD, THE BAD, AND THE UGLY

(SPONSORED BY COUNCIL FOR UNDERGRADUATE RESEARCH [CUR])

Involving students in undergraduate research in archaeology is essential as research in the field demands hands-on experiences. At the center of any good undergraduate experience is high quality mentorship and collaboration at the student-faculty, faculty-administration, and project-general public (local, regional, national, and international) levels. This session will examine the best practices of archaeological research, mentorship, and collaboration. In addition to the “good,” the session also will address some of the “bad” and “ugly” experiences that researchers have faced and how the researchers have used those experiences to improve the research experience for all involved.

[113] Symposium · SEASCAPES, WATERSCAPES AND THE RELATIONAL

In this session we consider how seascapes and waterscapes relate to the many and varied people, things, and places with which humans live. While many aspects of the archaeological record can be interpreted as referencing the watery realm through association (e.g., shell middens) or visual cues (e.g., rock art), our goal with this session is not to focus on simply identifying these connections, but to interrogate the nature of these relationships—to consider how water acts as a relational presence, and one that is informed by epistemologies and ontologies. Writing in the context of maritime people in Australia, McNiven (2008:149) identifies a 'relational nexus between people, spirits, and the sea'—a useful observation that orients our thinking about the various elements that can be used to explore the water/people relationship. We wish to address the complex relational aspects between people, things, and water as a way of better understanding the social/cultural networks in which they are embedded, and the myriad ways people construct, maintain and express their identity. This session includes papers that draw on archaeological, ethnographic and historical resources to address the relational through the lens of the watery realm.

[114] Symposium · INDIGENOUS ARCHAEOLOGIES: GLOBAL PERSPECTIVES ON ENGAGING WITH HERITAGE AND INTERPRETING THE PAST

Recent research in archaeology, anthropology, and heritage studies has examined the varied ways in which indigenous communities interpret and (re-)construct their past. Ancestral places, structures, and things provide fertile ground (and physical evidence) for people to negotiate the meaning of the past, remember ancestors, and to build, maintain, and revive ancestral knowledge. Indigenous archaeology has been couched as a knowledge-producing partnership between Western scientific methods (e.g., subsurface excavation, radiocarbon dating, artefact analysis) and indigenous ways of knowing the past. This session aims instead to foreground indigenous people as archaeological practitioners, examining how people interpret their past through engagement with archaeological and geomorphological features such as ancient landscapes, ecological patterns, surface finds, and subsurface sediments. We aim to bring together worldwide trans-disciplinary case studies to consider these indigenous past-making methodologies. This session asks what our discipline can learn from indigenous archaeologies, and their associated theoretical, methodological, and interpretational perspectives.

[115] Symposium · RESULTS OF THE NEH- AND NGS-FUNDED EXCAVATION AND ANALYSIS OF ROOM 28 IN PUEBLO BONITO

Initially excavated by the Hyde Exploring Expedition in 1896, Room 28 in Pueblo Bonito is best known as the room where cylinder jars were first identified in the U.S. Southwest and the locus of a cache of 111 such jars. In 2013, a crew from the University of New Mexico, led by Patricia Crown and funded by NEH and the National Geographic Society re-excavated Room 28 to record the original stratigraphy of the room, remove datable materials, and determine whether the HEE project located the room floor. The six week excavations recovered a remarkable assemblage of artifacts, fauna, and plant remains. Analyses of this material and collections from AMNH and NMAI permit new understanding of this part of Pueblo Bonito, including the northern burial cluster. It also shows how looting and backfilling affected our understanding of Pueblo Bonito.

[116] Symposium · ANTHROPOGENIC RAINFOREST: LANDSCAPE MANAGEMENT IN THE AMAZON BEFORE THE EUROPEAN CONQUEST

The symposium will explore the human active role in the landscape management and in the creation of a distinctive anthropogenic landscape in the Amazon rainforest over the past millennia. The presentations in this session will show that the indigenous people in the past did not adapted to environmental limitations, as previous cultural ecology theories posited. Instead, they manipulated and modified the landscape to meet social-economic needs. The native Amazonian population built an anthropogenic landscape through the creation of causeways, well or ponds away from rivers, raised fields, earthworks, large settlement mounds, Amazonian dark Earth soils and anthropogenic forest. When the Europeans arrived in the Americas, large and diverse groups of people with extensive networks of communication and hierarchical social-political organization had developed across the Amazon, and they had been constantly manipulating and managing the landscape to meet their everyday needs. Therefore, the Amazonian landscape provides a very important database for understanding previous occupation in this region.

[117] Symposium · VOICING THE COLONIZED: AN EXPLORATION OF DIFFERING EXPERIENCES AND RESPONSES TO CONQUEST FROM THE OLD AND NEW WORLD

From the Romans to the Inca, empires have conquered regional ethnic groups to gain access to territory and resources. While past research has focused on the role of intruding colonizers and assumes a passive response from smaller ethnic groups, this session takes a bottom-up approach and explores how processes of colonialism, defined as practices of control between two asymmetrical powers, are reacted to by subordinate groups and how local active agency transforms their own identities through alterations in their daily aspects of life. Were foreign practices resisted, adopted, or combined and hybridized with current practices? Did different social groups respond differently to the foreign group? This session takes a multi-component focus in examining both cultural (ex. architecture, ceramics) and biological data in order to understand the many facets in how societies respond to conquest. Additionally, this session examines both old and new world examples in order to compare and contrast differing experiences of colonialism. Overall, this session adds to our current understanding of how local communities resist and conform during times of conquest and serves as an analogy for modern interactions between dominant and subordinate ethnic groups.

[118] General Session · ADVANCES IN DIGITAL ARCHAEOLOGY**[119] Symposium · 1300–1500 CE: MIGRATION, RELOCATION, AND ABANDONMENT IN EASTERN NORTH AMERICA**

The period 1300–1500 CE in eastern North America is marked by profound migration episodes and depopulation of large areas that created clustering of societies on a regional scale. This interval is also associated with dramatic events like the collapse of Cahokia, village formation among non-Mississippian communities, and significant outbreaks of intergroup violence. To date, there

have been no broad-scale comparative studies across the larger region to address whether these events and trends are linked at a near-continental scale, or else are relatively independent, serendipitous phenomena. By gathering researchers from several areas across the Eastern Woodlands, this session aims to provide a better understanding of where depopulation, migration, relocation, internal growth and change, and stasis occurred and how these larger settlement and demographic events relate to social, political, economic, and ideological factors. The ultimate goal is to describe and explain the movement and distribution of communities and societies across eastern North America and explore to what degree these events in various regions were interconnected.

[120] Symposium · FLUTED POINT TECHNOLOGY: VARIATION ACROSS A HEMISPHERE

The transmission of Clovis fluted point technology, the earliest well-dated fluted point industry, is considered to have spawned regional variants of point forms as a result of cultural drift and founder effects as Paleoindian groups dispersed throughout the Western Hemisphere and adapted to local ecological settings. Recent research on fluted point technology in North and South America has highlighted such variability in technology and morphology across both geographic space and time. Now more than ever, researchers across the Western Hemisphere focus on understanding regional variants in fluted point technology in terms of their evolutionary development, historical relationships to earlier forms, and functional advantage in specific ecological settings. Traditional methods of technological and morphological comparison are met with digital analyses of morphology and shape using geometric morphometrics, phylogenetic analyses using cladistics, experimental analyses of function and manufacture, and technological analyses of manufacture sequence and reduction protocols. The papers in this session discuss morphology and technology of fluted point variants, such as Folsom, Cumberland, Barnes, Northern Fluted, Gainey, Suwannee, Fishtail, and their relationships to neighboring forms, both spatially and chronologically, as well as evolutionary evidence of their historical development and origin.

[121] Symposium · URBANISM, TECHNOLOGY, AND IDENTITY: CELEBRATING THE COMPARATIVE ARCHAEOLOGY OF RITA P. WRIGHT

Rita P. Wright's hallmark contribution to archaeology is a suite of concepts and critiques that provide a comparative framework that is unrestricted to a single geographical area. In her early work on ceramic production and craft, Wright synthesized the anthropology of technology with the archaeology of the Indo-Iranian borderlands, laying the foundation for a technological approach that transformed the archaeology of South Asia. Her critical re-evaluation of early cities, states, and complex societies incorporated past people and groups previously omitted from investigation, bringing to the forefront the political and economic dimensions of households and other social entities. Her work also drove the archaeology of identity and gender, correcting traditional approaches that too often left humanity out of explanations of the past. She has also established a landscape approach that examines the social relations that connected the city of Harappa to its many surrounding settlements, she has revealed rural/urban interactions that drove the emergence and transformation of urbanism. Wright has set the agenda for a new generation of comparative archaeology. The papers in this session celebrate this legacy, reflecting many threads of her research and providing an opening statement for an anthropological archaeology that is more insightful, holistic, and comparative.

[122] Symposium · AGENT OF CHANGE: THE DEPOSITION AND MANIPULATION OF ASH IN THE PAST

The archaeological record has an incredible diversity of depositional practices within and outside structures and features. This symposium focuses on one particular understudied constituent of deposits, ash, which has an underappreciated, singularized role in deposit composition throughout North America. The association of ash with assemblages of rare or unusual objects, and in the transition or transformation of depositional patterns is notable and suggests ash deposition is involved with ritual practices. World-wide, ash has been associated with fire and thus representative of or possessing transformative properties including purification. This symposium explores the properties, uses, meaning, and cross-cultural patterns in the deposition and manipulation of ash as it relates to ritual closure, social memory, and cultural transformation.

[123] Symposium · MATERIAL CULTURE AND MULTIVOCAL CULTURAL DIALOGUE IN THE CONSTRUCTION OF THE CRIOLLO UNIVERSE OF THE CARIBBEAN

Studies on the emergence and development of the creole societies of the Caribbean have centered on the socio-cultural mix produced by the colonial processes without considering similar phenomena present in the region during Pre-Columbian times. The application of category of indio has blurred, denigrated, and homogenized these people and the plurality of ways in which they interacted, placed themselves, and were present in the creole universe of the Caribbean. The production of simplistic views of the creolization process is due to the focus on the inter-cultural engagements between Europeans and Indians or between Europeans and Africans. Moreover, such perspectives have obscured the plurality of the indigenous groups who resided in the Caribbean. In this session, we will also explore a range of theoretical and methodological perspectives used in the studies of the heritage and cultural continuity of the Indigenous presence in the Caribbean. Many earlier models are based on outdated reductionist notions that leave little room to study processes such as transculturation, hybridization and ethnogenesis. We hope to contribute to "rethinking" of traditional models and contribute to a better understanding of cultural mixture processes and the emergence of creole societies in the Caribbean region.

[124] Symposium · INTRA-SITE SPATIAL ANALYSIS OF MOBILE PEOPLES: ANALYTICAL APPROACHES TO RECONSTRUCTING OCCUPATION HISTORY

Site level spatial analyses provides a means to evaluate past human behaviors such as the types of activities performed, the duration of occupation, and size of groups. However, the record is often fragmented and disorderly. Mobile peoples leave a spatial structure that is particularly convoluted, often lacking the features used as proxies of organizational parameters among more sedentary groups. Discerning between continuous and repeated occupations is another major challenge. Intra-site spatial analyses offer a way to untangle the archaeological record. Such studies have led to a proliferation of approaches but these efforts are rarely quantified in a manner that makes results comparable. This session will present papers covering a broad range of time periods and regions intended to foster a comparative analytical approach presently lacking in spatial analysis studies.

[125] Symposium · GETTING TO KNOW THE NEIGHBORS: ARCHAEOLOGICAL INVESTIGATIONS OF COMMENSAL ANIMALS

Commensal animals have cohabitated with humans for tens of thousands of years and played numerous roles in past societies, including as cherished companions, pests, food sources, and cultural symbols. In contrast to domestic animals, the term 'commensal' is biologically defined as an interspecies relationship wherein one species benefits and the other species experiences no impact. However, the complexities of commensal relationships between humans and animals become readily apparent once the term is applied to particular taxa and societies. Commensal animals have adapted to anthropogenic environments by living alongside humans and becoming dependent on their dwelling spaces and resources for survival. Explicit investigation of the commensal niche remains an underexplored topic in archaeology, despite the information these species can provide regarding anthropogenic ecosystems, lifeways, and food webs. Occupying the realms between 'domestic' and 'wild,' commensal species are positioned to provide a unique perspective on the dynamic interactions between human societies and ecosystems. This symposium aims to bring together diverse geographic, taxonomic, methodological, and theoretical perspectives to synthesize and advance current archaeological research on commensal animals and investigate their impacts on past human societies, animal species, food webs, and ecology.

[126] Symposium · COPROLITE RESEARCH: ARCHAEOLOGICAL AND PALEOENVIRONMENTAL POTENTIALS

Coprolites are unique packages of information that can provide high-resolution snapshots of an individual's diet and health, and how this varied over different timescales. Coprolite studies have traditionally focused on gross morphology and the microscopic analysis of inclusions such as parasites and plants. These approaches provide important information on human subsistence, health, and the environmental context of human adaptation, but coprolites can be morphologically ambiguous, and digestive processes break down many bone and plant fragments making their identification difficult. What we can see under a microscope is therefore only a fraction of what was eaten. New biomolecular methods are beginning to show promise in coprolite studies, and provide important additional information on human diet and health by analysing 'invisible' dietary clues. This session brings together an international group of researchers, covering a wide range of methodologies for the analysis of coprolites. The session aims to showcase current state of the art in coprolite research, and to establish best practice guidelines for the multi-proxy analysis of these remains. The goal of this discussion is to explore how this high-resolution information can be better integrated into broader analytical studies using more traditional forms of evidence.

[127] Symposium · RECONSTRUCTING FORAGER LIFEWAYS AT THE PLEISTOCENE-HOLOCENE TRANSITION

New information concerning the Late Pleistocene-Early Holocene transition and concomitant human adaptations continue to renew and revitalize interest in Paleoindian studies. Recent volumes concerning Paleoindian adaptations emphasize lithic technology, economy, and relationships with environmental variability. Less well represented are factors affecting assemblage formation at the site and regional levels—including social behaviors and local historical circumstances—which also must be considered in evaluating Paleoindian lifeways. Reconstructing Late Pleistocene-Early Holocene forager lifeways must rely on an accurate understanding of the interaction between cultural and natural formation processes. This symposium aims to explore how these factors including, but not limited to, mobility, interaction, and aggregation, may have operated in combination with fluctuating environmental conditions globally and locally to produce the varied archaeological signatures that characterize the Late Pleistocene to Early Holocene.

[128] Symposium · CLASSIC VERACRUZ DEITIES

Classic Veracruz was home to a variety of visual cultures and material practices referencing the supernatural. While systematic studies of gods and rites have a long established history elsewhere in Mesoamerica, particularly Highland Mexico and the Maya region, there are relatively few studies of Classic Veracruz deities as a coherent system (or systems). In this symposium participants explore the challenge of recognizing and amassing a corpus of deities in the post-Olmec Gulf lowlands, ca 1–1000 CE, with special attention to attributes, cosmography, and materials analysis. To date, Classic Veracruz deities have largely been analyzed in relation to Postclassic Mexican correlates. More recently scholars have productively explored regional and temporal continuities between Classic Veracruz and the Gulf Coast Formative period and Classic Maya, respectively. The Epiclassic period offers a particularly fruitful set of iconographic relationships forged across Mesoamerica. Regional ethnographic analogy has also been applied. In a counter-movement to these comparative studies some iconographers question the merits of assuming synchronic and diachronic continuity. Working together with a rich array of theoretical and methodological approaches this symposium seeks to generate a more nuanced understanding of Classic Veracruz religion.

[129] Symposium · PALIMPSEST URBANISM: CHARTING THE LONG-TERM DEVELOPMENT OF THE ANCIENT MAYA CENTER OF ACTUNCAN, BELIZE

Research by the Actuncan Archaeological Project since 2001 has revealed a dynamic series of boom and bust construction cycles beginning with the initial occupation of the site around 1000 B.C. and continuing until the site's abandonment during the Terminal Classic period (A.D. 1000). During its two millennium of occupation, the site developed as a low-density urban center that housed social, political, religious, and economic institutions. Drawing on collective action theory, we view the establishment and progression of Actuncan's institutions as the outcome of bargains struck between state authority and non-ruling groups. These negotiations must be viewed as iterative—informed in each instance by internal political dynamics, community practices, and local memory, as well as outside influences. The result is a palimpsest urbanism where residents lived in a historic center in which monuments, houses, and agricultural systems were built, occupied, renovated, and differentially abandoned according to existing conditions. In this symposium, contributors draw on data collected in and around Actuncan's urban center to explore the long-term trajectory of households, agricultural systems, urbanism, civic planning, and exchange at Actuncan.

[130] Symposium · DIGITAL HERITAGE TECHNOLOGIES, APPLICATIONS AND IMPACTS

The recent 'digital turn' in archaeology has spurred methodological advances and new research directions, with wide ranging impacts at multiple scales. The proliferation of imaging, remote sensing, laser scanning and photogrammetry applications has, at times, outpaced considerations about data archiving, digital epistemologies, and accessibility. This can lead to circumstances in which the creation of digital datasets is privileged over public dissemination or scholarly output—a situation that ultimately undermines the democratization of science. The future of digital heritage in archaeology thus lies in the integration of

methodological approaches to digitization with explicit project outcomes targeted at various communities and stakeholders—an approach that might be thought of as “applied digital heritage.” This session will highlight recent work in the field of digital archaeological heritage, with a focus on documentation, analysis, and dissemination. It is not constrained by geographical setting or time period. Participants are encouraged to consider the following topics: (1) digital techniques in archaeological field and lab research; (2) digital epistemologies and the interpretation of archaeological material; (3) dissemination and public engagement; and (4) the ethics and politics of digital archaeological heritage.

[131] Symposium · PERSPECTIVES ON DOCUMENTARY RELATIONS, ETHNOGRAPHIC OBSERVATIONS AND ARCHAEOLOGICAL INTERPRETATIONS: PAPERS IN HONOR OF CARROLL L. RILEY

Archaeologists once considered ethnohistorical document analysis an essential component of interpreting the archaeological record of the Mexican Northwest and U.S. Southwest (e.g., Riley 1987, 2005). Example source material included Spanish entrada accounts and Mission-era correspondence. The role of historical text sources fell out of favor with the advent of processual archaeology. Present trends associated with particularistic theories of cultural change as well as practical concerns, such as the inclusive criteria for determining NAGPRA affiliation, provide impetus to again consider the information offered from these sources. This session is intended to highlight the variable ways documentary texts are presently employed in the interpretation of archaeological data in the NW/SW. Critical points of contention in present applications include how to reconcile conflicting documentary and archaeological data and appropriate frameworks for extending historical descriptions into the past. Specifics topics of interest include the scale of interaction, the nature of political control, population estimates, causal factors in social change, and establishing continuity between modern and ancestral groups.

[132] Symposium · ARE WE INKAS? INKAS AND LOCAL POLITIES INTERACTIONS AS SEEN THROUGH THE MATERIAL CULTURE

The Tawantinsuyu was the largest New World Empire ever known. During the Inka conquest of this vast region the Inkas encountered numerous polities of different sizes and degree of complexity. The Inkas conquerors had to establish their political, social and economic systems in very disparate environments. This required the development of imperial polities that considered local identity, local social organization, local tributing, crafts production, exchange networks, geographical location, available natural resources and finally Inka imperial interests. This Symposium presents recent research exploring these heterogeneous interactions between the Inka and the local polities they dominated, through analyzing the material culture.

[133] Symposium · CHASING HUNTER-GATHERERS AND EARLY FARMERS IN THE GREAT LAKES AND BEYOND—45 YEARS OF RESEARCH DEDICATED TO UNDERSTANDING THE DYNAMICS BETWEEN PEOPLE, ENVIRONMENT, AND BEHAVIOR: PAPERS IN HONOR OF WILLIAM A. LOVIS

William (Bill) Lovis has made significant contributions to the discipline of archaeology since the early 1970s. His research and publications have included a staggering array of topics including Upper Great Lakes prehistory, the European Mesolithic, geoarchaeology, analytical methods, ethnoarchaeology, hunter-gatherers, and pedagogy. He has been many things to many people including an archaeologist, mentor, colleague, and teacher. He has undertaken various roles in the Society of American Archaeology (SAA) including Chair of the Government Affairs Committee (1989–1992), and contributed much time and leadership in ensuring the success of NAGPRA for Native American heritage. In recognition of his many contributions, he received the SAA Presidential Recognition Award in 1998. The papers assembled in this session, presented by students and colleagues, reflect the broad impact of Bill’s career with an emphasis on his archaeological legacy in the study of prehistoric hunter-gatherers, emergent farmers, and archaeological methods.

[134] Symposium · NEW APPROACHES TO THE ARCHAEOLOGY OF RITUAL IN THE SUBTERRANEAN REALM

Subterranean spaces in Mesoamerica tend to have a special character because of their association with indigenous concepts of the sacred, animate Earth. Cavities in the Earth, even when created by the mining of tepetate or sascab, tend to be seen as important and appropriated for ritual. Subterranean spaces tend to be dark and humid which also limits their utility for mundane activities. Thus, these spaces become some of the best venues for doing the archaeology of ritual. This sessions brings together papers exploring both natural and man-made spaces across a variety of contexts.

[135] Symposium · BURNING LIBRARIES: ENVIRONMENTAL THREATS TO HERITAGE AND SCIENCE

(SPONSORED BY SAA CLIMATE CHANGE STRATEGIES AND THE ARCHAEOLOGICAL RECORD COMMITTEE)

In 2015 the SAA launched the Climate Change Strategies and the Archaeological Record Committee. CCSAR has since grown rapidly, reflecting widespread concern about threats posed by climate change impacts (including wildfires, retreating glaciers and ice patches, loss of frozen ground, and accelerated erosion) to both heritage and to the scientific record. Just as new analytical approaches (including stable isotopes, trace elements, ancient DNA) are broadening the contribution of archaeological sites as a “distributed observing network of the past” for global change science our basic data is suffering accelerated loss worldwide. Local and indigenous communities are facing rapid loss of heritage and access to their past. Managers and funding agencies are seeking guidance in prioritizing response efforts, and the archaeological community at a whole faces significant challenges to our own “business as usual” practices in terms of excavation, curation, and site conservation. In alliance with IHOPE and the European Archaeological Association the CCSAR teams are working to pool expertise and broaden connections among academics, heritage practitioners, environmental managers, and (critically) local communities on the front lines of climate change.

[136] Symposium · PERFORMING IN THE SHADOWS: RITUAL PRODUCTION IN CAVES AND ROCKSHELTERS

Performances are often highly structured events that have the ability to convey crucial information about social processes. Through the differential engagement of multivocal performers and audience members, performances can operate as distilled social metaphors that are enacted through bodily participation. Over the last few decades, scholars have engaged with performance in the archaeological record, particularly through the lens of architectural spaces such as theaters, plazas, and stages. While caves have been recognized as important venues for ritual activity, the actions employed in these spaces have not been traditionally interpreted through the lens of performance or incorporated into the growing corpus of performance theory. However, the study of performance in caves affords the investigation of the intersection between natural and modified space, the

spatial and social implications for how performance is conducted and structured, and the social and political implications of cave ritual. Through case studies that are broad in geographical and temporal scope, this session explores the mechanisms of performance by expanding and refining existing frameworks as they pertain to caves.

[137] Symposium · NEXT GENERATION ARCHAEOLOGICAL SCIENCE: EVERYTHING YOU WANTED TO KNOW BUT WERE AFRAID TO ASK

(SPONSORED BY JOURNAL OF ARCHAEOLOGICAL SCIENCE)

Innovations within archaeological science are being launched and developed at a rapid pace, leading to significant advances in how we understand the past. But how to keep up with all the new ideas and techniques? And how to assess whether both the archaeology and the science are valid? This session offers an unsurpassable opportunity to update your knowledge so that you can take advantage of new approaches, but, through participating in the discussion, also contribute critically to their development and application. Leaders across the broad spectrum of archaeological science will select what they predict are the most important advances on the horizon. And, importantly, they will explain the hows and whys using language appropriate for a generalist archaeological audience. Expect to look into the future of dating, bioarchaeology, microfossils, geochemistry, isotopes and specialisms so new they don't yet have names!

[138] Symposium · ARCHAEOLOGICAL COLLECTIONS CARE FOR THE COLLECTIONS SPECIALIST: CURRENT TOPICS AND INNOVATIVE TRENDS IN THE REPOSITORY

(SPONSORED BY SAA COMMITTEE ON MUSEUMS, COLLECTIONS, AND CURATION)

Archaeological curation and collections management is an ever-changing field that draws upon new techniques and strategies for the long-term care, management, and use of objects and associated records. Technological advances continue to augment a professionally-established set of curatorial and conservation practices. This symposium, designed specifically for practicing collections managers, curators, and conservators, will explore current trends and topics in archaeological collections care including: care and management of anthropology collections; preventative conservation; creating and managing digital data; public outreach, education, and scholarly research; and curation of anthropology exhibitions. There will also be two opportunities to personally discuss your institution's unique challenges with the speakers.

[139] Symposium · CONTEXTUALIZING MUSEUM COLLECTIONS AT THE SMITHSONIAN INSTITUTION

As the archaeological community continues to grapple with the ongoing curation crisis, coupled with the lack of funding opportunities for large-scale excavation projects, museum collections are seen as valuable and sustainable resources for archaeological investigation. Nevertheless, too readily museum collections remain overlooked and underutilized. This mostly stems from the misconception that provenience and quantitative control are inadequate. Compounding this dilemma is the lack of democratized information concerning the breadth and vastness of collections in museums and difficulties gaining collections access. The Smithsonian Institution's mission is "the increase and diffusion of knowledge" and the National Museum of the American Indian (NMAI) and the Anthropology Department of the National Museum of Natural History (NMNH) make available for study some of the largest and most comprehensive archaeological and ethnographic collections and accompanying archival material representing Indigenous societies from throughout the world. This session includes a survey of archaeological and ethnographic collections under Smithsonian's stewardship and highlights research that has contextualized the collections through archaeometric techniques, comparative and archival studies, iconographic analysis, and tribal collaboration. These studies demonstrate the monumental potential of museum collections for advancing our understanding of the past.

[140] Symposium · EXTRACTION SITES AND CULTURAL LANDSCAPES

(SPONSORED BY SAA PREHISTORIC QUARRIES AND EARLY MINES INTEREST GROUP)

Archaeological research on raw material extraction sites provides opportunities to explore the scope and organization of activities that take place outside of settlement or residential contexts. For example, researchers working on extraction sites often examine reduction sequences, facilities and methods of material processing, questions of specialization, access, and apprenticeship, and transport of materials to other locations on broader cultural landscapes. In addition, sources of raw materials important to activities including tool or ceramic production, construction, or ornamentation may be used simultaneously by diverse cultural groups. Extraction sites are thus uniquely suited to addressing questions about regional processes and linkages between regions. This session brings together researchers from around the world that apply diverse theoretical and methodological approaches to the study of activities at extraction sites and their relationships to surrounding cultural landscapes.

[141] Symposium · ARTIFACT CHARACTERISTICS, PRODUCTION PROCESSES AND SOCIAL INTERACTIONS IN THE ANDEAN LANDSCAPE

While reference to established artifact terminologies is essential, new data and new analytic purposes often create a need to expand or modify style categories. Archaeometric techniques provide insight into the sources and movements of raw materials, as well as their transformation in production, artifact use, and post-deposition processes. Thus, integration of longstanding archaeological concerns and techniques with contemporary materials analysis can lead to new proposals on ways that the analysis of objects created and used by Andean peoples can inform proposals regarding their social relationships and ways of life.

Intersecting analyses of artifact style, techniques and practices, material composition and use wear provide insight into the organization of production and exchange. Leroi-Gourham's concept of chaîne opératoire and Lechtman's concept of technical style inform a close examination of components and their transformations, production practices and their sequences, formal similarities and distinctions, and evidence for transport and use. Architecture, lithics, metallurgy, ceramics, textiles and other objects created from mineral and organic materials all provide data that can inform models of communities of practice and exchange relationships, structured by the natural resources and nodes of interaction of the Andean landscape.

[142] Symposium · RECONCEPTUALIZING RURALITY: CURRENT RESEARCH IN THE ANCIENT MAYA HINTERLANDS

As scholarship continues to shift away from urban- and elite-centric perspectives, research in the ancient Maya area has increasingly included rural populations in archaeological interpretations. This symposium brings together current research from various Maya regions and time periods to illustrate the vast spectrum of rural settlement and to highlight the diversity and complexity found among ancient Maya hinterland populations. The topics of everyday life and interactions, heterogeneity and inequality, material culture, identity formation, the use and construction of landscapes, and the relationship between hinterlands and centers are considered, among others. Theoretical and methodological approaches suited to hinterland archaeology are discussed. This symposium aims to foster dialogue and future collaboration to answer the following questions: In what ways are hinterlands similar and/or distinct from heartlands? Can we discuss and define rurality without reifying the false dichotomies of urban-rural and elite-commoner? How might we challenge traditional yet persistent conceptions of hinterland people? In what ways does hinterland archaeology enhance our constructions of the past and of theory building? By engaging in critically meaningful analyses of the rural Maya on their own terms, these studies offer a unique vantage from which to investigate the constitution of complex societies.

[143] Symposium · BIOMOLECULES AND MUSEUMS COLLECTIONS: CHALLENGES AND BEST PRACTICES FOR DESTRUCTIVE SAMPLING

Biomolecular analyses of archaeological materials are rapidly expanding, providing new information on past peoples, pathogens, and ecosystems. Museum collections are a promising source of biomolecules but present many challenges when making decisions about collection access including increasing requests for destructive sampling. The types of materials sampled, how collections' requests and committees proceed, methodological limitations of biomolecular analysis, and how living decedents are engaged are all important considerations for discussing and developing best practices for museum collections. With biomolecular information being available from a variety of sources, including bone, teeth, soil, plants, feces, and pottery, this session will highlight the burgeoning possibilities, limitations, techniques, and questions for archaeological biomolecular investigations. Ultimately, this session aims to incite continued interdisciplinary discussion of how biomolecules are studied in museum collections.

[144] Symposium · “THE BRITISH ISLES”: ARCHAEOLOGICAL REALITY OR MODERN GEOPOLITICAL CONSTRUCT?

The archaeological literature often groups England, Scotland, Wales, and Ireland under the moniker of “The British Isles.” This grouping is particularly apparent in studies of interregional interaction, in which engagement between Continental sources and any of the above areas is argued to have been routed through southern Britain. This serves to justify the extension of southern British archaeological characteristics to outlying areas; such a practice risks the subsumption of archaeologically distinct areas of northern Britain, Scotland, Wales and Ireland under a category dominated, and therefore defined and driven by, southern British archaeology. The present session seeks to examine internal differences in material culture within “the British Isles” as well as differential exchange relationships with distant locales, in order to ascertain the degree of homogeneity within the imposed area. It asks whether the concept of “the British Isles” reflects an archaeological reality characterized by consistency in material culture and robust exchange relationships, or whether it constitutes an unjustified subjugation of several archaeologically distinct regions under a term derived from modern geopolitical constructs.

[145] Symposium · CASE STUDIES FOR THE SALALAH DOCTRINE: ARCHAEOLOGICAL HERITAGE MANAGEMENT OF WORLD HERITAGE SITES

(SPONSORED BY ICAHM)

In 2015 and 2016 the ICAHM (International Committee for Archaeological Heritage Management) scientific committee met in Florence and in Salalah, Oman to develop a doctrine for management of archaeological world heritage sites. Archaeological sites present management challenges distinct from monuments and landscapes preserved at other world heritage sites. The ICAHM doctrine seeks to recognize those differences and to propose strategies for sustainable conservation and preservation. This conference session is a forum to report the doctrine (on the agenda for consideration at the ICOMOS General Assembly in New Delhi in December 2017) and to present on case studies, including Nan Madol in Pohnpei, Federated States of Micronesia and in Petra, Jordan among others.

[146] General Session · PROTOHISTORIC AND HISTORIC RESEARCH FROM AROUND THE MEDITERRANEAN BASIN**[147] Electronic Symposium · RAPID ABANDONMENT, DE FACTO REFUSE, OR PILGRIMAGE EVENTS: DECODING THE ARCHAEOLOGICAL SIGNIFICANCE OF TERMINAL “PROBLEMATIC” DEPOSITS IN THE MAYA LOWLANDS**

Maya site cores often contain artifact deposits from around the time of abandonment. Following terminology established at Tikal, these are sometimes called “problematic deposits” to distinguish them from middens and burials. They have been interpreted in several ways, for example as de-facto refuse, as evidence of rapid abandonment, the remains of termination ritual, or as evidence of post-abandonment deposition (e.g., pilgrimage). Many of these deposits have been found in Western Belize over the last decade. This symposium brings together researchers with expertise in different artifact classes who have looked at problematic deposits in a variety of places. The goal of this electronic symposium is to reach some consensus on the significance of these deposits.

[148] Forum · SO YOU WANT TO WORK?: A DISCUSSION ON NON-ACADEMIC CAREERS IN ARCHAEOLOGY

(SPONSORED BY SAA STUDENT AFFAIRS COMMITTEE)

This forum presents a variety of non-academic (and perhaps non-traditional) career paths that rely heavily upon archaeology and anthropology. Additionally, it provides students and recent graduates an opportunity to ask archaeologists questions regarding how they obtained work in non-academic career paths, including research institutions, cultural resource management firms, and regulatory and non-regulatory government agencies. Panelists come from a variety of career stages, genders, and ages. Furthermore, they fulfill different roles within their organizations, including field archaeologists, researchers, project reviewers, and liaisons. This will allow for a variety of viewpoints and experiences as they answer questions asked by the audience.

[149] Forum · COLLABORATING ON ARCHAEOLOGICAL COLLECTIONS CARE*(SPONSORED BY SAA COMMITTEE ON MUSEUMS, COLLECTIONS, AND CURATION)*

Archaeology shares collection management, preservation, analysis, and data retrieval issues with many scientific and cultural disciplines. Accessing the knowledge and expertise of colleagues in the natural history, museum, and other related professions can improve archaeological collections management and further scientific research. In this session, we seek to encourage collaboration with colleagues in a variety of professional organizations, such as the Society for the Preservation of Natural History Collections, Society of American Archivists, American Institute for Conservation of Historic and Artistic Works, Society for Historical Archaeology, American Cultural Resources Association, the Cuneiform Digital Library Initiative, the Biodiversity Heritage Library, and others. The goal is to learn from and then adopt or adapt some of their best practices for the benefit of archaeological collections. Data management and data sharing, conservation and preservation, and sustainable management of collections are among the topics covered by session participants.

[150] Forum · CYCADS, HUMANS, AND MAIZE IN MESOAMERICAN ETHNOECOLOGICAL AND AGROECOLOGICAL SYSTEMS: TRACING AN ANCIENT RELATIONSHIP THROUGH ARCHAEOLOGY, GENOMICS, AND CULTURAL GEOGRAPHY

Cycads (Cycadales) are an ancient order of gymnosperm, three genera of which are prevalent in Mexico and played a critical though underappreciated role in the agroecology and foodways of Mesoamerica. Their neglect appears to stem from their toxicity which, while requiring similar processing to that of manioc, seemingly diverted attention away from cycads despite considerable evidence indicating their utilitarian and symbolic use from the Pleistocene–Holocene transition to the present. As a botanical resource that occurs in diverse ecosystems, cycads are used in a variety of ways and figure prominently in regional mythologies in which they often possess a close relationship with maize. This forum explores the role of cycads in Mesoamerican agroecological systems, particularly its enduring relationship to maize, through a range of data, from genomic, archaeological, linguistic, art historical, to ethnographic and human geographical evidence with a specific focus on the geographic corridor running from Oaxaca to Tamaulipas. Preliminary results of an ongoing interdisciplinary research project are shared with the aim to present new data and stimulate further discussion on the significance of cycads in Mesoamerican beliefs, foodways, and ecology.

[151] Forum · CULTURAL RESOURCES IN THE AGE OF TRUMP

Cultural resource legislation, particularly the National Historic Preservation Act, has been under near continuous attack over the last several decades. The current administration has made it clear that deregulation is a priority, and we anticipate that the National Historic Preservation Act and other federal legislation will remain firmly in the sights of both the Executive and Legislative branches. The SAA anticipates that similar efforts to weaken cultural resources laws will be proposed at the state level as well. This session will provide a discussion of SAA's Government Affairs Network, State Representatives, and advocacy tools so that cultural resources professionals can become advocates for their resource.

[152] Forum · ADVANCES AND PROSPECTS IN THE ARCHAEOLOGICAL SCIENCES ON THE 40TH ANNIVERSARY OF THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES (I)*(SPONSORED BY SOCIETY FOR ARCHAEOLOGICAL SCIENCES)*

The Society for Archaeological Sciences (SAS) is an international professional society of about 300 members dealing with natural science applications in archaeology, paleoanthropology, and conservation. The Society was founded in 1977, so this session commemorates the 40th anniversary of the beginning of SAS. These four decades have seen advances in techniques, applications, theories, and infrastructure surrounding the archaeological sciences. We take this occasion to reflect on some of these developments, as well as considering what the future may hold in store.

[153] Poster Session · PALEOETHNOBOTANY**[154] Poster Session · ARCHAEOOMETRY II****[155] Poster Session · HUNTER GATHERER ARCHAEOLOGY****[156] Poster Session · ARCHAIC LANDSCAPES: POVERTY POINT AND THE BROADER AMERICAN SOUTHEAST**

Archaeologists are increasingly interested in the broader social, political, and environmental landscapes found across the Late Archaic Southeast. Of particular importance is Poverty Point, one of the largest, most ancient, and most complex earthen mound complexes in the Western Hemisphere. As one of the most important sites in North America, Poverty Point has been studied for decades—yet current and ongoing research continues to produce new understandings of this iconic monument. Likewise, ongoing research along the Atlantic coast is revealing a complex landscape of human-made constructions that together form a web of interconnected sites spanning hundreds of kilometers of shoreline. This session brings together current research at Poverty Point and elsewhere in the southeast with a focus on how new technologies, new methods, and new theories are challenging traditional understandings of the Late Archaic.

[157] Poster Session · REPORTS FROM THE JUNGLE: NEW AND ONGOING RESEARCH FROM THE THREE RIVERS REGION OF THE MAYA LOWLANDS

In recent years the Three Rivers Region of Belize and Guatemala has seen some of the most intensive archaeological research in the Maya lowlands. Though studied for more than twenty-five years, new and exciting information at well-known sites such as

La Milpa, Blue Creek and Rio Azul, as well as surrounding areas, some never before investigated, are bringing fresh perspectives to research on the ancient Maya. This session brings together ongoing and new research, much of which has been conducted through the Programme for Belize Archaeological Project.

[158] Symposium · MAS ALLÁ DE LA ARQUEOLOGÍA OFICIAL: MODELOS DE CO-PARTICIPACIÓN CON SECTORES PRIVADOS Y COMUNITARIOS PARA LA INVESTIGACIÓN ARQUEOLÓGICA EN OAXACA

La arqueología en México se realiza por el estado a través del Instituto Nacional de Antropología e Historia, y en menor medida por instituciones académicas, principalmente universidades nacionales o extranjeras. A lo largo de la historia del INAH, este esquema ha producido importantes avances en el conocimiento del pasado prehispánico; sin embargo, diversos factores como el desarrollo del país y sus problemas económicos, y una creciente burocracia gubernamental han generado nuevas tareas que han mermado la capacidad de investigación, pues muchas de las labores se enfocan exclusivamente al manejo y protección de los sitios arqueológicos y a la atención de problemáticas derivadas de salvamentos y rescates arqueológicos.

Ante este panorama, en las últimas décadas, nuevos actores sociales -no necesariamente relacionados al gobierno o a instituciones universitarias- han propuesto novedosos esquemas de colaboración, con los que se han logrado importantes aportaciones al quehacer arqueológico mexicano. El presente simposio mostrará las aportaciones de los sectores privado y comunitario en la arqueología mexicana, especialmente en Oaxaca, ofreciendo una propuesta ética de trabajo, mostrando que con una colaboración responsable es posible llevar a cabo investigaciones adecuadas que no ponen en riesgo el patrimonio del país. Sin detrimento de la capacidad normativa del INAH.

[159] Symposium · ARCHAEOLOGY ON THE ATLANTIC SEABOARD AFTER HURRICANE SANDY

[160] Lightning Rounds · ENGAGING “ALTERNATIVE ARCHAEOLOGY” IN THREE MINUTES OR LESS!

Fantastic claims and fraudulent artifacts have formed a steady current of public interest in the archaeological past for more than a century, but the past two or three decades have witnessed a resurgence of books, magazines, films, TV shows, and websites promoting “alternative” readings of the past for an increasingly science-averse audience. One strategy for engaging with common archaeological myths—from the Atlantis Code to Ancient Aliens—is to promote critical thinking in the college classroom and non-academic venues, from popular media to public lectures. This session seeks to explore and share practical techniques for engaging university students and the general public in critical discussions of archaeological interpretations that professionals view as fringe ideas, all in three minutes or less!

[161] Symposium · ARCHAEOLOGICAL PERSPECTIVES ON THE ANTHROPOCENE

As a potential subdivision of the Geological Time Scale, the timing and scope of the Anthropocene is under consideration by the International Commission on Stratigraphy. There remain disagreements on how to gauge the scale of human impacts on the lithosphere and when (or whether) those impacts are measurable on the global scale. Some believe the Anthropocene began many millennia ago while others argue that ubiquitous, detectable human influences on landscapes are either a post-Industrial or post-Atomic Age phenomenon. Archaeologists are uniquely positioned to judge the ecological and geological circumstances associated with past human settlements, but generally work independently as regional specialists, which complicates assessing the global nature of these impacts. This session will critique whether a firm boundary (“Golden Spike”) can be established for the onset of the Anthropocene. By assembling a wide range of archaeological evidence from across the world, we seek to draw closer to an understanding of the ecological and social dimensions that underpin the Anthropocene.

[162] Symposium · PRECLASSIC LIFEWAYS IN THE NORTHERN MAYA LOWLANDS

Models for Preclassic Maya social and political organization have often been constructed with an implicit awareness that Classic period kingdoms would eventually develop. Yet archaeologists studying the Preclassic Maya of the Northern Lowlands have not only unearthed heretofore unknown sequences of cultural history, but have redefined the nature of social and political complexity for the Maya more broadly. Traditional archaeological methods such as survey and excavation have led to the identification of monumental acropoli, rural villages, and the construction of proto-urban spaces. These methods are increasingly being buttressed if not outright superseded by pioneering archaeological methods, including airborne LiDAR, chemical composition analyses, and sophisticated environmental studies. By exploring the adoption of new expressions of inequality, the effects of sedentary life, the construction of monumental spaces, and interaction with other Mesoamerican peoples, we seek to extend our knowledge of the Preclassic in this region beyond merely being a stepping-stone to the Classic period, and instead focus on its standing as a period of distinctive social and environmental adaptation.

[163] Symposium · PIEDRAS NEGRAS REVISITED: WAR, ECONOMY, AND POPULATION IN THE GREAT CLASSIC MAYA RIVER KINGDOM

Piedras Negras, Guatemala was the capital of a great Classic period (AD 250–900) Maya kingdom whose lords, at the height of their power, governed an area of perhaps 1,000 square km in western Guatemala and eastern Chiapas and Tabasco. Piedras Negras, with its impressive monumental architecture and unparalleled corpus of stone sculpture, was the subject of intensive archaeological investigations in the 1930s by the University of Pennsylvania and again at the turn of the millennium by a joint Brigham Young University-Universidad del Valle de Guatemala project. In the time since, research in the Middle Usumacinta River region has largely focused outside this great polity capital. Armed with knowledge gained from 15 years of regional work, the Proyecto Paisaje Piedras Negras-Yaxchilan returned to Piedras Negras in 2016 and 2017 to conduct focused investigation of the city’s defensive system, craft production, plant economy, and settlement in the near periphery. That work has been complemented by renewed efforts to protect the carved monuments that remain at the site. This symposium presents the preliminary results of those efforts, framed in broader discussions of ancient Maya war, economy, and population.

[164] Symposium · NEW FINDINGS FROM THE FAR WESTERN PUEBLOAN REGION: PAPERS IN HONOR OF MARGARET LYNEIS

This session commemorates the legacy of Margaret Lyneis, whose work has influenced countless researchers working in the

U.S. western deserts and in the Virgin Branch Puebloan region. An active scholar from the early 1960s until her unexpected death in 2017, her contributions have transformed our knowledge of these previously understudied areas. As well, her insistence as a young undergraduate that she be allowed to participate in fieldwork— at a time when few females worked, much less were allowed to excavate— helped pave the way for future generations of women. The papers in this session honor the life and career of Margaret Lyneis and highlight the continued impact of her legacy on scholars and on research in the Virgin Branch Puebloan region.

[165] Symposium · ANDEAN HOUSEHOLDS, LIVING SPACES

Houses and households vary across time and space, and many questions can be asked of household archaeology. Here we ask how Andean people used their living spaces, focusing on diverse lines of material evidence to build a sense of the conduct of daily life at home. How much space was appropriate for a dwelling? Were dwellings single-roomed or multi-roomed? How proximate were nearest neighbors? Can we argue from the spatial distribution of particular sets of material remains where particular activities occurred, for example cooking, storage, sleeping, crafting, discard? What activities occurred in adjacent external space? How did traffic flow into and through the dwelling? What degree of partitioning or privacy was relevant? Discussion focuses on comparisons of regional patterns and on the methodological strengths of different lines of evidence for building a fuller sense of how daily life was conducted at home.

[166] Symposium · FROM BEARDED ARCHAEOLOGISTS AND CLOSET CHICKENS TO MULTIPLE PASTS AND THE ARCHAEOLOGY OF YESTERDAY: HONORING THE CAREER AND IMPACT OF LARRY J. ZIMMERMAN

With a career spanning close to five decades, Larry Zimmerman has had a profound impact on archaeology and the broader discipline of anthropology, influencing how practitioners engage and collaborate with descendant communities, present their research to the public, and explore new avenues of inquiry and subjects. Along the way, Larry has mentored and collaborated with scholars from around the world, while also playing a pivotal role in early burial laws, repatriation efforts, and ethical practices. In this session, we aim to honor Larry and reflect upon his impact both personally and professionally. In doing so, we will also trace and assess changes in the practices and paradigms of American archaeology to be more inclusive in both methodology and subject matter.

[167] Symposium · TRANSFORMING MARGINALITY: EXPLORING MOMENTS OF RAPID SOCIAL AND ECOLOGICAL CHANGE

Moments of rapid transformation are often visible in archaeological data sets and are generally explored through either political or ecological lenses by focusing on social or environmental change. However, the reorganization of social and ecological landscapes tends to occur simultaneously, and it is through the interplay between such factors that archaeologically observable disjunctures materialize, including changes in settlement patterns, subsistence activities, or religious practice, among others. Widespread restructuring of labor or social organization can be brought to light by focusing on the moments in which such change takes place, along with accompanying transformations in the way social inequality manifests. Those on the margins—whether environmentally, socially, politically, spiritually, or otherwise—are often at the crux of these moments. Not only are people on the margins directly affected by the outcomes of rapid social and ecological change, their actions and day-to-day activities can also affect the process of transformation. This session will examine inflection points between political and ecological narratives: how do the structures of social inequality change as ecological practices change? Papers in the session draw from a variety of regions and time periods to explore these moments of transformation and their enmeshed social and ecological significance at multiple scales.

[168] Symposium · 21ST CENTURY APPROACHES TO ARCHAEOLOGY, EDUCATION, AND THE PUBLIC

(SPONSORED BY SAA PUBLIC EDUCATION COMMITTEE)

As archaeologists move further into the 21st century, we must be prepared for policy changes and funding cuts that can compromise advances in the field. A means of counteracting these challenges is developing informed citizens that engage in and value archaeological knowledge and preservation. Through relevant and innovative educational approaches, archaeologists can convey the value of our work to communities, policy makers, and funding agencies. This symposium presents new, innovative, and reimagined approaches to archaeological and heritage education that more closely align with current research-based educational practices as well as novel educational engagement that can broadly communicate the importance of the field. Examples of these approaches include STEM and environmental education, citizen science, and evaluation and assessment, among others.

[169] Symposium · THE STATE OF THE FIELD: CURRENT RESEARCH IN TARASCAN (PURÉPECHA) ARCHAEOLOGY: SESSION IN HONOR OF DOMINIQUE MICHELET

Over the past decade, research focusing on the Late Postclassic Tarascan (Purépecha) empire has been more prolific than ever before. Though the Tarascans have long been overlooked in favor of other better-known Postclassic kingdoms, today scholars are examining diverse topics that include political change, urbanism, environment, and economic trade and exchange. Ethnohistory does play a role in Tarascan studies, but new research increasingly focuses on archaeologically-driven questions, models, and interpretations. For 35 years, Dr. Michelet has worked to facilitate this proliferation of research into Postclassic western Mesoamerica. This session honors Dr. Michelet's career by bringing together papers that highlight current work in Tarascan archaeology. In doing so, we assess the state of Tarascan archaeology and its role for understanding the development, power, and decline of ancient empires.

[170] Symposium · THE ARCHAEOLOGY OF MONEY, DEBT, AND FINANCE

(SPONSORED BY SOCIETY FOR ECONOMIC ANTHROPOLOGY)

The relationship between money and debt in the ancient world has been the subject of investigation by many economic anthropologists and historians. Nevertheless, archaeologists have played only a minor role in debates about the origins of money, its chronological and functional relationship to debt, its materiality, its connection to finance and debt, and how these structure

power relationships. In this symposium, presenters use archaeological data to examine the material traces and social consequences of indebtedness; the processes by which objects become money; and the strategies used to manipulate money, finance, and debt to meet the needs of actors from the scale of the household to the state. An archaeological perspective expands the framework for studying the long histories of money, debt, and finance beyond written records or ethnographies of recent non-capitalist societies. By showcasing research from different parts of the world, the papers in this session also help to counterbalance a traditional emphasis on Eurasian economies in the study of money, debt, and finance. Together, the papers in this symposium show archaeological, historical, and ethnographic methods can be productively united under the common rubric of economic anthropology.

[171] Symposium · THINGS WITH A MIND OF THEIR OWN: THE ARCHAEOLOGY OF NON-HUMAN AGENCY

The concept of the Anthropocene is based on the premise that humans have had a profound, and increasing, impact on our environments. Yet many environmental conditions (such as earthquakes, storms, tsunamis, fire, disease, and other dramatic natural phenomena) can easily overpower human capacities resulting in moments of catastrophic change. Incremental processes of natural change, such as soil creep, vegetation growth, oxidation, and material fatigue similarly act against human intentionality by causing deterioration and decay whose denouement is unpredictable in timing and magnitude. The sentient world of animals, in which behavioral patterns have evolved for viability in a diverse world of predators and reproduction strategies, similarly presents challenges when managed under the assumption that humans are the primary determinant of comportment. In this session, speakers will consider the agentive effects of natural phenomena to which the direct human response is primarily reactive. The objective is two-fold: to highlight that even within the "Anthropocene" not all natural phenomena can be anticipated, much less controlled, by humans; and secondly, to critically evaluate the variety of human responses to natural and biological entities in the past as seen through the archaeological record.

[172] Symposium · AT-RISK WORLD HERITAGE AND THE DIGITAL HUMANITIES

(SPONSORED BY UNIVERSITY OF CALIFORNIA OFFICE OF THE PRESIDENT—RESEARCH CATALYST AWARD)

Providing viable solutions for the documentation and interpretation of at-risk archaeological heritage, digital and cyber methods in data capture, analysis, and 3D visualization have become widely adopted in excavations and surveys worldwide. However, research on the sustainability of the digital documentation process and on the data management, curation, and dissemination activities that follow the archaeological work in the field are still at an early stage. This session represents an important milestone in the dissemination of the results of the University of California Office of the President's At-Risk Cultural Heritage and the Digital Humanities project that is a collaborative research effort by four University of California campuses (San Diego, Berkeley, Los Angeles and Merced). This session is non-site and non-era specific and aims to bring together members of the archaeological community with technologists and heritage preservationists to discuss best practices and sustainability for the following main areas of interest: (i) digital documentation and analysis; (ii) online data curation; (iii) dissemination through hybrid print-digital publications and 3D scientific visualization (personal and large-scale Virtual Reality (VR)), and (iv) outreach in libraries and archaeological museums using visualization and computer graphics.

[173] Symposium · THE TIES THAT BIND AND THE WALLS THAT DIVIDE: PREHISTORIC TO CONTEMPORARY MAYA MANIPULATION OF SOCIAL SPACE

Boundaries define who we are, who we are not, and what we are and are not responsible for. At the same time, features that have been modified for transportation are symbolic of economic and political interactions. This symposium will focus on how ancient, historic and contemporary people living in the Maya region demarcated the use of space and formalized their landscapes with architectural features such as causeways, boundary walls, canals, plazas, and railways. It will also examine how interstitial communities related to major polities.

[174] Symposium · THE HUMAN ODYSSEY IN EARTH'S HIGH MOUNTAINS AND PLATEAUS

Mountain environments present humans with striking adaptive challenges, yet they also offer opportunities. That our genus pursued these is attested by widespread archaeological residues in such settings from pre-Middle Stone Age African populations, Neandertals and of course modern humans. Cross-cultural comparative research into montane hunter-gatherers in prehistory has focused on the settlement of expanses of contiguous high elevation terrain—the world's 'high plateaus.' But plateau peopling represents one chapter in a longer evolutionary story of when, how and why ancient people engaged with uplands, a history spanning hundreds of millennia, multiple hominin taxa, and most continents. To date, little effort has gone towards investigating the full variability of montane forager lifeways through time and space. This symposium brings together archaeologists and biological anthropologists studying hunter-gatherer biocultural adaptations in diverse upland settings across the globe. The presentation and discussion of new empirical data alongside novel methodological approaches and theoretical insights will help isolate key sources of variability that underwrote specific behavioral and biological records of montane adaptation. By exploring the timing, motives and modes of montane exploitation, we aim to elucidate the evolutionary processes by which our genus engaged with upland landscapes with increasing frequency and intensity.

[175] Symposium · URBANISM, PRODUCTION, AND EMPIRE: NEW CASE STUDIES FROM ANGKORIAN CAMBODIA

As populations move from rural to urban areas, understanding the processes of urbanization, regional networks, and production is critical for the continued existence and growth of communities today in urban and rural contexts alike. We investigate these themes through archaeological case studies from Angkor, Cambodia, one of the largest low-density urban complexes in the pre-industrial world. Recent archaeological investigations and remote sensing projects have revealed an expansive urban landscape with a long and complex history of occupation. In this session, we consider new lines of evidence on the themes of production, urbanism, and empire that contribute to inter-regional dialogs on the study of urbanism in the ancient world.

[176] Symposium · MAYA HIGHLAND AND PACIFIC COASTAL ARCHAEOLOGY: CONTINUING DEBATES ON INTERACTION

This symposium presents recent archaeological investigations on regional and interregional interaction in the Highlands and

Pacific Coast of Guatemala and Chiapas, a complex region of Mesoamerica. Studies using technologies such as isotope analysis, instrumental neutron activation analysis, and least cost routes applications of GIS are providing in depth analyses of the dynamic interactions of centers and nodes on routes of travel. In this symposium, case studies drawn from coastal and highland regions, will serve to highlight interregional exchanges while also focusing attention on key themes such as: economic systems, ideological and political evolution, migration, cultural stability and change, and identity. Researchers will discuss the theoretical, methodological, and technical approaches they are using to address these topics and present new data derived from recent analyses of material culture, sculpture, architecture, and settlement patterns. The symposium will serve to update scholars from neighboring areas of Mesoamerica on recent research, and will also stimulate increased communication, collaboration, and data-sharing among regional specialists.

[177] Symposium · WHAT'S HOT IN PYROTECHNOLOGY? CONTROLLING FIRE FROM CAMPFIRES TO CRAFTSPEOPLE

The defining characteristic of humanity was long thought to be the manufacture and use of tools. Toolmaking, though, has since been observed in not only other primates but also birds, otters, and octopi, among others. Making fire, however, remains an exclusively human skill. Much of our technology can be conceptualized in terms of the control of fire: pyrotechnology. Until recently in human history, the development of new technologies and materials depended on people attaining and controlling greater and greater temperatures. This process began more than one million years ago as the emergence and spread of our species depended on fire for warmth, cooking, and protection. Later we used fire to treat stone and wood implements and to create adhesives to join them together as compound tools. Baked clay eventually followed, as did ceramics, metals, faience, glass, and other substances upon which civilization was built. Additionally, fire is cross-culturally used ceremonially, and it is ascribed a variety of symbolic meanings. This session, organized by the Yale Initiative for the Study of Ancient Pyrotechnology, considers how our increasingly sophisticated control of fire, as evidenced in the archaeological record and in material culture, sparked behavioral, cultural, and societal complexity around the world.

[178] Symposium · NO LONGER A TRANSITIONAL ZONE: LOCAL DEVELOPMENTS, INTERACTION, AND EXCHANGE IN THE CEJA DE SELVA

The archaeology of the ceja de selva or eastern Andean slopes has long been framed by the region's position between the highland Andes and the Amazon lowlands. Largely understudied, scholars have typically regarded the region as either a barrier or conduit for highland-lowland interaction. However, recent investigations show that the ceja was not simply a transitional zone but rather a locus of complex cultural developments that occurred "in relation to" and "independent from" contemporary phenomena in adjacent coastal, highland, and tropical lowland environments. Similarities in material patterning from Ecuador to Bolivia suggest that autonomous ceja de selva societies were integrated within long distance intraregional interaction networks which potentially impacted local cultural change. These networks were oriented around rivers such as the Marañón and Huallaga which facilitated the movement of people, resources, and ideas. Unfortunately, understanding these relationships has often been hindered by models that emphasize highland or lowland developments, and either ignore the ceja, or treat it as a transitional environment exploited for resources. By analyzing ceja de selva societies as autochthonous and linked by intraregional and interregional interaction, this symposium aims to better understand ceja de selva cultural developments and their participating roles in the rise of Andean Civilization.

[179] Symposium · ARCHAEOLOGY, HISTORY AND OSTEOLOGY OF A 19TH CENTURY MEDICAL WASTE DEPOSIT AT POINT SAN JOSE, SAN FRANCISCO

In October 2010, while monitoring lead remediation efforts around the former Army hospital (1863–1903) at Point San Jose (now Fort Mason), California, archaeologists discovered a pit containing human remains. Further excavation of the feature revealed a plethora of waste material from the hospital in addition to the commingled skeletal elements of at least two dozen individuals. Recent historical research on the Point San Jose hospital and its staff and osteological analyses of the human remains, provides insight into the origin of the human remains and the surgeon responsible for their disposal in the pit. This symposium provides background concerning the history and archaeology of the discovery, and analysis of artifacts. Osteological assessments include skeletal element representation, paleodemography, stature, stable isotope analysis, paleopathology, and taphonomy. Although other possible explanations exist, the skeletal remains most likely represent discarded remains following anatomical dissection. The Point San Jose deposit offers extraordinary perspectives on late 19th century-era medical understanding, knowledge, practices, and education as well as the cultural context in which bodies were acquired for dissection.

[180] Symposium · METHODOLOGY AND INTERPRETATION IN THE ARCHAEOLOGY OF ROCK ART

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. For the purposes of the session, the discussion of method will be just as welcome as the description and interpretation of the art itself. The symposium is without geographic or temporal restraint.

[181] Symposium · MATTERING IMPERIAL POLITICS: HUMAN-THING PARTNERSHIPS IN LOCAL PRODUCTIONS OF POWER

The material turn, involving a re-awakened interest in the role of things in the constitution of the social, has been naturally and productively embraced by archaeology. To date, however, many archaeological studies that identify with this turn have focused more on the symbolic and communicative role of things, e.g., what they mean, rather than on the pragmatic and political dimensions of what they do and how they do it. The papers in this session aim to analyze the political work of things in the context of early imperial ambitions and maintenance. They take as their point of departure the idea that power does not exist as an abstract, a priori concept but rather is constituted, registered, and enacted materially through a heterogeneous mix of human and non-human actors. Together session contributors offer a broad comparative investigation into how assemblies of people and things worked collaboratively at the local level to make and unmake political power. Admitting things as key players in the constitution of imperial practice promises new insights into how state power was conceived, enacted and sustained across different times and places.

[182] Symposium · 2018 FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF VANCE T. HOLLIDAY*(SPONSORED BY FRYXELL AWARD COMMITTEE)*

Vance T. Holliday is the 2018 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 2018 Fryxell Award recognizes a scholar who has made significant contributions in the application of earth sciences to archaeology. It is fitting that Vance T. Holliday is the recipient, for few figures have in the last four decades been as prominent or prolific in contributing to North American geoarchaeology. Although best known for his meticulous stratigraphic and soil geomorphic work at Paleolithic sites on the High Plains, Holliday's substantive and methodological contributions span continents, and a range of Quaternary geological, geochronological, and archaeological settings, questions, and even a few controversies. In this SAA Fryxell Award symposium, we explore a range of topics that reflect and were inspired by his outstanding interdisciplinary research in support of archaeological questions.

[183] Symposium · WHAT TO DO WITH THE INTANGIBLE AND TRANSIENT: HISTORIC PROPERTIES THAT CHALLENGE TRADITIONAL RULES FOR EVALUATING SIGNIFICANCE AND INTEGRITY

Cultural resource professionals encounter a range of historic property types over the course of their careers. Certain historic property types, such as cultural landscapes and traditional cultural properties, may contain no observable evidence of human activity. Others, such as historic mining sites and historic trails, while textually-documented, were only temporarily used, abandoned, and physical evidence faded. Each historic property of this type is unique and provides challenges when evaluating its significance and integrity. This symposium provides different case examples for critical reflection.

[184] Poster Session · CHRONOLOGY**[185] Poster Session · BIOARCHAEOLOGY: THE OLD WORLD****[186] Poster Session · LITHIC ANALYSIS IN NORTH AMERICA****[187] Poster Session · ZOOARCHAEOLOGY: THE AMERICAN SOUTHWEST****[188] Poster Session · ZOOARCHAEOLOGY: MIDWEST TO THE EAST COAST****[189] Poster Session · ZOOARCHAEOLOGY: GLOBAL APPROACHES****[190] Poster Session · ARCHITECTURE, URBANISM AND MONUMENTALITY IN THE AMERICAS****[191] Forum · THE STATE OF INCLUSION: DIVERSITY IN NON-ACADEMIC ARCHAEOLOGY***(SPONSORED BY SAA QUEER ARCHAEOLOGY INTEREST GROUP)*

While archaeology's future seems to be grounded in diversity, with ever-increasing calls for multidisciplinary research approaches, this relates more to theoretical and methodological approaches—ideas—than it does to the archaeologists themselves. As an interpretive discipline, the views and experiences of archaeologists undoubtedly frame our understanding of the past. Consequently, having diverse archaeological practitioners is equally as important as having diverse methodological and theoretical approaches. Despite the fact that most archaeologists are employed by CRM firms, government agencies, museums, or community-based institutions, much of this discussion has occurred within and around academic environments. This panel will focus its discussion on how we can bring diversity to the forefront of non-academic archaeological practice by considering the following questions:

- What does inclusive archaeology look like when the work is client-based?
- How do we diversify the discipline, particularly in the areas of CRM, government, and museum archaeology?
- How do people's experiences of racism, homophobia, and sexism influence whether or not they pursue professional archaeology?
- What programs and initiatives are currently in place that focus on outreach and education to minority groups?

The panel will encourage the audience to discuss these questions and generate ideas about how to make archaeology a more inclusive, engaged community.

[192] Forum · SETTLEMENT, RESOURCE DISTRIBUTION, AND SUBSISTENCE IN COASTAL MESOAMERICA: INTERREGIONAL COMPARISONS

This forum focuses on the relationship of settlement patterning in Mesoamerican coastal environments to the distribution, use, and acquisition of subsistence resources. By including interdisciplinary data from across Mesoamerica, we seek to facilitate a comparative discussion on the reliance of coastal populations on aquatic versus agricultural resources. Researchers have found that Mesoamerican societies were more likely to depend on marine and estuarine fauna such as fish and shellfish before the Late Formative, when growing populations often moved inland. Such scholars assert that alluvial settings contained fertile soils with a higher surplus potential than estuarine habitats. Challenging this view, other scholars stress the abundance and protein values of

estuarine species. We will problematize this debate through three overlapping topics. First, to what extent have disciplinary biases underemphasized coastal productivity and settlement (c.f. Erlandson and Fitzpatrick 2006)? Second, are these biases linked to the obfuscation of coastal land use evidence via environmental changes (e.g., sea level rise or hurricanes)? Third, what potential factors contributed to variation in subsistence and settlement on Mesoamerican coasts? We will discuss factors such as estuarine ichthyofauna, coastal geomorphology, trade, boating technologies, and political shifts.

[193] Forum · NEW PERSPECTIVES ON HERITAGE PROTECTION

As documented by many videos posted on the Internet and other information sources, the cultural heritage of the United States, both terrestrial and submerged, is being lost at an alarming rate. There are the pat answers to the question of why this occurs such as the number of sites, the level of collector interest in the objects they contain, insufficient law enforcement and prosecutorial efforts, and the need for more and better public education. Answers like these and the solutions they generate have not solved the problem. Alternatively, there may be new perspectives on the cultural heritage depredation problem and, if so, they may suggest new and innovative approaches to preventing it. To deal with this situation, it may be necessary to address issues such as why many Americans disrespect other cultures, past and present, and believe they are entitled to damage and destroy the heritage of these cultures and why the views of Native Americans, other descendant groups, or responsible citizens apparently make so little difference to those who engage in these actions. The question of new perspectives on cultural heritage protection will be posed to a panel of representatives of the archaeological, Native American, and legal communities.

[194] Forum · ARCHAEOLOGY, OUTREACH, ADVOCACY, AND THE MEDIA

The goal of archaeology is to reconstruct the past. Inevitably the question arises as to whose past is being interpreted and who has the right to interpret it, and the discipline has sought ways to address those questions with the help of communities invested in that knowledge and of the media. Archaeologists now form part of the different communities invested in access to knowledge of the past where these communities seek to advocate for different voices to be heard. How these communities interact with the public and the role that broadcast, print, and social media play in those interactions is the focus of this proposed forum where members of the media, archaeologists, and stakeholder of the past communities share their thoughts to start a conversation about these communities' goals and expectations from each other and from the public, and how those goals and expectations play out on public medium forums and how these translate into other forms of civic advocacy such as activism, lobbying, legislation, and program implementation.

[195] Symposium · ECOLOGICAL JUSTICE AND THE LONGUE DURÉE: EXPANDING ACTIVISM, ADVOCACY, AND THE HISTORICAL ECOLOGICAL APPROACH

(SPONSORED BY NEW INTERNATIONAL COMMUNITY FOR HISTORICAL ECOLOGY [NICHE])

This session explores how archaeologists are using the historical ecology research program to guide their research design, praxis, and ontologies with a focus on improving our ability to contribute to social justice initiatives. It is clear that ecological degradation, including climate change, has not and will not affect all people equally due to structurally uneven access to social safety nets, mobility, knowledge, and political representation. Furthermore, sites of deleterious resource extraction are loci at which inequalities (in shared risk, representation, and benefit) are starkly experienced. In the spirit of the historical ecology framework, we call for papers that deal with the long-term roots and intersectional character of resource justice issues. We encourage contributors to share models for activism, advocacy, and improved collaboration demonstrated through social organizing, policy work, and knowledge production partnerships. Finally, we welcome critical challenges for academic structures and traditions of thought. The ultimate goal is to generously share and absorb perspectives that will improve archaeologists' abilities in advocacy and activism across the academic divide.

[196] Symposium · RE-CENTERING THE PERIPHERY: CONTEXTUALIZING THE FRINGES OF CONTEMPORARY ARCHAEOLOGICAL PRACTICE

What makes a periphery? In modern archaeological practice, certain regions and areas of study have been treated as peripheral to more central phenomenon. A considerable amount of literature since the 1990s has problematized unidirectional and monodimensional models of interregional interaction, premised on migration, diffusion, world-systems, state expansion, empire building, and more. However, despite considerable critique and increasing engagement with multidirectional and multi-scalar models for such interactions, many regions and moments in time remain outside traditional archaeological focus. This session examines areas of archaeological research that have been pushed to the margins of the discipline. Crossing chronological and regional boundaries, the papers presented here offer a global perspective on the causes and effects of disciplinary peripheralization in theory and practice. By more fully exploring the "peripheries" of human history, we can correct the interpretive biases that we create through the questions we ask and build more inclusive historical narratives.

[197] Symposium · PRIVATE RITUALS AND PUBLIC SPACES: THE ARCHAEOLOGY OF BELIEF AND PERFORMANCE

Ritual is often conceived of as a community effort, used to reinforce social structures, cultural mores and traditions, yet the variation between regions, shrines, burials and ritual spaces demonstrates that within the group, variation was often permitted. These variations allow for glimpses into the role of the individual and the flexibility of a culture. The regulation of ritual is a key aspect of social cohesion and status reinforcement, so what does it imply when there are variances in the performance of the ritual? Personal belief may diverge from public rituals as evidenced in burials and votive deposits, but are often included beneath the umbrella of the broader cultural norms. Rituals are represented in constructed spaces, feast refuse, burials, and votive deposits, all of which are conceptualized as reflecting an entire community, while being conducted by only a select number of individuals—making private belief a public ritual. This session will examine how rituals conducted in public spaces impact individual and group identity by examining ritual performance across social and geographic contexts.

[198] Symposium · THE RISE AND FALL OF THE AFRICAN HUMID PERIOD: CLIMATE CHANGE AND HUMAN RESPONSE IN HOLOCENE AFRICA

Modern climate change is fundamentally shaping our global social and economic future. Understanding its potential impacts requires looking to the past. While geological and climatological approaches reconstruct the physical impacts of climate changes,

archaeology is uniquely capable of evaluating their relations to social change. Africa's Holocene archaeological record offers an important perspective on human responses to some of the most extreme climatic fluctuations of the last 12000 years, beginning with the onset of the African Humid Period when lakes and rivers covered the Sahara, through the rapid return to aridity across many parts of Africa ~5500 BP. These shifts presented sequences of challenges to the diverse hunter-gatherers, farmers, and herders that coexisted across much of Africa. This session examines the ways in which societies across Africa responded to local environmental manifestations of larger Holocene climate changes, and the long-term legacies of both successful and unsuccessful responses. Papers will present new data-points and advances in relevant methods. We especially hope to develop theoretical approaches for studying the archaeology of climate change in the uniquely diverse social and economic contexts of Holocene Africa. While these discussions are of global significance, this session highlights emerging impacts of anthropogenic climate change in contemporary Africa.

[199] Symposium · MAKING MORE WITH LESS: REFLECTIONS AND NEW APPROACHES TO THE PROTOHISTORIC PERIOD IN THE NORTHEAST

Until 1990, with the introduction of NAGPRA, investigations of the Protohistoric Period (1500–1630) in the Northeast primarily focused on burial contexts stemming from 19th-century excavations. NAGPRA has been a significant, positive step towards a framework of respectful collaboration between Indigenous communities and archaeologists, but the amount of researchable materiality associated with this time period has significantly decreased due to repatriation. Contemporary researchers do not have access to the material upon which now outdated understandings of the Protohistoric Period are based and have struggled to find new approaches to the period. New theoretical perspectives are being applied to current Protohistoric research and are helping to define and interpret archaeological assemblages from the period as well as the ethnohistorical documentation. The introduction of ontological perspectives has provided new approaches to topics such as: change and continuity, memory, practice, hybridity, and sacred ecology. These new insights are allowing researchers to proverbially “shed new light” on this period by employing perspectivist approaches. By examining the current archaeological, ethnohistoric, and ethnographic collections ontologically, researchers are able to expand and provide further detail to the interactions between Indigenous Peoples and Europeans during the Protohistoric Period.

[200] Symposium · PALEOLITHIC SURFACE SITES: NEW SURVEYS, METHODS, AND DATA

Lithic Surface Sites are an ubiquitous but underutilized source of information about human foraging patterns, site formation processes, and landscape use. This symposium highlights new approaches to analyzing Lithic Surface Sites, with an emphasis on material from the Paleolithic. Researchers will present results from new surface surveys and discuss specific procedures for analyzing taphonomic effects on lithic surface material, survey methodology, and different lithic analytical techniques that can reveal important data about human behavior.

[201] Symposium · BEYOND ENGAGEMENT: ARCHAEOLOGISTS AT THE INTERSECTIONS OF POWER

In recent years, “engagement” has become a byword for archaeologists seeking to practice in ethical ways and many archaeologists currently seek to engage and partner with communities and the public. At the same time, archaeology is recognized as a powerful tool by governments, organizations, and communities around the world. Many of these groups seek to use archaeology for their own political purposes: to justify nationalism, to legitimize seizures of territory, and to assert certain historical narratives and rights. An archaeologist's commitment to engaged, ethical archaeology may prepare them to grapple with manifestations of colonialism and privilege, but what happens when that very ethics requires them to push back against the groups they hope to engage? How do archaeologists negotiate the practical issues that arise out of conflicting needs and desires by various stakeholders? This session explores how an ethics of engaged archaeology intersects with the dynamics of contemporary politics. In an age of rising, insular nationalism, “engagement” and “reflexivity” are insufficient guidelines when the archaeologist is situated within shifting and cross-cutting political dynamics. This session reflects this difficult position while attempting to chart a way forward for an ethical archaeology that recognizes archaeologists' position at the complex intersections of power.

[202] Symposium · WE DIG NATIONAL PARKS: THE PAST, PRESENT, AND FUTURE OF ARCHEOLOGY IN THE NATIONAL CAPITAL REGION

This session focuses on archeological research of the National Park Service National Capital Region which includes the greater Washington D.C. Metro Area. Through the presentation of a variety of case studies ranging from the precontact to the historic era, this session highlights the role the National Park Service plays in the excavation, preservation, and management of archeological resources in region. Underlying these presentations is an archeology of practice which promotes the narrative of our nation's heritage and its preservation.

[203] Symposium · THE CONNECTICUT STATE ARCHAEOLOGICAL PRESERVE PROGRAM: PROTECTION, PRESERVATION, AND PUBLIC OUTREACH

Connecticut is one of the few states that has a formal State Archaeological Preserve Program. That program was a legislatively-crafted initiative that provides public-private coordination for the recognition and preservation of the state's diverse archaeological heritage. The law creating the program is supplemented with significant penalties for vandalism or un-permitted collecting of archaeological materials from a listed preserve. Since its inception in 2000, 37 archaeological sites have been added to the list of State Archaeological Preserves. With public education and outreach in mind, funding has been provided by the state, supplemented by monies from local historical societies and environmental groups, for the publication of more than a dozen twenty-four-page color booklets, each focusing on one of these sites. This symposium will provide additional details about the State Archaeological Preserve Program and include presentations on a diverse sample of the individually designated sites.

[204] Symposium · BONES AND BURIALS IN PHILADELPHIA: UNMARKED CEMETERIES & THE ARCH ST PROJECT

Early American colonial settlements along the Eastern seaboard largely buried their dead inside the city's boundaries in much the same way as their European contemporaries. In cities such as London, Paris, and Rome it is not uncommon for modern urban construction projects to unearth human remains from burial grounds long forgotten. When this happens local and national

regulations dictate the process by which such remains are removed, studied, and reburied. In contrast, US cities often have no formal process and federal regulations do not address private development projects occurring on privately owned land. Nowhere is this more apparent than in Philadelphia, a city of cemeteries. When human remains were discovered at 218 Arch St the lack of regulation and legal precedent enabled a private developer to avoid conducting a salvage excavation of the burial ground until media pressure and concern from local archaeologists made it obligatory. This session will address the issues surrounding unmarked cemeteries in the Philadelphia region. We will examine the Arch St Project as an example of the pitfalls and research potential stemming from such projects including some of the preliminary findings from the site.

[205] Symposium · BLURRING TIMESCAPES: SUBVERSIONS TO ERASURE AND REMEMBERING GHOSTS

What happens when the memories of a place, people, and events are systematically erased, forgotten, and covered? How are the stories we tell shaped by the memories we have forgotten? A growing body of theory is emerging in the Social Sciences that focuses its inquiry on what might not be seen—on dimensions past what is recognized as traditionally empirical. This session seeks to explore and synthesize those growing bodies of theories and methodologies related to the discourses of Memory. Presenters examine the entangled and interrelated concepts of memory, materiality, nostalgia, trauma, and haunting. This collection of research critically evaluates perceptions and interpretations of the past and their impacts on the present. Contributors expose hidden narratives and examine the social mechanisms operating and organizing what is remembered, and what is lost to time. Others consider the material residues of remembering, how objects and their meaning transcend time and sometimes space. Researchers in this session take an activists stance, recognizing the emotional nature and empathy that can be evoked by the past.

[206] Symposium · CONNECTING COLLECTIONS: COLLECTORS OF PRE-COLUMBIAN AND INDIGENOUS AMERICAN ART IN THE AMERICAS AND EUROPE

This session examines the role of collectors of Pre-Columbian and indigenous American objects in the establishment of private and public collections in the Americas and Europe. Papers may address evidence of collecting during the Pre-Columbian era (e.g., as evidenced by Preclassic Olmec works found at the Mexica Templo Mayor) or collecting that initiated during the colonial period leading up to today. Speakers may also consider examining the formation and biography of particular collections, how they were assembled but also how they might have eventually been dispersed. What artworks and objects were deemed worthy of being collected and saved? Which were eventually purged from collections? What else did collectors of Pre-Columbian and indigenous American art collect? In which types of museums are these collections eventually housed and what how do they become recontextualized during the process of institutionalization? Or in exhibitions? What were the relationships between dealers and collectors? What is the relationship between looting and collecting (can be seen also from a historical perspective)? Can we reunite divided collections that ended up in different museums and continents by creating shared digital platforms? How have collections formed our understanding of indigenous art and culture in the Americas?

[207] Symposium · AYLLU THERE? HERDERS, FARMERS AND THE FORMATION OF COMMUNITY IN THE ANDEAN HIGHLANDS

The primary object of the session is to study the community—and the concept of the ayllu—in the Andean highlands. In brief, the ayllu has long been used as shorthand for community in the Andes, yet the parameters of the term—spatially, diachronically and culturally—have often been disputed. Here, we address the scope and limitations of this term in regards to cultural development, as well as archaeological analysis in the highland regions of the central Andes.

In this session, we focus primarily, but not exclusively, on the Late Intermediate Period (AD 1000—1450), examining what constitutes the community across the Andean highlands. In particular, we examine the role played by herders and farmers in the creation of community, and how the social and economic organization of these activities may have impacted the formation of such communities. The Late Intermediate Period is also seen as a period in which there was an increasing economic specialization by farmers and herders. This session includes contributions from the Central Andes—were the term ayllu has been most employed—as well as from other regions, including Ecuador, Bolivia, Chile and Argentina.

[208] Symposium · THE ARCHAEOLOGY OF “PROLETARIAN DRUG FOODS” IN THE CARIBBEAN

Sugar, coffee, and rum, what Sidney Mintz referred to as “proletarian drug foods” of the Caribbean, have had global socio-economic, political, and environmental impacts. The production, consumption, and exchange of these commodities from the late 15th century onwards quickly infiltrated the European social sphere. In the 17th century, the production of these commodities increased at a time when dispossessed European laborers were transformed into the new urban proletariat. Dubbed earlier as the “Commercial Revolution,” the expansion of these commodities directly altered the fabric of life across Africa and the Circum-Caribbean. Sugar, coffee, and rum were also influential in forming new European modes and ideas regarding capitalism and industry in the 18th century. This session seeks to evaluate how these products transformed from the exotic to the “...daily fare of even the poorest and humblest people” (Mintz 1985:6). How did the ever-increasing economic demand for such products alter the lives of enslaved Africans, alter the Caribbean landscape, and contribute to contemporary colonial legacies across the Caribbean? Session participants will draw from original archival, archaeological, and geoarchaeological research to explore the changing roles of these products and their differential impacts on societies, economies, and environments over time.

[209] Symposium · LOOKING TO THE EAST: CLASSIC MAYA LEGACIES IN ANCIENT MESOAMERICA

Traditionally, Mesoamericanists have focused on questions from the viewpoint of major Central Mexican metropolises such as of Teotihuacan and Tula, which dominated much of the cultural landscape of Mesoamerica over time. However, it has become increasingly clear that influence moved in multiple directions. As noted by Eduard Seler over a century ago, Nahua ethnohistories such as the Codex Chimalpopoca refer to the cultural region of the Maya as Tlilan Tlapallan, a land of writing and high art. In addition, archaeological evidence points to sustained artistic contact between Central Mexico and the Classic Maya kingdoms from as early as the Classic Period. While the geographic region of the Maya is famously known for its jade, cacao, rubber, copal, and tropical bird feathers, the peoples of these regions also actively participated in the borrowing and lending of artistic knowledge. This session will examine the legacy of Classic Maya art and culture within the wider cultural sphere of Mesoamerica, both in contemporary cultures and later peoples who inherited and innovated upon the complex visual artistic vocabulary

established in these earlier periods.

[210] Symposium · SPATIAL APPROACHES IN AFRICAN ARCHAEOLOGY: CURRENT THEORIES, NEW METHODS

(SPONSORED BY SOCIETY OF AFRICANIST ARCHAEOLOGISTS)

The social production of space has emerged as a significant theme in African archaeology and heritage studies over the past two decades. From local houses, to regional landscapes, to global entanglements, the spatial relations among people, places, and things at these multiple scales offer increasingly nuanced perspectives on cultural change and continuity both past and present. Meanwhile, a growing suite of spatial archaeometric techniques—including geographic information systems (GIS), satellite remote sensing, aerial and UAV imaging, laser scanning, and geophysical prospection—have become ever more valuable tools for documenting, interpreting, and preserving archaeological resources. The time thus seems ripe for a critical conversation among Africanist scholars about the ways in which we integrate geospatial analysis into our research. In this session we propose to explore the current interplay between spatial archaeometry and socio-spatial theory through case studies from historical and geographic contexts across Africa. By focusing on issues of practice, interpretation, and ethics, this session seeks to inform colleagues about the possibilities and challenges of integrating geospatial technologies with archaeology and heritage studies on and beyond the continent.

[211] Symposium · THE EMPIRE STRIKES BACK: NEW DATA ON WARI IN MIDDLE HORIZON PERU

Recent research on Wari imperialism from across Peru reveals both the diversity of local strategies of negotiation as well as the cases that demonstrate the imprimatur of Wari imperial influence. These papers interrogate the nature of Wari expansion and the role local communities played in creating a Wari empire. At the same time, they question attempts to characterize Wari as something uniquely Andino or to dismiss comparative perspectives on imperialism in the case of Wari. Rather, many firmly establish the case that Wari is an excellent exemplar of a first generation empire that drew on diverse sources of power to provide a political longevity over a broad area unparalleled in the prehispanic Andes.

[212] Symposium · INNOVATIVE APPROACHES TO HUMAN-CANINE INTERACTIONS

Human-animal relationships are a window into the daily lives of people in the past. Interactions with animals are ubiquitous across place and time in human history. Canids found in the archaeological record enrich interpretations about human and environmental interactions in the past. Papers presented in this symposium speak to the many directions research is taking to better understand the human-canine connection. Authors will present research that employs advanced interdisciplinary methodology to tackle varying questions about canids and their perceived interactions with humans across diverse geographic and temporal settings.

[213] Symposium · THE INTERSECTION OF SUSTAINABILITY AND CLIMATE CHANGE IN TROPICAL SOCIAL SYSTEMS

This session is part of a long-term agenda of analyzing the resilience of cultural life in tropical regions. Low-density urbanism, forest agriculture and 'gardens,' sustainable forest removal and regrowth, and the impact of climate change are key issues, especially with regard to the impact of changing climate on current sustainable practices. These topics address UN 2030 sustainability goals: sustainable management of water, consumption and production; resilient and sustainable cities; protect global heritage; sustainable use of ecosystems; forest management; decrease desertification, land degradation and biodiversity loss; and confront climate change impacts. What has been sustainable for millennia may be flexible enough to continue or may need re-evaluation in view of global temperature increase. For instance, with tropical belts expanding, new tropical regions will need to look to their tropical neighbors for guidance on future necessities. This session will present cases worldwide, derived from the archaeological record of tropical regions and discuss them in relation to policy issues in the modern world. The emphasis of these case studies is on sustainability and the impact of climate change; through which researchers should offer insights into past human behaviour that have relevance both for the past, and for today's issues in the tropical world.

[214] Symposium · ADVANCES IN ROCK-ART ANALYSIS: FROM PORTABLE INSTRUMENTATION TO NEW INTERPRETATIONS

Recent advances in portable technologies has opened up new interpretative vistas of rock art worldwide. From portable analytical instrumentation such as X-Ray Fluorescence, Raman, and FTIR along with imaging approaches such as dStretch, Reflective Transformation Imaging, and microscopic analyses, to a suite of innovative techniques analysing associated archaeological, geochemical, botanical, and archaeo-astronomical features, the study of rock art is advancing in leaps and bounds. Add in the increasing importance of digital, 3D, and Virtual Reality modelling for research, heritage, and dissemination purposes, and we can see that the future of rock art research will entail integrating many of these technological and methodological improvements into powerful interpretative and educational outputs. At the same time, each of these approaches has its own challenges and limitations. This session presents a series of case studies exploring how applying and even integrating new technologies and techniques can transform our understanding while considering the current limits and future possibilities of rock art research.

[215] Symposium · CELEBRATING LYNNE GOLDSTEIN'S CONTRIBUTIONS TO ARCHAEOLOGY OF THE PAST, PRESENT, AND FUTURE

Over the past four decades Dr. Lynne Goldstein has provided important theoretical and methodological contributions to mortuary archaeology and innovative insights into social organization through the analysis of space and place; significantly enhanced ethical dialogues within the discipline through her exemplary service, teaching, and research; furthered archaeological knowledge about the North American mid-continent; and been at the forefront of the evolving role of digital technology in public archaeology and cultural heritage studies. Now, at the inception of a new chapter in an illustrious career, colleagues, friends, and students gather to celebrate her impact on archaeology. The papers in this session demonstrate the depth and breadth of Goldstein's significant influences on the discipline of archaeology.

[216] Symposium · GENDER AND POWER ON THE NORTH COAST OF PERU

Given the extraordinary wealth and variety of data available, the North Coast of Peru offers an ideal context in which to study continuities and changes in the intersection of gender and power across millennia. While sustaining an underlying core of cultural continuity, this region was buffeted by a whole host of “natural” (e.g., earthquakes, ENSO flooding, droughts) and “human” (war, conquest) disruptions that led to disjunctions in practice as well as ideological and structural changes across time. Although traditionally many see gender and power as inextricably linked, we explore the validity of this of this notion more generally as well as the variety of ways in which this relationship was conceptualized, expressed, and practiced. The papers in this session draw on the rich domestic, spatial, mortuary, bioarchaeological, iconographic, and ethnohistorical data to consider gendered patterns of access to power, gender as a mechanism of control, and the role of gender in the ideological bases of power, among other topics. The availability of detailed, complementary data sets allows contributors to go beyond gender binaries to consider the evidence for multiple genders, gender inversion, and gender fluidity in both individual and normative cases.

[217] Symposium · IN THE SERVICE OF A GREATER GOOD: BROADER APPLICATIONS OF ZOOARCHAEOLOGY IN THE ERA OF INTERDISCIPLINARY RESEARCH

(SPONSORED BY SAA ZOOARCHAEOLOGY INTEREST GROUP)

In the pursuit of studying human-animal interactions in the past, zooarchaeologists have developed a range of analytical and methodological techniques used to extract meaning from archaeological animal remains. Zooarchaeology, however, is only one of many possible avenues of research into the past. Ironically, in the era of inter-disciplinary research, methodological and epistemological advances made by various archaeological subdisciplines, including zooarchaeology, are rarely combined and discussed collectively, as specialists overwhelmingly interact with peers in their own subdisciplines. In this session, we place zooarchaeology at the center of our anthropological and archaeological milieu to examine how zooarchaeological techniques and approaches can be made relevant beyond the more immediate reconstructions of human-animal interactions. Some issues to consider include: combining and reconciling zooarchaeological approaches with prevalent methodologies in other subdisciplines to produce more holistic and compelling narratives of the past; deploying zooarchaeological analyses as independent tests of inferences made based on other lines of evidence like ceramics, lithics, metals, botanical remains, etc.; using our understanding of human-animal interactions and animal behavior and physiology as the basis of investigations into settlement patterns, site occupation intensities, and patterns of mobility and migration; and using taphonomic histories of animal remains to assess greater site formation processes.

[218] Symposium · LEARNING FROM HOMOL'OVI: PAPERS IN HONOR OF E. CHARLES ADAMS AND RICHARD C. LANGE

This session celebrates archaeological research and public outreach in the Homol'ovi area of northeastern Arizona under the leadership of E. Charles Adams and Richard C. Lange. For more than three decades, Adams and Lange created foundational learning opportunities for dozens of professional archaeologists, as well as hundreds of volunteers and Hopi community members. The excavation techniques and recording procedures practiced by Adams and Lange have had an important impact on archaeological theory and methodology in the U.S. Southwest and beyond. Papers in this session highlight the influence of Adams and Lange, as well as the scale and diversity of information generated as a result of their work. Their contributions have enhanced understandings of settlement aggregation, the ritual closure of structures, and landscape use. Their efforts also demonstrate the benefits of public archaeology, experimental archaeology, and the integration of indigenous perspectives in archaeological research. The papers in this session speak to the impact of Adams' and Lange's work on archaeological research, as well as their personal influence on students and colleagues.

[219] Symposium · MOBILITY AS HUMAN-ENVIRONMENT INTERACTION

(SPONSORED BY HOMININ DISPERSALS RESEARCH GROUP)

This symposium takes a new approach to looking at human mobility through the lens of human-environment interactions by thinking of mobility as adaptation. The theme of Human—Environment Interaction encompasses aspects of human adaptation, environmental response, and environmental change through biological, behavioural, and technological means. Mobility as human-environment interaction combines a growing body of interdisciplinary and positivist approaches into a range of topics including but not limited to processes of human dispersal, ecological resilience, population dynamics, niche-construction and landscape approaches. This symposium will highlight an array of methodologies and regional studies in Old and New World archaeology that are concerned with the causes and contexts of human mobility within the coupled interactions of environmental and human social systems. Our objective is to bring together researchers that employ agent-based simulation, paleoenvironmental modelling, geographical information systems, landscape theory, and morphological analyses as we explore two key questions: what are the archaeological signatures of mobility as human-environmental interaction, and how should these signatures be studied? The symposium will also showcase current work from the Hominin Dispersal Research Group (HDRG), a multi-institutional, collaborative research cluster based out of l'Université de Montréal concerned with the study of dispersal events.

[220] Symposium · PONDERING GENDERED LANDSCAPES

In her landmark *Stonehenge: Making Space* (1998), Barbara Bender observed, “We can ponder an empowering and often gendered landscape...” This quote provided the epigraph for Wendy Ashmore's contribution to the *Handbook of Gender in Archaeology* (2006), where she observed that archaeological landscapes are often (if not always) gendered, making the pertinent question(s) “under what circumstances, in what ways, and by whom.” Ashmore briefly examined landscapes from a gendered gaze, gendered embodiment, gendered activity spaces, the marking of gender, and landscapes of gendered cosmology and history. Noting the heuristic and overlapping nature of these categories, she called for “more... pondering” to elucidate relationships between landscape and gender in the past. Ashmore's call provided the impetus for a 2013 conference of SUNY Buffalo's Institute for European and Mediterranean Archaeology (IEMA), “Engendering Landscape & Landscaping Gender.” This conference brought together scholars from various disciplines and institutions on both sides of the Atlantic to discuss the interplay of gender and landscape in Europe's archaeological record. Those present discussed questions of labor, mobility, community-building, cosmology, embodiment, and representation. This session seeks to extend the conversation begun at IEMA, pondering intersections of landscape and gender in the archaeological record within and/or beyond the confines of Europe.

[221] Poster Session · ENVIRONMENTAL ARCHAEOLOGY**[222] Poster Session · PUBLIC & COMMUNITY ARCHAEOLOGY****[223] Poster Session · EXPERIMENTAL APPROACHES TO ARCHAEOLOGY****[224] Poster Session · GEOARCHAEOLOGY****[225] Poster Session · TRADE & EXCHANGE I****[226] Poster Session · MESA VERDE ANCESTRAL PUEBLO VILLAGES: RECENT RESEARCH**

The largest Mesa Verde ancestral Pueblo villages were important loci influencing social, economic, religious, and political dynamics across the region throughout its occupation. These villages, also called community centers, were central places with complex social networks within and beyond the region that structured landscape use and settlement organization. Recent survey, mapping, in-field pottery analysis, and architectural documentation associated with stabilization has produced new information about agricultural systems, water management, roads and trails, and village and socio-political organization. This poster symposium brings together researchers from several institutions and projects to present the results of new fieldwork in the Mesa Verde core.

[227] Symposium · SOCIAL LEARNING IN THE PALEOLITHIC: EXPERIMENTAL APPROACHES

Since the discovery of the Oldowan it has largely been assumed that the social transmission of cultural information played a major role in the appearance and persistence of Paleolithic stone tool technology. However, detecting the presence and impact of cultural transmission in Paleolithic artifacts and/or assemblages remains problematic. Some researchers have begun to question whether the simplest Paleolithic stone tools were even cultural. This session brings archaeologists with a focus on experimental flintknapping together with modelers and human behavioral ecologists. Our shared goal is to improve our understanding of social learning in human evolution through study of the Paleolithic archaeological record. Participants will tackle some of the following questions: How is social learning embedded in lithic reduction? How is variation in tool form affected by social learning and ecological factors? Which tell-tale signatures of social learning should one expect to see over space and through time in the archaeological record, with special consideration given to the time-averaged nature of many Paleolithic assemblages? By mixing experts on lithics with experts on cultural transmission theory, we hope to build a foundation that will facilitate the development of the kinds of theory-driven expectations needed to identify social learning during the Paleolithic.

[228] Symposium · RECENT ADVANCES IN THE ARCHAEOLOGY OF THE CAROLINAS

Separated by geographic barriers, diverse colonial pasts and a formal historic split, the differences in the Carolinas have often overshadowed their archaeological connections. Shared regions, archaeological periods, as well as lithic and ceramic traditions, link the two states in addition to their rich Native American heritage and multicultural histories. The archaeological research programs of North and South Carolina have provided the discipline with innovations in historic, scientific, and underwater archaeology. This session will present the breadth and depth of contemporary work coming from both academic and cultural resource management work.

[229] Symposium · THE ATLANTIC IRON AGE AND THE CIVIDADE DE BAGUNTE IN NORTHWEST PORTUGAL

Abstract: Iron Age hillfort settlements, while outwardly similar, exhibit considerable diversity, resulting in problematic issues that continue to be debated. The papers in this session are based on several research seasons and address Bagunte's historical context and development and its relationship to other sites. Other topics addressed include the conundrums within the evidence; landscape and settlement; visibility and audibility; architecture and space; vegetation history and archaeobotany; and the production and economics of ceramics and metallurgy.

[230] Symposium · ARCHAEOLOGIES OF INFRASTRUCTURE: MATERIAL RELATIONS AND HUMAN HISTORIES

Archaeological discussions of infrastructure typically address the ways that the built environment fosters social cohesion or how technological interventions facilitate economic production. However, emerging transdisciplinary conversations on infrastructures are challenging social scientists and historians to rethink conventional, functional interpretations of infrastructures, and instead to assess their materiality in social and historical ways that go beyond simply fulfilling societal needs. Infrastructures are increasingly seen as unruly or fragile historical assemblages that can transcend or disrupt the historical conditions of their production. In this symposium, we ask contributors to pull on their expertise and case studies in studying the built environment, technologies, and landscapes to respond to one central question about infrastructures: how do physical and social dimensions of infrastructures relate across time and space? We urge contributors to address this problem through specific archaeological case studies and by considering issues that might be subsumed within them. These include: (1) infrastructures that facilitate some political projects, prevent others, and outlive still others; (2) infrastructures that are invisible and taken for granted or provide the material for spectacle, conflict, or violence; and (3) the multiple intended and unintended dimensions and consequences that stem from the coupling of social and physical infrastructures.

[231] Electronic Symposium · FUTURES AND CHALLENGES IN GOVERNMENT DIGITAL ARCHAEOLOGY*(SPONSORED BY SAA DIGITAL DATA INTEREST GROUP)*

Within the public sector, archaeologists and our agencies use a range of technologies to “do” archaeology in support of heritage management laws and mandates, thereby producing digital data. We are also faced with curating large volumes of digital media and datasets created by others. The quantity of data and speed of change pose challenges in making information useful and accessible internally, to researchers, the private sector, and the general public. But these factors also introduce new opportunities for understanding the material record and conveying its value.

Where are we now at various levels of government service and public outreach? Where do we hope to go? How can we collaborate across geopolitical boundaries? What would we build if we were free of financial and technological constraints? This electronic symposium will explore the possibilities, along with friction points and unintended consequences of the digital deluge through demonstrations, case studies, and discussion.

[232] Forum · MILITARY ARCHAEOLOGY RESOURCES SUBGROUP FORUM: ARCHAEOLOGICAL RESEARCH CONTRIBUTIONS FROM CRM ON MILITARY LANDS*(SPONSORED BY SAA MILITARY ARCHAEOLOGY RESOURCES SUBGROUP)*

In committing to their stewardship role for cultural resources, the Department of Defense funds a wide variety of archaeological investigations across military lands, from traditional inventories to creative mitigation and preservation endeavors. Cultural Resources Programs at installations, regional centers and headquarters offices continue to work to implement management protocols and methodology to properly identify, evaluate, manage and protect the archaeological heritage of the United States. This forum will share experiences across installations and include a discussion on what constitutes best management practices for military Cultural Resource Management and how this unique body of work might contribute overall to the discipline of archaeology.

[233] Forum · ENOUGH TALKING ALREADY: TIME TO DEFINE PUBLIC EDUCATION FOR THE NEXT 25 YEARS*(SPONSORED BY SAA PUBLIC ARCHAEOLOGY INTEREST GROUP [PAIG])*

It has been twenty-five years since the last Save the Past for the Future conference was held to determine how to prevent looting and vandalism on archaeological sites. Since that time, public education has become established in archaeology as an important preventative measure. Professional archaeological organizations have public education committees, CRM firms and museums regularly provide educational programming, and there has been an increase in community-based participatory research. Despite these advances, archaeological educators are not reaching all the “publics” we need to reach. In addition, we now find ourselves operating within the broader, interdisciplinary field of heritage studies, which unites practitioners from many fields. How do we navigate these new circumstances and incorporate the realities of this evolving profession? It is time to stop simply talking and to act. Participants in this session will consider how to incorporate past advances in public education, envision its needs, and provide new directions for growth in the 21st century. Come join in the discussion and help outline a Save the Past for the Future (3) conference!

[234] Forum · THE NUTS AND BOLTS OF AGENT-BASED MODELLING FOR ARCHAEOLOGICAL SCIENCE

Agent-based models (ABMs) are slowly becoming a common part of the archaeological science toolbox. However, even as they become more common there remains a lack of understanding among most archaeologists of what they are, how they work, and how they can contribute to broader archaeological research programs. Over the last few decades, articles and conference sessions applying agent-based models have demonstrated their utility to a variety of topics; however to the uninitiated agent-based models remain black boxes that are difficult to evaluate or to apply to non-ABM research. In this forum, we will attempt to dispel the mystery of archaeological agent-based models without delving too far into jargon filled computer code. Rather, we will present interactive and live-running agent-based models to show how archaeologists design and use them to address typical archaeological research questions. Presenters will highlight specific problems they encountered during their design, coding, parameterising, or validation phases and the choices they made to find a solution. The agent-based models presented will be available for forum participants to download and run themselves so they can follow along with the demonstrations and discuss their application.

[235] Forum · LEAST COST PATH TO REDUCE THE GENDER GAP: FEMALE VOICES CONTRIBUTING TO GIS AND REMOTE SENSING IN ARCHAEOLOGY

In the last two decades, archaeology as a field has increasingly integrated new and cutting-edge technologies from different fields. Archaeological field and laboratory research is positioning itself as a discipline in which technological experimentation has a growing role and is tied to new research questions, scales of study, and interdisciplinary approaches. However, as archaeology embraced new methods from traditionally male-dominated fields, it also inherited an under-representation of the continuous role of female scholars in advancing this new methodological approaches. This forum will discuss the presence of women in Geographic Information Systems and Remote Sensing as applied to archaeology, to explore current directions in the field, barriers to representation, and strategies for creating spaces for students and professionals to actively contribute in its development.

[236] Forum · HERITAGE STILL MATTERS: ARCHAEOLOGY AND COMMUNITY ENGAGEMENT THROUGH POLITICAL ADVOCACY*(SPONSORED BY COALITION FOR AMERICAN HERITAGE)*

Last year the Public Education Committee sponsored the first Heritage Matters panel to discuss forms of advocacy by archaeologists in reaction to the alarming trend of attacks on public funding. Under the guise of reform, the attacks on heritage preservation and environmental regulations have escalated over the past year. Attempts to decrease funding to the Historic Preservation Fund, redefine the boundaries of Bears Ears and other National Monuments, and weaken the National Historic Preservation Act, are among the many threats met with organized responses from the archaeological community. This panel will

continue discussions from a 2017 panel on advocacy by bringing together experiences ranging from city-specific advocacy to advising on national regulations and policy. We cannot do this work alone. It is more important than ever to engage local communities and be prepared to frame the benefits of archaeology succinctly given the limitations of public comment opportunities. Discussants will share recent challenges, successes, and lessons learned from their experience as local advocates, government employees, private sector employees, and leaders of professional and avocational organizations. This year's session is sponsored both by the Public Education Committee and the Coalition for American Heritage.

[237] Forum · THE INTANGIBLE DIMENSIONS OF FOOD IN THE CARIBBEAN ANCIENT AND RECENT PAST

The analysis of food remains has been key to understanding the lifeways of the Caribbean's earliest inhabitants. Drawing primarily on economic and behavioral ecology models, these studies have focused on subsistence strategies, carrying capacity, resource over-exploitation, extinctions, diet and health, and related questions such as the translocation of species. Food is integral to non-economic, social and cultural processes, though, and some anthropologists and food historians would argue that food is culture. The purpose of this forum is to discuss food-related issues such as identity and cuisine, performance, cultural taboos, status and social differentiation (i.e., the relationship between cuisine and social position), the symbolic meanings of some foods, creolization or transculturation, resistance and many others processes in the Caribbean's ancient and recent pasts. It is our hope that this conversation will challenge us to start looking at our food data in new terms. Discussion will also include planning a 2019 SAA session, and, second, the production of a publication addressing these issues.

[238] Poster Session · DIGITAL ARCHAEOLOGY: PHOTOGRAMMETRY, REMOTE SENSING, DRONES

[239] Poster Session · ARCHAEOLOGICAL APPROACHES IN GIS: NORTH AMERICA

[240] Poster Session · ARCHAEOLOGICAL APPROACHES IN GIS: SOUTH AMERICA

[241] Poster Session · HISTORICAL ARCHAEOLOGY OF NORTH AMERICA

[242] Poster Session · TRADE & EXCHANGE II

[243] Symposium · BELIZE CAMP 2017: EXCAVATIONS, ANALYSIS, AND INSIGHTS FOR THE COLHA ARCHAIC MAYA PROJECT

The archaeological site of Colha is located approximately 75 kilometers north of Belize City and spans an area of seven and a half square-kilometers. The site is bisected northwest to southeast by the Old Northern Highway, and further bisected perpendicularly by Rancho Creek. Cobweb Swamp lines the eastern boundaries of the site. Colha is located within the northern portion of the northern Belize chert-bearing zone. It is well-known for being one of the largest Maya lithic production sites with hundreds of chert workshops for the production of tools including adzes, celts, and stemmed blades. The site has occupation dating to the Archaic Period as well as the Middle Preclassic through the Early Postclassic.

The objective of the 2017 field season centered around fine tuning the chronology of the earlier occupation periods for the site during the Archaic and Middle Preclassic Periods, as well as investigations surrounding human environmental interaction during a critical cultural transition. Targeted excavations within the 4000 sector and the 2000 sector are the focal points of this session. An overview of excavation strategies and history of the site will lead into papers discussing preliminary analysis of burials, lithics, ceramics, faunal remains, paleoethnobotanical finds, and other analytical research.

[244] Symposium · INVESTIGATIONS INTO SUBMERGED PREHISTORY: METHODOLOGICAL APPROACHES, RECENT ENDEAVORS, AND NEW RESULTS

Archaeology seeks to interpret past human behaviors by placing sites, cultural features, and artifacts in their appropriate contexts. However, climate and other environmental shifts have left many formerly terrestrial landscapes submerged, obscuring them and rendering interpretation difficult. Despite this complication, submerged sites and landscapes can offer enhanced site preservation, unique taphonomic considerations, access to powerful remote sensing tools, and unique data for analysis. To take advantage of these benefits, archaeologists must overcome challenges that differ from terrestrial contexts. Nonetheless, these efforts on submerged sites and landscapes contribute significant data concerning human cultural developments during prehistory, especially when human groups faced rapid shifts in both ecology and climate.

This symposium explores the challenges archaeologists face when working on drowned landscapes and the range of new information these rich environments have provided. Papers presenting methodology and results for underwater landscape surveys, site testing and exploration, and underwater excavation demonstrate the growing importance of this area of research. With sites ranging in age from the terminal Pleistocene through the Late Holocene, explorations of underwater landscapes and drowned terrestrial sites are invaluable for current and future archaeological research.

[245] Symposium · ON THE SHOULDERS OF GIANTS: LONG-TERM COLLABORATIVE RESEARCH PROJECTS IN THE CARPATHIAN BASIN

This session provides an overview of collaborative prehistoric archaeological research in the Carpathian Basin of Eastern Europe. The past 20 years have witnessed an unprecedented increase in the number of international, collaborative, archaeological research programs in the region. Building on the long-standing tradition of innovative, ambitious, regional research in central and eastern Europe, recent long-term collaborations between North American and local archaeologists and specialists have yielded groundbreaking results in the prehistory of the Holocene. These projects are significant not only at the regional level but also have

contributed to major, continental and global, anthropological questions related to early village social dynamics and the emergence of hereditary inequality. The session includes papers by the directors of long-term, international, collaborative projects who will address: 1) the contributions their projects have made to major anthropological questions, 2) how the amalgamation of different research traditions, methods, and theoretical perspectives rendered their programs successful, and 3) a critical reflection of what they can do better to promote multidisciplinary international collaboration.

[246] Lightning Rounds · GEOCHEMISTRY AND IDENTITY

Compositional analyses have become an increasingly common part of the archaeological canon, particularly in investigations of craft production, exchange, and technological tradition and innovation. Whether the materials being studied are ceramic, metal, or glass, these compositional analyses all share the assumption that chemical data has meaningful parallels in the social world. Yet exactly how this connection is drawn varies substantially among projects. This session will take stock of how researchers working in contexts around the world are turning their analytical results into anthropological information, and how factors like production choice, raw material availability, mobility, and others impact these interpretations.

[247] Symposium · THE CLIMATE REALITIES OF CULTURAL HERITAGE AND ARCHAEOLOGY

We take it as a given that archaeology and the cultural heritage of which it is part have much to offer efforts to address climate change: from paleoclimatic data to models of adaptation and the roots of the modern global system within which modern climate change has developed. Evidence to date is showing that climate change presents an array of challenges for archaeology— from loss from erosion, fires, sea level rise, to disconnection due to migration and loss of contact of affiliated communities, and damage deriving from conflict and other social changes. If we understand climate change as a whole-of-society problem, then the fields of archaeology and heritage alone cannot realize its potentials for climate change or solve its challenges. So this session asks- where are we in connecting the past to efforts to address climate change? Where do we stand in engaging heritage and archaeology with climate policy, adaptation planning, community engagement, war and conflict, and to climate and migration solutions? This session brings together viewpoints from the local to global scale, projects completed and in progress, to share the current scope and state of the heritage and climate movement.

[248] Symposium · LOOKING DOWN ON MESOAMERICA: APPLYING GEOPHYSICAL PROSPECTION, UAV MAPPING, AND LIDAR TO THE ARCHAEOLOGICAL RECORD

The continued development of remote sensing technologies and the inventive ways in which archaeologists are applying these tools make this one of the most innovative areas of the field today.

The utilization of these applications in Mesoamerica, however, has traditionally lagged behind that of other areas—such as the US Southeast. This session assembles a number of case studies highlighting a variety of remote sensing methodologies, including ground penetrating radar, electrical resistivity, magnetometry, LiDAR, and mapping with the aid of unmanned aerial vehicles (UAVs) or “drones.” Furthermore, the papers focus on a range of scales and contexts, including monumental structures and public plazas, households, communities, and broader regions.

[249] Symposium · VARIABILITY THAT LIVES: ECOLOGICAL, POLITICAL AND SOCIAL ADAPTATIONS TO DIFFERENT ENVIRONMENTAL ZONES OF SOUTH AMERICA

Since the initial peopling of the continent, humans have been presented with an unparalleled diversity of ecological zones in South America, ranging from the vertical archipelago of the Andes in the west to the fluvial environments of the lowlands in the east. Consequently, humans responded to these challenges with a variety of cultural adaptations. These adaptations generated different types of societies whose identities are a product of economic systems derived from the environmental wealth that exists in South America. In this symposium, participants aim to explore the interdisciplinary ways in which adaptation is approached and contextualized within a variety of ecological zones across the continent. Key areas to be explored are mobility, subsistence strategies, cultural contact, exchange, and the intersections among these cultural adaptations. The goal of this session is to facilitate a running dialogue between scholars and to produce a more complete picture of anthropogenic influence on diverse environments in South America.

[250] Symposium · NOVEL ANALYTICAL APPROACHES TO ARCHAEOLOGY IN THE FAR NORTH

For decades, archaeologists studying the North American sub-Arctic have pushed disciplinary boundaries by combining innovative theoretical approaches and cutting-edge technology. With case studies spanning the late Pleistocene to the ethnographic present, this session will show that high-latitude archaeology continues to make invaluable contributions to interdisciplinary science-based research, both within and beyond the sub-Arctic. Presenters will describe emerging methodologies in geochemistry, geology, landscape analysis, and experimental archaeology that have the potential to change our understanding of prehistory. This session will explore on-going analytical contributions that cross theoretical, institutional, and chronological lines to showcase the new directions of anthropological archaeology in the 21st century.

[251] Symposium · ARCHAEOLOGY IN AND AROUND THE NATION'S CAPITAL

From early antiquarians and amateur archaeologists to modern professionals practicing in CRM, academic, and government settings, more than two centuries of archaeological exploration in and around the nation's capital have identified numerous pre-Contact and historic archaeological sites. Assisted by state, district, county, and local ordinances, archaeological investigations have exponentially increased our understanding of how the area evolved over the millennia and provided new insights into the history of this region. This symposium focuses on a broad range of projects across the capital region, ranging from the study of the area's earliest inhabitants to the twentieth century modernization of the area that transformed the landscape.

[252] Symposium · MONUMENTALITY AND THE PRECLASSIC MAYA

Recent work throughout the Maya world has increasingly demonstrated that construction at a monumental scale was widespread in the Preclassic Era. Examples of such architecture include temples and palaces, plazas and platforms, defensive walls and

canals, causeways, and other landscape modification to facilitate settlement or manage local hydrology. These discoveries serve to expand our understanding of the rise of Maya states, including the turmoil and likely collapse that attended the transition from the Preclassic into the Early Classic period. Additionally, they serve as the means by which a greater antiquity can be traced for some Classic period cultural practices, a continuity that is contrasted in other practices by exclusive association with one era or the other. Finally, as the regional specifics of the Preclassic come into better focus, the dynamics of the spread of cultural traits and political influence in the process of homogenization that established an identifiably "Maya" cultural appearance across the region are being brought to light.

[253] Symposium · THE CULTURAL AFFILIATION OF THE ANCIENT ONE (KENNEWICK MAN)

(SPONSORED BY SAA COMMITTEE ON NATIVE AMERICAN RELATIONS)

The Colville, Nez Perce, Umatilla, Wanapum, and Yakama utilized NAGPRA's preponderance of evidence standard to demonstrate a relationship of shared group identity with the Ancient One. The tribe's proactive approach with collaborative partners overcame the hegemonic ideology of a federal agency to repatriate the Ancient One for his final journey to the Creator. For over twenty years, the Claimant Tribes asserted their cultural affiliation. Our purpose here is to illustrate that, although he was repatriated under the WIIIN Act of 2016, there does exist evidence of a shared group identity based upon all available, population specific data for the Columbia Plateau. This information provided the evidentiary basis for the identification of an earlier group and cultural affiliation to the Claimant Tribes. The Ancient One falls within the variability exhibited at the same time period and throughout time on the Columbia Plateau. He was not outside of the norm for the population existing during the Early Cascade period and for the populations that followed for which he has a shared group identity. The Claimant Tribes are in fact culturally affiliated to the Ancient One and have never signed anything that legally says they are not.

[254] Symposium · PLANTS GOT A LOT TO SAY IF YOU TAKE THE TIME TO LISTEN: GARDENS IN THE AMERICAN NEOTROPICS

The purposeful cultivation of plants within settlements, in spaces referred to as infields and gardens, is significant throughout the tropics. Historically, archaeologists have focused on outfields to reconstruct ancient agriculture and subsistence practices. On the other hand, researchers studying contemporary gardening practices understand the cultural, economic, and ritual significance of gardens. Gardens are spaces where food, medicine, construction materials, and plants of aesthetic value are grown for household consumption and for sale in markets. They are also spaces to conduct household activities, generate supplemental income, and maintain cultural memory. Archaeological explorations of garden spaces, particularly in the American Neotropics, have tended to focus on their identification, through soil chemical, archaeobotanical, and spatial analyses. Now that we have refined our ability to identify garden spaces, we can turn to more anthropologically oriented questions. How do households use cultivated infield spaces, and what meanings are given to these activities? How do gardens serve as spaces for the display of wealth and status and as spaces of cultural memory? How do gender dynamics interact with physical garden spaces? Can changes in garden cultivation reveal larger shifts in the political economy? This session will situate gardens within social, cultural, and economic contexts.

[255] Symposium · BREAKING DOWN MATERIAL ASSUMPTIONS OF IDENTITY

Though anthropologists and ethnohistorians problematize terms like culture, ethnicity, and identity, archaeologists often attribute artifacts to a specific group of people and interpret identity based on static boundaries of time and space. Reducing cultural identity to the material ignores the complexities inherent in the constant negotiations and renegotiations by past peoples within their communities and between their neighbors. Perspectives written or spoken by the people studied and their descendants often remain ignored, and the reuse and reimagining of objects, raw materials, and places is rarely examined. These concerns can be addressed in variety of ways. Ethnoarchaeology connects the past to the present. Archaeometry traces the movement of pots, and microstyles investigate at a smaller scale than typologies. Historical documents offer corroborating or contradicting evidence, and contemporary artists provide nuanced perspectives of the past by reimagining traditions. These and other approaches offered by participants in this session problematize connections between past peoples and materials to inform interpretations and change our perceptions of the material and archaeological records.

[256] Symposium · RESEARCHING THE ANCIENT MAYA OF PACBITUN, BELIZE: A DECADE OF ARCHAEOLOGICAL DISCOVERY

Since the 1980s, the ancient Maya site of Pacbitun, Belize has been the subject of extensive excavations and research. The data accumulated, covering the nearly two-thousand year history of Pacbitun, has contributed to our understanding of the development and evolution of social, economic, and political institutions. The papers in this session will be a summary of the previous and ongoing research efforts at Pacbitun. Current research explores Pacbitun's modes of production and trade networks as it straddles the Belize Valley and Mountain Pine Ridge resource areas. Additionally, research efforts chart the use of environmental resources and the reshaping of the environmental topography. Expanding on earlier studies, excavations into plaza space have increased our understanding of the domiciles and production spaces of the site's earliest inhabitants while also adding a ceremonial dimension to their cultural repertoire. Other investigations have focused on Pacbitun's elite community and the events of the Classic period through an examination of residential, ceremonial, and causeway architecture. Finally, through the application of LiDAR and photogrammetry, we continue to technologically enhance our research capabilities.

[257] Symposium · COMPLICATING HISTORIES: ARCHAEOLOGICAL CHALLENGES TO NARRATIVES OF COHESION IN THE INKA AND AZTEC EMPIRES

Ancient empires relied on varying political and cultural strategies to emphasize the illusion of cohesion. For example, alliances, arranged marriages and ritual performances served to consolidate internal diversity and manage external challenges to the imperial façade. The historical record (a largely imperial perspective) often portrays encountered polities in subservient ways—as allies, as belligerent, as barbaric, or as the "other". Yet, empires were invariably constrained by the actions of competing and incorporated polities, who complicated the imperial narratives through their conscious or inadvertent engagements with the empire. The papers in this session center on material evidence from recent archaeological research to challenge historical imperial narratives, and explore the spectrum of imperial influence in local material cultural expression. Specifically, we look at the Inka in the Central Andes and the Aztec in Mesoamerica. In using a comparative approach, this session aims to characterize the

relationships that developed during the emergence, consolidation and maintenance of the two largest and most prominent American Empires.

[258] Symposium · THEORY, METHOD, DATA, AND THE ANTHROPOLOGICAL ARCHAEOLOGY OF MESOAMERICA: PAPERS IN HONOR OF JOSEPH W. BALL

Over a career spanning more than four decades, Dr. Joseph Ball's contributions to Mesoamerican archaeology can be characterized as having uncommon breadth and depth—from his seminal work at Becán, to his pioneering study of coastal Maya ceramics, to massive programs of excavation and analysis in the Belize Valley, to examinations of sites across the northern plains of Yucatan. Ball's work has led to a nuanced crystallization and use of a shared ceramic lexicon among Maya archaeologists. The larger impact of his scholarship, however, is seen in his broad syntheses of Maya culture history and his explicitly anthropological approach to archaeology. Through his work, for example, great strides were made in achieving a deeper understanding of Preclassic cultures and ethnicity in the northern and central Maya lowlands, particularly in the Belize Valley. Ball also developed the chronological framework for the Yucatan and introduced the conceptual structure for the segmentary state. Here, we bring together friends, colleagues, and students who have been influenced by Joe's work as an anthropological and Mesoamerican archaeologist, demonstrating how his legacy will continue to shape the future of our discipline.

[259] Symposium · DEEP ECOLOGIES OF NORTHERN NEW MEXICO

This symposium brings together papers exploring the idea of "deep ecology" in two primary ways: first, from an analytical perspective that addresses the nature and processes of ecological relationships, especially between plants, animals, and humans; and secondly, from a historical perspective that considers how these relationships change over deep time. Participants in this session present original research into the ecological history of the Northern Rio Grande from the Archaic through colonial periods. Individual papers consider the histories of particular anthropo-ecological practices, including hunting, herding, farming, and plant collection, and each emphasizes the way non-human agencies have shaped human communities in the region. In bringing these papers together, we hope to engage a deeper conversation about archaeological approaches to the emergence, persistence, and variability in human/non-human ecological relationships over time. In the process, we also report on the first ten years of work by the Gorge Project, an inter-institutional research collective formed to study the landscapes and histories of north-central New Mexico.

[260] Symposium · ADVANCES IN THE PREHISTORY OF SOUTHERN COSTA RICA AND WESTERN PANAMA: NEW PERSPECTIVES ON THE ARCHAEOLOGY OF GREATER CHIRIQUÍ

The Greater Chiriquí archaeological subarea comprises regions of the provinces of Limón and Puntarenas in Costa Rica and those of Bocas del Toro and Chiriquí in Panama. Like other cultural areas, its boundaries and distributions of distinctive elements by period remain ambiguous. New data allow us to distinguish subdivisions that are more in line with the distribution of elements in geographic units, some of which are transnational. These include the Térraba River basin, the Coto Colorado valley (Chiriquí plains), the Coto Brus valley (Chiriquí highlands), the Osa Peninsula, the Sixaola Valley, and Almirante Bay. Recent archaeological research has challenged previous models and addressed questions such as the emergence of horticulture, sedentism, and social complexity; paleoenvironmental reconstruction and human ecology; volcanism, and the cultural contexts of monumental sculpture—most notably sites with stone spheres in southern Costa Rica (recently declared UNESCO World Heritage). This symposium includes contributions on recent research by archaeologists of Costa Rica, Panama, and the U.S. Among the topics that unite them are issues of local culture change, intraregional networks of trade and communication, and the utility of the concept of Greater Chiriquí as an archaeological unit.

[261] Symposium · TOUGH ISSUES IN LAND MANAGEMENT ARCHAEOLOGY

Federal archaeology is framed by congressional direction through various statutes, including the Antiquities Act, the National Historic Preservation Act (NHPA), Archaeological Resource Protection Act (ARPA), and Native American Graves Protection and Repatriation Act (NAGPRA). Federal agencies are responsible for implementing these statutes while incorporating and adapting to changes in technology, land use, project scale, and public perspectives. The pace and trajectory of these changes have intensified and shifted in recent years. This symposium, focused primarily on the Bureau of Land Management, the nation's largest land manager, explores the successes and cautionary tales of governmental land management, while providing information on opportunities and efficiencies for future work.

[262] Symposium · DEVELOPING MACRO-REGIONAL PERSPECTIVES ON FORMATIVE CENTRAL MEXICO: INSIDE AND OUTSIDE VIEWS OF SOCIAL TRANSFORMATION

Recent research at the Formative sites in Central Mexico has provided new evidence on social transformations during the Formative period (ca. 1000 BC–AD 250), including early sedentary villages, interregional interaction during the Early and Middle Formative, and the rise of early cities during the Late and Terminal Formative. While Formative Central Mexico, especially before Teotihuacan, has been paid little attention until recently largely due to the fragmented nature of archaeological evidence, the new body of research has shed an important new light on some key aspects of social transformation during this period. The proposed symposium will address what constitutes Central Mexico as a macro-region, how it changed through time, key legacies for social change during the subsequent periods in Central Mexico and beyond, the changing nature of interregional interaction within Central Mexico and between Central Mexico and other regions of Mesoamerica, and the ways in which Central Mexico is similar to and different from other regions of Mesoamerica in terms of the scale of society, the degree of social inequality, and the economic organization

[263] Symposium · EXPLORING MOBILITY AND MULTICULTURAL LIFEWAYS IN PRE-COLUMBIAN CENTRAL AMERICA

Periodic changes in the pre-Columbian material culture of Central America are typically attributed to the impact of either migration to and/or conquest of regions by foreigners, or the diffusion of ideas along exchange networks. While technological and iconographic linkages are frequently raised as evidence for these events, very rarely are their mechanisms adequately defined or demonstrated archaeologically. Describing these changes, particularly involving groups of differing linguistic and/or ethnic

backgrounds, traditional linear narratives tend to focus on episodic cultural succession—the replacement of a passive (generally ‘indigenous’) group by a well-defined donor group or worldview—when some critical tipping point is met. In the material culture of Central America, this tipping point is frequently identified by shifts in choice of raw material, technology, symbolic content, function, and/or decorative style.

This symposium aims to transcend over-simplified notions of human mobility and social organization. In many regions, ethnohistoric and colonial records indicate that major centers frequently contained differing linguistic or ethnic groups at European contact. We welcome all papers that explore human mobility from multiscalar, nonlinear perspectives, and/or the potential implications of multicultural lifeways for archaeological reconstructions. How might we better access and demonstrate mobility and multicultural social organization in the record?

[264] Electronic Symposium · FROM CH’EEN TO WAK’A: HEMISPHERICAL VIEWS OF THE CEREMONIAL LANDSCAPES OF THE PRE-HISPANIC AMERICAS

Increasingly, archaeological, iconographic, ethnohistoric, epigraphic, and linguistic studies have shown the landscape was more than a passive backdrop upon which life was lived and from which resources were extracted for the people of the pre-Hispanic Americas. Instead, it was understood as being imbued with animate, generative forces such as Earth spirits and ancestors who were actively engaged on a regular basis as part of the culture-making process. These beings and forces were accessed through sacred landmark portals—caves, rockshelters, boulders, mountains, hills, and bodies of water—variably called wak’a, ch’een, and tzuultqu’a—where ritual petitions were made for gaining their favor, where community origins were celebrated, and where rulers demonstrated their supernaturally-sanctioned right to rule. As such, landmarks served as vital arenas of political power, markers of social memory, and fundamental loci of community identity. Yet, most such studies remain grounded within the culture area under discussion. Our goal for this electronic symposium is bringing together landscape archaeologists studying pre-Hispanic cultures of Mesoamerica and the Andes for exploring the related and contrasting ways past peoples of the Americas created and re-created their ceremonial landscapes through a variety of practices.

[265] Poster Session · CERAMICS AND TEXTILES

[266] Poster Session · MISSISSIPPIAN ARCHAEOLOGY

[267] Poster Session · THE AMERICAN SOUTHWEST

[268] Poster Session · CULTURAL RESOURCE MANAGEMENT

[269] Poster Session · ANCESTRAL PUEBLOAN ARCHAEOLOGY

[270] Poster Session · BIOARCHAEOLOGY IN THE ANDES

[271] Symposium · FORMATIONS OF BLACKNESS AND LATIN AMERICA

(SPONSORED BY SAA AFRO-LATIN AMERICAN ARCHAEOLOGY INTEREST GROUP)

The colonial metamorphosis from social classification to racial thinking centered on defining places, social and geographic, for and by Afro-Latin Americans. The Spanish American social classification schemes of types of people, castizaje or the casta system and racial thinking had its foundation in 16th- and 17th-century moral concerns related to maintaining the purity of Christian blood (limpieza de sangre). Ambiguous early terminology was tied to an imagined body of difference often focused on skin color, or colorism. Intimate relationships of blood mixing made it also fluid and opportunistic; the concept of caste retracted, stretched, and grew according to circumstance, eventually merging with the concept of race as it developed in the 18th and early 19th century. People constructed difference through the built environment, especially regarding by affecting mobility and invisibility, the selective use of kinds of ecologies (swamps, caves), urban space, and through bodies themselves. This topic offers a chance to discuss the gritty reality of the construction of race in different regions as well as assess differences among colonial powers.

[272] Symposium · ARCHAEOLOGY AND INDIGENOUS SCHOLARSHIP IN THE AMERICAS

Archaeology has increasingly been concerned with the ways that indigenous peoples’ perspectives can be acknowledged, honored, or made central in research efforts. However, this does not always translate into engaging with indigenous and Native American studies theoretical perspectives in representing the results of research, even if the research itself was collaborative.

Western epistemological traditions and the institutionalization of these understandings of the world—the academy—have constructed ideological and physical dichotomies between nature and culture, pre-contact times and post-contact times, and tribal and colonial state boundaries. Archaeologists are in a unique position to engage multiple datasets and knowledges in partnership with tribal communities to challenge these deeply rooted settler claims to intellectual and physical spaces.

Theoretical perspectives from Native American studies can help decolonize archaeological narratives to show how indigenous peoples in contact with Europeans continue their entanglements with land, ancestors, traditions and values. Archaeologists in this session use ideas developed in Indigenous and Native American studies to enrich their archaeologies with, by, and for indigenous peoples. The ideas used to clarify understanding range from Gerald Vizenor’s concept of survivance to Kim TallBear’s use of

“articulation” to address genealogical and genetic arguments.

[273] Symposium · HEGEMONIC PROCESSES AND STRATEGIES OF STATE DOMINATION IN THE ANDES: LOCAL/REGIONAL PERSPECTIVES

This symposium aims to address the different hegemonic processes associated with the emergence, development, domination, strategies of conquest and collapse of the complex societies of state level that originated in the Andean cultural areas. A number of societies known as “complex” at the state level emerged in this region, understanding that they developed a series of economic, political and ideological strategies that went beyond community-based organization and had different levels of domination and hegemony even in contemporary times. Among its characteristics are the emergence and adaptation of political and economic institutions, the emergence of religious ideologies materialized in iconographies, specialized production of material culture (ceramic, lithic, metallurgy), and architectural evidences that show different levels of complexity. The contribution of different case studies is expected to focus on the elements that made possible the different hegemonic and domination processes in these complex societies seen as part of endogenous and autonomous processes in the South American region. These particularities of complex societies can help to generate comparative perspectives better documented taking into account contributions from local perspectives, and contributing from ethnohistorical, ethnographic and anthropological sources

[274] Symposium · SILK PURSES FROM SOWS' EARS: A SESSION IN HONOR OF JOHN R. WHITE

In a career that spanned five decades, John R. White devoted his considerable energy to implementing the holistic vision of anthropology in the field, the classroom, and the community. His research and courses covered prehistoric and historic archaeology of the Old World and New World, the ethnography of native North and South America, and the anthropology of law. As a student of Aidan Treganza at San Francisco State, and then of Melvin Aikens at Oregon, John's early research focused on the prehistory of the West Coast. During his 34 years at Youngstown State, John developed an expertise in industrial archaeology, with a focus on 19th century blast furnaces. Through work on historic and prehistoric sites in eastern Ohio and western Pennsylvania, and in Israel and Central America, John gave several generations of students an array of opportunities. In addition, he made archaeology accessible to grade school and high school students through programs in summer camps. Each field project was an opportunity to share the excitement of archaeology with students whom he mentored and groomed carefully, and to satisfy his scholarly interests. John developed a true community archaeology, the spirit of which his students have continued since his passing in 2009.

[275] Electronic Symposium · SPANISH COLONIALISM IN THE GLOBAL REALM: ARCHAEOLOGICAL AND ETHNOHISTORIC APPROACHES TO CULTURAL ETHNOGENESIS AND PERSISTENCE

Research on questions of identity within and outside colonial contexts has generated many conceptual frameworks and methodological approaches to hybridity, syncretism, creolization, hispanization, ethno genesis, etc. This electronic symposium focuses on ethno genesis and cultural persistence as dynamic processes of identity creation, manipulation, and co-constitution, as well as the persistence, reinforcement and reconstitution of elements of ethno-cultural identities.

Moving beyond dichotomies of colonizer/colonized, dominance/resistance, or aggressors/passive recipients of change, we offer a more nuanced, comparative exploration. Encounters between agents of the Spanish State and native communities quickly created a web of pluralistic, global cross-cultural interactions. Spanish colonies in each region were hotbeds of cross-cultural exchange and conflict, including the creation and recreation of identities, as well as the persistence of local and indigenous traditions in old and new places and contexts. Within these multi-cultural contexts, archaeological approaches to ethno genesis pay close attention to patterned material practices that signify identity formation, manipulation and reinforcement.

This electronic symposium brings together research in six world regions (North America; Mexico and Central America; Andean South America; the Caribbean; Africa; and the Pacific/Southeast Asia). Papers variably employ material culture studies, demography and settlement patterns, household and community research, ethnohistory, and a variety of interdisciplinary approaches.

[276] Forum · KEEPING OUR SECRETS: SHARING AND PROTECTING SENSITIVE RESOURCE INFORMATION IN THE ERA OF OPEN DATA

For decades, cultural resource managers in the United States have protected sensitive site information by simply keeping it “under wraps.” However, this approach is becoming increasingly troublesome in the current information climate, which favors openness. In addition, the footprint of development activities and the information demands of associated compliance regimes are growing, and managers' and planners' ability to find and share large quantities of information is on the dramatic increase. As the manner in which we share and consume information has changed, some challenges inherent in the “keep it all secret” strategy have become apparent. Resource stewards find themselves forced to weigh the risks of keeping secrets with those of sharing across disciplines. For instance, under-sharing may mean that resources are overlooked by planners and first responders. However, disclosing certain information, such as specific locations, can enable resource theft or damage. Panelists with expertise in the management of cultural resources discuss how these tensions have affected their management strategies. Participants in this forum explore solutions for appropriate information sharing and resource protection, with special attention to climate change and incident response.

[277] Forum · SANNA: SOCIAL ARCHAEOLOGY OF THE NORTH AND NORTH ATLANTIC

Over the past 40 years, the archaeology of the North and the North Atlantic has seen ever-increasing numbers of researchers engaged in productive inter-disciplinary work crosscutting local, national, and regional boundaries. Research dominated by paradigms grounded in environmental archaeology have produced significant advances in methodology, collaborative practice, and zooarchaeological, paleoecological, and human-ecodynamic interpretations. However, approaches to the study of material culture in the North have been comparatively neglected. Relegated often to the field of “small finds” or examined solely for functional, chronological, or typological studies, analyses of Northern material culture participate only infrequently in theoretical discussions on materiality, the social lives of objects, symbolism, thing theory, etc., and have rarely been used to generate innovative methodologies or collaborations. SANNA (from Old Norse, “to prove, make good, affirm”) brings together papers by northern archaeologists interested in seeing beyond the immediate or visible characteristics of artifacts, architecture, and landscapes—material culture on multiple scales—to explore ways in which material culture can be used to develop new ideas

about past relationships and the social settings within which humans exploited their environments, made the North in their images and imaginations, or continue to use its material remains for contemporary agendas.

[278] Forum · COMMEMORATION, MEMORIALS, AND PRESERVATION: ARCHAEOLOGICAL INTERESTS, EXPERTISE, AND RESPONSIBILITIES

The role of public monuments and commemoration in political and social life in the United States became a focus of deadly violence in August, 2017, with demonstrations in Charlottesville centered on a controversial statue of Confederate general Robert E. Lee. A repeated refrain, echoed at the highest levels of national government, was that the removal of such statues was a destruction of “heritage” and “culture”. Some went further, arguing that it would destroy “history”. These words— heritage, culture, history— and the artifacts provoking their use all fall squarely within the domain of phenomena engaged with by archaeologists. Archaeological perspectives were represented, not only in the moment sparked by Charlottesville, but before it, in commentaries and professional articles in which archaeologists discussed the specific case of Confederate memorials, but also in broader debates about preservation and destruction of monuments that have assumed an aura of “negative heritage”. This forum invites participants to single out the key stakes in these debates, and to critically examine the positions archaeologists may have, or may be called on to take, on the intertwined questions of preservation of materials that cause pain, and the ways that painful histories are or are not embedded in public commemoration

[279] Forum · SKOPE: HOW WE ARE MAKING PALEOENVIRONMENTAL DATA USEFUL AND ACCESSIBLE

The NSF-funded SKOPE Project — Synthesizing Knowledge of Past Environments — is developing cloud-based and local computational tools that provide easy access to paleoenvironmental data and models. The SKOPE environment (demonstration available at <http://openskope.org/>) enables scholars to easily discover, access, explore, visualize, and synthesize data, information, and knowledge of both past and contemporary environments. Having selected a time period and area of interest, researchers choose from a menu of available environmental datasets that are visualized as time series graphs and maps, or downloaded for offline analyses. For select environmental reconstructions, users may adjust the model parameters, view the source code underlying each model, and even submit their own models to be run on the SKOPE infrastructure. In addition to the web application, the SKOPE project has developed FedData (<http://ropensci.github.io/FedData/>), an R package that automates downloading of geospatial data available from several federated data sources, and YesWorkflow (<https://github.com/yesworkflow-org/>), a declarative framework for recording and analyzing computational provenance within scientific workflows. In this forum, the SKOPE team will introduce SKOPE and perform live demonstrations of the SKOPE tools. Forum attendees will be invited to try the tools themselves, and provide feedback that will inform future SKOPE development.

[280] Forum · IN THE EYES OF THE LAW: CONTEXTUALIZING ARCHAEOLOGICAL LEGISLATION THROUGH TIME AND SPACE

(SPONSORED BY SAA GOVERNMENT AFFAIRS COMMITTEE AND THE HISTORY OF ARCHAEOLOGY INTEREST GROUP)

Due to the current political gridlock in the United States, it may appear as though nothing gets done in Washington—and certainly nothing of importance to archaeology. The purpose of this forum is to dispel this myth, while discussants look at how legislation has shaped the practice of American archaeology for more than a century. This forum is not simply a history lesson, but aims to be much more holistic. By concentrating on the struggles, lessons and loci of power within key pieces of archaeological legislation through time, as well as the people and circumstances that helped make these laws come to fruition, we urge members to consider our legislative needs from this point forward. As a discipline keenly focused on issues through time and space, it is particularly serendipitous that this forum will occur in Washington, D.C. in 2018. And while this forum is decidedly focused on the United States, discussants will offer broader lessons with a global reach.

[281] Forum · EXPLORING THE PATH FORWARD: THE BOY SCOUT ARCHAEOLOGY MERIT BADGE 20 YEARS LATER

(SPONSORED BY SAA PUBLIC ARCHAEOLOGY INTEREST GROUP)

The Boy Scouts of America created the Archaeology merit badge in 1997, providing archaeologists with an opportunity to excite future generations about archaeology while inspiring scouts to value and respect cultural resources. In 2017, members of the SAA's Public Archaeology Interest Group with prior experience of the archaeology merit badge, and drawing together the work of others who have studied the badge, conducted an evaluation of the archaeology merit badge, focusing on its strengths, weaknesses, and needed adjustments due to changing standards. Through their outreach efforts and contact with the Boy Scout organization, the group was then requested to submit a revised version of the badge to the Boy Scouts of America, which is currently under review for adoption. This forum will discuss the evolution of the badge, share the experiences of several current merit badge counselors as well as those who have staffed the archaeology merit badge booth at the National Boy Scout Jamboree, and will chart a path forward. The path forward includes improving outcomes and scout experiences with the badge; documenting and sharing current resources and best practices; and identifying and expanding the current network of archaeology merit badge counselors through recruitment and training.

[282] Symposium · US AND THEM: THE BIOARCHAEOLOGY OF BELONGING AND EXCLUSION

Building on a theme from the SAAs in 2017, this symposium contains the work of bioarchaeologists from across the globe who are exploring how to address the concepts of belonging and exclusion in the bioarchaeological record. The research included here utilized bioarchaeological methods, such as morphological variation, biodistance studies, anthropological genetics, isotopic analysis and paleopathological conditions, to address the possibilities of group admixture and segregation. The bioarchaeology work included is temporally broad and addresses research from various cultures around the world. Working from an anthropological perspective, the papers address notions of how bioarchaeological evidence of inclusion and division fits into the larger societal context.

[283] Symposium · THE HUMAN JOURNEY: UNDERSTANDING HUMAN MIGRATION IN THE PAST TO ADDRESS CHALLENGES FOR THE FUTURE

(SPONSORED BY NATIONAL GEOGRAPHIC SOCIETY)

Since our emergence out of Africa, humans have migrated across the globe in search of resources and new opportunities. In many ways, we are inherently a mobile species, albeit one that oscillates between settled urbanity and small mobile groups. With over 65 million refugees in the world today, and another 50 million “environmental refugees” estimated by 2020, the study of human migration has become both timely and urgent. What is the “tipping point” at which more people are on the move than settled, and what effects will this have on our cultures, our genes, and our societies? This symposium demonstrates how archaeologists are leveraging an array of techniques and evidence, such as ancient DNA, material science, isotopic analysis, and GIS, to address long-standing questions around the mobility of people in the past and the present.

[284] Symposium · EARLY NEOLITHIC IN THE LOWER YANGTZE: THE SHANGSHAN CULTURE

This symposium highlights progress being made by the collaborative Shangshan Culture Project based in the Lower Yangtze Valley of Zhejiang Province, China. The Shangshan Culture, identified just over a decade ago, was responsible for the first steps to agriculture in the region, if not all southern China. This symposium outlines our current understanding of the material culture, settlement, chronology, human ecology, geoarchaeology, and palaeoethnobotany of the culture, with emphasis on the Shangshan, Huxi, and Qiaotou sites. Shangshan dates to ca. 12,000–8,400 BP and is ancestral to the Neolithic Kuahuqiao and Hemudu Cultures. The Shangshan culture established substantial communities in elevated (40–100 m above sea level), intermontane river valleys well away from where the Kuahuqiao and Hemudu cultures eventually became established. Questions being addressed include what economically supported the occupations, how settlements were organized, the function and palaeoecology of substantial ditches at several Shangshan sites, the process of rice domestication, the meaning and technical skills behind the many forms of Shangshan pottery (including fibre tempered and thin, painted/slipped ware), and the relationships the occupations had with each other and to subsequent cultural developments in Zhejiang Province.

[285] Symposium · MESOAMERICAN CHIPPED STONE: A REGIONAL PERSPECTIVE FROM THE GULF COAST OF MEXICO

The analysis of chipped stone artifacts, which include both the products and by-products of reductive processes, provides an effective method with which to study a wide variety of behaviors, ranging from household quotidian activities to interregional interaction. In the Gulf Coast region of Mesoamerica, obsidian reigned as the primary raw material utilized throughout most of the prehispanic period. This material is ubiquitous within the Gulf Coast region, but of non-local origin, imported largely from sources in the Mexican Central Highlands, and, to a lesser extent, Guatemala. In this session, we present recent and current archaeological research focused on chipped stone from the Gulf Coast region, specifically the state of Veracruz, Mexico. These studies extend from the northernmost to the southernmost portion of the state, and span the Archaic period to the Postclassic period. With this session, we aim to disseminate findings derived from the numerous projects undertaken within the Gulf Coast region and foster greater collaboration among scholars working within this research area.

[286] Symposium · IS DIGITAL ALWAYS BETTER?

(SPONSORED BY NORTH AMERICAN CHAPTER COMPUTER APPLICATIONS AND QUANTITATIVE METHODS IN ARCHAEOLOGY [CAA-NA])

“Is Digital Always Better?”—The North American Chapter of Computer Applications and Quantitative Methods in Archaeology (CAA-NA) is sponsoring a session that examines projects or approaches where digital techniques have been particularly advantageous or disadvantageous. And, while digital technologies are becoming the mainstay of archaeological practice, they are not the end all, be all. In all the excitement, discourse often focuses on digital data acquisition at the expense of archaeological analysis and interpretation. Some topics addressed include: (1) How digital technologies allow us to address research questions that would otherwise be “unanswerable”? (2) When do analog techniques better serve archaeology? (3) Is data digitization enough? What are we actually doing with all of our digitized legacy data?, (4) What are the challenges of adopting digital technologies? How do we overcome these challenges? and (5) In what cases can digital technologies readdress old research questions?

[287] Symposium · POTTERY IN PRACTICE: THE PRODUCTION AND USE OF CERAMICS IN THE ANCIENT SOUTHWEST

Ceramic studies are a crucial component of the archaeology of the southwestern United States and northwest Mexico, encompassing a broad range of topics and applications from site chronology to material science and ancient ideologies. In this session, we draw together studies that take a robust theoretical approach to southwestern ceramics as physical objects in larger social and material contexts. Individual papers use data from a wide range of southwestern settings to examine topics such as production techniques; the distribution of vessels, including sourcing studies and the physical transportation of objects; the use of pottery in food preparation and serving; and the decision-making processes used by modern individuals in classifying pottery. By adopting a focus on “pots as objects,” these studies both build on a long regional history of materially focused ceramic studies and serve to shed new light on the roles played by ceramic vessels in the lives of past people and communities.

[288] Symposium · FROM EARLY FORMATIVE TO POSTCLASSIC IN THE MIXTECA OF OAXACA: THE FORMATIVE ETLATONGO PROJECT, 2015–17

Identified as an important Early Formative site from both a regional survey and archaeological testing by several previous project, Etlatongo, in the Nochixtlán Valley of Oaxaca, Mexico, has been the subject of a new research project, the Formative Etlatongo Project (or FEP), with three excavations seasons completed from 2015 through 2017. The new research confirms that Etlatongo would have been among the largest settlements in the Mixteca during the Cruz B phase (1200/1150–850 BC); the FEP excavations have also defined the presence of early public space at the site, with the focus a probable ball court that evinces two major Cruz B construction episodes. Comparative data from soil chemistry and obsidian analysis from different contexts at the site provide a more nuanced understanding of activities and consumption patterns between public space and different households at Early Formative Etlatongo.

Beyond the Early Formative, the recent excavations and ongoing laboratory research also provide new understandings of burial patterns and expand our knowledge of the Yucuita and Early Ramos phases, a time of early urbanism. The FEP has also encountered substantial Postclassic deposits, which allow interventions in ceramic production and exchange before the arrival of the Spanish invaders.

[289] Symposium · NOW THAT I HAVE MY DEGREE, WHAT DO I DO? GOING FROM THE CLASSROOM TO THE PROFESSION

Archaeology is changing. Technological advances, emerging social issues, and changes in the legal framework over the last quarter of a century are drastically changing how professional archaeologists conduct their business as well as opening new avenues of research. The result is diverse employment opportunities but these opportunities are still highly competitive. In order to succeed, students entering the profession need to understand what these new opportunities offer and what they will need to know to take advantage of them. This panel discussion brings together professionals representing different aspects of the discipline to discuss the current status of archaeology with respect to employment. Panelists will explore career opportunities, the skill sets graduating students will need to launch and advance their careers, and what the future holds. The session is aimed at those who have recently received or are about to receive their degree and are trying to transition into the profession. The session will be informal and attendees should come with questions.

[290] Symposium · MENTORING THE MISCELLANEOUS: PAPERS IN PALEOETHNOBOTANY

In 1957, Volney Jones articulated the idea that paleoethnobotanists, having one foot in anthropology and one in botany, were considered by those disciplines to be neither archaeologists nor botanists. This problem of “being miscellaneous” continues despite the role of paleoethnobotanists as vital members of research teams. One of the impacts of being a sideline speciality is the lack of structured training programs to develop the botanical knowledge alongside a standard curriculum in archaeology. Most undergraduates receive basic training in lithic or ceramic identification during field schools. However, paleoethnobotanical skills are not as frequently taught. Most training in paleoethnobotany has taken the form of a mentorship, often at great personal cost to the student. A great example of this is the summer Vaughn Bryant travelled from Texas to Canada for a summer at his own expense to study coprolite research under Eric Callen. These hours of one on one instruction under the fume hood, in front of the microscope, or in plant communities prepare students to become professionals who go on to establish their own research programs. This symposium emphasizes the importance of these mentorships and honors the many years that Vaughn Bryant has committed to mentoring generations of young scientists.

[291] Symposium · EXTENDING THE LEGACY OF THE LATE STEPHEN WILLIAMS

Stephen Williams (1926–2017) was the Peabody Professor of American Archaeology in the Peabody Museum and the Department of Anthropology at Harvard University. This symposium extends the legacy of his principal scholarly interests in North American archaeology, the history of anthropology, and “fantastic archaeology” by featuring contributions by his former students and colleagues. Among Williams’ principal foci was the prehistory of the Lower Mississippi Valley, with special emphasis on Woodland and Mississippian cultures. He also had a deep interest in the emergence of the discipline of anthropology in the United States, especially the use of ceramic analysis to systematize cultural chronologies and culture history. Williams developed a popular course on pseudoscience, using archaeology to teach hundreds of students the value of skepticism and the skills of critical thinking. These themes are represented in the scholarship of the symposium participants.

[292] Symposium · INTEGRATING CLIMATE CHANGE INTO ARCHAEOLOGICAL CURRICULA

Teaching students about climate change in the context of anthropology, and archaeology in particular, is more important today than it ever has been. While the evidence for the human role in climate change is increasingly clear, those who deny or ignore the situation, or even suppress critical data, currently have a powerful platform, making it difficult for students (and the public in general) to develop informed opinions. The archaeological record provides robust evidence of changing climate over time, as well as the increasing role humans play in the intensification of changes leading to the era we now define as the Anthropocene. Many archaeologists have created teaching approaches strongly integrating climate change and archaeology. In this session we will discuss successful pedagogical methodologies situating human beings in dynamically changing environments, both ancient and modern. The ultimate goal is to help students understand that if climate change is relevant to understanding archaeological questions, then there may be lessons learned for them to help with the future of our planet. The goal of the session is to bring together archaeologists who have developed curricula directed toward these goals, in order to share best practices.

[293] Symposium · PROJECT PLAZA OF THE COLUMNS COMPLEX: NEW INVESTIGATION OF A CIVIC-ADMINISTRATIVE COMPLEX AT THE HEART OF TEOTIHUACAN, MEXICO

We report on preliminary results from the first three seasons of the multidisciplinary Project Plaza of the Columns Complex (PPCC), centered on a civic-administrative complex at the heart of the ceremonial precinct of Teotihuacan, Mexico. Among its main objectives, this project investigates the sociopolitical dynamics of the residents of the complex through architectural, artefactual, and elemental analyses integrated into a city-wide LiDAR dataset. Using key markers to define areas of specialized activity within each excavation front and occupational layers across the entire site, we have begun reconstructing the history of the complex and the possible civic, administrative, and institutional roles played by its occupants. The site continues to yield fresh evidence, including an expanse of open plazas and other large-scale public works, remnants of elaborate feasting activities, and hallmarks of foreign artisans. By layering diverse datasets—derived from remote sensing, archaeomagnetic dating, zooarchaeological/paleobotanical analyses, and other methods—the project is generating a wealth of information pertaining to this previously unexplored complex and its relationship to the Teotihuacan polity. This includes the diverse interactions between ruling groups and foreign elites and the multifaceted social identities of the inhabitants of one of the largest multi-ethnic urban centers in the New World.

[294] Symposium · “WICKED AWESOME” ARCHAEOLOGY: NEW DATA AND DIRECTIONS IN THE ARCHAEOLOGICAL NORTHEAST

The prehistoric archaeology of New England and the Northeast presents many challenges. Archaeological sites in the Northeast are often perceived as less “visible” due to centuries of development following contact and poor organic preservation, making the purpose, patterning and interpretation of sites and material culture less apparent. Additionally, the region has seen a steady decline in academic research over the decades. Nevertheless, substantial data continues to be gathered from cultural resource management, academic, and state-level efforts using both traditional and non-traditional methods, that have expanded our understanding of Northeastern prehistory. These wide-ranging efforts from the different “branches” of archaeology are needed to maintain the legacy of Northeastern prehistory. This session highlights recent contributions and includes cooperative efforts between different archaeological “branches”, re-examination of existing artifact collections, and interdisciplinary research.

[295] Symposium · HUMAN ACTION AND DEEP TIME: A RETURN TO TIME AND SCALE IN ARCHAEOLOGY

This session explores the importance of long-term change and continuity in human society, culture, and environment through different archaeological perspectives. Archaeological discourse has largely shifted away from addressing long-term change and continuity, instead exploring human society in narrower slices of “ethnographic” time, with only superficial reference to larger time scales. This is partly a reaction to earlier examinations of large-scale or long-term change, which frequently produced deterministic explanations that reduced or ignored human agency, or was unable to explain how different time scales articulated with each other.

Yet this “ethnographic” approach has its own problems, and risks reconstructing archaeological “subjects” in ways that reinforce the divide between mind and matter, interiority and exteriority, or subject and object. How can archaeologists reinstate the “deep-time” perspective as one of archaeology’s greatest contributions to broader human knowledge? How could we turn to back to the *longue durée* in a way that addresses why people turned away from it in the first place? What should be the actual subject of archaeological history? How do objects, landscapes, materials, and other non-human entities contribute to deep histories? And how might we make room for agency and politics (if we can) in understandings of long-term change?

[296] Symposium · “IRISHNESS” WORLDWIDE: CONFRONTING THE VISIBILITY OF MATERIAL IDENTITY IN THE PAST AND PRESENT

What does it mean to be Irish? Archaeologists have long researched the ways in which cultural, ethnic, and national identities are expressed through material culture. But just how important is material culture to the expression of cultural identity? This session investigates the degrees to which “Irishness” is visible or invisible in the archaeological record, and how this identity is expressed intersectionally with other markers of identity such as class and gender. This symposium brings together research from Ireland and the Irish Diaspora to explore the local expressions of a cultural identity through material culture in the past and present.

[297] Symposium · RITUAL ECOLOGIES OF FOOD PRODUCTION IN THE ANCIENT WORLD

This symposium explores ecology at the intersection of ritual and food production. Food production, as a range of coordinated activities, is critical to the organization of society. Yet because it is necessary for survival, scholars often isolate it as a domain of domestic subsistence. Nonetheless, numerous ethnohistoric and modern accounts detail the important role that communal rituals had in organizing these activities, such as the intricate ritual-agricultural calendar of the Inka state or the elaborate water temple ceremonies in Bali. While these accounts articulate the sacred significance of food production practices and the collective rituals that organized them, these links are less commonly explored archaeologically. For example, although archaeologists often discuss the cultural meanings of consumption or the political economy of production-storage-redistribution cycles, few have addressed how rituals were perceived as essential to food production technologies. In turn, scholars often overlook how diverse kinds of labor, from ritual to food production, interlinked to organize ancient societies. By attending to these interconnections, papers in this symposium contribute to our anthropological knowledge of the complex practices that link people, plants, animals, land, water, and things and to address the imbrication of “sacred,” “community,” and “socioeconomic” landscapes and practices throughout the ancient world.

[298] Symposium · ARCHAEOLOGICAL SCIENCE MEETS THE CLASSICS: EMERGING KNOWLEDGE IN THE ANCIENT EASTERN MEDITERRANEAN WORLD

Archaeology in Greece, particularly Classical archaeology, with its emphasis on material culture, typology and historical narrative, has traditionally been considered distinct from theoretical and methodologically sophisticated anthropological archaeology. This divide has enhanced misconceptions on the state of current research, resulting in the perception that Greek Archaeology has a narrower scope than anthropologically-oriented archaeology. In recent years, however, archaeological practice in Greece has changed and become more integrative. Today it utilizes scientific methodologies and addresses problem-oriented research themes such as the evolution and impact of diseases, migration patterns, subsistence practices, the introduction of agriculture and animal husbandry, site formation processes, resource management, and the interaction between the environment and past human behavior. In this endeavor, the Malcolm H. Wiener Laboratory of Archaeological Science (American School of Classical Studies at Athens) has been a leader in interdisciplinary research merging Anthropology and the Classics in the fields of bioarchaeology, zooarchaeology, archaeobotany, and geoarchaeology. The goal of this session is to present work affiliated with the Wiener Laboratory to communicate the breadth of current archaeological research in the Mediterranean and to further ongoing discourse between archaeologists working in Greece and their colleagues around the world.

[299] Symposium · CURRENT ARCHAEOLOGICAL RESEARCH IN EASTERN, CENTRAL, AND SOUTHERN HONDURAS

While much of western Honduras has seen sustained archaeological research projects over the past several decades, due in part to the presence of Copan, other areas of the country are lesser known. A large portion of the research in the western region has been devoted to understanding both the Maya and non-Maya populations living along the border, yet very little is known about the groups living just beyond the edge of ancient Mesoamerica. Certainly, some groups in the rest of Honduras were influenced by the Maya and other Mesoamerican groups. Increasingly, influences from Lower Central America and the Caribbean are also being demonstrated. Given these diverse and often overlapping influences, current and future research in eastern, central, and southern Honduras necessitates communication across regions and borders. With this need in mind, this session aims to bring

together scholars currently involved in research in these understudied portions of Honduras. The goals of the session are to provide insights into recently initiated research projects in these areas, share current findings and results, and discuss common themes in future research questions and strategies.

[300] Symposium · PRELIMINARY RESULTS: 2017 FIELD SEASON, PROGRAMA ARQUEOLOGICO PREHISTORIA URBANA DE HUARI

The city of Huari was the first imperial capital of the Andes. Understanding the historically specific processes of developing urbanism in the city of Huari is not only key to understanding the Wari empire, but can also add a distinctive dimension to comparative analysis of early urbanism. Investigations at Huari have focused almost exclusively on monumental mortuary and ritual areas, leaving a gap in our understanding of quotidian life of the city. The Programa Arqueológico Prehistoria Urbana de Huari challenges generalizations about the nature of urbanism in early cities by investigating daily life and residential areas at Huari. Papers in this symposium offer insights from the first field season, 2017. With topics including subsistence and foodways, craft production, trade, ritual behavior, spatial organization, and vernacular architecture, we will build a picture of continuity and change in the activities of the people of Huari throughout the history of the city.

[301] Poster Session · WOODLAND ARCHAEOLOGY

[302] Poster Session · THE MAYAN WORLD

[303] Poster Session · LANDSCAPE ARCHAEOLOGY

[304] Poster Session · OLD WORLD PRE- AND PROTOHISTORY

[305] Poster Session · HISTORIC NORTH AMERICA: THE WEST AND MIDWEST

[306] Poster Session · BIOARCHEOLOGY: THE AMERICAS

[307] Symposium · CASE STUDIES ON HUMAN INTERACTION WITH WATER RESOURCES

Humans have a complex and evolving relationship with water, and this relationship can be examined through many different methods and approaches. In this session, we assess this relationship through four case studies ranging from the middle-Holocene and Angkorian Period in Southeast Asia to colonial and contemporary water issues cross-culturally. The first half of the session presents results on a drought during the middle-Holocene period that led to societal changes. As more complex societies emerged, the Khmer state developed sophisticated hydraulic engineering projects to centralize water management and strengthen political power. The second half of the session discusses the changes in water management as colonial powers replaced traditional local practices with dichotomized systems that ignored established and effective water management strategies. Finally, we consider contemporary local populations in Chile that are in conflict with the national government over the development of water sources for hydroelectric power on ancestral land.

[308] Symposium · THE ARCHAEOLOGY OF COMPARATIVE SLAVERY

Comparative slavery. Can slave societies be compared? Is there any uniformity behind the idea that a human being can be enslaved? How many varieties of slave societies are there? How many conditions of enslavement? What can be gained intellectually by comparing slave states and slavery as a condition? To what intellectual and political end would there be comparative slavery?

Can archaeologists use the work of Orlando Patterson whose *Slavery and Social Death* legitimized the study of comparative slavery 30 years ago? Has Patterson's work gained currency with archaeologists? What have archaeologists done with it? Does Patterson's characterization of slavery hold up for comparative cases?

Is there an archaeological trace that identifies the existence of slavery? Can an archaeological intervention that uses historical or classical archaeology provide a useful way of understanding slavery better?

This symposium will discuss conditions of slaves, circumstances of manumission, and conditions for comparison all used by archaeologists as we attempt to try to understand whether slavery in Antiquity, the Caribbean, North America, Brazil, or slavery's modern equivalent called trafficking in human persons should be considered separately, or offer an opportunity to see the conditions that create slavery, as well as those that might eliminate it.

[309] Symposium · ARCHAEOLOGY AND THE SENSES

The way we understand how our bodies internalize knowledge of the world is culturally constructed and this biases all engagement with our environments. Yet in archaeology, a field that professes to investigate past peoples, scholars rarely have sought to understand these ancient sensory frameworks despite their importance in dictating life-ways and organizing systems of value. Only recently have such approaches become spotlighted in archaeological research. The theory and methods supporting these studies are wildly diverse and so there is difficulty in communicating across specializations. This session seeks to bring together scholars examining ancient sensory experiences that they might discuss with one another what it means to study

sensory archaeology and what is accessible in the ancient sensory past. Areas of dispute thus far include: the centrality of the body to sensory research, the enumeration of the senses, phenomenological approaches, the importance of materiality, and the incorporation of interdisciplinary techniques like residue analysis, experimental archaeology, and even art historical and literary analyses. The goal of this session is to encourage discussions across specializations to promote collaboration and a comparative approach to the trans-corporeal nature of the human sensorium.

[310] Symposium · RICH LAND, POOR LAND: USING STABLE ISOTOPES TO EXPLORE ANCIENT FARMING AND HERDING PRACTICES

Stable isotope analysis has proven to be a valuable exercise for enriching understandings of social and environmental topics, including but not limited to migration, weaning, diet, and climate. Recently, isotopic analyses have also been used to investigate ancient farming and herding practices. This symposium includes papers that go beyond basic environmental reconstruction to examine how people coped with climatic and/or social problems that may have impacted animal husbandry and food production. In doing so, we seek to recognize the value of stable isotope analysis in helping to elucidate the motivations, techniques, and repercussions associated with ancient land-use practices.

[313] Electronic Symposium · FROM THE GROUND UP: UPDATES AND LESSONS LEARNED FROM AN OPEN NORTH AMERICAN ARCHAEOLOGY TEXTBOOK

Open Educational Resources (OERs), including open textbooks, are one of the biggest changes in the educational landscape since the new millennium. Inspired by this momentum, a cohort of archaeologists have been working on an open textbook on "North American Archaeology" since last summer. This electronic symposium is meant to offer a space for them to share their contribution in its draft form and discuss their successes and challenges along the way, as well as next steps. While the textbook is not yet ready for adoption, it will be soon, and the authors hope that potential adoptees will join us in this important conversation.

[315] Forum · ADVANCES AND PROSPECTS IN THE ARCHAEOLOGICAL SCIENCES ON THE 40TH ANNIVERSARY OF THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES (II)

(SPONSORED BY SOCIETY FOR ARCHAEOLOGICAL SCIENCES)

The Society for Archaeological Sciences (SAS) is an international professional society of about 300 members dealing with natural science applications in archaeology, paleoanthropology, and conservation. The Society was founded in 1977, so this session commemorates the 40th anniversary of the beginning of SAS. These four decades have seen advances in techniques, applications, theories, and infrastructure surrounding the archaeological sciences. We take this occasion to reflect on some of these developments, as well as considering what the future may hold in store.

[316] Forum · MAKING ARCHAEOLOGY FAIR

Most archaeologists today use computers and other digital technology to document their work. Many develop data management plans, as required by many funders of archaeology in recent years. Still, most archaeologists lack a clear understanding of both how to make their data widely accessible and intelligible for reuse, and why they would want to do so. This forum discusses the FAIR Data Principles, developed to guide data creators and publishers in making data Findable, Accessible, Interoperable, and Reusable (FAIR). Each forum discussant will select one FAIR principle to discuss in the context of archaeology. How well does archaeology currently address each of these challenges? Since archaeology can be a destructive practice, how much effort should we put into ensuring that our data is findable, accessible, interoperable, and reusable? What can we do to ensure that these goals are prioritized at a project's inception, rather than as an afterthought? How do we ensure that archaeologists collecting data also share algorithms, tools, and workflows that led to that data? Are there additional principles that define a "good" data dissemination in archaeology? Forum attendees can prepare for the discussion by reading "The FAIR Guiding Principles for scientific data management and stewardship": <https://www.nature.com/articles/sdata201618>.

[317] Forum · GENDER THROUGH THE GENERATIONS

(SPONSORED BY SAA COMMITTEE ON THE STATUS OF WOMEN IN ARCHAEOLOGY)

This forum brings together women across multiple generations from their 20s to their 70s to discuss the generational differences they have faced as women in the field, how things have changed over time, and the challenges that women in archaeology face today.

[318] Forum · ARCHAEOLOGY, SUSTAINABILITY AND ENERGY

(SPONSORED BY GRANTHAM CENTRE FOR SUSTAINABLE FUTURES)

Most energy and sustainability narratives have promoted an ahistorical view of Global Change, as they consistently highlight the western "industrial revolution" as the starting block for a race for progress (i.e., Steffen's "hockey stick curves") and concomitant environmental degradation. These narratives suggest that prior to this "revolution," communities lived in harmony with their environment and any impact was local and trivial. Archaeology has recognised the recurrent issues that diverse human communities have faced in managing energy and how this translates into food production, material acquisition, and social coherence, but, has failed to demonstrate the value of this research to wider Global Change and Sustainability Research Communities. Energy and sustainability are enduring problems for humanity and analyses of current conditions would benefit from a long term historical analysis addressing the relationships among innovation, materiality, subsistence and ideology. Although archaeology has produced extensive data sets relating to long-term human-environmental relations, it is not strongly featured within the Sustainability and Energy Research Community. This session therefore creates an opportunity for Archaeology to pronounce its unique perspective and rehearse its position in providing meaningful contributions to better understanding, modelling, and responding to the energetics of environmental, social, and political systems.

[319] Forum · 2018 EUROPEAN YEAR FOR CULTURAL HERITAGE: AN OPPORTUNITY FOR ARCHAEOLOGY AND ARCHAEOLOGICAL HERITAGE PUBLIC POLICIES

(SPONSORED BY EUROPEAN YEAR OF CULTURAL HERITAGE [EUROPEAN UNION AND COUNCIL OF EUROPE])

In 2018 the European Parliament and the Council of Europe celebrated the first European Year of Cultural Heritage (EYCH) with the goal of promoting cultural heritage as a shared resource to increase trust, mutual recognition and social cohesion as a means of promoting community identity across the European community as a whole. This comes at a time when the concept of the European community itself is questioned and weakened, including the use of cultural heritage in the construction of political or nationalistic identities that project the past onto the present, rather than examining shared interests and values. The role of international professional associations and NGOs active in the field of cultural heritage, particularly archaeology, is to ensure impartial and yet politically informed interpretation of cultural heritage, facilitating its preservation by engaging the public by engaging with the reflexive understanding of heritage. The forum will discuss how to relate the past with the present and make archaeological heritage relevant for the public.

[320] Forum · CITYSCAPES AND LANDSCAPES: BENEFITS & CHALLENGES OF 3D VISUALIZATION & ANALYSIS

3D is not new to archaeology. 2D drawings of architectural reconstructions and landscapes offer a 3D perspective that gives a sense of mass, scale, and spatial relations; however, these drawings are static and unidirectional. 3D digital technologies such as airborne LiDAR, UAVs, and terrestrial laser scanning and photogrammetry allow archaeologists to acquire x, y, and z data of extant features and terrain. While these reality-based technologies offer great advantages to capturing, visualizing, and analyzing data they are limited to what exists today—they represent the archaeological landscape, not the ancient landscape. To address questions of visibility, movement, and experience in the ancient landscape requires 3D modeling of partially standing, buried, or no longer extant architecture and landscape features such as shifted watercourses, elevated sea levels, or eroded mountains. But reconstructing ancient cityscapes and landscapes in 3D presents a suite of intellectual and documentation challenges that researchers must face. This forum discusses three key challenges: City and landscape reconstruction, focusing on the challenges of visualizing entire archaeological and/or historic cityscapes in 3D; visibility and movement in 3D + GIS cityscapes or landscapes; and scaling up data collection and visualization and/or analysis from the object/building to the city or landscape level.

[321] Forum · VIRTUAL AND DIGITAL ETHICS

(SPONSORED BY SAA ETHICS COMMITTEE AND DIGITAL DATA INTEREST GROUP)

The SAA Annual Meeting is replete with examples of emerging modes of archaeological documentation and production in virtual and digital realms: virtual reality (VR), photogrammetry, augmented reality (AR), 3D printing, LiDAR (and other means of landscape-level capture, analysis and appropriation), scanning and modeling of intellectual property, people, places and artifacts. The project of recording and producing 3D archaeological landscapes, sites, and artifacts with DSLRs, still and video virtual reality and immersive 360 cameras, unmanned aerial and underwater vehicles (drones), and laser systems extends to and beyond archaeologists.

A diverse array of discussants focus attention on issues appearing on the horizon of archaeological practice in order to prompt consideration of how and whether the existing ethical guidelines, that is, the SAA Principles, provide us as members with sufficient guidance for working in and planning the use of emerging and newer capture and presentation modes. These are now being used by the public, by scholars, entertainment and media, with and without government permits, so that intellectual property, appropriation, consultation, compliance, curation and access issues are being raised increasingly, whether or not they are being engaged.

[322] Lightning Rounds · IT'S HARDER THAN IT LOOKS: THE REALITIES AND COMPLEXITIES OF NAGPRA IMPLEMENTATION

(SPONSORED BY SAA COMMITTEE ON REPATRIATION)

Repatriation is a law, a profession, a calling . . . and sometimes a challenge. No matter your level of experience or training, you are likely to encounter novel situations for which the resolution is unclear. Curious about potential approaches to those situations and tips for addressing them? Our lightning round is your opportunity to bring questions directly to a panel of experienced NAGPRA practitioners who understand the reality and complexity of NAGPRA implementation. Each panelist will offer insights on specific aspects of the law based on their expertise. Topics will include the National NAGPRA Program, NAGPRA Review Committee, NAGPRA grants, Federal Register Notices, regulations on culturally unidentifiable human remains, international repatriation and the nexus between state laws and NAGPRA. Panelists will speak on tribal challenges, best practices for consultation, and the role of non-federally recognized tribes. Additional topics will include NAGPRA compliance in different museum settings (large natural history museums, tribal museums, and university museums), inadvertent discoveries and planned excavations, human remains documentation, and resources for research. A series of brief presentations will be followed by a moderated discussion and then a break out session during which attendees can network with experts on the panel and fellow audience members.

[323] Symposium · DISENTANGLING HUMAN-PLANT INTERRELATIONSHIPS IN ANCIENT CARIBBEAN SOCIETIES

Paleoethnobotanical information on the interrelationships between ancient human societies and plants in the Caribbean have been increasingly available in the last three decades because of the widespread application of novel methods for identification of macro and microbotanical remains. Consequently, the systematic identification of microremains such as starch grains, pollen, and phytoliths, along with the use of stable isotopes and other archaeometric techniques, has promoted renewed and more realistic visions on the use of plants by ancient Caribbean populations, and on the processes of domestication and dispersals of food crops in the area. During this symposium, lecturers will explore the results obtained from new methodologies regarding the identification and interpretation of different ancient plant signatures in the archaeological record. New plant-related (archaeometric) data and fresh archaeobotanical interpretations from different historic periods of the region will be exposed and discussed aiming to build needed and well-grounded interpretive tools to better appreciate cross-cultural and geographical variation of plant use, which have begun recently to be recognized from active researches in the area. The expected exchange of information and wide-ranging experiences of the researchers will provide an excellent opportunity to enrich our understanding on the long-term interrelationship between people and plants in the Caribbean.

[324] Symposium · THE EQUATORIAL ANDES: RECENT RESEARCH AND NEW PERSPECTIVES

Archaeological research in Ecuador is often overlooked compared to other areas of South America that have disproportionately captured the public eye, such as the Central Andes and the Amazon Basin. Ecuador has proven to possess an exceptional Pre-Columbian past, from a wide array of cultures to equally diverse environments. The purpose of this session is to highlight recent archaeological contributions from throughout Ecuador's many geographic regions.

[325] General Session · SOUTHWESTERN NORTH AMERICA**[326] Symposium · THE VETERANS CURATION PROGRAM: AN INNOVATIVE APPROACH TO COLLECTIONS MANAGEMENT**

The Veterans Curation Program (VCP) employs veterans of the Iraq and Afghanistan wars in the rehabilitation of archaeological collections under the administration of the U.S. Army Corps of Engineers St. Louis District's Mandatory Center of Expertise in the Curation and Management of Archeological Collections. Since its inception in 2009, the VCP has employed and trained more than 420 veterans who have worked with collections from 11 Corps Districts. In working with these collections, the veterans learn office skills including computers, records management, word processing, databases, and digital photography. Employed for five-month terms and provided support for personal growth and development as part of their employment, the VCP has also proven very successful in supporting veteran's transition to civilian life. Of the veterans employed at the VCP, 73% have obtained permanent employment while another 16% have pursued higher education. The presentations in this session provide perspectives on the VCP's engagement of veterans, the VCP as public outreach and advocacy, VCP operations, and collections based opportunities through the VCP.

[327] Symposium · FROM PROGRAM TO PRACTICE: PRAGMATIC PHILOSOPHY AND ARCHAEOLOGY

From the semiotics of Fredrick Peirce to the Philosophy of John Dewey and Richard Rorty Pragmatism has influenced social thought in North America for more than a century. This session presents a series of discussions of just how pragmatic philosophies have helped in reframing archaeological practice. Pragmatism has taken several forms in archaeology of late contributing to different form of community-based research, collaborative work with indigenous and descendant communities, as well as the way archaeologists communicate their results to different audiences. What all these approaches share is a commitment to making archaeology contribute in concrete ways to finding solutions to contemporary challenges. Those challenges can involve community stability or issues of heritage and identity politics in which archaeologists find themselves engaged with a large array of stakeholders. The papers in this session provide a range of examples of moving from program to practice in contemporary archaeology.

[328] Symposium · NATIVE AMERICAN SITES ARCHAEOLOGY IN THE MIDDLE ATLANTIC: CURRENT TOPICS AND CONTINUING INITIATIVES

(SPONSORED BY MIDDLE ATLANTIC ARCHAEOLOGICAL CONFERENCE)

As the archaeological practice of the Middle Atlantic region of eastern North America has evolved from culture history studies of the 19th century to modern research, archaeologists have always acknowledged the geographic complexity of the region as key to understanding prehistoric cultural developments and interactions. In settings ranging from the Appalachian highlands to the Atlantic coast, studies of the movement and interactions of Native American people demonstrate the significance of resources, alliance-making, and place-making to regional identities. This session illustrates the importance of enduring themes such as subsistence and settlement studies to our understanding of the cultural significance of specific foodways, landscapes, and persistent places. It highlights new initiatives, such as experimental studies in lithic analysis to understand mobility and regional interactions, and collaboration with descendant communities to better understand the diversity of Native American lifeways in the Middle Atlantic.

[329] Symposium · CHALLENGES AND ADVANCES IN THE ARCHAEOLOGY AND PALEOANTHROPOLOGY OF NON-MODERN HUMANS

The behaviour of non-modern humans (here defined as all archaic hominins not belonging to the species *Homo sapiens*) is a rapidly evolving area of research, in which new discoveries, both from archaeology and allied disciplines, regularly rewrite our understanding of the Pleistocene. This symposium will discuss recent advances in the study of non-modern humans, while also addressing the long-standing challenges, both methodological and theoretical. In particular we ask: how do we interpret material culture and investigate human societies produced by humans with different biologies and for whom comparable cognitive abilities with us cannot be assumed? What particular methodological challenges are associated with the limited material culture of the Pleistocene archaeological record, and how do we address, acknowledge, and overcome these in our research? And how can the fields of biological anthropology, genetics, and ethnography help to better understand the processes by which our early ancestors adapted to both internal and external pressures?

[330] Symposium · THE PROYECTO COSTA ESCONDIDA: RECENT INTERDISCIPLINARY RESEARCH ALONG THE YUCATAN PENINSULA'S NORTH COAST

Shorelines are dynamic places, both culturally and environmentally, and the Proyecto Costa Escondida (PCE) explores this dynamism by employing earth, biological, and social sciences to elucidate the linkages between human settlements and their coastline. Over the past three millennia, rising sea levels and fluctuating climatic regimes have dramatically transformed the north coast of Quintana Roo, Mexico, while Maya society witnessed the rise and fall of divine kings and the emergence of a market-based economy. By correlating multiple facets of the paleoenvironment with broader social and economic changes, the research team is beginning to reveal the challenges faced, and opportunities pursued, by these coastal peoples. The neighboring ancient Maya port sites of Vista Alegre and Conil are the focus of study. Located only 7 km apart, preliminary data indicate that human habitation along the coast was not continuous over the past, nor did the occupational histories at Conil and Vista Alegre mirror one another. Papers in this session highlight aspects of the interdisciplinary research being undertaken at these two sites ranging

from paleocoastline reconstruction to current attempts at developing a community museum with the community of Chiquilá, the modern port located where Conil once stood.

[331] General Session · EDUCATION, CRM AND PUBLIC ARCHAEOLOGY

[332] Symposium · CRM ARCHAEOLOGY ON FEDERAL LANDS: NEW CONTRIBUTIONS AND UNIQUE MANAGEMENT STRATEGIES

Archaeological research on federally managed lands in the United States is largely guided by development activities and changing government priorities. Government archaeologists and CRM companies manage and protect sites across the country with dwindling budgets, restricted field seasons, and shifting political pressures. Despite these hurdles, agencies are able to make significant contributions to the collective narrative of the prehistory and history of North America. This symposium highlights recent archaeological investigations and unique cultural resource management strategies employed by cultural resource professionals working on federal lands.

[333] Symposium · THE LEGACIES OF ARCHAEOLOGISTS IN THE ANDES

This symposium will focus on archaeologists working in the Andes during the nineteenth and twentieth centuries whose research and theoretical perspectives remain influential, whose students and students' students have pushed knowledge forward in significant ways, whose controversial work has been validated by later studies, whose publications continue to be read and analyzed and/or who have set up museum collections that continue to be consulted and interrogated with new questions.

[334] Symposium · GOVERNMENT, UNIVERSITIES, AND HERITAGE STEWARDSHIP: A STUDENT AND YOUNG PROFESSIONAL SYMPOSIUM

Federal, State, Tribal, and even Local Governments have formed partnerships with Anthropology and Archaeological programs at a number of American Universities. These partnerships have been mutually beneficial in many ways. The public-sector officials and agencies get cost-effective access to faculty expertise, a role in the development of young professionals, and the latest in research technologies and approaches. Universities benefit from new funding streams, practical and challenging research projects, and public service opportunities for both students and faculty. This session features 12 student/recent grad presentations representing 12 different projects, from seven different universities, five states, and eight government entities or agencies. It will highlight the programs, accomplishments, challenges and lessons learned from Public Sector-University partnerships, with an emphasis on student research, and propose ways they can be improved and expanded.

[335] Symposium · REGIONAL INTERACTION DURING THE ANDEAN MIDDLE HORIZON: ONGOING RESEARCH IN THE PERUVIAN SOUTH COAST AND YUNGAS

During the seventh century AD, fundamental changes occurred across the cultural and political landscape of the Central Andes. While the expansion of the Wari empire is largely responsible for some of these changes, it has also become evident that inter-regional interactions were increasing among the local communities along the south coast and yungas zones during this period. Recent archaeological investigations, for example, have revealed foreign-local interactions between the Nasca and Arequipa regions during the Middle Horizon (ca 600–1000 AD). This session highlights the cultural connectivity among the regions of the south coast and yungas (e.g., Ica, Nasca, Arequipa), or between coastal to mid-elevation and highland communities, specifically during the Middle Horizon. We welcome a variety of methodological approaches that demonstrate how these regions were interacting, from emulation and/or continuity in domestic and ritual practices to shifts in material culture.

[336] Symposium · HILLS, VALLEYS, AND PLATEAUS: EXPLORING HUMAN LANDSCAPE OF MOUNTAINOUS REGIONS IN EAST AND CENTRAL ASIA

Before 2000 BC, the Eurasian communities lived in a world of 'relative isolation': a protective rim of mountains and deserts centered by the uplift of the Himalayas and the Tibetan Plateau separate the warm and well-watered semitropical and tropical lowlands of South Asia from the seasonal and arid temperate Central Asia, and the monsoonal East Asia from the westerly southwest Asia. Only when arduous desert and mountain trails had been explored were farming and pastoralism opened up to wider contacts. In the symposium, we explore the human strategies on the edges of this mountainous rim. Drawing from numerous methodologies including ethnoarchaeology, geoarchaeology, zooarchaeology, archaeobotany and isotope studies, we explore the recurrent themes of foothill locations of early settlers in the context of the trans-Eurasian exchange.

[337] Symposium · LA CORONA ARCHAEOLOGICAL PROJECT: TEN YEARS OF RESEARCH IN NORTHWESTERN PETEN, GUATEMALA

The Proyecto Arqueológico La Corona (PRALC) has conducted research in the northwestern region of Petén, Guatemala for a decade, under the auspices of Tulane (USA) and Del Valle (Guatemala) universities. While the initial research in the area focused in proving the location of "Site Q", the interdisciplinary investigations carried out by PRALC have provided different types of information from a previously unknown zone in the Lowland Maya area. Architectural excavation, settlement research, epigraphic interpretation, artifact analysis, and paleoenvironmental study at several sites in the region have demonstrated that this area's culture history spans from the Middle Preclassic to the end of the Classic Period (600 B.C.E.—850 C.E.). All the data confirm that La Corona was the most important center of the region during the Classic Period, playing a major role in the broad geopolitical strategies executed by the Kaanul hegemonic polity between 520 and 750 C.E. This symposium will present a synthesis of the data collected during the first decade of the project, as well the interpretations derived from them.

[337a] Symposium · REPATRIATION UNDER THE NMAI ACT AT THE NATIONAL MUSEUM OF NATURAL HISTORY, SMITHSONIAN INSTITUTION

Since the 1989 passage of the NMAI Act the NMNH has returned thousands of Native American human remains and objects through over one hundred completed repatriations. This session will discuss the challenges and good practices developed during the repatriation process and will provide examples of the ways in which repatriation has led to new relationships between the museum and Native communities.

[337b] Symposium · AFRICAN DIASPORA ARCHAEOLOGY

The goal of this symposium is to present the most recent research pertaining to the archaeology of Africa and the Diaspora. Topics have focused on any number of broad topics pertaining to communities in Africa, the Americas, and the Caribbean integrating archaeological, ethnographic, and historical research.

[337c] Forum · NAGPRA MATTERS: REFLECTIONS FROM EMERGING PROFESSIONALS

The "Learning NAGPRA" project (2015–2018) looks to identify and understand the challenges to preparing professionals for work related to NAGPRA and repatriation and to create educational materials for several audiences. A core component of the grant through its first three years is the Learning NAGPRA Collegium, a workshop format that brings together graduate students, educators, museum professionals, tribal cultural specialists, and members of professional organizations to discuss and then create educational methods and materials for particular audiences in different disciplines and at all stages of career. The collegium setting, drawing from the scholarship of teaching and learning, is designed to create collaborative spaces where participants can evaluate information and brainstorm paths forward for teaching and learning about NAGPRA. In this session, organizers of the Learning NAGPRA Collegium and former student participants will reflect on how their Collegium experiences have enriched their understandings of Native American histories and rights, research ethics and methods, and their goals for their future careers. Attendees will be invited into discussion about such questions as why NAGPRA is important to teach, how it can be taught in the classroom and other educational settings, and how its application can be advanced in policy and professional settings.

[338] Symposium · STRIVING TOWARD EQUITY AND SECURITY IN ARCHAEOLOGY: ADDRESSING TITLE IX THROUGHOUT OUR DISCIPLINE

Discussions of Title IX have recently developed within our discipline as well as other field-based sciences. Instances of discrimination, harassment, and other civil rights violations have gained national media attention while struggles with widely accepted behaviors continue to place safety, well-being, and professional promise of many individuals at risk. If archaeologists intend to contribute to collective efforts to create safe and stable environments for students and colleagues to work and learn, it is important to address specific issues and collaborate to develop solutions and pervasively raise awareness. This session is designed to build upon efforts that are already underway and encourage their advancement for the benefit of the discipline as a whole. Papers and presentations will address improving environments and protections in the laboratory, institution, and the field, both domestically and abroad. It will conclude with a paper and discussion that addresses constructive ways to achieve these goals and raising the standard by which we adhere to as professionals. The session will be accompanied by an open mic gathering providing interested parties with an opportunity to share their experiences and informally continue to exchange ideas.

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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, approve, or censor them. Descriptions of events and titles are those of the organizers, not the Society.

ABSTRACTS OF INDIVIDUAL PRESENTATIONS

Abbott, David (Arizona State University), Caitlin Wichlacz (Arizona State University) and J. Scott Wood (Tonto National Forest)

[267] *Demarcating Spheres of Interaction in the Uplands of Central Arizona with Electron Microprobe Analyses of Phyllite-Tempered Pottery*
Various conflicting ideas pervade debate about how 13th century occupation was organized in the upland zone of central Arizona, which overlooks the Phoenix Basin to the south. Some researchers characterize the upland settlements as subservient and peripheral to the densely packed irrigation-based Hohokam communities along the Salt River. Others, instead, describe the upland populations as independent communities with rich histories of their own. Still others speculate about the extent to which different parts of the region were connected. As a contribution to this debate, we have used electron microprobe assays of phyllite-tempered ceramics to trace the movement of pots across the uplands and thereby demarcate networks of interaction among neighboring settlements. Several pertinent results have emerged. First, two disconnected spheres of interaction divided the upland region. One sphere included close connections with the Hohokam to the south; the other did not. One sphere engaged the populations on Perry Mesa to the north; the other did not. Second, Hohokam farmers probably imported seasonal agricultural labor from one part of the upland zone. Third, an integrated community along Cave Creek shared the same pottery until the area became an abandoned frontier, where unaffiliated farmsteads moved in without exchanging pottery with one another.

Abdelsalam, Heba

[32] *Implementing American Interpretative Methods for Better Preservation of a Cultural Heritage Site (Case Study: Mallawi Museum, Minya, Egypt).*

Heritage interpretation is one of the best methods for preserving cultural heritage since it assists a neighborhood in having a better understanding of the importance of its museums and historic sites. Lately, the world has witnessed the loss of many such sites in the Middle East. Therefore, the adaptation of the American models of interpretation would be ideal for addressing this problem. This paper provides an example of the use of these methods of interpretation for the preservation of sites in Egypt. The current research took place in the Mallawi Museum in Minya, Egypt. This museum was looted in 2013 when people broke into the museum and stole and destroyed its objects. After the reopening of the museum in 2016, it was important to establish a community engagement project to assist the stakeholders in understanding the value of its cultural heritage sites. Intensive workshops were held in the museum to inform people about the significance of historical and archaeological sites in Minya by using several interpretative methods such as storytelling and living history. An assessment survey shows that this kind of project can make a significant impact in the effort to protect cultural heritage sites in the Middle East.

Abdolahzadeh, Aylar (University of Pennsylvania), George Leader (Department of Sociology and Anthropology, The Coll), Tamara Dogandzic (Department of Anthropology, University of Pennsylv), Li Li (Department of Anthropology, University of Pennsylvania) and Harold Dibble (Department of Anthropology, University of Pennsylvania)

[304] *Raw Material Variability and Its Effects on Flake Production*

Archaeologists have long studied the effects of raw material variation on different aspects of lithic technology, primarily focusing on raw material availability and nodule size and shape. This paper presents the results of a controlled experiment designed to compare different rock types (obsidian, flint, basalt, quartzite, and silcrete) and assess their effects on flake production. The experiment utilizes a mechanical robot that applies force to pre-shaped cores, controlling for known independent variables such as exterior platform angle, platform depth, and angle of blow. Dependent variables include linear dimensions, surface area, and weight, as well as the force required for flake removal. All of the cores have been shaped to be of similar size and shape, and all have similar core surface morphologies. In comparing these results to those obtained using molded glass cores of similar design, we discuss and evaluate the applicability of previously published controlled experiments to a wider range of raw material types.

Abo, Stephanie (Brigham Young University)

[38] *Examining Fremont Snake Valley Black-on-gray Pottery through Neutron Activation Analysis*

Archaeologists widely argue that Fremont potters from the Parowan Valley, in southwestern Utah, manufactured Snake Valley pottery. I explore the distribution of Fremont Snake Valley Black-on-gray pottery using chemical analyses, metric data, and statistical methods. In my research, I compare neutron activation analysis data from Snake Valley Black-on-gray (SVBG) sherds found at archaeological sites within the Parowan Valley to SVBG sherds found at Fremont sites over 200 kilometers to the north. Through this project I hope to confirm whether the northern sherds were products of potters in the Parowan Valley, or if these sherds were made elsewhere.

Aboulhosn, Jad [130] see Lercari, Nicola

Abraham, Shinu [137] see Dussubieux, Laure

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

[275] *Rice, Rituals, and Identity: Resistance and Maintenance of Ifugao Agricultural Practice*

The shift to wet-rice cultivation and construction of rice terraces in Ifugao, Philippines has recently been associated with Spanish colonization. Previously thought to be at least 2,000 years old, investigations in the region have now established that wet-rice cultivation was a response of highland populations to the Spanish conquest at ca. 1650 CE. The shift to an intensive cultivation drastically changed Ifugao social organization that allowed them to successfully resist multiple attempts of the Spanish to place them under the colonial administration. Contemporary Ifugao identity is based on the narrative of being uncolonized as well as centered on wet-rice cultivation. Even when the market economy exerts pressure on the agricultural system, Ifugao families endeavor to continue producing wet-rice and sponsor rice-planting rituals. The persistence of wet-rice farming and rice rituals are interpreted as an active resistance of the Ifugao against assimilation to the larger Philippine society and conscious acts of maintaining their identity. Utilizing archaeological, ethnographic, spatial, productivity, and energetics data associated with wet-rice cultivation, this presentation aims to illustrate the continuity of Ifugao struggle against hegemonic cultures. As such, we show that resistance against Spanish colonialism became the foundation of Ifugao identity and resistance continues in the present.

Acabado, Stephen [117] see Echavarri, Mikhail

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Acevedo, Veronica (Licenciada Veronica J. Acevedo)

[95] *Tecnología cerámica, análisis petrográfico y técnicas arqueométricas en cerámicas policromas de las fronteras de Quebrada de Humahuaca, 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 norte, 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 ceremonial.

En este trabajo se presentan los resultados del análisis de caracterización petrográfica y pigmentaria de fragmentos de vasijas 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 las regiones mencionadas. Las técnicas analíticas usadas fueron: análisis sobre cortes delgados, microscopía óptica, microestratigrafías, espectroscopia Raman, DRX, entre otras.

Acosta, Esteban [132] see Lippi, Ronald

Acosta, Jocelyn (California State University, Los Angeles)

[134] *Caves, Copper, and Pilgrimage: Reinterpretation of Quimistan Bell Cave in Northwestern Honduras*

In 1910, A. Hooton Blackiston discovered a cave 25 miles from Naco containing a cache of 800 copper bells, a possible mosaic mask of turquoise, and other materials. Blackiston interpreted the cave as a place of worship dedicated to the bat god. Copper, however, has very rarely been reported from caves in Honduras. Metals enter Mesoamerican late in its history but quickly assume an importance equal to jade in the native value system. The only other cave known to have held copper bells is Tauleve Cave, near Lake Yojoa. The cave was known as a cache cave for a quantity of copper bells but these disappeared without being reported. Significantly, Tauleve Cave is known to have been a pilgrimage center of such importance that the Lenca in the area were known as the Taulepa. Interestingly, some of the copper bells from the Cenote of Sacrifice at Chichen Itza, another pilgrimage location, are reportedly from Quimistan. Copper bells may have assumed such importance that they were reserved as offerings only for the most important pilgrimages. I propose that the Quimistan Bell Cave was a pilgrimage center, possibly serving the people of ancient Naco.

Acosta-Ochoa, Guillermo (Instituto de Investigaciones Antropológicas), Emily McClung de Tapia (Instituto de Investigaciones Antropológicas UNAM) and Joaquín Arroyo-Cabrales (Instituto Nacional de Antropología)

[59] *Preceramic Cultures of the Basin of Mexico*

The period from early peopling until the appearance of pottery in the basin of Mexico is poorly known despite its importance to know the emergence of the early sedentary communities and the development of the first political centers in the area. This study summarizes the state of knowledge about hunter-gatherer communities in the basin and presents recent studies that have allowed us to expand our knowledge of this period, particularly for the so-called Archaic period. We highlight the profusion of findings for this period, mainly human remains, but with little information about the cultural, subsistence and environmental context of these societies. Recent studies in the areas of Texcoco, Tepexpan and Xochimilco allow us to obtain new data on cultural remains, paleoethnobotanical and paleoenvironmental data and also new 14C datings that allow us to expand our knowledge about this period.

Acosta-Ochoa, Guillermo [262] see McClung de Tapia, Emily

Acuña, Mary Jane (Washington University in St. Louis), Carlos Chiriboga (Yale University), Varinia Matute (University of Calgary) and Francisco Castañeda (San Carlos University of Guatemala)

[252] *Preclassic Landscape Modifications and Regional Networks at El Tintal, Petén, Guatemala*

The site of El Tintal, located in northern Petén, Guatemala, provides early evidence of monumental construction, initiating with the large-scale transformation of the landscape in preparation for the site's ceremonial core, followed by construction programs consisting of pyramids, elevated causeways, and a diversity of hydraulic features. Recent investigations at El Tintal have shed light on its Preclassic settlement, organized around what we propose was an ancient lagoon which settlers connected to the larger regional fluvial network by the construction of a 2.4 km-long artificial canal. Preliminary investigations show that this canal, although mostly constructed following a traditional open-channel design, appears to have had two sections flowing underground, with tunnel sections carved into the underlying bedrock, providing the first evidence of complex hydraulic engineering at such an early stage. El Tintal maintained a complex interregional network relying on both foot travel over causeways and trails, as well as canoe transportation across what is increasingly looking like a significantly more humid regional landscape. In this paper, we present our findings and supporting evidence, as well as initial interpretations which we believe are consequential in the understanding of Preclassic geopolitics.

Adams, E. (University of Arizona)

[122] *Complex Closure Practices Involving Ash at a Small Pueblo in Northeastern Arizona*

Excavation of a four-room pueblo in northeastern Arizona revealed complex closure practices that involved ash. A 5-cm thick layer of ash deposited on a defined, but extensive, exterior occupation surface adjacent to the pueblo, then covered with artifacts prior to the pueblo's wall being pushed on top, suggests the essential role ash played in the life and “death” of the pueblo. By reconstructing the pueblo's life history, the role of ash is examined and argued to be essential in the transformation of the village to its afterlife. The integral role of exterior space to the life (and afterlife) of the pueblo is a reminder that more of pueblo life was spent outside than inside pueblo rooms.

[218] *Discussant*

[122] *Chair*

Adams, Jesse (Logan Simpson Design, Inc.) and Danny Mullins (Logan Simpson Design, Inc.)

[92] *Paleoarchaic Occupations in the Eastern Great Basin: The Beast and Paleolandscapes in West Central Utah*

Within west central Utah, site locations dating to the Pleistocene-Holocene Transition (PHT) are generally associated with specific geographical features; such as, the Old River Bed (ORB), inverted stream beds/channels, and the barren playas of the Great Salt Lake Desert (Dugway). Over decades of cultural resource management inventories, numerous PHT-aged archaeological sites have been identified along the maximum extent, and subsequent shorelines and resulting feeder streams, of receding Lake Bonneville across the west desert of Utah. Sites include; The Beast—a massive PHT-age site identified at Dugway with an artifact assemblage consisting of over 800 formalized, a possible thermal feature, and 160 Great Basin Stemmed projectile points; as well as numerous PHT-age sites identified along Cove Creek. Here we explore the interconnectivity of these two areas separated by over 100 miles focused on the ORB. XRF studies conducted on obsidian artifacts provide more fine-grained information regarding PHT

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mobility and transfer networks. Additionally, site formation processes at The Beast, suggest that intact buried cultural materials from the PHT may be present.

Adams, Karen (Crow Canyon Archaeological Center) and Susan Smith (Consulting Archaeopalynologist)

[218] *Food for Thought: Engaging Field School Students in the World of Plants*

Field schools run by Chuck Adams and Rich Lange introduced students to many archaeological disciplines. Together an archaeobotanist and a palynologist pulled students into the world of plants via introductory lectures on plant macrofossils and microfossils. Hands-on activities then focused on learning the important plant resources currently available. Student pairs were sent into three different plant communities to collect samples of all the different plants they encountered. When re-assembled the group learned the names and facts about these plants. Later, students accessed ethnographic resources for historic uses, and gave short presentations on plants of interest. Sessions ended with tasting edible wild plants.

Adams, Karen [115] see Smith, Susan

Adams, Ron (AINW)

[140] *Examining Patterns of Toolstone Procurement in an Edible Lithic Landscape on the Columbia Plateau*

Expansive outcrops of high-quality cryptocrystalline silicate toolstone occur in many localities within the Columbia Plateau region of North America. Archaeological evidence indicates that these locations were utilized extensively by pre-contact Native American groups. The geological processes that shaped these landforms and produced outcropping lithic material also created ideal conditions for the growth plant food resources, particularly root crops. These root crops thrive on the lithosols containing outcropping toolstone and were extensively harvested by Plateau groups in the past. The Columbia Hills of south-central Washington State exemplifies this pattern. Myriad lithic extraction sites cover the ridgelines and slopes of the Columbia Hills, a landform that is also blanketed with important root crops. This paper examines the relationship between food resources, toolstone, and settlements in the Columbia Hills area. The distribution of Columbia Hills quarry sites and their spatial orientation in relation to subsistence resources and habitation locales in the surrounding area is indicative of the intensified use of the landscape for both food and lithic resource procurement. Comparisons to other areas within the Columbia Plateau suggest the presence of a regional pattern of intensive lithic procurement coinciding spatially with collector systems involving intensified plant resource gathering.

Adderley, Paul [167] see Woollett, James

Adler, Daniel [177] see Brittingham, Alexander

Adler, Michael (Southern Methodist University)

[122] *Fire, Ash and Sanctuary: Pyrotechnology as Protection in the Pre-Colonial Northern Rio Grande*

Ash deposits are commonly associated with site disuse and termination deposits across the Ancestral Pueblo region of the American Southwest. This paper contextualizes the use of fire, and fire-related products, as part of a larger suite of practices employed to protect past, present and future occupants of villages from malevolent "others" across the pre-colonial northern Rio Grande region.

Admiraal, Marjolein (University of Groningen), Alexandre Lucquin (University of York), Matthew von Tersch (University of York), Peter Jordan (University of Groningen) and Oliver Craig (University of York)

[50] *Investigating Organic Residues on Prehistoric Cooking Technologies in the Aleutian Islands*

Stone bowls and griddle stones were in use in the Aleutian Islands for the past 9,000 years. People invested great time and effort into the manufacture and maintenance of these artefacts which insinuates their importance in prehistoric Aleutian food processing practices. A sudden increase in stone bowl occurrence around 3,500 years ago emphasizes their importance during this particular time. What was it that made these artefacts so important? We believe the answer to this question lies in their function.

Despite their importance these artefacts have never been thoroughly investigated and mention of them is mostly absent in the literature. Exceptionally well-preserved organic residues found on the surfaces of stone bowls and griddle stones offer the opportunity to investigate function through molecular and chemical analysis. Using GC-MS and GC-c-IRMS we identified organic residue origins and were able to carefully suggest function for both artefact groups. Additionally we explored environmental change in the light of artefact function as a factor in the sudden change of stone bowl occurrence during the Margaret Bay phase (4,000–3,000 cal BP) on Unalaska Island.

Adovasio, J. M. (Florida Atlantic University), C. A. Hemmings (Florida Atlantic University), F. J. Vento (Clarion State University), J. S. Duggan (Florida Atlantic University) and J. H. Higley (Florida Atlantic University)

[35] *Preliminary Assessment of Recent Research at the Old Vero Site (8IR009), Vero Beach, Florida*

Intensive excavations and attendant analyses conducted at the Old Vero Site (8IR009) from 2014–2017 have revealed a long and complex stratigraphic succession which dates from ca. 30,000 B.P. to the present. The excavations have documented not only 195 species of plants and animals but also a human presence which extends back to at least 11,000 B.P. and, perhaps, earlier. Terminal Pleistocene extinction dates are provided on several taxa as well as observations about the environments within which they lived. Evidence of previously undocumented anthropogenic activities are also offered, including a very tentative Late Pleistocene tapir kill as well as later Archaic utilization(s) of this venerable site.

[193] *Discussant*

Aebersold, Luisa (University of Texas at Austin)

[243] *Seeds that Germinate: Models, Paleobotanical, and Archaeological Evidence for Colha's Early Inhabitants*

The archaeological site of Colha, located within the northern Belize chert-bearing zone, is well-known for being one of the largest Maya lithic production sites in Mesoamerica. The site has occupation dating to the Archaic Period as well as the Middle Preclassic through the Early Postclassic. Pollen and geomorphologic evidence suggest intensive forest clearance, wetland soil manipulation, swamp margin, and upland manipulation dating as early as the Archaic Period. Evidence for intensive blade production coincides with pollen evidence from Cobweb Swamp for economic species such as maize and manioc.

During the Archaic Period, a warmer, wetter environment jumpstarts an archaeologically visible trend in cultivation and domestication. Mesoamerica's biologically diverse landscape had much to offer its early revolutionary inhabitants. Research involving the cultural transition from complex hunter-gatherers to agriculturalists supports evidence that the early inhabitants of Colha can be studied as a regional model to understand their larger role during the commencement of the Maya civilization. These cultural phenomena and environmental trends are not exclusive to the region, but are also visible around the world. This paper discusses the chronology and significance of this pivotal era with preliminary archaeological and paleobotanical evidence recovered from the 2017 field season.

[243] *Chair*

Aebersold, Luisa [243] see Burns, David

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Aebersold, Luisa [243] see Kotsoglou, Anastasia

Afonso, Marisa (University of Sao Paulo)

[34] *Chronological Investigations at Coastal Shell Mounds, Southeastern Brazil*

Shell mounds (sambaquis) are a focus of scientific interest in Brazilian archaeology since the 1950's and also for interdisciplinary approaches. Located along the Brazilian coast from north to south, they present geographical and chronological variabilities. This paper discusses the chronological aspects of large and small sized shell mounds located on the coast of São Paulo State, Southeastern Brazil. Radiocarbon dates suggest a long occupation of coastal hunter-gatherer-fisher groups spanning from 8,000 to 500 years BP. This culture collapsed after the arrival of inland ceramic groups. We will focus on the synthesis and analysis of the radiocarbon record, using a geo-referenced archaeological database of radiocarbon dates. The analysis of previous excavations and lab reports helped to understand the exact sample location, and the archaeological and paleoenvironmental contexts. The review and contextualization of the shell mounds chronology allowed the comparison with other Brazilian regions and the study of the occupation of coastal landscapes during the Holocene.

Agarwal, Sabrina [66] see Miller, Melanie

Agbe-Davies, Anna (UNC-Chapel Hill)

[327] *Pragmatism, Archaeology, and the Race Woman*

At the Phyllis Wheatley Home for Girls in Chicago, and at Pauli Murray's childhood home, in Durham, NC, black women were in motion, actively reshaping their social worlds. Pragmatism, a philosophy of actions, effects, and consequences is a useful framework for 1) drawing out their theoretical contributions to 20th century social thought and civic activism; 2) understanding their actions via the archaeological record; and 3) thinking through what archaeologies of their lives might mean for us today. This project considers the intersection of two domains—institutional culture and the world of work.

Agorsah, Emmanuel (Professor Emeritus, Portland State University,)

[337b] *Historic Kormantse in the Formation of the African Diaspora in the Americas: Migration Routes*

The impact of "Kormantse" as a cultural entity on the interpretations of the formation and transformations of the African Diaspora remains a major challenge among academics as many questions about the origins, migration episodes of populations, events and the process(es) involved remain unanswered. While bio-anthropologists explore DNA evidence, using various techniques of sequencing for possibly identifying common African ancestral connections or relationships, the need to review various routes and sources of the migrations, as well as the associated historical circumstances and places continue to be very critical. This presentation examines selected maps and other related documentation for speculating about the possible origins or combination of origins and routes that may have triggered off or played various roles in the processes of the creation of what we often consider today as "Kormantse in the African Diaspora." Maps of selected slave trade and migration routes are reviewed against the backdrop of selected recent speculations and interpretations of "Kormantse" in the history and culture of the African Diaspora.

Agorsah, Emmanuel [337b] see Schaffer, William

Agostini, Mark

[269] *Technological Knowledge, Migrations and Ancestral Puebloan Communities of Practice in The Northern Rio Grande of New Mexico*

In the mid-late Classic period (AD 1250—1400), Ancestral Pueblo people living on the Pajarito Plateau of New Mexico experienced cultural change due to difficulties in farming during periods of drought. As a result, communities abandoned pre-contact plateau villages to join their Tewa-speaking relatives at the earliest historic period Rio Grande settlements. Oral histories from descendant communities from the 19th and early 20th centuries recount how the remaining members of these communities resettled at the extant pueblos of Santa Clara (Kapo), San Ildefonso, and Cochiti. In conjunction with ethnographic lines of evidence, this poster evaluates the possibility that the manufacture of ceramic vessels from sites in the Pajarito Plateau and the aggregating migrant sites of the Northern Rio Grande were crafted within crossing-cutting technological and belief based communities of practice that bridge the prehistoric and historic period divide. Time of flight-laser ablation-inductively coupled plasma-mass spectrometry (TOF-LA-ICP-MS) was used to characterize the chemical composition of a large sample of white ware sherds from ancestral sites within both culture areas, which can be used to better define the organization of production, the exchange of technological knowledge, migration, and the transformation of social networks in the pre-contact and contact American Southwest.

Aguilar, Joseph [138] see McBrinn, Maxine

Aguilar, Magdalena and Hirokazu Kotegawa (Museo de Córdoba, Veracruz)

[285] *La lítica tallada de Estero Rabón. Un estudio durante la Fase Villa Alta en la Costa del Golfo*

El empleo de la lítica fue una constante desde los primeros grupos humanos, solucionando sus problemas cotidianos. Por ello, estos artefactos nos aportan información importante para la comprensión de actividades domésticas, sociales, rituales y económicas de una sociedad. El sitio arqueológico Estero Rabón está ubicado en el Sur de Veracruz. A través de las excavaciones en dicho sitio se recuperaron materiales arqueológicos de la fase Villa Alta correspondiente al Clásico Tardío/Terminal. En este trabajo se pretende dar un panorama preliminar del análisis de la lítica tallada obtenida en el lugar. Dentro de las líticas analizadas se pudo identificar la obsidiana de distintos colores como material predilecto para la fabricación de artefactos, siguiendo en menor cantidad el pedernal; con ellos produjeron navajas prismáticas, lascas con huella de uso, desechos de talla, etc. A pesar de que este material arqueológico se encuentra frecuentemente en la superficie y durante las excavaciones, no siempre es localizado con el contexto primario que nos indique sus actividades; pero debe haber algunos indicadores como su forma, huella de uso, calidad y diferencia de materia prima, etc. Así, el presente estudio busca alguna manera para comprender las actividades realizadas con la lítica a través de distintas perspectivas.

Aguilar Diaz, Miguel (Pontificia Universidad Católica del Perú)

[333] *"Rimasinkuchun Amawtapaq: Luis Lumbreras y Ayacucho en la formación de la tradición científica de la arqueología andina"*

En esta presentación se exponen los aspectos fundamentales de la vida y obra del arqueólogo peruano Luis Lumbreras desde sus vivencias en su natal Ayacucho y la trascendencia de su formación personal y académica en la configuración de la consolidación de la tradición científica de la arqueología en el Perú, desde una perspectiva ofrecida por él mismo a partir de una serie de conversaciones entre Lumbreras y los autores, apelando a la memoria y la tradición oral como fuente histórica en la práctica y trayectoria de uno de los principales arqueólogos científicos del Perú y

América Latina. La presentación buscará entender los detalles fundamentales de su formación arqueológica y el impacto de su labor a partir de su propia interpretación de sus aportes como arqueólogo, antropólogo y su labor política en la arqueología andina.

[273] *Chair*

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Ahlman, Todd [90] see Schroedl, Gerald

Ahrlrichs, Robert (UW-Milwaukee)

[52] *Range and Variation of Copper Tools from Two Archaic Localities in Wisconsin*

Great Lakes Archaic copper artifacts have been well documented and typed for many decades. However, there is a lingering tendency to think of copper as primarily a social signifier and to shy away from development of economically oriented copper theory. One component of the problem is rooted in copper's innately malleable nature. Copper was made into a wide range of tools and non-utilitarian items during prehistory. While most of these types have been enumerated, there are no published resources suggesting the morphological range or variation of copper artifacts one might expect in any given region. This paper will report the morphological range and degree of variation measured on a collection of over 1000 copper artifacts from two localities in central Wisconsin. This data is then used to characterize copper usage in these two localities and provides comparative context for artifacts recovered in small numbers or through unconventional means. Ultimately, the goal of this project is to illuminate the economic significance of copper artifacts, and to encourage the development of useful archaeological theory for this component of the Archaic Hunter-Gatherer tool kit.

Ahrlrichs, Robert [89] see Sterner, Katherine

Ahlstrom, Richard [164] see Roberts, Heidi

Ahmadzai, M. Hussain [268] see Rawan, Atifa

Aimers, Jim (SUNY Geneseo)

[147] *The Pottery of a Problematic Deposit from Cahal Pech, Belize, and Its Implications for the Interpretation of Similar Deposits*

During the Belize Tourism Development Project (2000–2004), Awe excavated dense on-floor deposits on the stairs and stairside outsets of Structures A2 and A3 at Cahal Pech. These deposits were mainly pottery sherds but included a variety of other materials including whole and partial vessels, projectile points, obsidian blades, deer antlers, figurines and ocarinas, spindle whorls, and jade pendants. A standard interpretations of such deposits is that they represent garbage left behind by Terminal Classic or Postclassic occupants of the site. In this paper we focus on the pottery remains of this deposit and their implications for alternative interpretations of others like it.

[147] *Chair*

Aimers, Jim [147] see Awe, Jaime

Ainsworth, Caitlin (University of New Mexico), Patricia Crown (University of New Mexico), Emily Lena Jones (University of New Mexico) and Stephanie Franklin (Santa Fe National Forest)

[115] *Ritual Deposition of Avifauna in the Northern Burial Cluster at Pueblo Bonito, Chaco Canyon*

Birds are an important part of both modern and historic Puebloan ceremonialism: live birds, stuffed birds, and bird wings and feathers are used in prayers, in ceremonies, as sacrifices, and in the creation of ritual paraphernalia. Archaeological evidence suggests birds held a similar role in the past for some prehispanic Southwestern groups, including members of the Chaco phenomenon. Pueblo Bonito is one member of the Chaco system that might be expected to contain evidence of ritual use of birds, given other evidence for ritual activity at this site. Using a new avifaunal assemblage excavated from Room 28 in 2013, in this paper we assess evidence for ritual use of birds in Pueblo Bonito's northern burial cluster rooms. Multiple quantitative analyses establish the dissimilarity of this assemblage to other Chacoan sites and demonstrate that an unusually wide variety of avian species were recovered here. Wing elements are particularly abundant and may indicate the deposition of wing fans in the northern burial rooms.

Ainsworth, Caitlin [115] see Mack, Stephanie

Aitchison, Kenneth (Landward Research Ltd)

[32] *Who Works in African Archaeology?*

There are shortages of professional archaeologists in many African countries. It is a widely held view that there just aren't enough professional experts in Africa to carry out the work needed in projects, both large and small, that are affecting African cultural heritage and landscapes.

And these views are relevant, and important, and true—but they are often anecdotal rather than evidence-based. The first step in building capacity is to measure current capacity, then to use the results to identify what is needed and how to move towards.

The Heritage Management Organization, together with Landward Research Ltd, is developing a project with the support of the PanAfrican Archaeological Association and the Society of Africanist Archaeologists to measure African countries' professional archaeological capacities.

Learning from previous work in Europe (www.discovering-archaeologists.eu), we want to look at how many people work in archaeology across Africa (in all work situations—academia, private companies, governmental), what they actually do, what their ages, genders and qualifications are, and how archaeology "operates" in each country.

This project is building up a network of partners in Africa who want to share methodologies and results to support African archaeology today and to plan for its development tomorrow.

Aitchison, Kenneth [331] see Majewski, Teresita

Aiuvalasit, Michael (Southern Methodist University)

[297] *Placing Ancestral Pueblo Water Management Practices into Ritual Contexts*

Across cultures, the ritual use of water is nearly ubiquitous, yet most archaeological studies of water focus primarily on its socio-economic importance. The large (~200–1500 person) mesa-top Ancestral Pueblo (AD 1100–1700) villages of the Jemez Mountains, New Mexico are particularly good contexts for the archaeological study of water because small water storage features, often referred to as reservoirs, are found at many villages across the region. Alternative hypotheses for feature function, such as water storage for domestic use, watery shrines, mortar mixing pits, or some combination thereof, have been proposed, but not tested. Also, archaeologists have given little consideration to how these features may serve as archaeological proxies for Ancestral Pueblo collective action surrounding water in domestic, social, and ritual spaces. As part of recent interdisciplinary investigations into the vulnerabilities of prehispanic Ancestral Pueblo communities to climate change, I used behavioral geoarchaeological approaches to reconstruct the use-life histories of fifteen of these features at nine sites. In this presentation, I focus on the potential ritual significance of feature use-life histories for Ancestral Pueblo of the Jemez Mountains by integrating ethnological and ethnohistorical records of Pueblo water use with geoarchaeological evidence from reservoirs.

Aiuvalasit, Michael [103] see Burger, Rachel

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Ajithprasad, P. [297] see Chase, Brad

Ajú, Gloria [176] see Arroyo, Barbara

Akina, Kaila (University of Minnesota)

[197] *"Filled with Faith and the True Spirit of Mormonism": Ritual and Belief at Iosepa, Utah*

In this paper, I investigate the intersections between ritual, belief, and practice at Iosepa, Utah, a historic townsite built by diasporic Polynesian members of the Church of Jesus Christ of Latter-day Saints (LDS). In 1889, the LDS Church assisted approximately 50 Polynesian LDS to establish and relocate to Iosepa for 28 years before disbanding the settlement in 1917. I explore how the Church leadership and the Polynesian LDS created and actively negotiated the landscape of Iosepa into a community and home according to often fluid social and religious ideals and practices. I argue that this case can lead to interesting questions on the archaeology of belief and ritual as well as how both can play into the archaeology of colonial entanglement and mission contexts. Focusing on an existing collection of materials from one LDS family's household along with spatial organization and historical documentation from the broader community, I first consider the implications of ritual, belief, and practice between the individuals and the community and second, I show how this understudied context expands the discussion on belief and ritual in mission studies and recent historical archaeology.

Akman, Melis [137] see Wales, Nathan

Akoshima, Kaoru (Tohoku University)

[89] *Lithic Micro-wear Traces at Morphological Junctions: Function vs. Typology Reconsidered in Terms of Technological Organizations*

The paper investigates some fundamental aspects of use-wear of lithic artifacts, concerning the relations between function and morphology. During the course of micro-wear research since the 1960s, it was often questioned whether tool typologies actually reflects their functions, or which morphological attributes are diagnostic of their utilization. Case studies in the Upper Paleolithic of East Asia also revealed variability in end-scrapers whose functions seem to be relatively consistent as hide working tools, to burins which exhibit diversified usage, as well as projectile points whose functions are less evident from traceological data. A more theoretical approach to use-wear is proposed here for understanding the complex diversity of tool function. The concept of "technological organization" (by Binford) combined with settlement patterns along a river basin, is applied to traceological research in the Paleolithic of northeastern part of the Japanese archipelago. The Mogami River archaeological project and standardized experimental program of the Tohoku University team provide concrete data bases for this methodological discussion. Investigations at the Kamino A site, the Takakurayama site, the Hakusan E and B sites of blade industry, the Araya and Kakuniyama sites of microblade industry, shed light on the theme of the organizational approach to lithic use-wear.

Alaica, Aleksa (University of Toronto) and Véronique Béliisle (Millsaps College)

[217] *Middle Horizon Cusco and Long-Distance Networks: Reconciling Spatial Variation through a Zooarchaeological Lens at Ak'awillay, Peru*

The ten years of research at the Middle Horizon site of Ak'awillay in the Cusco region of Peru have attested that local elites were the main interlocutors of trade with Wari colonists (Béliisle, 2013). In the era of interdisciplinary research, zooarchaeological methods have the capacity to shed new light on patterns that are seen in other material remains. In the case of the Middle Horizon (AD600–1000) contexts of Ak'awillay, new insights into the extent of trade networks and long-distance interaction are visible through the faunal record. The presence of sea lion, penguin, and coastal shell within house contexts dominated by New World camelids demonstrates that the villagers of Ak'awillay had access to long-distance exchange networks. A comparison between the public building and house contexts further reveals that these exotic species were not exclusively used and discarded in public areas but also kept within private domestic spaces. This paper will argue that the presence and use of exotic species, which could have been distributed by local elites to their loyal followers during large feasts, are possible evidence for the interconnectedness of Ak'awillay to coastal and highland communities without the dominance of Wari influence.

Aland, Amanda (Southern Methodist University) and Kylie Quave (Beloit College)

[100] *From Heartland to Province: Assessing Inca Political Economy through Material Culture Signatures*

Archaeological studies of Inca hegemony often focus on the intensity or degree of "Incanization," or assimilation to Inca material culture. These studies particularly rely upon well-preserved and highly visible remains, especially well-fired polychrome ceramics and monumental architecture. While Inca scholars have begun to analyze Inca hegemony in theoretically sophisticated ways that reveal how material culture legitimizes imperial rule, these approaches present several weaknesses: (1) sampling complications that can bias assessments of intensity; (2) insufficient consideration of the nature of Inca hegemony in diverse provincial settings; and (3) undue assumptions about the Inca heartland material assemblage to which provincial remains are compared. Because heartland sites have not been systematically reported in great numbers, we propose that more rigorous comparisons of horizontal excavations in the heartland are necessary for productively evaluating provincial contexts. Comparisons of Inca material signatures from recently-excavated heartland sites and one provincial site (Chao Valley) underpin our plea for more robust analyses of the nature of Inca hegemony. We further argue that rather than assess Incanization directed from center to periphery, we must acknowledge that the archaeological record was formed by local decisions and actions as much as by imperial policies.

Alarcón, Teresa [59] see Winter, Marcus

Alberti, Benjamin (Framingham State University)

[259] *Rock Art, Hunting, and Life*

Archaic rock art in the Rio Grande Gorge in northern New Mexico demonstrates an intimacy with the ecologies of which it is a part, from the microscopic life with which it shares its surfaces, to the talus slopes it occupies or watches over. Knowledge of materials and the ecological processes with which they were thoroughly entangled encouraged hunters to lay down tracks and traces of their own, including the geometric patterns and animal and bird prints that constitute the archaic rock art tradition of the area. The rock art appears as either isolated, often barely visible, communications with the heavily patinated basalt surfaces on which it is pecked; or as sites that are made up of the dense iterative marks left by itinerant hunters, marks that transformed boulders, reshaping them in line with the natural ecologies of which they are a part. Through a consideration of several sites investigated by members of the Gorge Archaeological Project in the light of recent work on ecology and hunter-prey relations, this paper examines the ways in which rock art exists on a continuum with other, older practices, rather than being indicative of a moment of radical separation.

Albornoz, Ximena [153] see Belmar, Carolina

Alcalde, Veronica [34] see Flores-Fernandez, Carola

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Alcalde Gonzales, Javier I. (Universidad Nacional Mayor de San Marcos)**[273]** *Mito y rito, en tanto política y gobierno, en la costa de los Andes Centrales durante el Tawantinsuyu*

Las formaciones sociales de carácter imperial se articulan desde sus propias dinámicas, reproducidas desde sus relaciones y su territorio. Estos mecanismos deben ir reformulándose en el proceso de expansión, integrando las dinámicas sometidas políticamente, desarrollándolas y transformándolas, originando nuevas formas políticas dentro los antiguos procesos regionales y en el propio centro imperial.

El caso particular del Tawantinsuyu parece generar tres tradiciones integradoras diferenciadas, y que representan también los particulares procesos históricos previos de cada territorio social. Hacia el norte del Cusco nos encontramos con dos ejes, que son distinguibles a pesar de sus procesos complementarios: un eje cordillerano y uno yunga. Hacia el sur se puede distinguir un eje de “discurso legitimador” que desde la cordillera andina integra también sus flancos.

Nos interesa en este caso discutir la tradición del eje yunga, que como estrategia política se desarrolló desde Ica (Perú) hasta las costas septentrionales (Ecuador). Estrategia que se sustentaría en integrar los mitos regionales como una política de cohesión, y que se manifiesta en la particular arquitectura imperial que conjuga lo local, lo regional y lo imperial, como expresión de un discurso hegemónico, sobre la base material de estas sociedades: el paisaje entre el mar y la cordillera.

Alcantara, Keitlyn (Vanderbilt University Department of Anthropology)**[257]** *Conquering Aztecs and Resisting Tlaxcaltecas: The Body as a Site of Creating and Challenging State Narratives*

Narratives of Aztec grandeur dominate portrayals of Late Postclassic (AD 1325–1519) Mesoamerica. While imperial influence spread rapidly and thoroughly throughout the central valleys, Tlaxcallan appears as a rift in imperial control, resisting the encircling empire. Aztec narratives relegate Tlaxcallan to the peripheries, downplaying Tlaxcaltecas as one-dimensional barbaric enemies, unconquered by choice. In contrast, ethnohistoric accounts from within Tlaxcallan emphasize a state that intentionally separated itself from the Aztecs in ideology, social organization, and political and economic alliances, actively challenging the encroaching empire. For both groups, rising political tensions at the end of the Postclassic served as a catalyst for specific constructions of identity, demonstrating the political value of an image of cohesion. While these identities are often portrayed as fixed, this presentation will analyze human skeletal remains excavated from the urban center of Tepeticpac, Tlaxcallan to explore how the body serves both as a point of state defined identity, while also capturing lived experiences that depart from controlled social and political categories.

[257] *Chair***Alcock, Susan (University of Michigan)****[1]** *Discussant***Alconini, Sonia (University of Texas At San Antonio)****[100]** *To the East of the Titicaca Basin: The Yunga-Kallawayas and the Inka Frontier*

The Kallawayas region was an important imperial breadbasket of the Collasuyu, located to the east of the Titicaca basin. Formed by a set of narrow temperate valleys, this region was a natural corridor that led to Apolo and the Mojos savannas to the north, and to the east to the tropical Yunga mountains. Because of its marked altitudinal variation, this region was suitable for pastoralism, the production of corn and coca, and farther east, the exploitation of gold mines. The Inkas at their arrival expanded dramatically the system of agrarian terraces along the set of valleys, and promoted the influx of a large contingent of mitmaquna colonies for farming and productive ends. This was accompanied by the establishment of sizable storage facilities, including the control of key trading networks that crossed the frontier. Using a regional-scale perspective, this poster explores the scale of such socioeconomic shifts, and the ways in which indigenous Yunga-Kallawayas populations reacted and adapted to such changes.

[100] *Chair*

Alconini, Sonia [207] see Hoyle, Alesia

Alcover, Omar (Brown University), Thomas Garrison (Ithaca College) and Stephen Houston (Brown University)**[248]** *Bridging the Gap: Spectral and Structural Analysis of Archaeological Settlement in El Zotz, Guatemala*

In the last decade, archaeologists have successfully employed active remote sensing technologies, such as LiDAR, to identify ancient settlement in the Maya lowlands. Near the site of El Zotz in northern Guatemala, this technology has aided in the identification of fortresses, terraces, and a network of raised roads. Archaeologists who employ LiDAR focus principally on the structural data acquired from the LiDAR point clouds. Building on these methodologies, we assess the benefits of incorporating both structural and spectral derived data from LiDAR sensors. Specifically, we address the use of intensity measurements attained during a 2016 flight over the northern Peten by a Titan Multispectral Mapping LiDAR. Intensity measurements are used to create multispectral datasets of above and below canopy measurements that clarify spectral properties of the archaeological landscape. These datasets allow archaeologists to assess how structural components of tropical environments (canopy height, varying vegetation, and surface elements) relate to their spectral properties. Additionally, these multispectral datasets allow researchers to regionally assess long-term effects of landscape use and change in Mesoamerica.

Alcover, Omar [163] see Matsumoto, Mallory

Alden, John**[246]** *Discussant***Aldenderfer, Mark (University of California)****[174]** *Discussant*

Aldenderfer, Mark [155] see Iizuka, Fumie

Alencar, Soraya**[25]** *Aging and Funerary Practices at Monte Alban, Mexico*

In the past decades, new theoretical and methodological developments in bioarchaeology and archaeology of death have allowed the exploration of age categories that are very challenging to access archaeologically: infants and older adults. Although Mesoamerican archaeology has largely used evidence for representations of aging in different sources of information (textual and iconographic) to engage in a broader consideration of funerary practices, approaches of old age as an identity category has been neglected by archaeological inquiry. This article explores the funerary practices of the elderly at Monte Alban and how it contributes to an understanding of the longevity in the past and the attributions based on age in the context of the organization of the domestic labor in complex societies. Aged bodies were selected considering pathologies and markers of senescence that include, for example, joint diseases, osteoporosis, traces of wear and tooth loss (n=40; 12.1%). Some symbolic aspects of longevity were introduced in the

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funerary practices to give meanings to the preservation of the memory of the house. Equally, older people are engaged in occupational specializations of the residential group, as ceramic production and trade of prestige goods, throughout the time of occupation of the site.

Alessi, Joe (Slippery Rock University)

[274] *John White's Playboy Black vs. Playboy White, Part 2*

John White once published a piece comparing the depiction of both Native Americans and Blacks in the cartoons of Playboy Magazine from its inception to 1970. In this work, John discovered that as a result of the Civil Rights Movement of the 1960's the image of Blacks in cartoons changed from ones oriented on cultural and racial distinctions to ones that merely displayed blacks in the cartoon. In short, the humor of the cartoon was no longer fixated on Black race or culture, but on other subjects such as politics. In contrast, John also discovered that the image of Native Americans never changed. That the humor of all cartoons in playboy fixated on Native American culture. In honor and at the encouragement of John, he asked me to pick up where he left off and to see if the dynamics changed. This work is the follow up to John's work and looks primarily at the images of Native Americans through not only the lenses that John used in his original research but also from the concept of Cultural Appropriation.

Alexander, Katharine [52] see Hummel, Rebecca

Alexander, Rani (New Mexico State University)

[173] *Cross Markers and Commemorating Place in the Titles of Ebtún, Yucatán*

Cross markers that consist of a wooden cross supported by a stone cairn (multun) are among the most pervasive landscape features encountered in rural Yucatán. They delimit water sources, features along roadways and paths, agricultural parcels, and the entrances of rural towns. The cross markers show substantial formal variation and are associated with material evidence indicating diverse practices of veneration. Cross markers were first established in the sixteenth century after the Spanish invasion, and they are documented in both Maya- and Spanish-language land surveys that run from the 1550s to the present day. These boundary markers, however, commemorate places long abandoned by inhabitants. They convey multitemporal notions of history and social memory, as well as spatial movement and circulation. In this paper, I examine how present-day cross markers in the areas surrounding the towns of Ebtún, Cuncunul, Kaua, Tekom, and Tixcacalcupul relate to the historical contingencies of movement documented in the Titles of Ebtún, a corpus of Maya-language land survey documents. Activities known as tzol pictun, taking a tour of the boundary markers, is a contemporary place-making practice that has continually reproduced local authority and renewed social memory from the sixteenth century to the present.

Alfonso-Durruty, Marta (Kansas State University, Universidad Alberto Hurtado), Miguel Vilar (National Geographic), Manuel J. San Román (CEHA, Universidad de Magallanes) and Flavia Morello Repetto (CEHA, Universidad de Magallanes)

[283] *mtDNA and the Peopling of Fuego Patagonia*

Information regarding the prehistoric human migration into Southernmost Patagonia and Tierra del Fuego provides a baseline against which it is possible to compare interpretations regarding the colonization of the Americas, including its timing and rates of human dispersion. The earliest archaeological evidence in Fuego- Patagonia dates to the Late Pleistocene (c. 10.500 BP). By the Middle Holocene archaeological record (c. 8000–4000 BP) shows marked differences between the technological, economic, and cultural practices of inland and coastal peoples. These differences, indicate the presence of two divergent adaptations: nomad canoe/marine hunter-gatherers and pedestrian terrestrial hunters, although the archaeological record shows several complementary economies. To date, proposed migration routes into Fuego-Patagonia include the Pacific rim, the Atlantic coast, and inland or intermountain corridors. This study presents mtDNA results from 50 prehistoric individuals dated to ca. 6,000–390BP. The results identify three main haplogroups (C1, D1, and D4h3a) which distribution suggest the presence of at least two migration routes into the region, one through the inland and east of the Andes, and one through the coast, along the Pacific. The results agree with archaeological evidence, which reveal the sudden appearance of a marine adaptation strategy c.a. 6500BP.

Alfonso-Durruty, Marta [155] see Morello Repetto, Flavia

Alizadeh, Karim

[71] *Climate Change or Muslims? Collapse of the Late Antique Sasanian Settlements, Mughan Steppe, Iranian Azerbaijan*

Recent research in the borderlands has increased our knowledge on the irrigation systems and urbanization plans of the Sasanian Empire in the late antiquity. In particular, surveys and excavations in the Mughan Steppe indicate that irrigation canals connected nearly all Sasanian settlements. Evidence suggests that after the 7th century AD most of the elaborate settlement system was abandoned and its irrigation infrastructure went out of use. While the exact date of this abandonment is unclear, it is possible that the collapse of the irrigation system itself could have brought an end to the Sasanian settlements which happened before the appearance of the Muslim army in the region in the mid-7th century. In this paper, I will present evidence of climate change that could have caused the abandonment of the Sasanian irrigation systems and associated settlements. Unlike a popular explanation of the decline of the Near East and the role of Islam, the evidence suggests that climate change could have contributed significantly to the collapse of Sasanian settlements before the arrival of Muslims. Understanding the causes of collapse is significant and may shed some light on the socio-political transformation of the southwest Asia at the end of late antiquity.

Allaby, Robin [143] see Kistler, Logan

Allan, Pamela, Moira McMenemy (University of Strathclyde), Kelly Brown (University of Strathclyde), Matthew Baker (University of Strathclyde) and David Robinson (University of Central Lancashire)

[214] *Testing the Trance Hypothesis: Identifying Hallucinogenic Compounds from Quids at Pinwheel Cave, California*

For decades, debates have raged over the role of trance in the origination of rock-art. However, there remains almost no direct evidence of the ingestion of trance inducing material at any rock art site world-wide. The site of Pinwheel Cave has a large element thought to represent the opening of the flowering Datura. Dozens of quid, or 'chews'—i.e. masticated fibres of unidentified plant material—are found within the ceiling of the cave. A sample of this was taken and analysed to determine if they contain the Datura plant. Extraction and analysis methods were developed for the two main toxic alkaloids within Datura: atropine and scopolamine. The alkaloids were successfully extracted, identified and quantified from standard solutions and spiked eggplant leaf samples. Low concentrations of atropine and scopolamine were detected within one 'chew' sample extract. A further six 'chew' sample extracts await analysis by high performance liquid chromatography mass spectrometry (HPLC-MS). This paper discusses this procedure and the implications of this discovery and the community aspects of both the past and present local Native population.

Allard, Francis (Indiana University of Pennsylvania)

[196] *Centering the Periphery: The Case of Southeast China during the Early Imperial Period*

First incorporated into China in 214 BCE, the southern region known as Lingnan (which consists of the present-day provinces of Guangxi and Guangdong), has traditionally been regarded as one of China's peripheral regions. Not only was Lingnan distant from imperial centers in the north, its native pre-literate 'Yue' inhabitants spoke non-sinitic languages and were known for their distinctive 'uncivilized' behaviors. Along with its location at the

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southern margin of modern China's territory, the fact that political, cultural and material elements originating north of it did have a significant impact on Lingnan's long-term development further helps mark the region as 'peripheral'. However, by focusing on unidirectional currents emanating from distant political centers, one risks underestimating the influence of areas 'beyond the periphery', as the case of Lingnan illustrates when one takes into account material and cultural elements which reached southern China along the 'Maritime Silk Road'. Having said this, the mere act of 'centering' so-called peripheral regions for the purpose of understanding local change is in itself insufficient, as the analysis must consider not only the origin of single elements of interaction, but also their magnitude, impact, and the extent of their social and spatial penetration at the local level.

Allcock, Samantha [4] see Jenkins, Emma

Allen, Kathleen (University of Pittsburgh)

[301] *Pottery Analysis as a Window into Site Function and Community Identity: A Haudenosaunee Case Study*

Previous analyses at two early contact period Haudenosaunee village sites in the Cayuga region of central New York State (Parker Farm and Carman) have provided evidence for differences in the intensity of occupation and in the distribution of activities. Interpretations of site activities have included a more intensive focus on pottery production and utilization at Parker Farm and greater emphasis on hunting and shell bead production at Carman.

Although differences in the reasons for the occupation of these sites have focused on seasonality, gender, and production, another possibility is that they may have been occupied by different groups moving into the area during the early contact period. Variability in the material culture might indicate increased interaction and entanglement with their neighbors. This paper presents results from an analysis of pottery designed to elicit patterns of design, function, and technique with implications for discerning community identities and activities during this period of rapid change. This analysis also sheds light on the processes of engagement with other groups and the environment in the early contact period.

Allen, Melinda S. [85] see Huebert, Jennifer

Allen, Mitch (University of California Berkeley) and William B. Trousdale (Smithsonian Institution)

[3] *The Iron Age Culture of Sistan, Afghanistan*

Our knowledge of the cultural history of western Central Asia is spotty and incomplete between the collapse of complex societies of the Bronze Age and the middle of the first millennium BCE. This is particularly true of the little-studied Sistan region of southwest Afghanistan and eastern Iran. The Helmand Sistan Project, conducted by the Smithsonian Institution and Afghan Directorate of Archaeology and Historic Preservation through the 1970s but hitherto unpublished, uncovered through survey and excavation an extensive settlement system along the lower Helmand River dating to this time period. This presentation will outline the basic elements of the Iron Age culture of this region. We will document the construction of a regional irrigation canal system that allowed for extensive desert cultivation in the Sar-o Tar region and along the Helmand River, describe the series of platform-based sites that anchored this system, and show key elements of material culture on those sites uncovered by the project. The presenters will situate these finds in the context of other cultures known from neighboring areas in the late second and early first millennia BCE

Allen, Susan (University of Cincinnati), China Shelton (American Center for Oriental Research) and Calla McNamee (Wiener Laboratory for Archaeological Science, ASCS)

[298] *Preservation and Perception: Archaeobotanical Patterning and Site Formation Processes in Mycenaean Messenia*

Despite the increased application of spatially intensive sampling for archaeobotanical remains at large Mycenaean sites in Greece, the recovered assemblages are typically small and show poor preservation. Here, we consider the macrobotanical assemblage recovered through flotation of more than 7000 L of sediment at the site of Iklaina, in Messenia, in conjunction with microbotanical remains (starches, phytoliths) to illuminate cultural and natural site formation processes that have either negatively or positively affected plant preservation and recovery. We have observed three tentative patterns: the relative absence of materials in both natural and anthropogenic drainage areas, compounded by the downhill erosion of deposits leading to "shallow sites"; heavy clay content which is destructive for both micro- and macro-remains; and the importance of dumping episodes in relatively undisturbed areas that had fallen out of active use. This combination of patterns means that where evidence is preserved, it is rarely in primary contexts that can be used to discuss active-use spaces. Instead, it is better suited to discussions of disposal processes that reflect general and cumulative near-by activities and long-term patterns of resource use. Nonetheless, extensive horizontal excavation at Iklaina has revealed intra-site variation perhaps related to administrative zones vs. combined-use domestic/industrial areas.

Allentoft, Morten [143] see Lynnerup, Niels

Allgaier, Paul (University of Utah Archaeological Center) and Brian Coddig (University of Utah Archaeological Center)

[92] *Prearchaic Settlement Decisions in the Great Basin*

Researchers propose that the first people to occupy the Great Basin preferentially settled near pluvial lakes to exploit highly profitable wetland habitats. However, a systematic evaluation of this hypothesis has yet to be undertaken. Here we test predictions from an ideal free distribution model to determine if the settlement decisions of Prearchaic foragers were indeed biased toward pluvial ecosystems. The results not only elucidate Prearchaic settlement patterns, but also establish expectations about the subsistence practices and technology of central Great Basin foragers prior to 9000 BP.

Allison, James (Brigham Young University)

[164] *Ceramic Production and Exchange among the Virgin Anasazi, 30 Years Later*

At the 1988 SAA annual meeting in Phoenix, Margaret Lyneis presented a paper with the title Ceramic Production and Exchange among the Virgin Anasazi. In that paper she presented convincing evidence that, despite its abundance in the Moapa Valley of southeastern Nevada, Moapa Gray Ware was produced 70–100 km to the east, near the north rim of the western Grand Canyon. She also defined a new type of pottery, which she was calling Shivwits Brown at the time (later Shivwits Plain). Shivwits Brown (or Plain) was also abundant in the Moapa Valley, but Lyneis argued that it was made on the Shivwits Plateau, also north of the western Grand Canyon but west of the main Moapa Gray Ware production zone. That 1988 SAA paper inspired much subsequent research, including my doctoral dissertation, which (in part) examined the distributions of Moapa Gray Ware and Shivwits Plain across the western part of the Virgin region and within the Moapa Valley. In this paper, I update and expand on that study, adding data from recent excavations, from my unpublished fieldwork on the Shivwits Plateau and in the St George Basin, and from recent reanalysis of ceramic assemblages from the western Virgin region.

[234] *Discussant*

Almeida, Fernando [70] see Klokler, Daniela

Alonso Olvera, Alejandra [173] see Smith, J. Gregory

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Alonzi, Elise (Arizona State University)

[23] *Traveling Monastic Paths: Mobility and Religion in Medieval Ireland*

Monasteries were powerful social institutions in early and late medieval Ireland that took drastically different forms over time. Medieval historical records, such as annals and Saints' Lives, and archaeological data, such as the layout of monastic buildings, suggest that small communities of monks at early medieval Irish monasteries followed ascetic or austere ways of life. Contrastingly, historical and archaeological sources indicate that monks at late medieval monasteries, founded by English and continental religious orders, lived in large communities and interacted with lay or non-religious people. Historical texts also record that high-status Irish monks and nuns traveled throughout Ireland, Scotland, England, and continental Europe. However, documents record little information about lower status monks and lay people. Thus, it is unknown how frequently people traveled as part of monastic life and how frequently local individuals participated in monasticism. This study leverages unique burial contexts of 88 individuals at five Irish monastic sites spanning nine centuries (8th-16th centuries AD) through biogeochemical analysis of human bones and teeth based on three isotopic systems (radiogenic strontium, oxygen, and carbon), compared to a geological baseline of plant samples, to uncover patterns of medieval Irish mobility in connection to the changing practices of Irish monasticism.

Alqahtani, Mesfer

[12] *GIS Investigations on Stone-Circle Structures in the North of Saudi Arabia*

The theme of the poster will address archaeological phenomena in the north of Saudi Arabia. The archaeological phenomena are stone-built structures that can be seen by satellite images. These stone-built structures have various types, and one of them is the circle type.

The poster will show the method of creating predictive models of stone circles by using the Geographic Information System (GIS). To create these models, two zones from the north of Saudi Arabia should be selected: study zone and applied zone. The study zone is where the distribution of stone circle locations will be analyzed to create predictive models. The applied zone is where predictive models will be applied to be testable in the future. The predictive models will be based on quantifiable attributes of stone-circle locations from the study zone. These attributes will include the relationship between stone-circle locations and environmental variables such as the landform and the distance of water resources. These attributes will be analyzed by ArcGIS to obtain environmental characteristics representing high, middle, or low probability models for the presence of stone-circle locations. In the applied zone, similar environmental characteristics will be identified to determine high, middle, low predictive models.

Alsgaard, Asia (University of New Mexico), Carolyn Freiwald (University of Mississippi), Stephanie Orsini, Douglas J. Kennett (Pennsylvania State University) and Keith M. Prufer (University of New Mexico)

[155] *Quantifying the Exploitation of Faunal Remains by Pre-ceramic Societies in Southern Belize*

Beyond occasional reports of Pleistocene megafauna, there is a paucity of faunal data from the Mesoamerican Paleoindian and Archaic periods. This poster presents faunal data from three rockshelters in southern Belize located in two distinct environmental regions. Tzib'te Yux, is located in the Rio Blanco Valley in the foothills of the Maya Mountains and has an intact deposits from Cal. 14,000 to 6,000 BP. In contrast, Maya Hak Cab Pek and Saki Tzul, are both located in the interior of the Maya Mountains. They have intact deposits from Cal. 12,000 to 1,100 BP. Despite varying degrees of bone fragmentation, the analysis of the deposits from all three rockshelters during these early periods of human occupation provides a unique insight human subsistence choices and food processing. Our precise chronologies are anchored by over 100 precise AMS dates, giving us a high-resolution view into animal exploitation by pre-agricultural hunting and foraging societies in the Central American tropics

Altamirano-Sierra, Ali [64] see Chen, Peiyu

Altschul, Jeffrey (Statistical Research, Inc./SRI Foundation)

[151] *Discussant*

Altschul, Jeffrey [24] see Ciolek-Torello, Richard

Alvarado, Aimee I. [7] see Wisner, Gavin

Alvarez, Arlene and Corinne L. Hofman (Leiden University, The Netherlands)

[108] *Archaeological Heritage Market and Museums in the Dominican Republic*

The first Dominican heritage legislation indicates that there were private collecting practices of local archaeological materials already by the end of the 19th Century. Heritage museums formed archaeological collections with donations or purchases from private collectors who often depended on individuals that made a business out of locating sites with the desired pieces. The continued institutionalization of collections without context that gave rise to several museums has contributed to the perpetuation of an antiquities market that has negatively impacted the community's connection to the country's indigenous heritage and its perceived value and relevance.

Heritage legislation regarding the protection of pre-Columbian archaeological materials continues to be weak. Despite the bureaucratic control over international scientific research, there are no local regulatory mechanisms that register the sale of archaeological objects by street vendors, huaqueros, or between private collectors that continue, at a lesser but impactful rate, to expand their collections, prestige, and market value.

Examining lessons learnt, museums can work towards a more coordinated effort to minimize looting of archaeological sites. Through collaborations, museums can develop internal policies that discourage acquisitions of looted objects, and create best practices to provide contextual information, improving the way communities access collections on display.

Álvarez, Ana María [285] see Rivera, Luz Stephanie

Alves, Diana [116] see Maezumi, S.

Alveshere, Andrea (Western Illinois University)

[26] *Burning Down the House: Evidence for Controlled and Uncontrolled Structure Fires among the Late Woodland and Mississippian Settlements at the Orendorf Site in Fulton County, Illinois*

The Orendorf site (11F107), located on a bluff overlooking the central Illinois River valley, comprises a mound group and a series of Late Woodland and Mississippian habitations. The occupation of the site is characterized by a gradual migration of the community to the west through successive abandonment and rebuilding. Burned structures have been found in all Orendorf settlements, and at least two of the abandonments followed complete burning of all structures. Intensive salvage excavations of the westernmost areas were conducted during the 1970s, and research has continued through the 2017 field season, during which a Mossville-phase Late Woodland/Mississippian structure was excavated in the easternmost habitation area.

Although structure fires appear to be common to all Orendorf settlements, there is substantial variation in several characteristics of the burned house features. An analysis of these variations suggests that both controlled (intentional) and uncontrolled (either accidental or malicious) structure fires are

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represented among the settlements at Orendorf. "Controlled" and "uncontrolled" classes of burned structures are considered within the context of other archaeological, ethnohistoric, and ethnographic evidence for ceremonial burning, utilitarian burning, wildfires, and warfare. Special challenges in the detection and excavation of these different classes of burned structure features are also examined.

Alvitre, Cindi [306] see Kennedy Richardson, Karimah

Amador, Julio (UNAM)

[180] *Rock Art at Chalcatzingo, Morelos: Methodology and Techniques for Recording, Documenting and Elaborating Preservation Strategies*
This presentation describes the process of recording and documenting the pictographs found at the site of Chalcatzingo, Morelos, in central Mexico. It shows the way in which state of the art technology is used for the first time at the site for this purpose. Iconographic analysis, landscape archaeology and the analysis of painting techniques and materials are as well employed to enrich the interpretation of rock art at the site. Upon this basis we elaborate a hypothesis about their relations with landscape, astronomical phenomena and the other elements of material culture. We also present a preliminary description of the preservation conditions of the pictographs.

Ambrose, Stanley (U. Illinois, Urbana-Champaign), Andrew Zipkin (U. Illinois, Urbana-Champaign), Douglas J. Kennett (Pennsylvania State University), Abigail Fisher (Southern Methodist University) and Jessica Thompson (Emory University)

[198] *Dietary and Environmental Reconstruction with Stable Isotopes of Early, Middle and Late Holocene Humans from Northern Malawi*
The early Holocene African humid period (AHP, ~12,000–6000 bp) was followed by the Middle Holocene dry phase (MHDP, ~6000–3500 BP), and the modern climatic regime was established during the later Holocene (~3500 bp to present). The relationship of environmental change to human social and territorial organization adaptations are fairly well-documented in northern, eastern and southern Africa. However, the Holocene terrestrial record of environmental change in east-central Africa is poorly documented. Stable carbon, nitrogen and oxygen isotope analyses of human bones and teeth from northern Malawi suggest that hunter-gatherers exploited humid closed woodlands during the AHP (low 13C, low 15N), drier more open habitats during the MHDP (higher 13C, very high 15N), and relatively closed, humid woodlands during the later Holocene (low 13C, low 15N). Iron Age peoples consumed substantial amounts C4 plants (high 13C, low 15N). Strontium isotope data for small subset of these skeletons are insufficient to reconstruct residential life histories. With a more detailed terrestrial environmental history, more human Sr isotope data and a strontium isoscape, it may be possible to test ecological models of hunter-gatherer social and territorial organization in changing Holocene environments in Malawi.

Ambrose, Stanley [99] see Hu, Lorraine

Ameen, Carly, Anna Linderholm (Department of Anthropology, Texas A&M University), Ellen McManus-Fry (Department of Archaeology, University of Aberdeen), Kate Britton (Department of Archaeology, University of Aberdeen) and Keith Dobney (Department of Archaeology, University of Liverpool)

[212] *Friends in High Places. An Integrated Examination of the Long-Term Relationship between Humans and Dogs in Arctic Prehistory*
Dogs are arguably the most significant domestic species in the circumpolar North, in both their universal importance to life-ways and their near-uniqueness as a regional domesticate. The Arctic was the gateway for at least 4 independent waves of migration of dogs into the Americas, beginning as early as ~17,500–13,000 years ago, making this region particularly important for investigating not only the cultural and technological functions of Arctic dogs, but also the impact of successive introductions in the past 1,000 years on the high-latitude adaptations of prehistoric Arctic human populations.
This paper will focus on the integrated use of genetics, GMM and isotopes to reconstruct individual and population life-histories of prehistoric Arctic domestic dogs. This combination of interrelated analyses allows for a comprehensive investigation into genetic, morphological and dietary variability for the identification of domesticates from archaeological assemblages, and for examining the relationship between domesticates and wild canids in archaeological contexts. Our results demonstrate that this three-strand analytical investigation can shed new light on continuity and change in human-canid relationships during these periods of migration, providing valuable information about the relationship between humans and animals in prehistory, and the complex cultural and technological diffusions of successive human migrations across the Arctic.

Ameen, Carly [212] see Dobney, Keith

Ames, Nicholas (University of Notre Dame)

[296] *Objects in Motion: The Materiality of Irish Emigration in the 19th Century World*
When departing one's home, how does an emigrant decide what to bring? In arriving at a destination, in what ways does an emigrant (re)construct their understanding of place? This paper addresses the question of materiality in emigration by investigating the objects surrounding the act departure, and (re)structuring of one's life in emigration. I focus on three facets of the material expression of emigration: the things they bring, the worlds they build, and the resulting influences they have 'back home.' Using the prism of local and regional experiences, I demonstrate how these acts of object-movement reflect wider narratives of national and international affect. Namely, how those emigrated objects reflect perceived values within a country; how the materiality of public and private spheres displays multifaceted identities and engagement with particular (and often overlapping) communities; and the ways in which emigrants shape, through remittances, letters, and return, the narratives of expectation and acts of consumption practiced 'back home.' By looking at the ways in which networks and social identities are expressed in the materiality of emigrant's lives, I aim to engage with the complex narratives of trans-locational experiences, and the act of movement, from an archaeological lens.

Ames, Nicholas [54] see Ullah, Isaac

Amgalantugs, T. [24] see Ciolek-Torello, Richard

Amico, Jennifer [156] see Gilleland, Sarah

Ammerman, Steven

[171] *Animal Agents in the Human Environment*
Humans' increasingly close relationship to animals constitutes one of the most important cultural, social, and economic developments of the past ten thousand years of our history, as well as being a key factor in the changes in climate referred to as the Anthropocene. Animals are important resources of food, labor, and secondary products in many societies, as well as symbolically important features of the ritual landscape. As relationships with animals intensify, processes such as domestication ensure that humans are potentially able to control the behavior and deployment of large numbers of animals, altering ecosystems and creating an anthropogenic landscape. However, these types of relationships are heavily structured by the innate attributes of the animals involved. Pre-evolved characteristics create the set of possibilities on which human agents can act, and actions undertaken by

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animals without the influence of humans can have major impacts on human behavior. Because of this, evaluating “human” environments as complete ecosystems with multiple players is an important part of understanding how we exist within the environment.

Amorosi, Tom [155] see Morello Repetto, Flavia

Anaya, Tanya [248] see Mercure, Danielle

Anaya Hernandez, Armando [252] see Reese-Taylor, Kathryn

Ancona, Iliana [142] see Pantoja, Luis

Anderson, Amber (RIT, Medaille College)

[257] *Inka Conquest Narratives along the Northern Frontier: Evidence from the Pais Caranqui, Ecuador*

When the Inka moved into Northern Ecuador at the end of the 15th century, they were met with fierce resistance from the semi-autonomous societies of the Pais Caranqui. Chronicler accounts and Inka narratives note that conflict occurred and fortifications were constructed before the Inka were eventually victorious and continued their conquest northwards. However, these accounts do not accurately highlight the true complexity of the groups the Inka encountered, the prolonged nature of the conflict that occurred, and the massive changes that were implemented in the region after conquest. Excavations and the resulting material evidence indicates that unlike elsewhere in the empire, the Inka had a high interest in control and fortification construction, with a low emphasis on imperial architecture, and locales within the Pais Caranqui were not all affected the same way.

Anderson, Arthur (University of New England)

[199] *Strategies for Exploring the Protohistoric Period on the Southern Maine Coast*

As investigations of the Protohistoric period move away from a reliance on the reliable material culture recovery found in burial contexts, our basis for investigation of protohistoric sites and landscapes in the Far Northeast often begins with European historical records. Recent excavations in the area described in 1607 by Champlain as the village of Chouacoet in Saco Bay, Maine highlight the fact that many of the equivalencies drawn between the archaeological record of the protohistoric and European accounts can be tenuous. This demonstrates that archaeologists must be wary of focusing on seeking the sites, or the types of sites, described by Europeans.

We should acknowledge that European visitors did not experience the same sensory or cultural landscapes as the indigenous populations. A fuller understanding of the experiences, cultural transitions and tragedies of the Protohistoric period can be gained by shifting focus to the way the indigenous inhabitants experienced and inhabited sites and landscapes. This requires a move away from European sources for exploring protohistoric archaeology, more detailed radiocarbon dating of potential protohistoric sites and components (with or without demonstrable European material culture), and an integration of the Protohistoric into wider understandings of the prehistoric Northeast.

[199] *Chair*

Anderson, C. Broughton (Berea College), Annie He (Berea College), Bianca Godden (Berea College), Samantha Sise (Berea College) and Alicia Crocker (Berea College)

[241] *A Study of George White through Flight and Light*

Imaging is a critical part of the archaeologist's toolkit. Likewise, the capture, manipulation, enhancement, and interpretation of images has been the subject of significant research in computing over the past 20 years. This project brought together five students studying archaeology and computing to collaborate on fieldwork—and the hardware and software that supports that fieldwork—to engage in an exploration of the life of George White, a freed slave and property owner in Madison and Jackson counties during the mid- to late-19th century, that would otherwise be impossible undertaken separately. This interdisciplinary research project relied on macro-scale, overhead drone images of sites as well as high-resolution, micro-scale RTI dome images of excavated artifacts. George White's story will add a new dimension to our understanding of the lives of freed blacks in the 19th century in Madison County and add to the growing database of significant archaeological resources located within the Berea College Forest. More broadly, this research will contribute to a greater understanding of how enslaved individuals in Kentucky purchased their freedom and established themselves as property owners in an unstable pre-Civil War world.

Anderson, David (University of Tennessee), Thaddeus Bissett (Northern Kentucky University), Stephen Yerka (University of Tennessee), Joshua J. Wells (Indiana University South Bend) and Eric Kansa (The Alexandria Archive Institute/Open Context)

[135] *Drowning the Library: Sea-Level Rise and Archaeological Site Destruction in the Southeastern United States*

The impacts of past and projected climate change and specifically sea level fluctuations on heritage resources are examined across the southeastern US using site and environmental data integrated in DINAA (Digital Index of North American Archaeology). Minor changes in sea level have shaped human settlement from the late Pleistocene onward, including in recent millennia when shorelines are incorrectly assumed to have stabilized at or near present levels. In the near term, tens of thousands of known archaeological sites and historic structures, and countless more currently unknown or undocumented, will be lost given modest (1–5m) changes in sea level. Millions of people will also need to move, which, depending on where they relocate and how potential flooding is to be mitigated, will also lead to the vast destruction of heritage resources. Consideration of large linked datasets is essential to developing procedures for the sampling, triage, and mitigation of predicted losses to our collective heritage. DINAA is one of several emerging solutions to the challenge of working with the vast record about the past that has been generated. Positive, multi-organizational collaboration facilitating open access to linked heritage and environmental data from multiple sources is essential to saving the past for the future.

Anderson, David S. (Radford University)

[160] *Discussant*

Anderson, Emily (Johns Hopkins University)

[146] *Like a Lion, as a Man: Seals and Poetry in Minoan Crete*

This paper investigates how parallels were drawn between lions and human in Bronze Age Crete, and how this parallelism potentially developed concurrently through material culture worn on the human body and oral narrative. I argue that the unique qualities of seal stones, namely their close association with human identity and their physical location on the human body, positioned them to be potent venues for asserting parallels between man and beast. I begin in the late Early Bronze Age, with a small group of seals engraved with a novel composition type that set humans in a direct visual and conceptual parallel with lions. I then trace the re-invention of this parallel in the glyptic of the subsequent palatial periods. Here the seal's position as a worn object was capitalized on, with the body of the beast engraved on the seal being juxtaposed with the body of the human wearer. I investigate how this parallelism was established and emphasized through the objects and compare it to the distinctive narrative device of the animal simile in Homeric epic, which was likely taking root in oral traditions at the same time.

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Anderson, Mark [5] see Stroh Messerole, Megan

Anderson-Cordova, Karen

[123] *Indian Ethnic Complexity in Hispaniola and Puerto Rico and Its Implications for the Study of European/Indian Contact During the Early Colonial Period*

Scholarly interest utilizing archaeological and ethnohistorical studies to understand the genesis and development of Caribbean creole societies has grown in the last few years. Perspectives have shifted to emphasize the diversity of groups in the Caribbean during precolonial times, and how this continued into the colonial period as Europeans and Africans coalesced in the area. The conflictual aspect of this interaction whereby Europeans imposed a system of forced labor, along with drastic Indian population losses have obscured the contributions of indigenous peoples to colonial societies and culture.

This paper summarizes archaeological and historical data for Puerto Rico and Hispaniola on the diversity of Indian groups in the early colonial period and the different ways they reacted and responded to Old World peoples. It postulates the concept of cultural transformation to explain the process of change occurring among these populations, and how they employed strategies which varied from island to island. It discusses the evidence for the persistence of Indian groups well into the colonial period and what this may imply for the formation of creole societies, and ends with a call for further archaeological research focusing on early colonial sites.

Andrade Pérez, Axel (Arqueólogo) and Karla Itzel López Carranco (Pasante en Arqueología)

[158] *Proyecto Arqueológico Cuenca del Río el Maíz: investigación científica y trabajo comunitario en Santos Reyes Nopala, Juquila, Oaxaca*

Se muestra el trabajo realizado por el Proyecto Arqueológico Cuenca del Río el Maíz en coparticipación con las autoridades municipales y la comunidad de Santos Reyes Nopala, la Fundación Mexicana para la Educación Ambiental y el Departamento de Mecatrónica de la Universidad Tecnológica de los Valles Centrales de Oaxaca, como una contribución al estudio científico de la arqueología de la región, cuyo objetivo principal consistió en la investigación, salvaguarda, rescate y difusión consciente del patrimonio arqueológico.

Andreou, Georgia (Cornell University)

[34] *Coastal Erosion Management in Archaeology: Turning Challenges into Opportunities*

Coastal erosion is a known problem in cultural heritage management, particularly in the Mediterranean, which lends itself exceptionally well to studies of maritime trade and connectivity. The loss of coastal land to erosion presents a serious obstacle to our understanding of the archaeological coastscape, due to the unpredictable rate in which it exposes and damages archaeological features. The exposure and subsequent disappearance of material culture is seldom accompanied by systematic archaeological recording. As a result, a wide range of past activities associated with the coast remain unrecorded, their context poorly understood and our understanding of past human interaction at local, regional and inter-regional scales impaired. Coastal erosion is, thus, both a predicament of cultural heritage preservation and an epistemological problem.

Since 2014 the Cyprus Ancient Shoreline Project employed integrated methodologies to record, monitor and contextualise the impact of coastal erosion on the cultural heritage of the south-central coast of the island of Cyprus. In this paper I present some of the results of the lab- and field-based methodologies we implemented to quantify and monitor the loss of information. I also demonstrate how we turned the problem of coastal erosion into new opportunities for understanding the Cypriot coastscape.

Andrews, Anthony (New College of Florida)

[271] *Discussant*

Andrews, Bradford W. [242] see Franklin, Paris

Andrews, Brian [44] see Eren, Metin

Andrews, E. Wyllys (Tulane University)

[162] *Discussant*

Andrieu, Chloé (CNRS Université Paris I La Sorbonne), Edgar Carpio (Universidad San Carlos de Guatemala), Brent Woodfill (Georgia State University) and Arthur Demarest (Vanderbilt University)

[176] *Not All Distance Is Kilometric... Obsidian Procurement and Exchange at Salinas de los Nueve Cerros and Cancuen*

During the Classic period most lowlands cities imported obsidian from the El Chayal source, the other two major high quality outcrops (SMJ and Ixtepeque), being in the minority by comparison. Despite the fact that much has yet to be understood about the way this material was transported from the Highlands to the Lowlands, the recent discoveries at Cancuen of a single cache containing hundreds of complete prismatic cores demonstrated that this site played a major role in the production and export of El Chayal obsidian blades to the rest of the Lowlands during the Late Classic period. However, Salinas de los Nueve Cerros, located only 40 km from Cancuen, happens to be the only Lowland Late Classic site presenting a higher rate of SMJ than the El Chayal material. This data raises many questions about the possibility of Salinas being related to another exchange sphere than the classic Lowland Maya one, and enables us to discuss questions of contacts, and frontiers between these two major sites.

Andrieu, Chloé [121] see Victor, Bart

Anfinson, Scott [74] see Scott Cummings, Linda

Angiorama, Carlos [132] see Franco Salvi, Valeria

Ankele, William (University of Oklahoma)

[21] *An Early Archaic Melting Pot in the Southern Rocky Mountains: Early Holocene Mobility and Settlement Patterns in the Gunnison Basin, Colorado*

In comparison to the Late Paleoindian Period (10,000–8,000 rcybp), the Early Archaic (8,000–6,500 rcybp) in the Gunnison Basin, Colorado is a poorly understood time because of its relatively light archaeological signature. Not only is the archaeological record more ephemeral, but we also see a change in technologies, such as projectile points types, in this transitional period. Some archaeologists explain these observations as a result of changing environments and shifting settlement processes as new populations moved into the basin. Preliminary research has shown that Early Archaic projectile point types from the Rocky Mountains, Great Basin, Southwest, and Great Plains are all present in the Gunnison Basin. Using multiple lines of evidence, I investigate the settlement and mobility patterns of the people who lived in the Gunnison Basin during the Early Archaic Period.

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Anklam, Andrew and Dan Wendt**[239]** *Modeling Proglacial Shore Lines of Glacial Lake Agassiz around Prehistoric Quarries in Northern Minnesota*

Since 2009 the Knife Lake siltstone quarries in the Boundary Waters Canoe Area Wilderness of Minnesota U.S. quarry district have been the focus of archaeological and geoarchaeological research. A recent survey conducted in 2014 and 2015 identified several relic beach features at varying elevations above the current water line of Knife Lake. GIS was used to model and predict these proglacial lake shoreline features to better understand the procurement patterns of Knife Lake siltstone, a prominent lithic material in Minnesota. It is believed that these beachlines were formed by successive phases of a proglacial lake and may relate to an eastern extension of glacial Lake Agassiz during the Late Paleoindian period when several of the Knife Lake quarries were active.

Using the elevation of relic beach features identified by survey, several different inundation maps were made using GIS to visualize the Knife Lake area during each of the different phases of the hypothesized proglacial lake. The maps were made using LiDAR data freely available from the Minnesota Geospatial office. These maps are being used to help archaeologists better understand the potential distribution of archaeological sites on relic beaches at an unexpected distance from the present extent of Knife Lake.

Anschuetz, Kurt F. (Rio del Oso Anthropological Services, LLC) and Richard I. Ford (University of Michigan, Emeritus)**[297]** *Earning Their Living: Archaeologies of Ideation, Ritual, and Agricultural Practice in the Southwestern Pueblo Landscape*

Agriculture among the northern Southwest's Pueblo communities traditionally and historically was more than merely an economic activity through which the people "made their living." Steeped in ritual and informed by principles of stewardship, spiritual ecology, and ensoulment that explicate their orientation within the Natural World and their obligations to the Supernatural World, indigenous agricultural practice was literally and figuratively a key element in each individual's everyday observation of their respective community's spiritual belief. Interacting with their plants, soils, and water in terms of these fundamental understandings, Pueblo people "earned their living." Our discussion draws from our ethnographic work with Tewa and Western Keres Pueblo representatives, as well as our field studies of the archaeological traces of late prehispanic and early historic agricultural fields and associated blessing features in the greater Tewa homeland of northern Rio Grande Valley and the Western Keres Culture Province of west-central New Mexico. We examine the organization of agricultural field rotation and short-term sedentism through the lens of the Pueblo cultural landscape theme of movement to contribute a richer understanding of the body of interrelated rituals metaphors expressed in the core Pueblo idea that "People are Corn."

Anthenien Jr., Ralph A. [46] see Sagripanti, Jose-Luis

Anthony, Alexander**[296]** *"Irishness" and Tea Consumption: The Materiality of Ethnicity*

Excavations at the McHugh Site (47WP294), a mid-to-late Nineteenth Century homestead in Wisconsin, resulted in the recovery of a large material culture assemblage. Historical documents reveal the site's occupants to have been pre-famine Irish emigrants who settled in Ohio before moving to Wisconsin in 1850. However, analyses of the material culture have thus far failed to uncover evidence of an Irish identity distinct from an American identity. This paper presents results of an analysis of the teaware component of the McHugh ceramic assemblage that attempted to identify potential markers of traditional pre-immigration behaviors. Since tea is consumed by cultures across the world, the presence of teaware alone is not enough to indicate "Irishness." Thus, this study explores the correlates of the material manifestation of tea consumption within the McHugh household and offers a comparison with selected contemporary sites as well as modern Irish and Irish American households. The aim of this study is to discover if there is an inherently Irish style of tea consumption and to determine whether or not the associated behaviors can inform our understanding of the McHugh assemblage.

Anthony, David (Hartwick College) and Dorcas Brown (Hartwick College)**[212]** *The Dogs of War: A Bronze Age Initiation Ritual in the Russian Steppes*

At the Srubnaya-culture settlement of Krasnosamarskoe in the Russian steppes, dated 1900–1700 BCE, a ritual occurred in which the participants consumed sacrificed dogs, primarily, and a few wolves, violating normal food practices found at other sites, during the winter. At least 64 winter-killed canids, 19% MNI/37% NISP, were roasted, fileted, and apparently were eaten. More than 99% were dogs. Their heads were chopped into small standardized segments with practiced blows of an axe on multiple occasions throughout the occupation. The repeated violation of the canid eating taboo, unique to this site, combined with the metaphor of human transformation into male canids, suggests that the participants entered a liminal state typical of a rite of passage. Parallels from comparative Indo-European (IE) mythology provide the indigenous narrative that gave meaning to this ritual: we argue that it was an initiation into the widely attested IE institution of youthful male war-bands, symbolized by transformation into a dog or wolf.

Antonelli, Caroline (University at Albany—SUNY)**[254]** *Landscape Modification Seen from Above: Remote Sensing Analysis at Postclassic Mayapan*

This paper examines shifting environmental paradigms in the Maya realm. Using Mayapán as a case study, a site long-considered to be located in a "marginal" environment for agricultural productivity, I will evaluate site resilience, sustainability, and self-sufficiency and use these concepts to create a more nuanced perspective of human-environment interactions. Data from Mayapán will be cross-referenced to other similar sites across the Maya region. I will show that assumptions about the environment in the Northern Yucatán Peninsula is rooted partly in culture historical interpretations of the previous century. Modern investigative techniques from the last twenty years have allowed for more robust scientific research that contrast the environmental perspectives of the past, challenging these long-held beliefs and opening up new avenues of research. These new investigations show that the environmental history of the Maya in the Northern Yucatán Peninsula is even more complex than previously understood. Occupation in this area is both highly adaptive and stable at different points in time.

Antonio, Luz (Proyecto de Investigación Arqueológica Prehistoria Urbana de Huari)**[300]** *Relaciones estilísticas y culturales en un contexto temprano del Horizonte Medio*

Enmarcado dentro del Proyecto de Investigación Prehistoria Urbana Huari 2017 se realizó un hallazgo peculiar de objetos cerámicos interrelacionados temporal y espacialmente. El grupo de objetos encontrados—que preliminarmente tiene relevancia simbólica temprana—fue hallado como un relleno de prepiso y con posibilidad de uso ritual. Su importancia es que es el primero en encontrarse de manera intacta e interrelacionado con una posible arquitectura doméstica.

Entre las preguntas preliminares que genera este grupo de objetos está su función, la filiación estilística y la temporalidad dentro de las actuales cronologías propuestas y al interior del propio sitio arqueológico Huari.

El trabajo se enfocará en el análisis de los rasgos estilísticos, para la cual se revisaran los estilos analizados y descritos por Menzel y los planteamientos de autores posteriores. La observación de pastas servirá para diferenciar estas vasijas de otros objetos cerámicos asociados que los

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circundaban. El objetivo es establecer las relaciones estilísticas y culturales de este interesante hallazgo y lograr un aporte para este importante proyecto de investigación que ha generado inquietantes luces en su primera temporada de excavación.

Antoniou, Anna (University of Michigan) and Earl Davis (Shoalwater Bay Tribe)

[250] *Collaborative Archaeology in Willapa Bay, Washington: Supporting Communities through Scientific Research*

How can archaeologists and indigenous communities work together to transform an understanding of prehistory into something that serves the community's goals? Since the 1990's archaeologists have become increasingly dedicated to developing new ways to directly and meaningfully engage descendant communities. This paper presents a case study of collaborative and applied archaeology from the Pacific Northwest Coast. In it, we describe our ongoing efforts to collaboratively define the questions, methods, and outcomes of archaeological investigations at Nukaunanlh Village in Willapa Bay, Washington. Through rigorous scientific analyses of archaeological deposits, oral histories, and ethnohistorical accounts pertaining to prehistoric subsistence practices, we aim to support and reinvigorate culturally important foodways that are in danger of being lost within the current descendant community. In particular, we hope that results stemming from our collaboration will aid in the community's legal battle to regain their ancestral fishing rights.

Anyon, Roger [72] see Sezate, Adam

Aragon, Leslie (Archaeology Southwest)

[91] *Identity and Ideology in the Hohokam Ballcourt World*

The Hohokam Ballcourt World encompassed much of the middle Gila River watershed from around A.D. 800 to 1100. The widespread ideology that many archaeologists associate with the use of ballcourts correlates with an expression of group identity that manifests itself in the archaeological record as the suite of traits that mark the Hohokam pre-Classic period. Despite the fact that archaeologists commonly define groups based on their material culture, these groups are not static. Parts of identity within them are often fluid, changing with the prevailing socioeconomic tides, while other parts of identity are more persistent. This project will combine multiple material classes into a framework capable of assessing multiple scales of identity during an important period in the Hohokam pre-Classic, when a new religious ideology—the Hohokam Ballcourt World—developed, spread, and eventually declined. The goal of this study is to use a multiscale approach to identity, emphasizing both active and latent expressions, to demonstrate that outward displays of cohesion at Hohokam sites mask underlying social diversity related to persistent local identities.

Aragon, Leslie [91] see Schaefer, Jonathan

Arakawa, Fumiyasu [91] see Crawley, Andrea

Aranda, Claudia [105] see Peralta, Eva

Araujo, Astolfo [2] see Correa, Leticia

Araujo, Astolfo (Museum of Archaeology and Ethnology—USP)

[2] *A Major Hiatus in the Mid-Holocene Archaeological Record of Eastern South America: Reassessing the "Archaic Gap"*

A decade ago, we suggested that the low frequency of archaeological sites dated from the mid-Holocene in several portions of Lowland South America (what we have called the "Archaic Gap") was due to an increase in the magnitude of dry periods. Since then, data regarding paleoenvironmental reconstructions for Lowland South America, coupled with an increase of the archaeological knowledge, allows us to reassess the idea of the "Archaic Gap" and redefine both the areal extent of the phenomenon and its possible causes. However, as expected when larger data sets are available, it is possible to perceive oscillations in the archaeological signal that suggest reoccupation of some areas. Although we maintain that the main reasons underlying these patterns are still related to climate, they are most probably related to an increase in climatic variability, and not necessarily to an increase in dryness.

[2] *Chair*

Arbolino, Risa (National Museum of American Indian)

[139] *Chair*

Arbuckle MacLeod, Caroline (University of California, Los Angeles)

[32] *Ethnoarchaeology in Egypt's City of the Dead*

Many of the initial approaches to understanding ancient cultures were centered on ethnographic observations. These early studies tended towards overly simplistic arguments that often either overtly or inadvertently supported social Darwinism. Recent applications of ethnoarchaeology have also been accused of falling into similar pitfalls. While the critics are right to highlight the limitations of this approach, scholars can avoid making dangerous assumptions by working alongside the societies they wish to study. Working with modern communities to interpret the past is a valuable technique that can reveal different ways of doing that may not have originally occurred to the investigator. This paper shows how the assistance and guidance of carpenters living and working in Cairo's City of the Dead has enabled a more nuanced and realistic view of ancient woodworking practices. These modern artists have inspired hypotheses that, when tested against the material evidence, have led to a new understanding of technological processes and the position of craftspeople in ancient Egyptian society. Through this case study, the responsible application of ethnoarchaeology is explored in order to demonstrate its use as an invaluable tool for archaeological interpretation.

[32] *Chair*

Archuleta, Bernardo [27] see Sosa Aguilar, Danny

Ardagna, Yann (UMR 7268 Marseille), Emeline Sperandio (UMR 7268—ADÉS Marseille) and Bruno Bizot (Service Régional de l'Archéologie, DRAC PACA and U)

[88] *The "Provence-Alpes Côte d'Azur" Regional "Human Bone Library": A Tool for Anthropological Research and for the Preservation of Human Remains*

Following an evaluation between 2004–2006, it appeared that more than 200 anthropological series had been assembled following excavations led in Provence Alpes Côtes d'Azur (PACA) region. These extremely scattered series had not all been subjected to a precise inventory, were disparately curated or even lost. Therefore, most of these collections were not or no longer accessible to scientists. Faced with this question concerning the heritage preservation, different regional actors invested in anthropological research argued on the best way to improve this situation. It was decided to create the "human bone library of PACA region". Today, the "human bone library" is part of the regional archeological deposit of the French Ministry of Culture and Communication in charge of curating archeological material. The "human bone library" comprises close to about 6000 subjects overall dating from the Neolithic to the Modern period. Now, with a little perspective, we can confirm that this "human bone library" is starting to impact

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anthropological research and valorises the collections on regional and national levels.

Besides presenting the "human bone library", this talk aims to highlight the conditions of the collections and of anthropological research in Southern France before and after this scientific management tool was implemented.

Ardelean, Ciprian (University of Zacatecas, Mexico)

[79] *The Chiquihuite Cave in Zacatecas, Mexico: Cultural Components, Lithic Industry and the Role of This Pleistocene Site in the Peopling of America*

The high altitude Pleistocene site of Chiquihuite Cave, in the Central-Northern Mexican Highlands, is slowly turning into one of the most important players on the sensitive stage of the debates about the earliest human presence in North America. After the first three exploration seasons and before the imminent continuation of the excavations at this multi-component archaeological site, we can surely talk about several important Late Pleistocene, older-than-Clovis occupational phases. Dozens of radiocarbon and luminescence dates confirm the chronological sequence of this prehistoric locality spanning over millennia. The sediments produced chemical signatures of human presence, as well as interesting palaeoenvironmental indicators. The complicated lithic industry at the Cave, based on silicified limestone, shows a large array of taxonomic units, revealing strange but consistent technological approaches: flakes and blades, scrapers, burinated points, points on transversal flakes, bifacial and unifacial tools, intentionally fractured calcite and quartz laminae and so on. The explorations at Chiquihuite are the result of an international and interdisciplinary effort. Novel techniques have been implemented and the results produced a complex view of the ancient archaeological record. Dennis Stanford himself and the Smithsonian Institution played an important role at the very beginning of this scientific endeavor.

Ardren, Traci (University of Miami)

[254] *Household Garden Plant Agency in the Creation of Classic Maya Social Identities*

Domestic gardens are a well-established aspect of Classic Maya residential settlement, and they are rightly considered important components of food security and even food sovereignty strategies utilized by the ninety-nine percent. Taking inspiration from the emerging field of human-plant studies, I argue daily interactions with household garden plants exerted a profound influence on not only the daily habits of ancient Maya populations, but also on their memories and sense of social identity. Tending gardens was a repeated behavior that almost all members of the social majority shared in common. Taking a perspective that common Maya garden plants such as chaya and chile were agents in, rather than objects for, the production of knowledge and social meaning, this paper argues that household garden plants actively helped shape crucial aspects of Classic Maya social identities along gendered and age based axes. Data on domestic compounds from the site of Yaxuna are used to illustrate how, through human circulations within garden spaces located between structures, plants and humans co-generated cultural values, practices, and relations.

Ardren, Traci [66] see Palacios, Horvey

Areche, Rodrigo (Qhapaq Ñan Project)

[65] *Evaluando la explotación de los recursos malacológicos en el Cerro Azul prehispánico*

El impacto de la expansión Inca a lo largo de los Andes Centrales ha sido documentado y conceptualizado de diferentes maneras. Ciertas elites de los grupos culturales locales inmersos en este proceso tuvieron un escenario beneficioso que permitió una reformulación en las relaciones políticas y económicas en diferentes grados y escalas. Presentaremos el caso de Cerro Azul o también conocido como la gran fortaleza del Huarco en el valle de Cañete de la Costa Centro Sur de Perú. Este sitio es reconocido etnohistóricamente por su fuerte componente inca, también como lugar de elites de pescadores locales. Los datos de excavación del Proyecto Qhapaq Ñan en Cerro Azul sugerirían un crecimiento y reorganización espacial a la llegada inca.

Los análisis y comparaciones del material malacológico proveniente de basurales en edificios de élite evalúan el rol de la explotación, se plantean áreas de captación y una variabilidad y densidad de especies malacológicas que indicaría una jerarquización económica y política entre las élites de pescadores en Cerro Azul durante la ocupación inca.

Arend, Tiffany [261] see Barnes, James

Arias, Pablo (Universidad de Cantabria)

[136] *Paleolithic Art and Ritual: An Exploration on Human Activity inside Caves in Southwestern Europe*

Caves provide a privileged context for the study of Prehistoric ritual activity. Inside them, we enjoy the unique possibility of directly observing and analyzing spatial features that have hardly changed (and in some cases have not changed at all) since the Paleolithic. However, the poor preservation of the archaeological evidence during the earliest years of the research, and particularly the enormous cultural gap between the Paleolithic codes and systems of beliefs and the modern observers hinder the reconstruction of the events that may have taken place in those places.

In this paper, the available evidence on human action in caves with rock art of southern France and northern Spain will be described and analyzed. We will address relevant topics such as the spatial relationship between Paleolithic graphics and scenographic features of the caves (visibility of the paintings and engravings, capacity of the chambers, sound properties of the decorated areas...) and the evidence of human actions inside the karst (footprints, paths, archaeological items in passages and walls, artificial modifications of the cavern space...). The case of areas of concentration of portable art inside caves, such as Enlène and La Garma, will also be included in the discussion.

Arias, Veronica (West Texas A&M University)

[44] *An Isolated Middle Archaic Bison Kill Site in the Northern Texas Panhandle*

The discovery of a nearly complete, articulated *Bison occidentalis* in association with a Calf Creek projectile point in the northern Texas Panhandle in 2002 constitutes one of the few known Middle Archaic archaeological sites in the region. As the remains were found incidental to the construction of a

new municipal swimming pool, documentation of the excavation and any subsequent analysis were less than ideal. A recently obtained AMS radiocarbon date of the remains at 5115 RCYBP falls within the established time range for the Calf Creek Horizon. This paper reports on the results of new faunal, lithic sourcing, and paleobotanical analyses conducted on materials from this site. It focuses on the context of the discovery of the Stinnett Bison Site, the material culture, and the implications for past human activity in the area. As the only Middle Archaic site excavated in the Texas Panhandle to date, it offers insights into the nature and timing of occupation during the late Allthermal period. The results of the present study both conform to what has been established about the Calf Creek Horizon elsewhere and expand our understanding of it.

Aricanli, Sumru [333] see Barnes, Monica

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Arieta Baizabal, Virginia (Universidad Veracruzana)

[19] *Estudio arqueológico preliminar de un posible sitio olmeca: Antonio Plaza, Veracruz*

El objetivo de la ponencia es presentar los resultados preliminares del programa de mapeo intensivo en Antonio Plaza, Veracruz—un posible sitio olmeca ubicado en la cuenca alta del río Uxpanapa en la costa del Golfo de México—. Dicha etapa de análisis revela información proveniente de la superficie terrestre y es portadora de numerosas ventajas para el futuro planteamiento de un programa de reconocimiento de superficie. El estudio empleó el análisis de la información a través de Sistemas de Información Geográfica (SIG) lo que permitió la comprensión de la superficie y la ubicación geográfica y gráfica de los sitios. Se presentará el análisis espacial y la elaboración de mapas temáticos sobre delimitación de áreas próximas, costos y distancias, rutas mínimas, accesos, índice de vegetación de diferencia normalizada (NDVI), modelos de superficie en 3D. Los resultados preliminares dan cuenta de lo que se ha realizado en el proyecto, así como de la identificación de elementos claves para el planteamiento de una etapa siguiente en torno al recorrido de superficie sistemático, esta vez con información previamente valorada de manera intensiva a través de las nuevas tecnologías en la arqueología.

Arikan, Bulent

[71] *Modeling the Changes in the Surface Processes at Arslantepe (Malatya) during the Early Bronze Age-I (ca. 5000–4750 cal. BP)*

Agent-based modeling of land use not only illustrates how ancient production mechanisms evolve, but such models also have the power to reconstruct changes in spatio-temporal changes in the dynamics of surface processes in relation with the changes in climatic conditions and varying type and intensity of human land use. Early Bronze Age-I at Arslantepe represents a time period when the paleoclimatic dynamics changed towards more arid conditions while the economy of the site shifted from intensive irrigation farming to site-tethered pastoralism. Concurrently, the social organization moved from a hierarchic to a heterarchic structure. Extensive geoarchaeological research around the site suggests a low rate of sediment deposition for this phase. Under more arid climatic conditions, it is expected that various modes of land use would have different impacts on the surface processes. The results of numerous scenarios tested in agent-based models at Arslantepe during the Early Bronze Age-I show that the rates of erosion and deposition change as patterns of precipitation and the mode of land use change. The results of simulations prove that the shift in economic and social organization alleviated the environmental disturbance that the residents of Arslantepe were faced with at the onset of the Middle Holocene.

Arksey, Marieka (Office of the Wyoming State Archaeologist), Paddington Hodza (University of Wyoming Geographic Information Science) and Greg Pierce (Office of the Wyoming State Archaeologist)

[42] *WyoARCH: Increasing the Impact of Archaeological Repositories through Spatially-Enabled Collections Management*

The University of Wyoming Archaeological Repository (UWAR) is the largest archaeological collection and the only federally-regulated repository in Wyoming, providing an unprecedented centralized location for researchers and the public to discover and engage with the 16,000 years of human occupation in this part of North America. However, the current collections management system at UWAR does not facilitate public dissemination of this data, nor does it enable curatorial staff the ability to properly support researchers, educators, or the public in making effective use of the collections. The Wyoming Archaeological Research and Community Hub (WyoARCH) project seeks to resolve this situation through a collaboration between UWAR and the Wyoming Geographic Information Science Center (WyGIS) to develop a public access interface to interact with a new spatially-enabled collections management system.

Arkush, Elizabeth (University of Pittsburgh)

[207] *Land Use, Settlement Patterns, and Collective Defense in the Titicaca Basin: The Constitution of Defensive Community*

This paper starts from the hypothesis that “community” in the Andean highlands in the Late Intermediate Period (LIP) had a great deal to do, not only with kinship and territory, but also with collective defense, including the defense of important common resources. If so, how would the socioeconomic activities of farming and herding have affected the practical organization of defense, and the formation of communities based in part on common defense? I draw on the archaeological record of the Titicaca Basin for a preliminary exploration of this question. The production regimes used by Titicaca Basin peoples changed markedly over time, shifting from intensified agriculture in the Middle Horizon to relatively risk-averse strategies of pastoralism and rain-fed terrace cultivation in the LIP. But notwithstanding many basic cultural similarities among LIP Titicaca Basin societies, there are significant contrasts across this large region in the opportunities the land affords for farming and herding and the relative importance of these activities in late pre-Columbian times. These regional contrasts provide an opportunity to explore how farming, herding, and related settlement patterns influenced the organization of defense and the constitution of LIP communities.

[75] *Discussant*

Armijo Torres, Ricardo [30] see Ek, Jerald

Armit, Ian (University of Bradford)

[144] *Can We Define a British Iron Age?*

The Iron Age in Britain has traditionally been seen as a period of hierarchical, warrior-based, Celtic societies, characterised by hillforts, defended settlements and elaborate weaponry. The dominant interpretive models have emanated from Wessex—that area of central southern England where the largest and most impressive hillforts are found. In recent decades, however, archaeologists have increasingly recognised the marked regional differences inherent in Iron Age societies across different parts of Britain. As a result, the conventional, Wessex-dominated models have fallen from favour and been replaced by a myriad of regionally-focussed analyses. This approach, however, has its own problems. Different regions of Britain might have very different archaeological sequences in the Iron Age, yet there are some traits (including the uptake of continental La Tène art styles, the paucity of visible burial rites and the use of the roundhouse as the normative domestic form), that display a layer of cultural unity underlying this apparent variation. This paper explores how we might reconcile these tensions between regional distinctiveness and broad-scale cultural similarities across the British Iron Age.

Armstrong, Aaron and Martha Tappen (University of Minnesota (Twin Cities))

[217] *Implications of Efe Ethnoarchaeology for Recognizing Human-Derived Faunal Assemblages and Carcass Processing Decisions*

Archaeological analyses of faunal remains frequently rely on observations derived from ethnoarchaeological studies to identify bone surface modifications that were the result of animal capture, butchery, and consumption by humans. In addition to the accurate identification of human-derived modifications, ethnoarchaeological studies in which carcass processing and consumption were observed and documented can provide a more precise means to recognizing specific human behavioral choices, such as carcass skinning, defleshing, disarticulation, marrow and grease extraction, and, ultimately, culturally-mediated processing decisions. However, many zoo-ethnoarchaeological studies have focused on larger bovines, and it is not clear that smaller animals retain similar types and frequencies of human-induced surface modifications. In this paper, we present analyses of size 1 bovines (<20 kg body weight) captured, butchered, and consumed by Efe foragers of the Democratic Republic of Congo and ethnoarchaeological observations of animal capture, carcass processing, and consumption. We document the frequency, location, and morphology of bone surface modifications as well as skeletal part frequencies, butchery patterns, and processing decisions. Our study provides a control assemblage focused on size 1 bovines and reveals that their carcass remains exhibit numerous bone surface modifications that are the residues of specific behavioral choices of the Efe.

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Armstrong, Chelsey Geralda and Christina Sam-Stanley (Research Office, Kitsumkalum First Nation)**[114]** *Fruits from the Ancestors: Tsimshian Forest Gardens in the Pacific Northwest*

The historical ecology of Dalk Gylakyaw, the ancestral village of the Gitsm'geelm Tsimshian, is a community-based research program that focuses on connecting the past to the present using a heterarchy of ethnographic, ethnohistorical, and archaeological methods that are organized from Tsimshian Adawx, worldviews, and community objectives. Traditional resource management and environmental wisdom are explored as a means of investigating the archaeological past in less invasive ways. In this context, we explore how descendant communities connect as intensely with the plants that continue to grow above ground at ancestral village sites—their names, smells, stories, tastes, and management practices—as they do with traditional archaeological materials and features found below the ground, such as stone tools or cultural depressions. Living heritage embodied by plants provide touchstones of memory and literally bring forth the fruits of the ancestors.

[195] *Discussant*

Armstrong, Douglas (Syracuse University)**[123]** *Indigenous and Transcultural Implications in the "Seasoning" of Early 17th-Century Settlers of Barbados*

The early 17th century settlement of Barbados is often projected as "Little England" and the settlers unidimensional as "Englishmen Transplanted" onto a rather blank slate of an abandoned island (Puckrain 1984, Gragg 2003). Current archaeological investigations of the initial period of colonial settlement on Barbados focusing on Trents Plantation, and the pre-sugar era (1627–1640s) project an all-together different picture. The archaeological and historical record projects a multivalent, multicultural, mix of engagements between Indigenous, African, and European settlers. This complexity is expressed in the material record, particularly with the mix of locally produced and imported ceramics from the early 17th century plantation context at Trents. The emerging colony on Barbados was English in name, but backed by the Dutch, and assisted by a group of Indigenous people who joined them from Guyana and Africans captured from a Portuguese ship. Moreover, this colony was established in the 17th century Caribbean, a theater contested by the Spanish, Portuguese, Dutch, and English, as well as a complex array of Indigenous peoples. The result was the construction of a complex multi-vocal cultural ensemble of cultural and material expressions that is consistent with the dynamic cultural diversity that emerged in the region.

Arnauld, Charlotte [80] see Marken, Damien

Arnauld, Marie (CNRS)**[169]** *Cities on the Move across Northwestern Mesoamerica: Contribution by Dominique Michelet*

The paper aims at enhancing the contribution by Dominique Michelet and his teams to the knowledge of sedentism and urbanization on the northern and northwestern fringes of Mesoamerica (mainly San Luis Potosí, Guanajuato, Michoacán, Mexico). Distinct processes of mobility, migration and agglomeration developed in those regions, in particular with reversibility of sedentary life related to multiple factors, among which climatic and agrarian cycles are only partly known so far. Specific community organizations were plausibly experienced through a series of 'transformative relocations' (Nelson et al.). The latter would have produced Postclassic urban capitals like Tula, Hidalgo, as well as 'pre-Tarascan' and 'Tarascan' large and compact settlements like Milpillan, and Malpais Prieto, (Malpais de Zacapu, Michoacán). Michelet brought up detailed results of fieldwork explorations combined with acute perception of broad environmental, subsistence and cultural changes on a Mesoamerican scale.

[80] *Discussant*

[80] *Chair*

Arneborg, Jette [34] see Madsen, Christian K.

Arnett, Abraham (Logan Simpson), S. Joey LaValley (Logan Simpson) and Travis Cureton (Logan Simpson)**[325]** *The Undiscovered Country: New Insights into the Anchan Tradition of Central Arizona*

Between November 2016 and September 2017 archaeological surveys performed by Logan Simpson on behalf of the Tonto National Forest in the Hell's Hole region of central Arizona revealed an abundance of previously undocumented Anchan and early Salado Tradition Settlements. Numerous single room habitations or field houses and large masonry structures with fully enclosing plaza or compound walls indicate a substantial population in an area traditionally considered a hinterland between the Sonoran Desert and the Colorado Plateau. GIS-based analysis of the distribution of architectural features and artifacts demonstrates changes in settlement and land use patterns across the landscape over time. Comparisons with survey data from other areas of the Tonto National Forest, the southern Colorado Plateau, and the Phoenix Basin suggest a blending of in-situ social and economic developments with in-migration from adjacent areas to the north and south.

Arnold, Dean (Field Museum)

[246] *Discussant*

Arnold, Philip (Loyola University Chicago)**[128]** *A Fettered Serpent? Quetzalcoatl and Classic Veracruz*

Great is the conflation of Ehecatl Quetzalcoatl and Topiltzin Quetzalcoatl: a mythical player in the world creation of Mesoamerican groups vs. a semi-historical personage who presaged the arrival of Hernán Cortés. Veracruz, a region implicated via the activities of both avatars, is particularly enmeshed in this duality.

The Postclassic narrative whereby Quetzalcoatl journeyed to the Gulf lowlands appears to be foreshadowed in the desecralization of Teotihuacan's Feathered Serpent Pyramid at the end of the third century AD. This ritual destruction has been linked to a political realignment at Teotihuacan, instigating the departure of refugee groups who fled the Basin of Mexico.

The founding of Classic Period Matacapán, in the Tuxtla Mountains of southern Veracruz, may have been linked to this exodus. This paper considers the regional impact of this relocation via the appearance of Quetzalcoatl imagery along the Veracruz lowlands, both through overt representations as well as potential proxies (e.g., Reptile Eye glyph, Venus symbolism, the Ehecaocozatl "wind jewel"). Variations in how Feathered Serpent imagery is manifest could well reflect autochthonous lowland ideals versus notions related to an intrusive highland cosmivision. Thus, not all Quetzalcoatl imagery is equal, nor is it equally unfettered.

[150] *Discussant*

Arredondo, Ernesto (Dr.)**[337]** *Excavations at El Achiotal: Changing Political and Religious Institutions Reflected in Architecture*

The archaeological site of El Achiotal is located on the southwestern fringe of the region known as the Mirador Basin. During the Late Preclassic period (300 BC—250 AD), it participated in mainstream architectonic traditions of the Central Maya Lowlands, exemplified by its main building, Structure 5C-

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01. With the advent of Early Classic times (ca. 250 AD), changes appeared in the architecture of Structure 5C-01 and at the adjacent Structure 5C-08. These later changes express the political fluctuations in the region. In this paper we will review the construction sequence observed at the site, after three field seasons as part of the larger La Corona Regional Archaeological Project.

Arriaza, Bernardo [87] see King, Charlotte

Arroyo, Barbara (Instituto de Antropología e Historia de Guatemala), Gloria Ajú (Proyecto Zona Arqueológica Kaminaljuyu) and Javier Estrada (Proyecto Zona Arqueológica Kaminaljuyu)

[176] *Residential Compounds At Kaminaljuyu: Evidence Of Long Distance Interaction*

Kaminaljuyu is a site of critical importance that has been partly destroyed by Guatemala City. However, there is important evidence buried in locations that have not been previously considered for research. Most of the excavations at Kaminaljuyu have taken place inside mounds, offering information on a sector of the society. This research has yielded data on the site's chronology, function of the mounds, and site layout. Recent excavations have uncovered important information regarding specific activities near domestic areas as well as remains within these areas. This information has provided data on the extension of the prehispanic settlement, learning that spaces that had not been previously considered as being inhabited represent important domestic areas. This paper will present results from recent excavations in various locations of the site, indicating interaction with various sites in the Maya highlands and the Pacific Coast and beyond. They contribute to the larger understanding of Kaminaljuyu's long history of occupation.

Arroyo-Cabrales, Joaquín [59] see Acosta-Ochoa, Guillermo

Arroyo-Kalin, Manuel (Institute of Archaeology, UCL) and Santiago Rivas Panduro (DCC-, Loreto)

[178] *Revisiting the archaeology of the Napo River*

This paper provides an overview of results of a recent archaeological survey of the lower Napo River, from its better known Ecuadorian reaches to its discharge point into the Amazon river, within Peruvian territory.

Arruza, Antonio [35] see Savarese, Michael

Arthur, John (University of South Florida St. Petersburg), Matthew Curtis (UCLA Extension), Kathryn Arthur (University of South Florida St. Petersburg) and Jay Stock (University of Cambridge)

[198] *From Bayira, the Earliest African Genome, to a Place of Refuge: Mota Cave's History in Southwestern Ethiopia*

Mota Cave located in southwest Ethiopia was found in 2011 in collaboration with local Gamo elders and partially excavated in 2012. The cave has exposed a long sequence of occupation (5295 Cal BP to 305 BP) revealing remarkable technological, subsistence, and cultural changes. We uncovered a burial of a male with the earliest complete ancient genome recovered from the African continent. We have named him Bayira, meaning "first born" in the Gamo language where the cave is located. Bayira begins to tell a story of how people were utilizing the Gamo highlands 4500 years ago. In addition to Bayira, Mota Cave contains a diverse lithic assemblage, as well as the onset of pottery. The cave has revealed evidence for the beginning of food production in the region. Fauna and flora remains suggest that agropastoralism began over the last two millennia. The excavations suggest that Mota Cave was utilized for a variety of purposes from a mortuary site to a living site to a place to seek refuge in times of conflict. The southwest Ethiopian highlands provides a unique perspective on the ending of the African Humid Period and its aftermath providing us with exciting insights on Eastern Africa's past.

Arthur, Kathryn (USF St. Petersburg), Sean Stretton and Matthew Curtis

[210] *Mapping Historical Sacred Spaces in Southern Ethiopia*

In 2011, we began a collaborative project with Boreda Gamo communities of southern Ethiopia to understand the spatial and historical relationships between settlements and sacred areas. Community elders guided us along winding footpaths that ascended 9 mountain tops leading to settlements that were first occupied in the early 13th century and have now been abandoned for nearly 100 years. Surrounding these historic settlements are sacred groves with springs, caves, and boulders that give physical evidence in their Indigenous religion of the animation of the non-human world. Yet, the canopy of trees also harbored cemeteries, Orthodox Churches, and stacked stone walls, berms, and trenches that reveal a history of conflict. We use Geographic Information Systems software in conjunction with collected locational data, physiographic and land cover data, oral traditions, toponymical associations, historic maps, and other documents to build historic settlement and environmental models. Using spatial data in collaboration with community knowledge we can begin to understand the complex local histories related to the introduction of Christianity, conflict, and environmental change.

Arthur, Kathryn [198] see Arthur, John

Asher, David [33] see Kinsman, James

Ashlock, Dawn [53] see Ashlock, Phillip

Ashlock, Phillip (CIRCA) and Dawn Ashlock (CIRCA)

[53] *Exploring the Use of 3D Technologies, Virtual Reality, and Immersive Media in Public Archaeology to Advance Awareness of Material Culture across Social Media Platforms*

With the increasing issues surrounding access to remote sites, record low attendance of traditional museum settings, and trends involving greater interaction with social media platforms among upcoming generations, this poster presentation attempts to explore the use of 3D technologies, virtual reality (VR), and immersive media in Public Archaeology to advance awareness of material culture across social media platforms. These methods provide the ability to disseminate content to the public en masse, and are considered a critical tool in challenging anti-science rhetoric by demonstrating accurate visual representations of the past.

Ashmore, Wendy (University of California, Riverside)

[220] *Discussant*

Askan, Kevin [183] see Darrington, Glenn

Asrat, Seminew [200] see Reeves, Jonathan

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Atalay, Sonya (University of Massachusetts Amherst)**[110]** *Indigenous Knowledge in Dangerous Times: Research Partnerships, Knowledge Mobilization, and Public Engagement*

What are the impacts of the contemporary political climate on community-based research with Indigenous communities? When archaeologists work in partnership with communities what added complexities do they face during a time when accusations of “fake news” are ever-present, conspiracy theories abound, and the science of climate change is questioned. Contrary to the way some have framed indigenous knowledge as being at odds with science, I'll discuss approaches in which community-based research follows a model of “braiding knowledge”. Rather than thinking of archaeology as being at odds with indigenous knowledge or as being based on fundamentally competing systems of viewing and understanding the world, I'll discuss research partnerships with indigenous communities in which archaeological ways of knowing compliment indigenous knowledge systems. I will discuss use of graphic novels, animations, and virtual reality within my research and teaching, and will share ways of using these methods to ‘mobilize knowledge’, moving it into places where it's accessible by multiple public audiences.

[1] *Discussant*

Athassopoulos, Effie F. [70] see Salem, Rebecca

Athenstädt, Jan (University of Konstanz), Lewis Borck (Faculty of Archaeology, Leiden University), Leslie Aragon (Archaeology Southwest), Corinne L. Hofman (Faculty of Archaeology, Leiden University) and Ulrik Brandes (University of Konstanz)**[287]** *Plain Ware and Polychrome: Quantifying Perceptual Differences in Ceramic Classification*

In the course of the NEXUS1492 project in the Caribbean we are interested in potential differences in the perception of archaeological ceramic sherds. A pilot study was conducted across four states in the US Southwest, to explore how different groups of peoples cognitively sift experiential information of ceramic sherds.

In different sorting exercises, participants of the study were asked to arrange the sherds according to their perceived similarity based on standardized questions. The spatial arrangement of the sherds is averaged within the groups and used to quantify variation and similarity between individuals and between groups.

In this presentation we will discuss the results of the study and evaluate the results in regard to the following questions:

- Does the perception of pottery differ within and between groups of peoples?
- Are there implications of these differences for archaeologists?

Ideally the results can help archaeologists refine their social interpretations of ceramic data.

Atici, Levent (University of Nevada, Las Vegas)**[217]** *Explanatory Frameworks in Zooarchaeological Research: Are Dichotomies Necessary and Meaningful?*

Zooarchaeologists have often employed binary oppositions such as “urban consumers” and “rural producers” and distinguished between centralized/regulated and decentralized/unregulated animal economies with direct/indirect food provisioning systems to elucidate pastoral economies of early complex societies. As zooarchaeologists, we are tasked with bridging more abstract and ideational anthropological variables with the archaeological hard evidence as well as with a narrower set of more explicit zooarchaeological measures, thus moving from heavily fragmented animal bones to complex and abstract human behaviors. A large corpus of cuneiform tablets from the Middle Bronze Age (ca. 2000–1750 BC) urban center of Kanesh (the archaeological site of Kültepe, Kayseri, Turkey) provide direct and indirect evidence for various aspects of agropastoral economy and offer detailed information on food ways with specific reference to animals. Thus, we have a unique opportunity to question the applicability and meaningfulness of dichotomized approaches to organization of every state or society in the ancient Near East or elsewhere. Theoretically, I focus on centralization and bureaucratic control, asymmetrical access and inequalities, and production-distribution-consumption dynamics. Methodologically, I bring together as many independent lines of evidence as possible with special emphasis on combined use of zooarchaeological and historical data to develop comprehensive and fine-resolution pictures.

Atici, Levent [71] see MacIntosh, Sarah

Atkins Spivey, Ashley (Pamunkey Indian Tribe)**[255]** *“To leave a part of who you are here:” Reusing and Reimagining the Archaeological Record on the Pamunkey Indian Reservation*

Archaeologists rarely examine the reuse and reimagining of artifacts within contemporary Indigenous communities. The Pamunkey Indian Tribe, located in the Tidewater region of Virginia, has a long history of utilizing materials from the Reservation's archaeological record in a variety of ways. For over a century, tribal members have reused artifacts in methods similar to their intended function, and they have reimagined them to create artwork and encourage artistic inspiration. Archaeology has always played a visible role in the lives of Pamunkey tribal members, from the exhibitions displayed at the community's museum, to the multitude of artifacts one can find along the surrounding banks of the Pamunkey River. Unfortunately, this visibility and engagement on the Reservation is in stark contrast to the archaeology of Native Americans elsewhere in the region. Interweaving Pamunkey perspectives, opinions and memories with ethnographic and archaeological research, this paper contextualizes tribal members' reuse and reimagining of the Reservation's archaeological record throughout the past century. Recognizing that the purpose, use and meaning of the archaeological record are varied among Native communities, the research conducted with the Pamunkey community demonstrates those various perceptions can aid archaeologists in our interpretations of the archaeological and material records.

[255] *Chair***Attarian, Christopher****[37]** *Complementary Economic Specialization in an Emerging Decentralized Exchange System: A Case from the Late Classic Naco Valley, Honduras*

This paper describes the reuse of a small structure at Late Classic (CE 600–900) Site 426 in the Naco Valley, northwest Honduras. The structure shows evidence of being converted from residential use to firing ceramic vessels. The current interpretation of the structure's reuse is that it emerged as a center of ceramic manufacture as power waned at La Sierra, the valley's previous political capital. In this context, Site 426's residents, along with their immediate neighbors, sought some prominence and economic security by engaging in the complementary production of different goods for their own use and exchange with others within and beyond the valley. Recovery of a cached Peten polychrome vessel at the structure implies that this strategy enjoyed some success.

Auchter, William (Aarcher, Inc.)**[42]** *Cell Towers: Where the Archaeology Is a Mile Wide and an Inch Deep*

Cultural Resource Management investigations associated with the deployment of telecommunications infrastructure in the United States are unique. From the size of the undertaking, to the task that CRM/NEPA professionals are prescribed to accomplish, cultural resource professionals are able to see a wide breadth of cultural landscapes from across the country for short periods of time. Using examples from across the country, a critical examination will be made of this unique aspect of CRM. How has this type of archaeological investigation contributed to the larger understanding of the

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past, if at all? What lessons learned from this field can be applied to the broader archaeological/CRM world? What understandings from the broader archaeological community can be incorporated into this field to create more effective opportunities from the thousands of projects that are performed? What can be learned from these infrastructure undertakings to better understand the past and prepare to understand the future past?

Auffray, Jean-Christophe [125] see Cucchi, Thomas

Auld-Thomas, Luke

[337] *El Achiotal in Context: Settlement and Geopolitics in the Northwest Peten, Guatemala*

This paper presents research carried out by members of the Proyecto Regional Arqueológico La Corona at the site of El Achiotal since 2009, with emphasis on new findings since 2015. Occupation at the site spans the Late Preclassic and Early Classic periods (roughly the 1st to 5th Centuries AD, with the possibility of some earlier occupation). An inscribed stela discovered in 2015 provides critical insight into the geopolitics of the Early Classic period and establishes greater time-depth for some known aspects of Classic Maya statecraft. Moreover, an airborne LiDAR survey carried out in 2016 and ground-truthed during the 2017 field season indicates that El Achiotal may have been part of a larger and more complex settlement system than was previously recognized. The survival of this political and demographic system during the transition to the Early Classic period, when monumental construction decreased or stopped altogether at many large centers in the region, will be considered in ecological and political terms.

Auld-Thomas, Luke [337] see Canuto, Marcello

Austin, Anne (University of Missouri—St. Louis)

[316] *Discussant*

Austin, Anne [130] see Kansa, Sarah Whitcher

Austin, Rita (University of Oklahoma)

[143] *Strategies for Understanding Biomolecular Preservation within Archaeological Collections*

Technological and analytical advancements of biomolecular techniques allow scientists and museums to explore and assess archaeological collections from a new perspective, revealing new insights into past peoples, health, and the environment. One of the major challenges for biomolecular research on archaeological remains are uncertainties surrounding biomolecule preservation. Information on how samples were collected, washed, preserved, and maintained are valuable for generating and interpreting biomolecular data. This presentation will discuss reasonable tactics museums and researchers can utilize to help direct and optimize archaeological biomolecular sampling approaches and requests. Specifically, how and why museums should document collection-specific preservation methods and materials, and calling on researchers to assess biomolecular preservation for a collection prior to larger sampling requests. Together these approaches can preserve collections for the future while providing critical information about the potential of museum collections for biomolecular research.

[143] *Chair*

Austvoll, Knut Ivar (Department of Archaeology, Conservation and History, University of Oslo)

[29] *Seaways to Complexity. Sociopolitical Strategies in Northwestern Scandinavia in the Early Bronze Age*

Along the northwestern coast of Scandinavia the reliance and utilisation of the sea set the stage for a more advanced sociopolitical organization. The technological innovations prompted by the Late Neolithic (i.e. ship technology), turned the sea into a connective arena of interaction and trade. This is seen with the widespread distribution of finely crafted Jutish flint daggers from Late Neolithic I, followed by a steady increase of metal, burial mounds, and settlement sites in Late Neolithic II and the Early Bronze Age. Despite having a material culture expressive of a region well-integrated within a Nordic World System, these societies are juxtaposed by a long coastline of climatic and ecological distinctiveness that forces insular practices in subsistence and organization. This paper will explore the contrasting practices in sociopolitical organization and the strategies implemented to take advantage of the local resource potential. The dependency of trade is identified as a key element to uphold power in certain regions, exercised through coercive strategies, but the paper also points to the inevitable fragility of such an organisation and the more long-term stability of cooperative strategies.

Avila Peltroche, Mary Claudia (UNMSM)

[7] *Camelids Consumption and Utilization at the Archaeological Site of Huayuri, South Coast of Peru*

In this work the author presents the preliminary results of the animal bones analyzes from the archaeological site of Huayuri. This site, located in the south coast of Peru, shows evidences of occupations since the Late Intermediate Period to the Late Horizon. The materials were recovered during the excavations that took place in 2002 and 2005 in the Compound 03, located at the south part of the site. The analysis was primarily focused on the camelid bones, taking into consideration the cultural modifications, pathologies and age groups present in the bone assemblage. The results give insights on the situation of the domestic camelids and the herd management in the archaeological site of Huayuri. These animals were usually used for consumption and also there was an exploitation of secondary products, giving them an important role in the foodway practices of the people at the site.

Avilez, Monica [99] see Merritt, Stephen

Awe, Jaime, Julie Hoggarth (Baylor University), Christophe Helmke (University of Copenhagen) and Jim Aimers (SUNY Geneseo)

[147] *The End Is Nigh: Applying Regional, Contextual and Ethnographic Approaches for Understanding the Significance of Terminal "Problematic" Deposits in Western Belize*

The discovery of cultural remains on or above the floors of rooms and courtyards at several Maya sites has been interpreted by some archaeologists as problematic deposits, de facto refuse, or as evidence for rapid abandonment. Investigations in the Belize River valley have recorded similar deposits at several surface and subterranean sites. Our regional and contextual approach to the study of these remains, coupled with ethnohistoric and ethnographic information provide limited support for previous interpretations and suggest that the deposits are more likely associated with peribandonment ritual activities and/or the reoccupation of sites following their abandonment.

[147] *Chair*

Awe, Jaime [14] see Harvey, Amanda

Ayala, Max

[55] *Obsidian Debitage Sequence in Three Sites in West Mexico during the Late Classic Period: A Proposal*

During the years A.D. 550/600 to A.D. 900/1000 there was a significant emergence of sites with large populations who at one point were subjected to Teotihuacan's control. This period is known in Mesoamerica as the Late Classic or Epiclassic period. At this time emerging groups sought to control specific resources that would give them power over other groups. One of the most sought after and exploited resources was obsidian. It is known that

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some deposits were not exploited as intensively and systematically by nearby populations as others. For prehispanic groups obsidian was a raw material used for commerce and in everyday life. This work will propose a theory about what really happened with this raw material in West Mexico specifically at sites within the modern state of Michoacán during the Late Classic period.

Ayers-Rigsby, Sara (Florida Public Archaeology Network) and Rachael Kangas (Florida Public Archaeology Network)

[53] *Save Our Sites! Using Archaeology to Educate the Public about Climate Change in South Florida*

Miami is often presented as the poster child of sea level rise; while climate change is generally accepted as an observable fact in south Florida, elsewhere this issue is regarded as too politically charged for frequent discussion. This renders sensitive archaeological sites vulnerable to coastal erosion, storm surge, and other factors. The Florida Public Archaeology Network's Heritage Monitoring Scouts (HMS) Florida program is designed to raise awareness of how these factors will impact archaeological sites and to engage the public in monitoring these sites, through workshops which include basic climate science, an overview of Florida archaeology, and laws that protect archaeological sites. This citizen science initiative encourages people to actively document the effects of sea level rise, and gives them the tools they need to educate climate skeptics. Additionally, it provides archaeologists with a venue to discuss how early Floridians adapted to rising sea levels. This poster will address the efficacy of this workshop at the frontline of climate change in south Florida.

Ayers-Rigsby, Sara [135] see Walker, Karen

Baaske, Benjamin (Center for Heritage Conservation, Texas A&M University) and Kevin Austin (Maya Research Program)

[238] *Study of Historical Visualization: Case Study in Process Documentation at Xno'ha*

The presentation of heritage sites is critically important to the perception of historical narratives. A key goal is to help both scholars and the general public to see heritage as dynamic and living. This project explores the visualization of archaeological excavations through preservation technologies, specifically photogrammetric data. Our study focuses on a patio group at the Maya site of Xno'ha (occupation dates range from the Late Preclassic to the Terminal Classic) in northern Belize, and the current excavation and photogrammetric documentation of three administrative structures (32, 33, and 34). Sequential photogrammetry was conducted throughout the entire stratigraphic excavation of Structure 34's unit, resulting in 9 layers of photogrammetric documentation. The same process was applied to a chultun feature (single chamber) at Structure 33, creating 18 layers of photogrammetric data at regular intervals. For Structure 32, a single-phase, 3D model was generated, successfully stitching the above-ground unit to its corresponding, subterranean chultun (three chambers). Additionally, photogrammetry was used to create a plan view of the patio group area, and to create wall elevations. This methodical documentation of the process of excavation, in the span of months, records a three-dimensional time-lapse dialing back architectural conditions of the site hundreds of years.

Babbitt, Bruce

[96] *Discussant*

Baca Marroquin, Ancira Emily (University of Illinois at Chicago)

[257] *Constructing Local Identities in the Central-South Coast. The Coayllos in the Asia Valley*

Narratives regarding the response from local groups to the Inca conquest of the Peruvian Central-South coast portray two confronting scenarios: resistance and acceptance. Resistance to the Inca conquest would have required a more violent Inca military campaign meanwhile acceptance would have required specific diplomatic negotiations. Written documents describe the actions taken by the Incas when a group resisted to be conquered. These actions include removing original populations and dispersing them along the empire to repopulate the new region with groups loyal to the Incas. These relocation measures would have created disruption in the regional interaction networks. In the Central-South Coast, written documents indicate that the Coayllos from the Asia valley repopulated the Cañete Valley after the Inca conquest. Current archaeological evidence from the Asia valley, Central-South Coast of Peru indicates that interactions were maintained with Central South Coastal groups after the Inca conquest. This data provides insights to evaluate the relationship established between the Inca and the Coayllos after the conquest of this region and how these coastal groups (re)defined their position and affiliations within the Inca empire apparatus.

Bachelet, Caroline (National Museum, UFRJ-Rio de Janeiro), Veronica Wesolowski (Museum of Archeology and Ethnology (MAE) University) and Levy Figuti (Museum of Archeology and Ethnology (MAE) University)

[2] *Holocenic Occupations on Central Brazil: The Archaeological Complex Morro Solteiro*

Central Brazil includes archaeological sites dating from the Pleistocene/Holocene transition, mainly rock shelters and more rarely open-air sites. However these are important for understanding patterns of subsistence and settlement of populations. In Mato Grosso, research on the left bank of the southern course of Rio Vermelho has revealed a complex of occupations, in shelter and open-air, pre-ceramic and ceramic, dated since the middle Holocene. On the opposite side of the river, in a conspicuous sandstone hill, Morro Solteiro exhibits shelters of rock art. Although Morro Solteiro I (MS1) and the contiguous open air site, Aldeia Morro Solteiro (AMS), have rich ceramics occupations, dated to around 1000 years BP, pre-ceramic occupations only have been recognized in AMS and dated from 6000 years BP. Homogeneous data obtained in AMS and MS1 indicate that this site was occupied successively by groups, at first hunter-gatherers then horticulturalists, from the beginning of the Holocene. Similarities between ceramics and lithic industries from MS1 and AMS suggest that it could be a unique archaeological ensemble in litho-ceramic horizons. This type of association shelter/open-air site is rare in the Rio Vermelho region, which makes the Morro Solteiro complex an exceptional site and probably an important center of occupation.

Bacon, Wendy (The History Center of Tompkins County NY)

[33] *The Dwarf Motif in Classic Maya Monumental Iconography: A Spatial Analysis*

Although scholars of Classic Maya art have described certain short-statured figures as dwarves and endowed them with mystical significance, the motif has gone undefined. This contextual analysis identifies the anatomical and cultural attributes of the dwarf motif and interprets its meaning within the ancient Maya conception of time and their ideological integration of the natural and supernatural.

A spatial analysis of 45 depictions of short-statured individuals on archaeologically provenienced monuments reveals that the dwarf motif follows the trajectory of political power in the Maya lowlands, beginning within the Caracol-Calakmul polity and expanding with its reach. The dwarf motif appears at Tikal, in new stylistic configurations, upon its defeat of the Caracol-Calakmul alliance. Sites with flexible allegiances display the dwarf motif as a combination of local and regional stylistic elements. Evidence from small, dependent sites and regional superpowers reveals ancient Maya artists adapting broadly shared iconography to express locally the relationship between identity and power.

Monumental depictions of dwarves associate with symbols of liminality, implying that the Maya channeled the 'otherness' of dwarves into a visual metaphor for transition. Such depictions reveal an ancient society in which the 'other' expressed the integration of the natural and supernatural realms.

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Badilla, Adrian (Museo Nacional de Costa Rica)**[260]** *Arquitectura Habitacional: Sistema Constructivo y Organización Espacial en el Sitio Finca 6, Delta del Diquís, Costa Rica*

El Delta del Diquís en el sureste de Costa Rica se ha postulado como un centro diferenciado en la producción de bienes (cerámica, oro, esculturas de piedra) durante el Periodo Chiriquí (800—1550 d.C.) como parte de una sociedad jerárquica. La arquitectura y la configuración interna que presentan los sitios reflejan manifestaciones particulares donde destaca la construcción de montículos de tierra compactada con mampostería de cantos rodados y ornamentación de rocas calizas. Las estructuras varían desde formas circulares, rectangulares hasta formas compuestas en la que se articulan varios volúmenes. Recientes investigaciones realizadas en el sitio Finca 6 han permitido estudiar un conjunto de dos unidades habitacionales cuyo análisis se ha enfocado en la exploración del sistema constructivo, forma, distribución y uso del conjunto artefactual asociado a estas unidades. Lo anterior en procura de documentar los procesos de cambio social que ayudan a entender la organización espacial y complejidad social en el asentamiento.

Badillo, Alex E. (Indiana University) and Marc Levine (Oklahoma University)**[248]** *Mapping from the Heavens: UAV(Drone) Data Collection at Monte Albán, Oaxaca, Mexico*

The use of Unmanned Aerial Vehicles (UAVs) in archaeology has increased rapidly in recent years as drones have become more affordable and easy to use. Accessible commercial grade equipment can quickly capture data to produce maps and 3D models of high accuracy and precision. During the Summer of 2017, the Proyecto Geofísico de Monte Albán (PGMA) integrated the use of a UAV technology into their geophysical survey project at the UNESCO world heritage site of Monte Albán located in Oaxaca, Mexico. The main plaza and the surrounding monumental architecture was captured using aerial photographs and digitally reconstructed to scale in 3-dimensions. In this presentation, we present on data collection techniques, post-processing methods, and discuss some of the results of UAV mapping and photogrammetry within the context of the broader geophysical project at Monte Albán. Throughout, we discuss some of the successes and challenges of UAV mapping and post-processing. Finally, we explore the use of UAVs and 3D modeling in archaeology that go beyond visualization.

[320] *Discussant*

Badillo, Alex E. [248] see Levine, Marc

Baert, Patrick (University of Cambridge)**[327]** *Pragmatist Philosophy of Social Science: A Proposal*

This paper explores the potential of a pragmatist-inspired philosophy of social science for both archaeology and social anthropology. Firstly, we explain the main tenets of contemporary pragmatism and the variations within it. Secondly, we analyse the potential methodological ramifications for both archaeology and social anthropology. Thirdly, we discuss some of the critique of this pragmatist stance.

[327] *Discussant*

Baggio, Jacopo [105] see Nabity, Samantha

Bagheri-Jebelli, Niloofar [4] see Cioffi-Revilla, Claudio

Bailey, Chris [331] see Edwards, Briece

Bailey, Deanna**[85]** *Landscape Archaeology & the Irish Chalcolithic—Early Bronze Age: Discovering Termon, Co. Clare, Ireland*

The Burren is a region located in southwest Ireland containing the highest concentration of wedge tombs in the county showing a significance of place in the Chalcolithic—Early Bronze Age. Contemporary to wedge tombs are large complex systems of settlement enclosures, farm fields, and other ritual monuments, which can be seen at sites across the Burren, such as Roughan Hill, Coolnatullagh, and Carran Plateau. Excavations at these sites have provided cohesive radiocarbon dates within the Chalcolithic—Early Bronze Age. The context and patterns seen within this time period have yet to be explored at other locations across the Burren where wedge tombs are present. In 2016 a survey was conducted by the author as a part of a M.A. in Landscape Archaeology at the National University of Ireland, Galway with the central aim to identify Chalcolithic—Early Bronze Age farming, settlement, and ritual patterns in the Burren townland of Termon. A secondary aim sought out to compare patterns seen at Termon to Roughan Hill, Coolnatullagh, and Carran Plateau in effort to shed further light into the Chalcolithic—Early Bronze Age Burren. Cross-site analysis revealed several similarities between features with differences expressing complexities within the Chalcolithic—Early Bronze Age.

Bair, Daniel A. [288] see Terry, Richard E

Baird, Graham [130] see Lercari, Nicola

Baitzel, Sarah (Washington University in St. Louis) and Arturo Rivera**[100]** *In the Land of Llamas and Aji: New Insights into the Late Horizon Inca Occupation of the Middle Sama Valley, Southern Peru*

Since the 1970s, the Sama valley on the far south coast of Peru has been known to house the Inca site of Sama Grande since the excavations of German archaeologist Hermann Trimborn. Situated at the crossroads of the Quapaq Ñan running parallel to the Andean foothills and from the coast to the highlands, Sama Grande was assumed to direct people, animals, and goods across the region during the Late Horizon (14th–15th century AD). In 2017, full-coverage pedestrian survey of the coastal desert plain overlooking the middle Sama valley near the foothill zone (400–600 masl) revealed a wider Inca presence dating to the Late Horizon and early Colonial period in the form of architecture and other material culture. The predominance of Inca-Cusqueño and Inca-Altiplano ceramic styles, with an emphasis on depictions of llamas and ajies (chili peppers), suggests that under Inca control the valley was principally used for camelid pasture and ají cultivation.

These research results highlight the importance of the Sama valley, a previously unexplored area, within the broader regional network of Inca imperial presence on the far south coast of Peru, and add to current models of the transformative impacts of imperial strategies on local landscapes and resources.

Baitzel, Sarah [335] see Baka, Abby

Baka, Abby (Washington University in St. Louis), Sarah Baitzel (Department of Anthropology, Washington University) and David Broman (Department of Anthropology, Washington University)**[335]** *Settlement Patterns in the Upper Mantaro Valley Revisited: Assessing the Effects of Wari State Expansion on the Central Andes during the Middle Horizon (A.D. 500–1000)*

Archaeological studies of the Upper Mantaro Valley region in the central Andean highlands have played an essential role in shaping current models of Andean complex societies and state expansion during the Middle Horizon (A.D. 500–1000) and subsequent periods. Among the pioneer studies of this

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region was Browman's pedestrian survey of the Upper Mantaro valley between Jauja and Huancayo, Peru for his doctoral dissertation, during which he registered over 106 sites dating to the Middle Horizon. Using temporal data, qualitative descriptions of features and artifacts, photographs and maps from Browman's original field notes and dissertation, we reconstruct his findings in ArcGIS to re-analyze changes in settlement patterns, architecture and ceramic distributions through time and space. By integrating these patterns with newly available information about the environmental, social, and political contexts of the region, we build on previous work using technology unavailable at the time of the initial field research. Our re-examination focuses on the Middle Horizon period to specifically assess the influence of the Wari state on the Upper Mantaro region.

Baker, Joe

[148] *Discussant*

[334] *Chair*

Baker, Matthew [214] see Robinson, David

Baker, Matthew (University of Strathclyde), Clare Bedford (University of Central Lancashire) and David Robinson (University of Central Lancashire)

[214] *Integrating Portable Spectroscopy into Rock Art Investigations*

Molecular spectroscopy is an information rich technique that is rapid, non-destructive and easy to operate. These qualities combined with a mature market in handheld spectrometers makes molecular spectroscopy an ideal technique for on-site analysis which is suitable for austere environments.

This paper will discuss the use of Fourier Transform Infrared (FTIR) and Raman spectroscopy to in the Gordian knot project based upon the Californian polychrome rock art site Pleito in order to provide a deeper understanding of the pigments and binders used in creating Pleito. We will show strategies and results from a survey of Pleito highlighting opportunities for data analysis (e.g. multivariate analysis) and future data fusion of techniques to provide greater understanding of Rock Art processes and procedures

Bakken, Rikka [39] see Myster, James

Balcarcel, Beatriz [252] see Hansen, Richard

Balco, William (University of North Georgia), Scott Kirk (University of New Mexico) and Michael J. Kolb (Metropolitan State University of Denver)

[85] *Pixellated Survey: Archaeology at Monte Bonifato, Sicily*

Site-specific archaeological survey of forested environments can be challenging, particularly when ground disturbance is prohibited. Site-specific archaeological survey serves as an essential component of archaeological exploration, delineating areas of past human activities on complex multi-component sites. This paper presents the preliminary results of the first season of the Alcamo Archaeological Project, a site-specific survey of the forested summit of Monte Bonifato in western Sicily. This area poses a challenge to archaeologists as Iron Age, Roman, and Medieval occupants have used and modified this landscape intensively. Field methods employed during the survey are presented as well as how these methods were adapted to local conditions and regulations, demonstrating the necessity for flexible survey strategies in conjunction with intensive data collection. Furthermore, this paper addresses the need for balance between collecting high-quality data and survey coverage during short field seasons.

[112] *Discussant*

Baldi, Norberto (School of Anthropology, University of Costa Rica)

[260] *The Role of Kinship Networks and the Lowland Ecology in the Interpretation of the Caribbean Archaeology of Greater Chiriquí*

Archaeological investigations in the Caribbean region of Greater Chiriquí conducted over the last two decades have documented occupations dating to the second millennium BCE. Similarities in material culture suggest local and trans-isthmian cultural relationships within Greater Chiriquí and a pattern of scattered hamlets associated with the exploitation of marine and lowland ecosystems. In order to provide a model for this settlement pattern, we offer a theoretical model based on ethnohistorical accounts, ethnographic information and current biodemographic research based on living indigenous populations of southern Central America. Kin-based population structure is the result of a migratory behavior of a familial group in which fragmentation, movement and relocation occurs among populations of high mobility such as hunter-gathers and mobile agriculturalists. The information provided by these lines of research suggests that ecological conditions and kin-based population structure may be responsible for the population aggregation along the Caribbean coast of Central America and can explain similar behavior seen in the archaeological record of the Caribbean lowlands of Greater Chiriquí.

Balenquah, Lyle

[61] *Discussant*

Ball, Christopher (University of Toronto)

[86] *Micro-habitat Production in the Late Woodland Period*

This paper presents the results of recent statistical analyses focused on relative plant species distributions among six Princess Point sites in Late Woodland Southern Ontario and explores potential markers of micro-habitat production in the region.

Ball, Joseph [258] see Reents-Budet, Dorie

Ballenger, Jesse (EcoPlan Assoc., Inc./U. of Arizona)

[182] *Doc Holliday Goes to Tombstone*

In 2002 Vance won the role of Executive Director for the Argonaut Archaeological Research Fund (AARF) at the University of Arizona. The program provided immediate funding for a number of graduate students working on the archaeology and Quaternary geology of the Desert Southwest. A renewed investigation of the upper San Pedro Basin was among those projects. Vance endured every possible graduate student misstep, some of which are reviewed here, to assemble new information about long-term and hotly debated topics such as mammoth hunting, late Pleistocene paleoecology and extinctions, and even the question ET impacts. These new contributions were made under the shadow of his close friend and colleague, C. Vance Haynes, Jr. The combined efforts of "both Vances" is a case study in the scientific value and intrigue embodied by the Fryxell Award for Interdisciplinary Research.

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Baller, Kendall (School of Human Evolution and Social Change, Arizona State University)**[267]** *Investigating Social Boundaries in Southwestern New Mexico*

Social network analyses provide insight into the strength and weakness of social connections across geographic areas. Discussions in the literature of the Mimbres region in New Mexico have stated that during the Classic period, the Mimbres ceramic tradition is confined to southwestern New Mexico, though this has not been tested with statistical assessments of data. Using ceramic style data from sites within and surrounding the Mimbres region, I investigate the levels of social 'boundedness' in the area through statistical computing methods. Social network analysis can determine whether boundaries were more clinal or rigid, and test whether or not this region is statistically more 'bounded' than others visible in the archaeological record. With access to deep archaeological time scales and the breadth of data from the Mimbres region, I will present my research on the impact of social networks on connections between groups of people living in the past. By furthering our understanding of social networks in the past, we can inform our understanding of how people today interact and exchange ideas across perceived social boundaries.

Bamforth, Douglas and Kristen Carlson (Augustana University)**[21]** *Oneota Expansion and Ethnogenesis on the Eastern Great Plains*

The late 1200s and 1300s saw substantial population shifts in the eastern Plains and Midwest. These occurred in the context of profound sociopolitical and demographic changes, particularly the political decline and depopulation of Cahokia, and regional climatic variation, including significant changes in northern hemisphere temperatures and severe regional droughts. Oneota groups expanded into the east-central Great Plains during this time, at the same time that indigenous Plains farmers abandoned the western parts of their ranges and moved east. Interactions between these groups remain poorly understood and likely varied in time and space. However, a series of sites in northeastern Nebraska show blended patterns of ceramic design suggesting that they may have lived side by side in at least some areas, interacting face-to-face and forming new communities with distinct identities. The assemblage from the Lynch Site (25BD1) includes classic Oneota shell-tempered pottery that is likely imported, classic Oneota and Central Plains Tradition pots made locally, and pots that blend elements of Oneota and CPT styles. We present data on inter-household variation in pottery derived from excavations at Lynch in 1936 and 1959 and consider some of the implications of these data for community formation.

Banghart, Thomas (University of California, Santa Cruz)**[10]** *From Shore to Mountain: Insights into Resource Selection and Processing along the Central California Coast*

Salvage excavations conducted in the 1970s at the Red, White, and Blue Beach site (CA-SCR-35), located in northern Santa Cruz County on the central California coast on Monterey Bay, recovered a large and diverse vertebrate faunal assemblage with a well-defined Middle Period (2800–900 cal BP) component. Few faunal assemblages from this area of the Central Coast have been thoroughly analyzed and little is known about resource selection and processing during this time. I use archaeofaunal data from SCR-35 to explore prey choice, handling practices, and seasonality of occupation, comparing these to recently published data from CA-SCR-9, a generally contemporaneous site in the coastal uplands of the Santa Cruz Mountains. This comparison contributes to understanding of Middle Period economic strategies by providing a synchronic and regionally specific comparison of coastal and inland extractive tactics in this currently understudied part of California.

Banghart, Thomas [195] see Perez, Erina

Banikazemi, Cyrus (UNCC)**[154]** *Metal, Pigment, and Prestige: An Analysis of the Form, Decoration, Status, and Use of Inca Stone Vessels*

The ethnohistoric and archaeological records provide ample evidence of the ideological significance of metals and pigments in the pre-Columbian Andean world. This study explores the use of these materials in the complex decorative techniques utilized by the Inca when finishing stone vessels. This research integrates data generated from ethnohistoric sources, portable X-Ray Fluorescent (pXRF) tests, and reconstructive experimentation in order to provide a better understanding of how metals and pigments were used by the Inca to signify the elevated status of certain stone vessels. This project intends to show that the decorative processes implemented in the construction of stone vessels can illuminate on how these artifacts were used within Inca society.

Banikazemi, Cyrus [211] see Fitzgerald, Curran

Banks, Kimball (Metcalfe Archaeological Consultants Inc. & Combined Prehistoric Expedition Fdtn)**[289]** *Chair*

Banton, Caree [308] see Reilly, Matthew

Baram, Uzi (New College of Florida)**[53]** *Popular Beliefs of Safety in an Age of Rising Sea Levels: Public Archaeology as a Means to Counter Exceptionalism on the Florida Gulf Coast*

Before every hurricane season, the myth and popular belief that Sarasota, a medium-sized city on Florida's Gulf Coast, is safe from hurricane gets repeated in the local newspaper. Like many folktales, the story that pre-Columbian Native American burial mounds or Ringling Brother Circus performers knew of a special quality to the region or their spirits protect it comforts the ever growing population living on the Gulf of Mexico coastline. With the majority of the residents having no long-term connection to the region and the landscape displaying mostly the contemporary, with the historic being mostly the 1920s Boom Times, the past is nearly invisible. One of the tasks for public archaeology is exposing the hidden histories of the region, a rich but racially complex heritage that can counter the myth of exceptionalism. Over the past several years, the New College Public Archaeology Lab has hosted programs for community members and school children that teach about the archaeology and environment for the region's waters, specifically Sarasota Bay and the Manatee River. The activities instruct on the long history of people in the region, offering scientific approaches to addressing understandings of the past and offering cultural relativism for pre-industrial technologies.

Barba, Luis (Universidad Nacional Autonoma de Mexico), Jorge Blancas (Universidad Nacional Autonoma de Mexico) and Agustín Ortiz (Universidad Nacional Autonoma de Mexico)**[293]** *Geophysical Prospection at Plaza of the Columns Complex, Teotihuacan*

Geophysical techniques used in Plaza de las Columnas Complex, Teotihuacan has been successful to locate the buried remains of foundations, walls and other architectural features. As usual, magnetic gradient allowed to recognize linear patterns that suggests the wall remains usually made with volcanic stones with mud mortar. Electrical resistance was successful to recognize the presence of floors and verify the previously detected walls. Finally georadar survey verify the location and depth of buried architectural remains. This combination of techniques provided detailed information from most of the area requested by the project and allowed to locate the excavations to verify the presence of domestic units that are surrounding the main structures, in addition to detect some remains located in main plazas and the big wall that marked the western limit of this large compound.

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Barba, Luis [89] see Lozano Bravo, Hilda

Barba Pingarrón, Luis [177] see Seligson, Ken

Barbari, Maira [2] see Silva, Rosicler

Barber, Sarah [9] see Wedemeyer, Rachael

Barber, Sarah (University of Central Florida)
[192] *Discussant*

Barbir, Antonela [304] see Karavanic, Ivor

Barbour, Terry

[35] *Anchoring in the Gulf: Trans-species Dwelling and Building in Gulf Coast Florida*

Drawing inspiration from the work of Tim Ingold, I seek to find the middle ground of phenomenology, ecology, and materiality in describing how humans dwell and make their worlds among the various other communities around them. In the Lower Suwannee River Valley, Florida, human and oyster communities have interacted and intersected with another for millennia. Like people, oysters dwell and build creating their Umwelt, a concept introduced by Von Uexküll. This resulted in communities numbering in the millions. When the Umwelten of oysters and people are juxtaposed, it is argued that oysters 'anchored' people differentially throughout the history of the region. These oyster communities are argued to represent Heideggerian Buildings, as they are locations which make sites for several coastal Umwelten, people included. Prior to 1500 BC, human communities relocated their dead to keep pace with the rising sea, emplacing oyster shell midden during the process. After an occupational hiatus, changes in human building and dwelling after 750 BC were a direct result of inhabiting an area already full of history, including past interactions with oyster beds. Florida Gulf Coast peoples in the Lower Suwannee in many ways defined themselves through relationships with the oyster communities with which they interacted.

Bardolph, Dana (Cornell University), Brian Billman (University of North Carolina, Chapel Hill) and Jesús Briceño (Ministerio de Cultura, Peru)
[297] *Hidden Labor: Exploring Food, Gender, and Ritual in the Prehispanic Moche Valley of North Coastal Peru*

Archaeologists have successfully used spatial analyses of different contexts (elite/non-elite, ritual/domestic, public/private, etc.) to examine the intersection of food-related activities with status, political economy, gender, ritual, and the public/private division. In this paper, I consider the intersections of food processing, ritual, and gendered labor through an examination of paleoethnobotanical data from Cerro León, a Gallinazo/Early Moche phase (A.D. 1–300) highland colony in the Moche Valley of north coastal Peru. A variety of ancestor rituals, work parties, and other large-scale commensal events occurred in large public spaces in high status compounds at Cerro León. But where did food preparation occur for these events, and who was likely responsible for such preparation? Employing intrasite spatial analysis, I explore the movements through various spaces, public and private, that provided opportunities for social interaction or restrictions on visibility and community integration. Drawing on archaeobotanical and ethnohistorical evidence, I argue that household members (likely women) primarily prepared food in private behind-the-scenes contexts for supra-household ritual events and public displays. These women may have prepared for public events totally apart from, and without being included, in such events. This consideration of 'hidden' labor sheds light on a frequently overlooked aspect of ritual and food production.

Barg, Diana (Bureau of Land Management, Utah) and Nathan Thomas (Bureau of Land Management, Utah)

[261] *Education and Enforcement: How the Bureau of Land Management Is Confronting Looting on Public Lands in Utah*

Looting of archaeological resources on public lands has been an issue throughout the United States for over a century, and Bureau of Land Management (BLM)-administered lands are no exception. Looting can take many forms, ranging from a visitor looking for a souvenir to intense, large-scale, and intentional desecration of sites for personal profit. Looting issues can be exacerbated by the limited on-the-ground resources of federal agencies that manage millions of acres. The proactive actions the BLM is taking against looting has resulted in increased Archaeological Resources Protection Act investigations, the recovery of looted artifacts, and educational campaigns to curb unintentional, destructive behaviors. The BLM-Utah's dual approach of education and enforcement illustrates the active role the BLM is taking to reduce looting. The BLM-Utah manages large collections of archaeological artifacts recovered from law enforcement investigations and prosecutions, is currently determining best practices for the long-term curation of recovered artifacts, and is developing anti-looting centered interpretation of the collections. Site stewardship programs, Project Archaeology curriculum, and the Respect and Protect education campaign are major initiatives the BLM-Utah and its partners are using to educate the public about responsible public land use and citizen stewardship of archaeological resources.

Barker, Graeme [137] see Hunt, Chris

Barker, Claire (Arizona State Museum), Samantha Fladd (University of Arizona) and Kelley Hays-Gilpin (Northern Arizona University)

[218] *Macaws on Pots: Images, Symbolism, and Deposition at Homol'ovi*

Widespread archaeological evidence—including egg shells and skeletal remains recovered from archaeological sites as well as imagery on pottery, kiva murals, and rock art—suggests that macaws, their feathers, and their imagery played important roles in ancient Puebloan society. Ethnographic accounts also indicate the importance of macaws to ancient Puebloan peoples and modern groups. Macaws have been interpreted as indicators of exchange, aspects of intricate ritual systems, and indexes of social complexity. This research attempts to further our understanding of the roles macaw imagery have played in Puebloan culture through an analysis of images on pottery and the depositional contexts of the vessels or vessel fragments bearing these representations at the Homol'ovi Settlement Cluster, a 13th-14th century ancestral Hopi group of villages located in northeastern Arizona. Is macaw imagery tied to certain wares, types, or vessel forms? How are these birds depicted on ceramics? Are items adorned with macaw imagery and macaw skeletal remains deposited in similar contexts? Considering the contexts in which objects decorated with macaw imagery were deposited in reference to macaw and other bird burial practices may provide a more refined understanding of the functions these artifacts served and the symbolism they evoked in prehistoric Puebloan society.

Barker, Alex (University of Missouri)

[322] *Discussant*

Barkot, Theresa (California State University, Los Angeles), Andrew Garrison (Brian F. Smith and Associates), Claudia Camacho-Trejo (California State University, Los Angeles) and David Sosa (California State University, Los Angeles)

[223] *Revisiting the Function of Humboldt Points: Reflections from the Late Prehistoric Hackney Site in Mariposa County, California*

CA-MRP-283, the Hackney Site, is a late prehistoric/protohistoric site in Mariposa County, California. Excavated by California State University, Los Angeles in 1972, the flaked-stone assemblage includes debitage, projectile points, and flake tools. A reanalysis of the debitage shows that late stage

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biface production, expedient flake-tool production, and the production, repair, and replacement of projectile points were all common activities at the Hackney site. A recent analysis of the projectile points that included a characterization of macro-damage, also showed distinctive use-breakage patterns that suggest it may be time to reexamine the hypotheses surrounding the function(s) of Humboldt/Sierra concave-base series points. Such points are hypothesized to have been used as knives, dart points, or even dispatching spears. The Humboldt points present in this assemblage are all broken with abundant evidence of impact damage. Moreover, an examination of reports on assemblages from other contemporaneous sites in the Sierra Nevada region and elsewhere suggests this is a widespread pattern. To examine the potential cause(s) of these features, we conducted experiments testing macro-damage created in use as a knife, dispatching spear, and atlatl propelled spear. We present here the results of the projectile point assemblage analysis and some preliminary findings from the use experiment.

Barkwill Love, Lori (University of Texas at San Antonio)

[91] *The Social History of Mogollon Village: A Bayesian Approach*

Emil Haury's excavation of Mogollon Village in 1933 helped to provide the first overview of pithouse occupation for the Upper Gila and Mimbres Valley areas as well as establishing the Mogollon culture concept. Tree-ring data from Haury's excavation suggested that the site was occupied from at least A.D. 730 to 900; however, the stratigraphy of the site suggested that the site was occupied prior to A.D. 700. Further excavation work at the site conducted in the late 1980s and early 1990s suggested that the site also had an Early Pithouse (~A.D. 200 to 550) occupation. Thus, Mogollon Village had a long-term history of pithouse occupation. For this poster, Bayesian chronological modeling of existing radiocarbon dates and new AMS dates is used to provide a structural narrative of the occupation of the circular pithouse structures at Mogollon Village. This refined chronology will then be used to examine pottery production and obsidian procurement at the site. Future research to further refine the chronology of the site will also be discussed.

Barnard, Hans [210] see Fenn, Thomas

Barnard, Hans (Cotsen Institute of Archaeology at UCLA), Maria Lozada (University of Chicago) and Augusto Cardona Rosas (Centro de Investigaciones Arqueológicas de Arequipa)

[335] *Analysis of the Ancient Built Environment of the Millo Complex, Vitor Valley, Peru*

The Vitor Valley is an alluvial oasis linking the Arequipa highlands to the Pacific coast of southern Peru. The northern limit of the valley hosts a dense archaeological landscape of interspersed fieldstone structures and cemeteries known as the Millo Complex. This cluster comprises three principal segments referred to as Millo 2, Millo 3, and Millo 4; each of which preserves extensive architecture. Surface ceramics from across the Millo Complex and radiocarbon analysis of charcoal samples recovered from excavations at Millo 2 place the complex within the Middle Horizon (600–1100 CE), a period of profound social change and reconfiguration of geopolitical relationships across the south-central Andes. The exact role that the Millo Complex played in this period of regional transition remains unclear. While sizable Ramada cemeteries adjacent to these sites point to local origins and activity, the intrusion of an iconic D-shaped structure at Millo 3 may indicate the introduction of non-local traditions associated with the Wari state. We suggest that these segments operated as contemporaneous and interdependent components of the larger settlement.

Barnes, Jodi [168] see Beahm, Emily

Barnes, Monica (Andean Past)

[333] *The Legacy of Andean Archaeologists from the American Museum of Natural History*

This paper will discuss the chain of Andeanists that began with Adolphe Bandelier in the late 19th century and continued into the 20th century with Charles W. Mead, Ronald Olson, Wendell C. Bennett, Junius B. Bird, Harry and Marian Tschopik, James A. Ford, John Hyslop, and E. Craig Morris and continues to the present with various fellows and research associates. Although not formally affiliated with the AMNH, John V. Murra is a link in this chain because of his personal and theoretical influence on Morris and Hyslop.

[207] *Discussant*

[333] *Chair*

Barnes, James (Bureau of Land Management), Karen K. Swope (Statistical Research, Inc.), Carrie J. Gregory (Statistical Research, Inc.) and Tiffany Arend (Bureau of Land Management)

[261] *Hard Questions for Hardrock Places: Integrating Academic-Based Research Questions into the Management of Hardrock Mining Sites on Public Lands in the Southern California Deserts*

Land-managing agencies have to make tough decisions about what archaeological sites are worth conserving—decisions that are getting tougher as the capacity of agencies continues to be stretched. Academics may disagree with these decisions, yet their approaches to research have long been crucial to defining what is significant. The Bureau of Land Management California (with Statistical Research, Inc.) has recently completed a comprehensive management program for hardrock mining sites on 10+ million acres of public lands in the southern California deserts. The program presents several original and innovative research questions (stemming from theoretical trends in academia) for evaluating National Register of Historic Places eligibility of hardrock mining sites that will advance management, as well as scholarly research, in the region. This presentation explores the challenges and benefits of integrating academic-based approaches into landscape-scale management of historic-era industrial archaeological sites on federal lands.

Barnes, Kelli (BLM-ID-SO)

[261] *Recognizing Redundant Data: Preventing Perseveration and Saving the Significant*

What is so fascinating about heritage resources? What is it that sparks the imagination and instills a sense of place and wonder? What great lessons can we take away from the past? The most important roles of a federal archaeologist are to try to encourage public interest in questions like those, while preserving select sites with the greatest potential to provide the answers. However, compliance work for federal undertakings often focuses our attention and limited resources on the least significant and most abundant resources such as lithic and historic debris scatters. We must avoid habitually collecting redundant data for upholding tested theories so that new questions can be posed and answered using more modern techniques. Applying the National Register of Historic Places eligibility criteria in standardized ways and other increased efficiencies can free up time to spend on outreach, scientific inquiry, and the protection of sites with greater heritage and data values. This presentation will demonstrate the need and means for a careful and scientific approach to making site eligibility determinations and management recommendations in order to facilitate a focus on the most culturally valuable resources.

Barnett, Kristen (Bates College)

[220] *Ellmig Qukaq. She is the Center: Indigenous Archaeology of Temyiq Tuyuryaq*

Ashmore and others have taken the time to observe and discuss the inherently gendered 'nature' of the landscape. As an indigenous scholar this discussion directs me toward concepts of "nature" and specifically, our mother earth, our peoples, and our celestial beings. Mother earth is impregnated with our past, cradling our lives and our ancestors in her womb, from which they once came, and returning (for matters within our discipline) to us in "archaeological context", if you will. I argue that it is irrelevant as to whether or not your ideology fits within this indigenous belief

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system, archaeologists engaging in pre-colonial, indigenous 'sites' of study are entrenched in a gendered cultural landscape. In my research I explore Temyiq Tuyuryaq, named for the three women whose lives were taken at the mouth of the bay. Overturning concepts of the "colonial ghost" (Hokowhitu 2009) I approach the cultural landscape through a mode of continuity experienced by the Yup'ik community residing in Tuyuryaq, and consider the gendered experience of place throughout the last 1200 years in Bristol Bay Alaska.

[338] *Discussant*

[338] *Chair*

Barnett, Ashley [268] see Dempsey, Erin

Baron, Joanne (University of Pennsylvania)

[170] *Making Change: Currency Use and Social Transformation among the Classic Maya*

At the time of Spanish contact, the Mesoamerican commercial economy was highly elaborated, with an interconnected system of marketplaces, a large variety of goods bought and sold as commodities, and the widespread use of currency in the form of cacao and woven textiles. While much of what we know of this economic system is provided by written records, the presence of large-scale marketplaces and currency can be traced into earlier periods using archaeological evidence. This evidence suggests that, in the Maya lowlands, both of these features began in the 7th century, as the rival kingdoms of Tikal and Calakmul attempted to consolidate and centralize their regional economies. These economic strategies increased the demand for currency commodities, reconfiguring economic relationships far beyond these two kingdoms. This paper will address the archaeological evidence for rapid changes along the San Pedro River in Northwestern Guatemala, an important trade route for cacao importation. Focusing on the site of La Florida, it will discuss the rapid rise of this kingdom, its establishment of economic and political relationships with distant partners, and its strategic control of the San Pedro trade route.

[170] *Chair*

Baron, Joanne [337] see Barrientos, Tomas

Barrackman, David [183] see Dice, Michael

Barragan, Jose

[132] *Fortification on the Margins of the Bolivian Eastern Highlands*

Frontiers are usually spaces of interaction between multiple groups of people navigating through established cultural and political lifeways. The zone of Tumupasa functions as a peripheral site on the margin between the Yungas and the Amazon. This region will form the center of my study area to identify historical and archaeological lines of interaction between highland and lowland groups. I argue that the region of Tumupasa, Bolivia is situated on a natural geographic transit point between the Yungas and the Amazon Amazonian flood plains. This research will attempt to contextualize the region of Ixiamas-Apolo within a frontier centered framework by understanding the spatial and cultural characteristics of regional archaeological sites. The goal of this research is to explore the entangled networks of interaction between highland and lowland groups through taking a preliminary look at local site characteristics and their spatial relationship with the fortification of Ixiamas, Bolivia. I hypothesize the region between Ixiamas and Apolo was a Pre-Hispanic network of Amazon-Andean movement that was utilized prehistorically through the present (Saignes 1985, Tylanueva 2015). Specifically, I argue that the area of Tumupasa was a strategic crossroad of economic and cultural exchange between lowland and highland groups.

Barrera Rodríguez, Raúl [31] see Medina Martínez, Lorena

Barrett, John

[318] *Discussant*

Barretto-Tesoro, Grace (University of the Philippines-Archaeological Studies Program)

[275] *Placemaking through Objects: The Global World in 19th Century Towns in the Philippines*

This paper will explore the idea of placemaking in Philippine towns established in the latter part of 19th century AD under the Spanish colonial period. The Spanish regime through the Laws of the Indies significantly altered the indigenous concepts of territory and space. I propose that the Europeanised local elites straddled between the European and indigenous ideas of boundaries and space. Following the colonial religious and administrative boundaries and the customary notions of interactions, I hypothesize that the rise of the middle class, referred to as ilustrados, marked their new place in the landscape through the acquisition of foreign items. These foreign items, commonly seen as status symbols, have a wider impact in the notion of placemaking. I will integrate archaeological model of interactions, political economy model, and placemaking in urban planning to interpret the presence of foreign objects in areas considered to be peripheries.

Barrientos, Gustavo [155] see Belardi, Juan

Barrientos, Tomas (Universidad del Valle de Guatemala)

[337] *Charismatic and Religious Aspects of Maya Rulership: An Interpretation of the Coronitas Temple Complex of La Corona*

The Coronitas Group at La Corona presents a unique architectural setting, consisting of five pyramidal temples aligned in a north-south row and several attached structures. Excavations in this group have been carried out since the beginning of the project, providing important data concerning the function of these temples throughout the site's occupation. A detailed chronological analysis has shown that this architectural complex was one of the main ceremonial areas of the site, evinced by not only the presence of royal tombs but also the location of important hieroglyphically inscribed monuments. These texts suggest that these temples were related to the patron deities of the site who played an important role in the legitimation practices of the Corona rulers when they became vassals of the Kaanul hegemonic dynasty. This paper will present a synthesis of the archaeological and epigraphic data collected in 10 years of excavations, and the interpretations derived from them.

[337] *Chair*

Barrios, Abby [118] see Roldan, Jonathan

Barrios, Edy (CUDEP-USAC), Cameron L. McNeil (Lehman College and the Graduate Center, CUNY), Mauricio Díaz (USAC), Walter Burgos (The Graduate Center, CUNY) and Antolín Velásquez (USAC)

[142] *The Country and the City: Explorations of the Relationship between Río Amarillo and Copan, in the Copan Valley, Honduras*

Cities and the communities in their hinterlands are inextricably linked, and yet the objectives of their inhabitants can be starkly different. The archaeological sites of Río Amarillo and Quebrada Piedras Negras shared a fertile plain along the Río Amarillo and Río Blanco Rivers. Several scholars have suggested that the arable fields here may have acted as a bread basket for the urban center to their west. Research at Río Amarillo has yielded evidence of strong ties to Copan including architectural forms, and iconography on altars, a structure, and a censer that broadcast the power of

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the city, and in particular, evince respect and veneration for the Copan dynasty founder, K'inich Yax K'uk' Mo'. Patterns of construction, destruction, and collapse in the center of Rio Amarillo suggest however, that the city to its west did not maintain its hold on this community throughout the entirety of the Late Classic period, but that this control faltered when the rulers of the city faltered. This paper will explore the various identities expressed in groups excavated in "the country" and the agency of the inhabitants who buffered their success by maintaining strong ties to both the west and the east.

Barse, William (Smithsonian Institution)

[69] *Ronquin Re-visited Yet Again: New Radiocarbon Dates and Their Implication for Orinoco Ceramic Chronology*

A series of radiocarbon dates obtained recently from carbonized encrustations on ceramics sheds new light on the Barrancas to Ronquin ceramic sequence, a chronology that has been long contested in the Orinoco River Valley by many investigators. These new radiocarbon dates clearly argue that the so-called "long chronology" suggested by Rouse and Roosevelt for the La Gruta to Ronquin sequence developed for the Middle Orinoco River, a chronology that was argued to extend close to 4000 years, is invalid and is in need of revision. The new radiocarbon dates supplement those obtained previously by the author, providing the basis for a more solid chronology, one that falls within the first millennium AD. It is a sequence that links well-dated Ronquin and cognate ceramic assemblages found within wide-spread paleosol horizons that are nothing more than allogenic stratum linked to broader climatic events both within and beyond the Orinoco Valley.

Bartelink, Eric [179] see Hall, Sarah

Bartelink, Eric (California State University, Chico) and Sarah Hall (Arizona State University)

[179] *Region of Origin Predictions of Human Remains from a Late 19th Century Medical Waste Pit: Oxygen and Strontium Isotope Evidence from the Point San Jose Hospital, San Francisco*

In 2010, human remains were discovered in a medical waste pit behind the Civil War-era hospital at Point San Jose, San Francisco by National Park Service archaeologists. The commingled assemblage consisted of thousands of human bones, including cranial and dental remains. Extensive cut marks on these remains indicated they were used for anatomical dissection. Assessment of biological characteristics suggested that some of the individuals targeted for dissection are of non-European ancestry.

In this study, we use stable oxygen and strontium isotopes to predict region of origin of the craniodental remains of eight individuals from the medical waste pit. A molar tooth and skull fragment were sampled from each individual and were prepared for isotope analysis. Stable isotope data from bone suggest that these individuals may have had a common origin (possibly the San Francisco Bay Area). In contrast, data from teeth are more heterogeneous and suggest a variety of different places of childhood origin. Using isoscape prediction maps, we present possible regions of origin for these individuals, including in and outside the continental United States. We hypothesize that the remains in the medical waste pit at Point San Jose represent selective targeting of the dead from minority communities.

Barton, C. Michael (Arizona State University) and Julien Riel-Salvatore (Université de Montréal)

[219] *You're Going to Carry That Weight a Long Time*

Mobility is a phenomenon of importance across all past and present societies. For hunter-gatherers, mobility structures ecological strategies, social organization, and response to environmental change. For prehistoric societies, we cannot observe mobility but it is possible to study it through a proxy record of discarded material items and biological remains that form the archaeological record. Increasingly archaeological practice has shifted from proposing intuitive links between mobility and the archaeological record to developing testable hypotheses evaluated through systematic, controlled experimentation. Computational modeling is becoming an important tool applied to this effort, for testing intuitively proposed relationships and discovering unexpected, counterintuitive ones.

Building on prior modeling experiments on mobility and formation of the lithic archaeological record, we examine the impacts of the geographical extent of hunter-gatherer movement on technological and compositional characteristics of accumulated lithic assemblages. We situate these computational modeling experiments in a digital representation of a humanized landscape in which both stone outcrops and archaeological sites are potentially exploitable and potentially finite resources.

[234] *Discussant*

Barton, Loukas [249] see Franchetti, Fernando

Bartov, Gideon [140] see Zipkin, Andrew

Bartusewich, Rebecca (University of Massachusetts Amherst)

[77] *Pottery Production at Idalion, Cyprus: Investigating First Millennium BCE Politics and Culture through Ceramic Petrography.*

On the island of Cyprus, the first millennium BCE was a period of change in politics and culture brought about by new people, new governance, and new technology. This paper attempts to analyze these changes using one site. Idalion is located in the east-central part of the island. The polity went through many changes from its founding, c. 1200 BCE, through the first millennium BCE and I have begun to investigate some through petrographic analysis of pottery. Pottery production can represent social and political culture, as it is the result of the needs of society and the desires of economic elites. In craft production literature, much ink has been spilled theorizing how politics can effect production. My project attempts to validate some of these theories, as others in the field have done already; specifically one by Costin (1991) who suggests that craft production could be influenced by political power in some form or another. At Idalion, I have sampled pottery from several use-areas of the site and analyzed the sherds through petrography to track production practices through time and space. The results of this analysis show that some changes are related to political shifts and others are not.

Basanti, Dil (Northwestern University)

[32] *From Building to Connecting: Shifting Portraits of Complexity in Ancient Aksumite Monument Construction (50–400 AD)*

This paper looks at how network theory and materiality may challenge progressive evolutionary models of complexity. Archaeologists working on the African continent have long argued against neoevolutionary models of complexity, advocating instead for understandings that promote dynamism and fluidity. However, the spectre of neoevolution still claims the public imagination: bigger still seems to be better even if we agree it really shouldn't be. This paper aids in complicating these views by emphasizing how recent understandings of network theory and materiality shift the portrait of complexity from one of linear progression to one of social disconnection. More specifically, this paper explores how current ideas of materiality inherently flip our value system for how societies may be complex—so that bigger is not necessarily better, but the result of peoples attempts to deal with isolation, alienation, disconnection, and sometimes social instability. A case study on the construction of the Aksumite funerary monuments (50–400 AD) in ancient Ethiopia will be used to illustrate the two approaches.

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Bascopé, Grace Lloyd (Maya Research Program/BRIT)**[173]** *An Ethno-ecological View of the Evolution of “Solares”: A Yucatan Maya Houselot Case Study*

Using a household ecology model, this longitudinal comparison of the flora and fauna of village yards attempts to show how and why solares and their contents have evolved over the last two and one-half decades. Particular emphasis is placed on showing how such changes might be detected in and impact current and future archaeological explorations of Maya farming communities. Changes in water usage, economic activities, family structure and social organization, religious beliefs, evolving house construction methods, the acquisition of material good, and population pressure all go to influence a new matrix in houselot use. Finally, these same elements of change are also reflected in the use of the milpa, traditional cornfield, and this presentation will touch on the evolution of this subsistence pattern, as well.

Basiran, Alper [41] see Yaman, Irfan

Bassett, Madeleine (William & Mary)**[32]** *Religious Conversion and Ritual Practice in the Horn of Africa: A Case Study from Islamic-Period Djibouti (ca. AD 800–1200)*

The Somali Coast has long been a center of global commerce. At the confluence of the Red Sea and the Indian Ocean, port cities like Zeila and Berbera witnessed the arrival of Greek and Roman traders (ca. AD200) and Chinese merchants (ca. AD1300). Contacts with Muslim merchants from the Arabian Peninsula (ca. AD800) were particularly transformative, and by the tenth century, communities across Djibouti and Somaliland were converts. Scholars have hypothesized that pre-Islamic “monument sites” across the region—specifically, ancestor shrines and cairns—remained centers of ritual practice long after communities converted to Islam. This study seeks to test this hypothesis by identifying evidence of changes/continuities in ritual practice at a complex of monument sites along the Wadi Buleh in eastern Djibouti. Results of pilot research (2015, 2016) suggest that several monuments (cairns) remained loci of activity throughout the Islamic Period.

Bates, Brian (Longwood University)**[112]** *Discussant*

Bates, Brian [159] see Farrell, Mary

Battillo, Jenna (Southern Methodist University)**[126]** *Reconstructing Diet from Combined Pollen, Macrofossil, and DNA Analysis of Human Paleofeces*

This work integrates multi-proxy data from 44 human paleofeces in order to study resource use among early farmers in the northern Southwest. Macrofossils and pollen were analyzed for all specimens. Since not all foods leave pollen or macrofossils identifiable after digestion, available resources unlikely to be visually identified were targeted for PCR-analysis in 20 samples using mitochondrial and chloroplast DNA primers. Separate cluster analyses of each of these datasets showed almost no discernable, cross-cutting patterns. Considering these datasets together rather than separately provides a broader view of the diet. However, the fact that they are measured by different metrics and do not necessarily represent the same time period thwarted statistical integration of the results. Pollen and DNA pass through the digestive tract intermittently and over a longer period than macroscopically visible food remains. Furthermore, the pollen or DNA present may be derived from multiple meals. As such, it was determined that the datasets were best examined separately and integrated through qualitative interpretation of the aggregate results rather than direct statistical comparison of separate lines of data from individual samples or groups of samples. While these conclusions may not be universally applicable, these results have implications for future multi-proxy paleofecal studies.

Battle-Baptiste, Whitney**[278]** *Discussant***Bauer, Brian and Matthew Piscitelli (National Geographic Society)****[100]** *Mapping the Cuzco Ceque System*

The Cuzco Ceque System was composed of 328 shrines (huacas) organized along 41 lines (ceques) that radiated out from the city of Cuzco, the Inca capital. Historic research indicates that the ceque system was conceptually linked to the fundamental social divisions of the Cuzco region. The ceque system of Cuzco has been frequently discussed in the literature, and anthropologists and historians have long speculated on the locations of shrines in the system and the projection of the ceque lines. The goal of this study is to develop an empirical understanding of the distribution of the Inca shrines and the direction of the ceque lines across the Cuzco region using field data as well as Google Earth Pro.

[211] *Discussant***Bauer, Alexander (Queens College, CUNY)****[327]** *The Pragmatic Semiotics of Cultural Heritage*

This paper interrogates the pragmatics of heritage in two ways. First, what are the discourses and rhetorics of heritage—how is heritage invoked and talked about, like a sign of history, in making statements about the world? How has that shifted over time, as the term is increasingly invoked to explain and defend a wide range of actions and attitudes, and how do the different discursive communities who speak about heritage engage (or not) with one another? Most importantly, why have these discursive transformations not been accompanied by similar transformations in policy? The answer to that last question requires us to consider a second mode of heritage, namely, what does heritage do, as a sign in history, when it is invoked, encountered, and circulated? What does heritage activate, and what are its “practical effects”? Drawing on several examples including the recent removal of confederate monuments in the US, I argue that while operating in these two modes—as signs of and in history—heritage’s greatest potential for transformational change is when it ceases acting as a rhetorical device and instead becomes itself the center of experiential social action, such as through its encounter, circulation, or being made visible (or invisible).

[196] *Discussant***Bauer, Andrew (Stanford University)****[230]** *Growing Infrastructure, Cultivating Differences: The Temporalities of Agricultural Assemblages and the Social History of the Raichur Doab, Southern India*

This paper examines the history of medieval (circa 500–1600 CE) agricultural infrastructure—assemblages of soils, irrigation wells, and processing facilities—in the semi-arid conditions of the Raichur Doab, Southern India. Despite some investiture from ruling elites and temples, the material evidence for agro-infrastructure development suggests that it was not merely a project of state or institutional design. Rather, its development might more productively be characterized as a process of “growth” in which socio-material systems for facilitating the movement and production of matter and things emerged in relation to a range of differentiated actors and unruly cultivation conditions. The durable associations of soils, cultigens, and water appear to belie the common characterization of the Raichur Doab as a space of inherent “fertility” and calls into question the assumption that the region’s unique multiculturalism during the medieval period was an outcome of competition for its economic resources, as is commonly emphasized.

[230] *Chair*

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Baumann, Timothy (University of Tennessee), Charles Faulkner (University of Tennessee) and Heather Woods (University of Tennessee)

[90] *The Diet and Identity of Enslaved African Americans in the Upper South*

Enslaved African Americans in the Upper South worked and lived in both rural and urban settings as farm laborers, cooks, house servants, miners, and roustabouts. Their quality of life and cultural identity may be best understood by how their food was acquired, the types of plants and animals eaten, and the recipes they created. This paper provides a summary of the enslaved African American diet in the Upper South and compares it with that of their white owners as well as with enslaved populations in the Deep South and Chesapeake Bay region.

Baumanova, Monika (Uppsala University)

[210] *Context-Specific Applications of Space Syntax on African Urban Sites*

Organisation of space in preserved buildings and town layouts in sub-Saharan Africa have increasingly been in the research scope of archaeologists and architectural historians alike. The methods of space syntax and its associated theory have, especially since 2000's, paved its way to African archaeology and used for new interpretations of architecture e.g. of Benin, Dahomey and the Swahili coast.

Traditionally, space syntax is undertaken using access analysis graphs for individual buildings, and axial maps for towns, which allow researchers to comprehend the configuration of space formally represented as connected points and lines in a network. This paper presents a selection of illustrative case studies on how space syntax can work with remote sensing data, GIS databases and other analytical tools, and adapted to address specific research questions and historical cultural contexts in Africa. Street network analyses of West African historic towns and structural examinations of preserved stone buildings on various sites along the Swahili coast are used to show in what ways space syntax graphs can be adjusted to the current research agenda. Investigation of the built environment using complex graphical representations of its spatial partitioning and culturally embedded properties may include sensory perceptions such as vision and kinaesthetics.

Bastian, Kathryn (Skidmore College), Danielle M. Romero (University of Nevada, Las Vegas), Barbara Roth (University of Nevada, Las Vegas) and Darrell Creel (University of Texas, Austin)

[325] *Tracing Lineages and Regional Interaction in the Upper Mimbres Valley: Preliminary Bioarchaeological Indicators at the Elk Ridge Site*

Three seasons of excavation at the Elk Ridge site in the Upper Mimbres Valley suggest close familial social structures within this Classic period community. As a part of this preservation project, excavation of endangered burials has revealed mortuary and biological patterns that renew thinking of community dynamics in the region. Previous research by Harry Shafer has proposed that Mimbres communities organized around the family unit and lineage groups. Data from Elk Ridge thus far support this in the continued use of architectural plots and numerous burials within pueblo rooms. In this paper, mortuary treatments and cranial characteristics (especially occipital flattening) of 20 burials are considered as markers of familial identity. Observations of adult individuals suggest multiple ethnic identities and contact with contemporary Mogollon groups to the north. Preliminary interpretations of Elk Ridge are presented and compared to other examples of regional interaction observed in skeletal remains during a period of reduced extra-local activities.

Bautista, Stefanie (Stanford University)

[335] *Quilcapampa: A Wari Colony on an Interregional Trail on the Coast of Southern Peru*

In the ninth century AD, Wari settlers founded the site of Quilcapampa in the Sihuas Valley of southern Peru. The first definitive Wari settlement in Arequipa, the site was founded astride an inter-valley trade route that had been used for at least a millennium. This paper will discuss both the site's clear link to Wari, as evidenced by its architecture, ceramics, and foodways, as well as the possible links to the Nazca region where Wari control was likely fractured due to conflict and possible drought. Founded some two hundred years after the Wari expanded along the coast of southern Peru during the seventh century AD, Quilcapampa residents arrived at the end of a period of increased interregional interaction, then abandoned the site only a couple of generations later as Sihuas and surrounding valleys were drawn more closely into a regional trade network. More importantly, who were the people of Quilcapampa and what was their relationship with people from Nazca and in the Wari state capital?

[335] *Chair*

Bauvais, Sylvain [137] see Dillmann, Philippe

Baxter, Carey (USACE ERDC-CERL), Michael Hargrave (USACE ERDC-CERL), George Calfas (USACE ERDC-CERL), Samuel Vance (USACE ERDC-CERL) and Andrew Hamblin (USACE ERDC-CERL)

[238] *3-D Scanning, LiDAR, and UASs in Cultural Property Protection*

Archaeologists managing cultural resources on military installations have increasing opportunities to leverage unmanned aircraft systems (UASs), LiDAR, ground-based 3-D scanning, near-surface geophysics, and other remote sensing methods into their Cultural Resource Management (CRM) practices. These techniques are being integrated into CRM work under controlled conditions where adequate time and technical expertise is available. Military archaeologists are also developing Cultural Property Protection (CPP) approaches to assist U.S. forces and partner nations in protecting cultural properties outside the continental U.S. that are threatened by looting, natural disasters, and armed conflict. Such approaches must be cost-effective and scalable to austere circumstances that may include serious shortages in time and trained personnel and harsh, potentially dangerous conditions. Methods such as 3-D scanning, UASs, and LiDAR will play important roles in CPP because they can collect useful, reliable data very quickly. We present a decision matrix intended to help those engaged in CPP make sound decisions about the use of both aforementioned "high tech" methods, as well as traditional archaeological methods including surface collection, soil coring, and photography to collect meaningful data for particular threats, site types, and conditions.

Baxter, Erin (University of Colorado, Boulder)

[190] *Aztec Ruins, Architecture and Augmented Reality*

The mounds immediately south of Aztec West were partially excavated in 1916, 1934 and 1960. These data have not yet been synthesized. Taken together, information from pottery, photographs, sketch maps and grey literature indicate the presence of masonry walls, possible staircases, and depositional patterns that are analogous to the Pueblo Bonito mounds. This poster will show these data in both traditional (2 dimensional) and augmented (3 dimensional) formats. Augmented reality will be used both to bolster Aztec architectural data, and illustrate its potential as a means to enhance poster presentations in many formats with projected data (viewed through smartphones and tablets) for an enriched graphic, video, and data-enhanced experience.

Bayani, Narges (ISAW)

[3] *Borderland Processes and the Question of BMAC in NE Iran*

How frontiers and borders are conceptualized in archaeology is critically influenced by the approaches and perspectives in culture contact research. Absence of written documents from Bronze Age Central Asia severely limits the application of such theories. The nature of the Bronze Age civilization of Bactria-Margiana Archaeological Complex (BMAC) in Central Asia, and its dispersion to neighboring NE Iran has been a long-lasting question in study of Prehistoric Western Asia. This paper aims to examine the BMAC presence in NE Iran, using Tepe Hissar as a case study, to understand how

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BMAC interacted with local cultures in this region. The evidence for existence of BMAC in NE Iran and the nature and extent of BMAC's dispersion out of Central Asia is revisited from the perspective of frontier and borderland studies. The goal of this paper is to identify different types of borderland processes that occurred in NE Iran, where these two cultures came into contact. In order to hypothesize about this interaction sphere, I turn to borderland theories, specifically the "continuum of boundary dynamics" and "borderland matrix" models in order to conceptualize the material culture evidence for BMAC in Iran as markers of various borderland processes.

Bayarsaikhan, Jamsranjav [3] see Parrish, Deborah

Bayman, James [275] see Moragas, Natalia

Bazan Perez, Augusto (Fundacion Augusto N. Wiese)

[249] *Assessing Chronology, Spatial Setting, and Architectural Planning at Pampa de Llamas-Moxeke, Casma Valley*

The archaeological site of Pampa de las Llamas-Moxeke in the Casma Valley, Peru is an architectural complex comprising two opposing large platform mounds united by a sequence of aligned rectangular platforms and structures. The site was studied mainly in the 20th Century by various investigators; the most recent of whom carried out intensive excavations in the 1980s aiming to produce exact dates and explain the function of the settlement. This previous work suggested that the complex dates to the Early Formative Period, implying contemporaneity with local sites including Las Haldas, Sechín Bajo, Cerro Sechín, and Sechín Alto. However, the occupational history of Pampa de las Llamas-Moxeke is considerably more complex than what was originally proposed. New data contribute to explanations of the construction sequence, settlement planning, use of the natural setting, and the reasoning for the selection of the complex's physical placement, particularly in political and economic terms. As such, construction of Pampa de las Llamas-Moxeke began in the end of the Late Archaic and was subject to modifications according to the social transformations occurring with the introduction of ceramics and the Chavín phenomenon. In turn, its ruling class would have dominated the socio-political scene in the middle Casma Valley.

[216] *Discussant*

[216] *Chair*

Beach, Timothy [153] see Wendel, Martha

Beach, Timothy [243] see Kotsoglou, Anastasia

Beahm, Emily (Arkansas Archeological Survey), Jodi Barnes (Arkansas Archeological Survey) and Elizabeth Horton (Arkansas Archeological Survey)

[168] *Gathering, Gardening, and Agriculture: Arkansas Archeological Survey's Plant-Based Public Archeology*

The Arkansas Archeological Survey has been practicing citizen science and developing educational tools for engaging local communities in the study of the past since the 1960s. In this paper, we discuss recent efforts by the Survey to develop educational content specifically aimed at highlighting the history of plant use through time in the southeastern United States. The Survey received grant funds to develop the 5th grade social studies curriculum, Gathering, Gardening, and Agriculture: Plant-based Foodways in the Southeastern United States. We designed the curriculum to improve students' scientific literacy and foster a greater sense of the importance of preservation among both students and teachers. Through this curriculum, teacher workshops, web-based content, and native gardens at several research stations, we have developed a suite of educational approaches to help teach how people in the past used plants, while emphasizing the important contributions that southeastern Indians made to the ways people use plants today. We discuss the success of our approach to public archeology and education, as well as our assessment and evaluation of our educational programming as we considered education and archeology in the 21st century.

Beamer, Dawn [294] see Singer, Zachary

Bean, Danial [101] see Nyers, Alexander

Beatrice, Jared (The College of New Jersey), George Leader (The College of New Jersey; University of Pennsylvania), Kimberlee Moran (Rutgers University-Camden) and Anna Dhody (Mutter Research Institute)

[204] *Bioarchaeological Analysis of Human Skeletal Remains from the Historic First Baptist Church Cemetery, Philadelphia (ca. 1700–1860): Preliminary Results*

The inadvertent discovery of the historic First Baptist Church of Philadelphia cemetery resulted in the recovery of a large sample of human skeletons composed of commingled remains as well as discrete individuals associated with intact coffins. Analysis of the skeletal remains prior to reburial provides insight into demography, behavior, and living conditions among members of this congregation interred circa 1700–1860. While preservation of the remains is variable within the cemetery, preliminary results include a paleodemographic profile consistent with high infant and childhood mortality. Moderate prevalence rates of developmental enamel defects are also indicative of physiological stress experienced during early childhood. In addition to paleodemographic and paleopathological trends, we present the osteobiography of an adult male exhibiting multiple well-healed traumatic injuries and evidence of autopsy—a form of postmortem examination that appears infrequently in public cemeteries dating to this period.

Beaubien, Harriet "Rae" [139] see Harrison, Ainslie

Beaudoin, Ella (Smithsonian Institution National Museum of Natural History), David R. Braun (George Washington University) and Jonathan Reeves (George Washington University)

[41] *Spatial Variation in Tool Use: Acheulean Forager Patterning at Elandsfontein, South Africa*

Despite more than a century of scholarship, our knowledge about the use of stone artifacts remains relatively sparse. Major advances in the analysis of microscopic wear have been the primary focus of much previous research. However, post-depositional processes and the logistics of microscopic analysis limit sample sizes in these studies. New approaches that quantify macroscopic damage patterns on the assemblage scale provide a robust basis for drawing behavioral inferences about hominin tool use. Here we apply these new techniques to a large assemblage of stone artifacts from multiple excavations at Elandsfontein (1 Ma—780Ka) from the Western Cape of South Africa. Measures of damage location, continuity, and extent provide intriguing insights into the variability in tool use patterns. This analysis is combined with experimental studies of tool use and their subsequent damage patterns. Results indicate differences in tool use across an ancient landscape. These differences correlate with complimentary data sets from across Elandsfontein. This further supports this method in the investigation of tool use in Paleolithic contexts. This research was supported by the National Science Foundation Research Experience for Undergraduates (NSF-BCS- 1620907).

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Beaule, Christine**[275]** *Ethnogenesis and Cultural Persistence in the Global Spanish Empire*

Ethnogenesis and cultural persistence are dynamic and variable processes of identity creation, manipulation, and co-constitution, which also include the persistence, reinforcement, and reconstitution of elements of cultural and ethnic identities. Our focus is not simply on indigenous groups or colonists, but rather on the larger context of agents within multi-cultural, pluralistic colonies. The colonies established by the Spanish throughout the Americas, the Caribbean, Pacific, Southeast Asia and Africa, brought together individuals and groups from both near and distant diverse cultures. Together, these colonies were economically, politically, and religiously connected to one another. Spanish colonies were, moreover, a catalysis of cross-cultural exchange, conflict, and persistence as colonists, merchants, and various indigenous individuals and groups moved throughout the empire. It is thus an ideal setting to explore questions of ethnogenesis and the persistence of local and indigenous traditions in old and new contexts. This paper offers a broad, comparative exploration of the archaeology and ethnohistory of ethnogenesis, persistence, and the many permutations of identity throughout the Spanish Empire. It sets up a conceptual framework for the case studies that follow, representing seven world regions.

[275] *Chair*

Bebber, Michelle and Michael Wilson (Kent State University)**[89]** *Why Wasn't the Ceramic Arrowhead Invented?*

In biology the concept of theoretical morphology has been used as a heuristic device for better understanding the evolutionary trajectories of organisms. Theoretical morphology proceeds by creating and examining hypothetical specimens not actually found in nature. So instead of asking "why does feature X exist?", a theoretical morphological approach asks "why doesn't feature Y exist?". Here, we use this approach to address the question of why ceramic technology did not evolve to replace stone technology with respect to hunting weapon tips (spear points, atlatl dart tips, arrowheads). In other words: why didn't the ceramic projectile point emerge? Clay is a readily available, economically efficient, and easily workable raw material. Likewise, objects made out of fired clay are extremely hard, sharp, and generally durable. We hypothesized that there was perhaps a functional constraint such that ceramic hunting weapon tips cannot perform as effectively as stone ones. We conducted an archaeological experiment using stone and ceramic replicas, and assessed point penetrability and durability. The results of this study will have implications for our understanding of prehistoric weaponry evolution.

Bebber, Michelle [44] see Eren, Metin

Becerra, Gibrán (Universidad Veracruzana)**[93]** *Habitar en los bordes, ocupación Clásica en lomeríos y crestas montañosas al oriente de los volcanes de Los Tuxtlas*

Los sitios localizados sobre la planicie costera y en el pie de monte de los volcanes de Santa Marta y San Martín Pajapan, en el sur de Veracruz, se caracterizan por la presencia de arquitectura monumental, grandes áreas domésticas, sitios acondicionados como estaciones portuarias, talleres de artefactos de basalto en formato pequeño y posiblemente áreas de cultivo. En el periodo de mayor ocupación (650–1000 dC.) los terrenos bajos estaban totalmente ocupados, por lo que el asentamiento comenzó a crecer hacia los lomeríos y las crestas de la Sierra de Santa Marta y faldas del Volcán San Martín. Aunque sin arquitectura monumental, la ocupación de lomeríos y crestas montañosas fue una solución en el crecimiento del asentamiento; en la ponencia se exponen las principales evidencias de modificación del terreno de este tipo de sitios, los materiales arqueológicos asociados y se evalúan las posibilidades de aprovechamiento y explotación de recursos locales y su impacto en el desarrollo general de la población de la zona costera de Los Tuxtlas y del Sur de Veracruz.

[93] *Chair*

Becerra Alvarez, Marimar (Universidad Veracruzana)**[93]** *Paisajes aprovechados y causas modificados en el sistema portuario de la costa este de Los Tuxtlas, Veracruz*

En la zona este de Los Tuxtlas se ha identificado un complejo sistema de intercomunicación fluvial y marítima, construido a partir del aprovechamiento y acondicionamiento de corrientes acuáticas. Una gran parte de estas vías de comunicación confluyen en el sistema portuario de la costa este de Los Tuxtlas. La región se caracteriza por estar en un abanico aluvial, por lo que presenta un gran dinamismo fluvial, es decir los causes no son estáticos en el tiempo.

En los estudios arqueológicos debe considerarse estos fenómenos naturales como variables complementarias, pues ayuda a entender como fue la relación de las sociedades con su entorno. Para el caso del sistema portuario de la costa este de Los Tuxtlas, trataremos de entender la relación que tuvo el dinamismo fluvial de la región para la configuración de los sitios, en qué medida estas variables transformaron el paisaje y cuáles fueron los mecanismos que las sociedades adoptaron para apropiarse el entorno.

Becerra-Valdivia, Lorena (ORAU, University of Oxford), Thibaut Devière (ORAU, University of Oxford), Thomas W. Stafford Jr. (Stafford Research, LLC), Michael Waters (Center for the Study of the First Americans, Texas) and Tom Higham (ORAU, University of Oxford)**[184]** *Comparison of Preparative Chemistry Methods for the Radiocarbon Dating of Anzick Site, Montana*

Found in 1968, the archaeological site of Anzick (24PA506), Montana, contains the only known Clovis burial. Here, the partial remains of a male infant (Anzick-1) were found in association with a Clovis assemblage of over 100 lithic and faunal bone artifacts—all red-stained with ochre. The incomplete, unstained cranium of a separate individual (Anzick-2), dating to ~8,600 radiocarbon years before present (BP), was also recovered. Previous chronometric work has shown an age difference between the Clovis assemblage (represented by two antler rod samples), dated to ~11,000 BP by XAD-purified collagen, and the Anzick-1 individual, dated to ~10,700 BP by XAD-purified collagen. The discrepancy between the age of the human remains and the osseous artifacts has led to much speculation. Here, we present the results of a comprehensive radiocarbon dating program that utilized different preparative chemistry methods on osseous material from the site, including a single-amino acid extraction protocol using preparative High Performance Liquid Chromatography (prep-HPLC) optimized at the University of Oxford. This comparative approach has allowed us to obtain robust chronometric data for a key site in First Americans research.

Beck, Chase, Vaughn Bryant (Texas A&M University, Department of Anthropology, P) and Dennis Jenkins (University of Oregon, Department of Anthropology)**[290]** *Pollen, Contamination, and Interpretation at Paisley Caves Archaeological Site*

In studying the early inhabitants of North America, some of the frequently revisited questions involve how they lived, what they ate, and what their world was like. Archaeological Palynology is a well understood method for addressing these questions. Because of the constant pollen rain and the purposeful and incidental ingestion of pollen and spores, well-preserved pollen is repeatedly found in association with human habitation sites and human artifacts. Paisley Caves, Oregon, established itself as one such early human habitation site when human DNA was found in coprolites dating to the oldest associated with humans in America. In addition, the sediments within caves at the site contain an abundance of well-preserved pollen. Knowing more about the environment reflected by the sediments at Paisley Caves can tell us more about the people who lived there, the lives they led, and the obstacles they faced as they ventured into the undiscovered American continent. However, the cave setting as well as the presence of packrat coprolites, thoroughly mixed within the sediments, adds levels of complexity that makes the sediment at Paisley Caves a unique interpretive challenge.

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Beck, Jess (University of Cambridge), Colin Quinn (Hamilton College) and Horia Ciugudean (National Museum of the Union, Alba Iulia)
[29] *From Mounds and Museums: Building a Bioarchaeology of the Early Bronze Age in the Apuseni Region of Transylvania*

The Apuseni Mountains of southwest Transylvania, Romania, are amongst the richest gold and copper procurement zones in the world. Metals from this region helped fuel the rise of inequality across Europe during Late Prehistory, and the area is also home to a rich mortuary record, with archaeological survey identifying over one hundred mounded tomb cemeteries belonging to Bronze Age communities. However, none of these cemeteries have been fully excavated and only a small sample of skeletons has been studied. Here, we describe the results of bioarchaeological analysis of human skeletal remains from a sample of previously unanalyzed Early Bronze Age sites that encompass a significant degree of environmental and cultural variability, including upland cemeteries with stone-covered cairns, as well as lowland cemeteries with earthen cairns. These cemeteries show evidence of diverse mortuary treatments, including primary burials, secondary burials, and commingled interments. Our analyses assess age, sex, health, and funerary treatment, providing preliminary information about how mortuary treatment intersected with aspects of identity and lived experience. This study builds a foundation for future bioarchaeology in the Apuseni region and emphasizes the need to supplement osteological analysis of the scant museum collections with larger-scale excavation of cemeteries.

Beck, Jess [185] see Cobb, Emilie

Beck, Margaret (University of Iowa)
[246] *Discussant*

Becker, Sara (University of California, Riverside)

[220] *Landscape and Labor: Bones and Bodies of the Tiwanaku State*

Modern, archaeological, and bioarchaeological accounts of South American Andean workers show labor divisions by age, then gender, with a focus on duality between the sexes. Within the Tiwanaku state (AD 500–1100) of Bolivia and Peru, labor was also divided across the landscape within its heartland and colonies, and especially within its multiethnic neighborhoods in the heartland city of Tiwanaku (Becker 2017). Pondering these labor communities further with a focus on data from these peoples' skeletal remains, this paper discusses the embodied physical changes noted on these Tiwanaku bones associated with varied task and subsistence-based lifeways. While it may not be possible to link certain jobs with each individual, locating gendered spaces and tasks may be conceivable spatially within the population. Further features may also be identified by focusing on certain parts of the anatomy, like hands, feet, and the spine, which would have been important body regions to show labor distinctions associated known Andean crafts like potting, weaving, and the movement of goods using backpacks across the highly variable elevations of this state. Hence, this research takes a wide-to-narrow scope across the Tiwanaku polity to understand labor, gendered activity spaces, and embodiment on human bone.

Becker, Sara [270] see Herndon, Brianna

Beckett, Jessica [136] see Skeates, Robin

Becks, Fanya (Stanford University)

[58] *What Should We Call the Rocks in Living California Landscapes?*

As archaeologists in Central California shift towards understanding indigenous agencies within the indigenous landscapes of colonial contact (Panich and Schneider 2015) an opportunity has arrived for the field to consider the practical implications of autochthonous Central Californian relationships and ontological perspectives for research praxis. The question posed in this paper, is what are rocks as interlocutors in relationships; how do you think of a rock when it is a part of a place that is recognized to be vibrant, living, and interconnected with living and ancestral Central California peoples. Fire-cracked rocks, rounded river stones, and other rocks that are not obvious flaked or ground stone tools are a prominent component of archaeological sites that are little recorded and often not recovered from the field. While collection strategies are an important pragmatic part of archaeological investigations, the fields privileging of formal tools and chronologically significant artifacts miss potential information about many pieces of places that are not understood. In this paper, I discuss examples within the ethnographic archive that may help us consider the role that rocks have played in the autochthonous landscapes of the past and present, which might otherwise have eluded western eyes.

Beddows, Patricia A., Dominique Rissolo (University of California, San Diego), Emiliano Monroy-Rios (Northwestern University), Dominique Meyer (University of California San Diego) and Beverly Goodman-Tchernov (University of Haifa)

[330] *Coastal Hydrogeological Context of Potable Water Sources of the Vista Alegre Maya Port Site, Yucatan Peninsula, Mexico*

Ongoing investigation at the ancient Maya port site of Vista Alegre has revealed a multi-phased and significant occupation spanning the Preclassic to Postclassic periods. However, the vital source of potable water that would have supported this coastal settlement remains unknown. We present a hydrogeological assessment of the region to understand changing water sources over the last 2 millennia. Potential groundwater foci at the intersections of conjugate fracture sets are presently either mantled in sediments, and/or flooded by saline-hypersaline waters. Nearby surface drainage from rain-fed savannas also has seasonally variable salinity commonly exceeding potable limits. A number of shallow springs discharge a range of reduced salinity and cooler waters. These are locally called Ojos de Aguas, a form of flooded sinkhole. Casting the coastal landscape under the marginally lower sea levels of the late Holocene (-2m), some of the known ojos would have been terrestrial sinkholes/cenotes above sea level. Recent evidence indicates a downward tectonic movement of the Yucatan north coast, which would further leave the ojos unaffected by direct mixing with marine waters. Vista Alegre's inhabitants may have benefited from cenote potable perennial water sources that are now clandestine due to the sea level and tectonic shifts.

Beddows, Patricia A. [330] see Meyer, Dominique

Bedell, John (Louis Berger)

[202] *The Potomac Gorge*

The Potomac Gorge is a canyon through which the river passes through the Falls Zone from Great Falls down to Washington, D.C. Ever since John Smith met Indians fishing below Little Falls in 1608, it has been widely assumed that the Potomac Gorge was a prime Native American fishing spot. The numerous prehistoric archaeological sites along this stretch of the river have often been interpreted as fishing stations. However, re-examination of the archaeological record in the Gorge, carried out as part of multi-year archaeological surveys in Rock Creek Park and the George Washington Memorial Parkway, suggests a more complex picture. Most of the known Archaic and Woodland sites are in places that make them unlikely fishing spots. This discovery directs attention to other ways ancient Native Americans might have used the gorge: as a boundary, as a transportation corridor, and as a possible approach route for dangerous outsiders that had to be carefully watched.

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Bedford, Clare (University of Central Lancashire) and David Robinson (University of Central Lancashire)

[214] *Deconstructing Rock Art—An Experimental Approach to the Application of Portable Analytical Instrumentation to Applied Pigments at Pleito, South-Central California*

The composition of background substrate, overpainted layers and admixtures can influence the data acquired from portable instrumentation at rock art sites. An understanding of the extent and impact of this influence is crucial when comparing in situ rock art pigments with potential source materials. This study uses an experimental process to assess the impact of factors such as a pigment thickness, overpainting, and addition of organic binders on the readings acquired using portable instrumentation including pXRF, Raman and FTIR. Approximately 150 samples collected from potential pigment sources in South Central California, are used to form experimental paints, as well as forming a comparative collection. In addition to these mineral sources various fats, plant gums and resins are tested. The aim is to establish a method to compensate for the background and overpainting effects. This method is considered a means to identify pigments and binders in situ and compare these between panels and with potential source materials. This experimental work forms part of the Gordian Knot Project based at the polychrome rock art site of Pleito and the results are applied to compare pigments at this site between panels and with potential sources.

Bedford, Clare [214] see Kotoula, Eleni

Beecher, Cathy Jo [334] see Pfau, Justin

Beggen, Ian (North Carolina State University)

[240] *Preliminary Investigations into the Site of Chullpa K'asa in Southwestern Bolivia*

The site of Chullpa K'asa, located in the Potosí Department of southwestern Bolivia, covers an area of around 45 hectares and contains the ruins of dozens of Prehispanic buildings. This poster presents the results of preliminary investigations of the site based on pedestrian ground survey and an assessment of artifacts housed at a nearby Indigenous museum. Systematic survey and mapping, which included the recording of surface artifacts at 43 locations across the site, revealed two areas of concentrated architecture, one area of tombs, abundant ceramic sherds, groundstone tools, and evidence of metal production. Based on survey data and the artifacts housed in the museum, the site appears to have been occupied from the Intermediate onward to the Late Horizon Period, roughly coinciding with the end of Tiwanakan influence, subsequent occupation by warring polities in the Late Intermediate Period, and finally the invasion of the Inca as they established the southern extent of their empire. Artifactual and architectural data provide a basis to interpret the function of the site as a frontier of the Incan Empire, develop research questions for future investigations at the site, and contribute to the sparse amount of archaeological information concerning this area of the world.

Begley, Christopher (Transylvania University)

[299] *3D Imaging in Remote Areas, Rainforests, and Other Hostile Environments: Investigating Identity and Interaction in Eastern Honduras*

Ancient eastern Honduran populations utilized foreign symbols in limited elite contexts, such as site planning and architecture, but most elements of material culture reflect clear connections to Lower Central America. Iconography seen in petroglyphs appears significantly different from that seen in other media, and may yield additional information and insights into identity formation and interactions within the region. For many reasons, these petroglyphs have not been extensively studied. While some of the petroglyphs are easily visible, many are highly eroded, hard to access, and difficult to identify, document and interpret. Recent work in high resolution 3D imaging using rugged and portable structured light illumination systems may offer an inexpensive solution to identifying, documenting, and interpreting these important symbols in remote areas or hostile environments.

Begun-Veenstra, Erica (Grand Valley State University)

[205] *The Science of Souvenirs: Past, Present, and Future*

For many people, material objects hold the memory of a time and place. For some families, these objects, collected at meaningful and important times and places, can become heirlooms with an additional, familial significance tying generations to a distant time and place. For others, these objects reflect personal journeys and experiences. By examining two case studies—the Michoacan originating ceramics of the N1W5:19 compound at Teotihuacan and the exchange and collecting of lapel pins at an international children's competition—this paper seeks to address the importance of collecting keepsakes and souvenirs as markers of memory of distant lands, personal connections, and travels.

Behling, Emma (Augustana University) and L. Adrien Hannus (Augustana University)

[223] *Experimental Recreation of Shell Fishing Implements at Mitchell Indian Village in South Dakota*

Over the years of excavation at the Prehistoric Indian Village at Mitchell, several similar shell artifacts were discovered. Excavators came to the hypothesis that the shell items had been fishing lures, and set out to test it. The shell artifacts were replicated and used as lures on several fishing expeditions. These shell items functioned as lures, and we are led to believe that the artifacts found at Mitchell could indeed have been fishing lures.

Behrensmeyer, Anna K. [189] see Hutson, Jarod

Beisaw, April (Vassar College)

[205] *Manifesting the Ghosts of Place through Archaeology and Empathy*

Hauntings rely on an ability to envision someone from the past retaining agency in the present, a ghost. Often barely perceptible, the ghost's actions tend to be routine (walking, sitting, etc.) but their message is profound (I was like you, until something happened). Archaeology relies on an ability to envision the past, present, and future as intruding into each other at a defined place, a site. Often missed by those without proper training, archaeologists recover mundane objects (plates, cups, etc.) and use them to speak about grand social issues (past peoples have left lessons for us). These parallels are not uncanny, they are noteworthy. By investigating how and why a space takes on the aura of a haunted place, archaeology can tap into the enthusiasm for the past that ghost hunters/tourists espouse. After seven years of incorporating ghost stories and hunts into my teaching and research, I've found a formula for manifesting the ghosts of place—summarized as “we remember what we fear and we believe what we can envision.” Any space becomes haunted once good storytelling taps into empathy. The objects made, used, and left behind by those we have lost aid the conjuring.

[60] *Discussant*

Belardi, Juan (Univ Nac de la Patagonia Austral), Flavia Carballo Marina (Universidad Nacional de la Patagonia Austral), Gustavo Barrientos (Universidad Nacional de La Plata—CONICET) and Patricia Campan (Universidad Nacional de la Patagonia Austral)

[155] *Southern Patagonian Hunter-Gatherers: Distributional Archaeology in the North Shore of the Viedma Lake (Santa Cruz, Argentina)*

Results obtained through a distributional archaeology project along the north shore of the Viedma lake basin are introduced. The aim of the research is to gain knowledge about hunter-gatherer landscape use during the Holocene and to incorporate the basin within a broader discussion of the population of the western side of Southern Patagonia. Different altitudinal sectors along an East-West axis -from the steppe to the forest- were surveyed in order to understand seasonal mobility: 1) the coast of the lake (255–300 masl), 2) pampas (300–700 masl)-, large open spaces formed by glacial deposits-, 3) basaltic plateaus basis (750 masl), and 4) the plateaus (950–1000 masl). Lithic artifactual densities are evaluated considering local geomorphology,

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new data on chronology, technology, rock art and guanaco (*Lama guanicoe*) archaeofauna. All these data is framed on a regional hunter-gatherer landscape use model that is compared to the ones built for neighbour lake basins like the Tar-San Martín (to the north) and Argentino (to the south).

Belardi, Juan [155] see Nuevo Delaunay, Amalia

Belcher, Megan [86] see Colclasure, Cayla

Beliaev, Dmitri (Knorozov Mesoamerican Center, Russian State University for the Humanities), Alexandre Tokovinine (Department of Anthropology, The University of Alab) and Milan Kovac (Department of Comparative Religions, Comenius Univ)

[33] *Ballgame, Ritual and Monument Reutilization at the Ancient Maya Site of Uaxactun*

During the 2017 field season of the Uaxactun Archaeological project new monument was excavated at Buena Vista, a minor center at Uaxactun urban periphery. It is a small carved altar or ballcourt marker, which according to its style dates to the Early Classic. High quality of the carving and the hieroglyphic inscription indicates that the altar/marker itself was a part of the monumental corpus of Uaxactun urban core; uncomplete text provides important new information on the dynastic history of the site. During the Late/Terminal Classic it was moved and reutilized by the occupants of Buena Vista as a ballcourt marker. Its importance probably lasted to the Postclassic when it became the object of the veneration and unusual offering was placed associated with the monument.

Bélisle, Véronique (Millsaps College)

[117] *Reassessing Wari Power in the Central Andes: Local Agency, Trade, and Competition in the Cusco Region*

The Wari state of the Central Andes has traditionally been interpreted as an expansive polity that incorporated numerous provinces during the Middle Horizon (A.D. 600–1000). Most research has focused on the large Wari installations built in several regions of Peru, leading many scholars to conclude that Wari administrators established direct imperial control over these areas. More recently, scholars have started to adopt a complementary bottom-up approach to study changes experienced at the regional and household levels by smaller communities living outside the large Wari installations. This new perspective challenges previous interpretations of Wari as a strong, centralized, all-controlling colonial authority. In the Cusco region, survey and excavation data suggest that local populations were little affected by Wari presence. Continuity in settlement patterns and domestic and ritual activities reveal that locals did not adopt Wari practices. Like other early states worldwide, the Wari polity might have built enclaves that helped its settlers tap into the knowledge, authority, and networks of local elites. Obsidian, hallucinogenic snuff, and other exotic goods from Cusco further demonstrate that Wari colonists did not interrupt regional and long-distance exchange networks, but might have intensified prestige-goods competition and altered the balance of power among local societies.

Bélisle, Véronique [217] see Alaica, Aleksa

Belknap, Daniel [84] see Miller, Jacquelynn

Bell, Joshua (National Museum of Natural History, Smithsonian Institution)

[114] *Transforming Ideologies and Hopes of the Past in the Purari Delta of Papua New Guinea*

In the wake of several decades of resource extraction (logging and oil/gas exploration), the past as articulated in particular places, material things, names and narratives has taken on new urgency in the Purari Delta. For over a decade communities have struggled to marshal these assemblages of cultural heritage to demonstrate their traditional ownership to acquire resource royalties. An imperfect and highly political process, claimants must overcome the legacies of out-migration, Christianity, and iconoclasm which have unevenly configured the distribution and knowledge of the past. In the midst of these processes, aspects of this diffuse heritage emerge unexpectedly: a WWII airplane rising up from the delta, stone tools unearthed by bulldozers, or rumours of ancestral beings encountered in the forest. In this paper I examine these periodic returns as a way to think through the region's transforming ideologies, how the past is being marshalled by individuals and their communities to make a more hopeful future, and what role anthropology has in these processes.

[114] Chair

Bell, Elizabeth E. [268] see Newman, Tiffany

Bello, Charles [42] see Dillian, Carolyn

Bellorado, Benjamin (University of Arizona)

[74] *Fancy Threads and Tree-Ring Dates: New Chronometric Controls for the Development of Cotton Weaving Technologies and Ritual Textile Production in the San Juan Basin, A.D. 1150–1300*

The introduction of cotton tapestry weaving traditions transformed Ancestral Pueblo ritual costuming traditions in the San Juan Basin ever after. After its introduction, documenting developments and changes of cotton-weaving technologies and ceremonial garment fashions is difficult because most of the associated materials are perishable. Arid conditions at the numerous cliff dwellings occupied in the Pueblo III period (A.D. 1150–1300) have fostered the preservation of abundant evidence of cotton-textile production in the form of loom anchors and spinning-and-weaving tools, but little synthesis of these data has been attempted in decades. Even less is known about spatiotemporal changes in weaving production technologies and the contexts where weaving took place. Newly developed tree-ring chronologies from rooms yielding weaving-related materials, cross-media stylistic studies of pottery and mural imagery, and archival documentation of weaving assemblages from cliff-dwellings in the region provide new data about the nature of cotton textile production in the region in the twelfth and thirteenth centuries. In this paper, I present the results of recent analyses that shed new light on the origin, development, and distribution of cotton-weaving technologies and ritual-garment production industries in the San Juan Basin.

Bellorado, Benjamin

[96] *Discussant*

Belluzzo, Nick (College of William & Mary)

[20] *"The Other Half of the Sky": Competitive Anarchy in Contact-Era Palau*

This paper explores the way in which contact-era Palauan society negotiated between hierarchy and heterarchy to ensure long-term sociopolitical stability, developing and deploying a theory of competitive anarchy. The evaluation critiques the frequent correlation of complexity with hierarchy and centrality and does so through a geostatistical analysis. This investigation begins with the development of a proposed model of Palauan sociopolitical structure, derived through ethnographic descriptions contextualized with re-readings of contact-era narrative accounts. This proposed model provides a hypothesis which is tested in a geographic information system (GIS) through the geostatistical analysis of regional settlement patterns and the distribution of village sites across the landscape at multiple scales. Through modelling clustering and dispersion of village sites across the landscape,

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the evaluation of central places and authority in Palau suggests the presence of meaningful settlement patterns at both local and regional scales. The results suggest that intentional and complex social structures can allow competition while both limiting social inequality and ensuring group cohesion.

Belmar, Carolina (Depto. Antropología, Universidad de Chile), Omar Reyes (CEHA, Instituto de la Patagonia, UNAG, Punta Arena), Ximena Albornoz (Fondecyt Grant 1170726), Flavia Morello Repetto (CEHA, Instituto de la Patagonia, UNAG, Punta Arena) and Manuel J. San Román (CEHA, Instituto de la Patagonia, UNAG, Punta Arena)

[153] *Diet among Marine Hunter-Gatherer-Fishers of the Northern Patagonian Channels (41°50'- 47° S): Assessing Plant Use and Consumption through Dental Calculus Studies*

In the western Patagonian channels, the archaeofaunistic record, technological and isotopic studies show subsistence strategies based on fishing, hunting and gathering of marine resources. Unfortunately the consumption of plant resources still has not been assessed for this area and the consumption of C3 plants is hard to detect through these type of analysis. Our aim is to evaluate the consumption of wild and domesticated plants and parafunctional use of the teeth for the processing of plant fibers. For this study we examined the microfossil evidence contained in the tooth calculus of 47 individuals from 17 sites from the Chiloé and Chonos archipelagos. In the cases that isotopic information is available, we shall compare and evaluate how the integration of both types of information -isotopic and microfossils- can contribute in the general overview of diet reconstruction. FONDECYT Grant # 1170726.

Beltran, Boris [306] see Hannigan, Elizabeth

Bement, Leland C. [155] see Tharalson, Kirsten

Ben Tahar, Sami [210] see Fenn, Thomas

Benchley, Elizabeth (University of West Florida) and Judith Bense (University of West Florida)

[215] *Lynne Goldstein: A Pioneer in Public Archaeology*

We will celebrate the contributions of Lynne Goldstein to regional and public archaeology both in the Midwest and in Florida. We will begin by reviewing her innovative work with regional archaeology and political outreach in Wisconsin. When the opportunity arose in Florida to create a state-wide public archaeology program, we called on her to assist with forming the plan and with its implementation. The Florida Public Archaeology Network owes much to Dr. Goldstein, who has served on its board since its inception for her expertise, perseverance, commitment to digital and social media, and her insightful and critical thinking.

Benden, Danielle (Driftless Pathways, LLC)

[138] *New Digs for an Old Collection: A Case Study in Rehabilitating Legacy Collections*

Legacy collections—those typically generated decades ago that do not meet current professional curation standards and require a substantial resource investment for long-term preservation—are housed in nearly every archaeological repository across the country. Many are the result of under-funded university field schools or public archaeology projects that didn't account for either the initial curation preparation or the long-term costs and maintenance of collections care. The deeply stratified and federally-owned Tillmont site, located on an island in the Upper Mississippi River, is one such collection that was recently rehabilitated to meet the federal curation regulations (36 CFR Part 79). This paper explores that rehab process, along with the challenges encountered and the solutions for overcoming them. The end result is a collection that is fully digitized, organized, indexed, and ready for a variety of uses, including research and education.

[149] *Discussant*

[138] *Chair*

Bendremer, Jeffrey [222] see Thomas, Jayne-Leigh

Benev, Megan (Emory University), Shelby Putt (Indiana University-Bloomington) and Dietrich Stout (Emory University)

[227] *Pedagogy in the Paleolithic? The Influence of Verbal Teaching on Stone Knapping Skill Acquisition*

Teaching is uniquely developed in humans and was likely critical to the emergence of cumulative culture. However, the importance of various forms of teaching, including the use of language, in transmitting Paleolithic skills like stone knapping is less understood. Here we examine the knapping behaviors of 17 subjects who learned to make Oldowan and Acheulian stone tools from watching video demonstrations either with verbal instruction or without sound. Despite intriguing differences in brain activity (measured with fNIRS) between these groups, the mode of social transmission has yet to reveal significant effects on handaxe morphology, suggesting that verbal teaching may not have been necessary for the social reproduction of early stone toolmaking skill. We coded video-recordings of subject performance using BORIS event-logging software and a knapping ethogram to test for possible behavioral differences between conditions that might explain observed differences in brain activity and indicate influences of teaching on early-stage skill acquisition that are difficult to detect from artifacts. These data allow us to test for differences in the frequency and sequential structure of knapping actions across conditions and individuals, potentially guiding further artifact analyses and providing a more detailed picture of the influence of verbal teaching on knapping skill acquisition.

Benfer, Adam (University of Calgary)

[263] *The Archaeology of Travel in Greater Nicoya*

Sometime before AD 1, a dynamic interaction and exchange network developed among the villages and hamlets of Greater Nicoya. The range and frequency of trade within this region is demonstrated by geochemically sourced ceramic and stone artifacts. The travel routes along which these artifacts were traded remain poorly understood. Geographic information systems (GIS) offer a means to predictively model the optimal terrestrial and aquatic travel routes that interconnected the settlements of Greater Nicoya. Accounting for both pedestrian travel on land and canoe-borne travel in the rivers and lakes, I use a GIS to present a probable simulation of the travel infrastructure that facilitated the regional movement of trade goods. I then test and refine the results of my simulations against the rest of the archaeological record. By interpreting this simulated travel network and the given distribution of traded goods within an intersocietal interaction framework, I discuss the role that intraregional movement and mobility played in the evolution of the societies that once thrived in this section of southern Central America. While some trade goods traveled long distances, most interactions were oriented locally or among neighboring polities.

Benfer, Bob (University of Missouri-Columbia)

[64] *Late Pre-ceramic Peruvian Effigy Mound Imagery*

Here I report the use of multiple imagery for understanding the coastal valley site studied most intensively, El Paraíso. Photographs of carved bone figures, plane table maps, Total Station maps, kite orthophoto maps, aerial photos, Google Earth satellite maps, and planetarium maps provide images that, taken together, permit identification of the effigies.

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Identities of both arms of the El Paraíso complex can be recognized: One is a bird. The other resembles the three mythical figures Bischof named the "Monstruo" in an incised bone.

The long axis of the Bird mound at El Paraíso is oriented from the corridor of the principal temple of the site through the body and eye of the bird. On evenings after Zenith days, both the Bird and Monstruo mounds have an azimuth of 32° towards the rise of the celestial river—the Milky Way—through its southernmost point. Other Late Preceramic effigy mound sites and the Late Horizon Machu Picchu site share this orientation. The figures likely represent Andean dark-cloud constellations in the Milky Way.

Bengtson, Jennifer (Southeast Missouri State University) and Amy Michael (Idaho State University)

[215] *Mortuary Analysis and Bioarchaeology: A Survey of Integrative Approaches*

In her chapter in the 2006 volume "Bioarchaeology: The Contextual Analysis of Human Remains", Lynne Goldstein considered the intersection of mortuary analysis and bioarchaeology through a survey of articles from eight prominent archaeology journals (1995–2000). She concluded that significant work remained to be done to appropriately integrate the two fields. In our paper, we summarize Goldstein's critiques and examine more recent publications in these same journals (2006–2016) to characterize the extent to which the potential for further integration noted in her chapter has been realized. We also discuss what Goldstein characterized as emergent foci of mortuary archaeology—namely gender, the individual, the emotive, and landscape studies—to gauge the extent to which such topics have been considered by bioarchaeologists since 2006. We end with reflections on Dr. Goldstein's influence on our own work, particularly as her guidance has inspired us to highlight mortuary analysis and use holistic approaches in our bioarchaeological research.

Benitez, Alexander (University of Alabama)

[139] *The Central American Ceramics Research Project: A Case Study on How to Make Old Museum Collections Relevant Again*

The Central American Ceramics Research Project, a student driven and collaborative research program carried out between 2009–2013, completed a scholarly survey of more than 13,000 ceramic objects in the collections of the National Museum of the American Indian (NMAI). The project originated as an effort to update old catalog information and bring to light important but largely forgotten collections of ceramics. However, it quickly developed into a major collaborative research effort that brought together university students, archaeologists and museum specialists from the U.S. and Central America, established new partnerships between the Smithsonian Institution and Embassy staff from various Central American countries, and ultimately served as the basis for the NMAI's longest running temporary exhibition, "Ceramica de los Ancestros: Central America's Past Revealed." This paper describes the CACRP's history and scholarly research, and offers it as one student driven case study in how to make old museum collections relevant again.

Bennett, Callie [90] see Schroedl, Gerald

Bennett, Rhianna

[168] *Deviating from the Standard: The Relationship between Archaeology and Public Education*

As a social science, archaeology utilizes disciplines within science, mathematics, and technology to answer questions about human behavior and our shared cultural heritage. With its interdisciplinary nature, archaeologists and educators over the last few decades have sought to promote archaeological lessons in K-12 classrooms. The presentation, "Deviating from the Standard: The Relationship between Archaeology and Public Education" uses the state of Georgia as a case study to examine the past, present, and future potentials and impacts of archaeological education in the classroom. By studying educational theory, current federal and state standards, archaeological outreach practices, and presenting data from questionnaire surveys and interviews of educators and archaeologists, this presentation will demonstrate the important contributions that archaeology can make to Georgia education.

Bense, Judith [215] see Benchley, Elizabeth

Benson, Erin (University of Illinois at Urbana-Champaign)

[266] *Composing the Late Cahokian Countryside: A View from the Rhea Site, St. Clair County, Illinois*

The transition between early (AD 1050–1200) and late Mississippian (AD 1200–1350) in the American Bottom is recognized as a significant moment of socio-political and religious change in the historical trajectory of Cahokia. During this time, relationships between persons, places, and things transformed, resulting in different ways of engaging with both Cahokia and the non-human powers that underwrote it and the broader Mississippian world. With a goal of investigating a Moorehead phase occupation in the uplands, the 2017 University of Illinois field school undertook excavations at the Rhea site, uncovering an important site with an unexpectedly complex transitional Mississippian occupation. Specialized architecture suggests a possible "nodal" site, though that which constitutes such a site clearly was changing. Focusing on the material engagements evident at Rhea, preliminary results from ongoing investigations begin to address these changing relationships between Cahokia and its hinterland inhabitants during this pivotal time. Comparing Rhea to known regional patterns provides a basis for focusing on the practices, materials, and architectures that constitute extra-domestic, special-purpose sites after AD 1200.

Benson, Kristin (Vanderbilt University), Teresa Franco (Vanderbilt University) and Tom Dillehay (Vanderbilt University)

[6] *Comparative Micro-Usewear and Residue Analyses on Late Pleistocene Unifacial Tools from Huaca Prieta, Peru, and Monte Verde, Chile*

This study presents the results of a comparative multi-year analysis of high and low power micro-usewear and residue patterns on 14,000–10,000 cal BP unifacial stone tools from the late Pleistocene archaeological sites of Huaca Prieta on the north coast of Peru and the Monte Verde I and II sites in south-central Chile. The archaeological stones from these sites are also compared with experimental assemblages employing various actions (e.g., scraping, cutting, gouging, perforating) to work several types of materials ranging from hard and soft plants to animal hide and meat to fish and shellfish, among others. The analyzed tools are contextualized within the specific activity areas where they were recovered within sites. The contribution of these results to the broader inter-assemblage interpretation of the sites is discussed.

Bentley, Heath (AmaTerra Environmental), Norbert Stanchly (Texas State University) and James Garber (Texas State University)

[43] *From the Sea to the Smoker: A History of Sea Turtle Exploitation on St. George's Caye, Belize*

Historic literature frequently mentions the exploitation of sea turtles throughout the Caribbean by indigenous populations and early settlers alike. Large and abundant, these animals provided a readily accessible protein source for European and African populations as they traveled. A review of documents held by the Belize Archives and Records Service reveals that sea turtle capture and sale was once a large contributor to Belize's coastal economy. Commonly called "turtlers", 25% of the population was involved in the capture and sale of sea turtles by the late eighteenth century. Offshore reconnaissance on St. George's Caye has led to the recovery of sea turtle remains associated with turtle corrals that were documented on a 1764 map. Per results of faunal analysis from the island, the majority of animal remains recovered belong to at least two different species of sea turtle. Turtle species varied in their preference by people as a food item, the method of capture, and their role in the economy. The distribution of the remains of

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these different turtle species across the island helps to provide insight into the relationship of the many inhabitants of St. George's Caye with the various aspects of turtling.

Beresford-Jones, David [224] see Whitlock, Bethany

Berger, Martin (National Museum of World Cultures, The Netherlands)

[70] *From a Cave near Tehuacán? Reconstructing Object Histories of Looted Postclassic Mesoamerican Turquoise Mosaics*

The mid-20th-century market for pre-Columbian antiquities is notoriously opaque. Riddled as this moment in the market is with stories of looting, forgery and deceit, the period between roughly 1950 and 1990 is also the era in which significant parts of today's best-known museum collections of pre-Columbian art were formed. Because of the practices of art dealers many pieces that once formed part of the same original deposit are now scattered over the globe. Any possible information on the provenience of these clusters of objects can only be found hidden away in the archives of the institutions that hold them. The only way to bring these pieces back together and (partially) recontextualize them is through the study and publication of their object biographies.

In this presentation I attempt to reassemble a corpus of Post-Classic Mesoamerican turquoise pieces, that were probably looted in the late 1950s/early 1960s and appeared on the market between 1950 and 1980. All of these are said to come from caves near Tehuacán, but lack any further information on their exact provenience and provenance. Nonetheless, the pieces can be relatively securely traced to specific localities or regions through a combination of stylistic, archaeological and archival research.

Berger, Uri (Israel Antiquities Authority) and Gonen Sharon (Tel Hai College)

[71] *An Israeli (real COOL) Dolmen*

Excavation in the Shamir Dolmen Field (comprising over 400 dolmens), on the northern Israeli basaltic terrains, was carried out following the discovery of enigmatic rock art engravings on the ceiling of one of the largest dolmens ever recorded in the Levant. Excavation of this dolmen, covered by a basalt capstone weighing some 50 tons, revealed a secondary multi-burial (of both adults and children) rarely described in a dolmen context in Israel. Engraved into the rock ceiling above the multi-burial is a panel of 14 forms composed of a vertical line and downturned arc motif. Building of the Shamir dolmens required a tremendous amount of labour, architectural mastery, and complex socio-economic organization well beyond the capacity of small, rural nomadic groups, thought that have lived on this era. The monumental megalithic burial of the Shamir dolmens indicates a hierarchical, complex, non-urban governmental system. The newly discovered rock art and the burial uncovered beneath it, brings new hope, to the dolmen culture research in Israel and the Levant. The dolmens of Shamir, bring us a new leap on the way knowing one of the most mysterious and underestimated cultures of the biblical landscapes.

[71] *Chair*

Bergh, Sarah (Union Institute & University)

[188] *Changes in Resource Use during the Mississippian Period on St. Catherines Island, Georgia*

After more than forty years of zooarchaeological research on prehispanic collections from coastal Georgia, it is clear that people exploited the same suite of estuarine resources from the Late Archaic through the Mississippian periods, despite changing socio-political conditions. However, changes in resource use over time are evident when fine-grained recovery and multiple analytical techniques are applied to vertebrate and invertebrate collections from the Mississippian period on St. Catherines Island. Specifically, late Mississippian populations used different fishing techniques and exploited a wider range of shellfish habitats. In addition, these analyses suggest differences in length of site occupation and waste disposal practices. This research demonstrates that analyzing multiple datasets recovered with fine mesh can yield new information, and supports the hypothesis that societies with different socio-political realities have different relationships with their environment.

Bergin, Sean (School of Human Evolution and Social Change, ASU) and Grant Snitker (School of Human Evolution and Social Change, ASU)

[221] *Large-Scale Socioecological Transformation: The Effects of Subsistence Change on Holocene Vegetation across Europe*

During the early and middle Holocene, the introduction of agropastoral subsistence to Europe resulted in significant social and economic transformations. For decades, researchers have recognized that early agricultural communities had an ecological impact on the surrounding landscapes. As a whole, paleoecological records indicate increases in charcoal abundance and changes in vegetation communities' distribution or diversity related to Neolithic agricultural land clearing, burning, or pastoral activities. Yet, most research on the paleoenvironmental impact of Neolithic agropastoral systems have been limited to site-based or regional analyses—without a broader discussion of the ecological impact of Neolithic land-use across multiple ecoregions.

This study attempts to better understand the spread of Neolithic subsistence across Europe by contrasting the chronological and spatial patterning of the spread of agriculture with the palynology of Europe during this period. We utilize a database of over 5,000 radiocarbon dates from Neolithic contexts through Europe and a comprehensive pollen dataset adapted from the European Pollen Database. From these data, we construct and statistically compare chronosurfaces of Neolithic occupation and major vegetation transformations to track the pace and intensity of ecological change in Europe due to the initial shift to agropastoral land-use.

[234] *Discussant*

Bergmann, Christine (University of South Florida) and Robert H. Tykot (University of South Florida)

[154] *Assessing Food-Based Trade and Mobility in the Chincha Valley (Peru) Using Portable X-Ray Fluorescence Spectrometry*

Peru is commonly known for having the largest empire in pre-Columbian America, but comparatively little is known about the subsistence practices of the pre-Inca communities that existed in the inland valley of Chincha during the Late Intermediate Period (AD 1000–1476). The Chinchas formed a powerful socio-economic entity within the Chincha Kingdom in part of the southern region of Peru nearest to the Pacific Ocean. Our research tests the hypothesis that individuals relied more heavily on a food-based trade networking system with other coastal rather than highland populations, using a portable X-ray fluorescence spectrometer to measure strontium, barium, calcium, and other elements in twenty-six human bones from four tombs in the Chincha Valley as a case study. Although the use of a non-destructive pXRF has become a very beneficial tool for the analysis of archaeological materials, relatively little has been done on human bone to elucidate subsistence practices, mainly due to limitations of surface analysis on potentially degraded and/or contaminated material. In addition, newly created bone standards are used to calibrate and enhance the validity and reliability of our data.

Berman, Judith [206] see Glass, Aaron

Berman, Mary Jane (Department of Anthropology, Miami University)

[323] *Lucayan Paleoethnobotany: Dynamism and Stability in the Bahama Archipelago*

Since the first overviews of Lucayan paleoethnobotany were published, the means and sites of archaeological recovery have expanded and the body of finds has increased. In this presentation, we summarize these findings, evaluate the current body of knowledge, discuss the contexts in which they were recovered, analyze their recovery methods, and examine their

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economic and social uses. We discuss the evidence for “transported landscapes,” cultivation management systems, wild plant collection strategies, plant food preparation, fuel wood management, perishable technologies, transportation technologies, and the uses of various plants for symbolic and political purposes. Finally, we discuss temporal and inter-island differences in plant use in the face of climatic variability and change during the period of Lucayan occupation.

[237] *Moderator*

Berman, Mary Jane [123] see Gnivecki, Perry

Bermeo, Nicolas (Université Paris 1 Panthéon-Sorbonne), Michelle Elliott (Université Paris 1—UMR 7041 ArScAn), Nicolas Goepfert (CNRS—UMR 8096 ArchAm) and Belkys Gutiérrez (BGL Arqueología)

[153] *Fuel Use and Management at the Specialized Fishing Site of Bayovar-01 in Northern Coastal Peru (5th–8th Centuries AD), Contributions of Charcoal Analysis*

The Sechura desert located on the extreme northern coast of Peru is one of the most arid places on the planet. Nonetheless, human settlements have been recorded from 5000 BC up to the 15th century. Recent archaeological excavations have been carried out at the site of Bayovar-01 (occupied from the 5th to 8th centuries AD). The new data provide insight into the activities and adaptations of the desert’s ancient inhabitants. The presence of two small structures, a large activity area containing a significant amount of fish remains, and traces of hearths, indicate that Bayovar-01 was an opportunistic settlement, benefitting from favorable environmental conditions: the presence of an ancient lagoon; and served as a specialized site for fishing and the preparation of fish.

The analysis of charcoal remains from three different features corresponding to large hearth remains sheds light on practices of firewood gathering and usage. Taxonomic and morphological analyses reveal strong preferences for certain taxa, possible gathering strategies combining dead wood collection and tree felling, the usage of several different tree parts, and consistent combustion conditions across the three features. Despite selection biases, taxa composition may offer yet another indication of the existence different environmental conditions in the desert.

Berna, Francesco [41] see Hlubik, Sarah

Bernal, Itzayana [293] see Soler-Arechalde, Ana

Bernardini, Wesley [218] see Duff, Andrew

Berquist, Stephen (University of Toronto) and Thomas Hardy (University of Pennsylvania)

[295] *Deep Time and Human Action: An Introduction*

The end of history has ended. Our social conditions, and indeed many of our greatest social ills, are now understood to have been generations in the making, the result of accumulations and sedimentations of quotidian human action. This introduction posits that such accumulations and sedimentations are not mere metaphor, and that the material world is the ongoing expression of the force of history. Following key post-structuralist insights, we argue that the contents of these histories are not internal to the human mind, nor to abstract ideological structures, but are produced through embodied practices that mobilize material objects and leave material traces, whether those traces be ceramic sherds, architectural remains, or bureaucratic documents. As such, archaeology is poised to not only engage with critical theoretical discussions in the social sciences but also to impact to our understanding of the “long now” of the present. Recent archaeological and anthropological publications have indeed proposed frameworks for conducting archaeological interpretation and analysis of the longue durée. This paper will review these important contributions, putting them in the context of the broader historical and archaeological turns in the social sciences, before opening the session to our contributors.

[295] *Chair*

Berrone, Morgane

[324] *Las practicas funerarias del Formativo en la costa ecuatoriana: resultado de*

El presente estudio se organiza en torno a una doble problemática relacionado al Formativo de la costa ecuatoriana (4400—300 BC): el examen de los gestos funerarios y su comparación en una perspectiva diacrónica e intercultural. Con un examen teórico y estadístico se puede identificar normas funerarias propias a cada cultura. La comparación intercultural permite de subrayar similitudes y diferencias entre las diferentes culturas del Formativo.

Procede de los diferentes trabajos arqueológicos llevados sobre el sujeto y de ese análisis que las prácticas funerarias están caracterizadas por una gran variabilidad en cada cultura formativa y entre ellas. Detrás de esas costumbres se esboza un fondo espiritual y cultural relativamente homogéneo, subrayado sobre el plano arqueológico por construcción de tolvas, generalización de inhumación, presencia de elementos simbólicos similares en las tumbas. Ese vestigio son indicios de forma de organización complejas en aquellas los líderes podrían utilizar practicas funerarias para legitimar un orden social y cosmológico por un culto de ancestros por ejemplo.

Berryman, Carrie Anne [87] see Blom, Deborah

Berryman, Judy and William Walker (New Mexico State University)

[122] *Ashes, Arrows, and Sorcerers*

Magic and witchcraft, like many classic topics in the anthropology of religion, involve everyday things such as dogs, plant pollen, ashes, and arrow points. As such the archaeological record offers a rich source of ancient religious practices if we can link formation of its deposits to past ritual activities. For example, strata exhibiting ash and projectile points deposited on floors and in the fill of abandoned houses may derive from protective magic. Rather than haphazardly tossed hearth detritus and/or lost arrow points, these common deposits may reveal uncommon evidence of ritual reactions to malevolent power. In the ethnographic record of the American Southwest, ash and projectile points offer protection against death and sickness caused by witchcraft and sorcery. Our case study at Cottonwood Spring Pueblo, a late prehistoric village (A.D. 1300–1450) in southern New Mexico, demonstrates that ash and arrow points prophylactically protected these places and their former occupants from harm.

Berryman, Stanley (NMSU)

[258] *Joe Ball, Friend and Mentor*

As one of the fortunate students who was at San Diego State University in 1975, I was present for the announcement that Dr. Joe Ball had been hired as a professor of Anthropology in the Department of Anthropology. As a contemporary of Joe, I had the opportunity to see his early contributions to the growth of the Department in the 1970’s and his willingness to give his time and energy to help his students be successful regardless of their focus in archaeology. It did not matter if the student’s interest was in Mayan archaeology or in San Diego County archaeology—academic or CRM they received the same time, effort and concern. Joe sponsored a field school at the La Fleur site in eastern San Diego County to help train students, most of whom would remain in the region. I had the good fortune to be involved in those early years of his tenure at San Diego State University and can directly place much my success in archaeology with having been a student and friend of Joe.

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Bettcher, Katrina and Lidio Valdez (MacEwan University)**[333]** *The Archaeology of the Acari Valley and the Legacy of Francis Allen "Fritz" Riddell*

In 1954, newlywed archaeologists Francis Allen "Fritz" Riddell and Dorothy Menzel arrived in the Acari Valley on the south coast of Peru with the purpose of investigating the site of Tambo Viejo as part of the Inca Royal Highway Project directed by Victor von Hagen. Various sites in the region were recorded and investigated. After retirement in the early 1980s, Fritz was drawn back to Peruvian archaeology. With the California Institute of Peruvian Studies, projects involving Peruvian and foreign archaeologists, as well as non-professional participants from Acari and abroad, revisited sites and investigated new findings. Fritz was concerned about the destruction of sites that had been recorded in the 1950s so he worked with local officials and citizens to encourage preservation. Rescue excavations were carried out at Tambo Viejo. Materials from looted sites were recovered, catalogued and stored. Though he passed away in 2002, Francis A. Riddell's legacy endures in the Acari museum that has been named after him and in continuing work at the site of Tambo Viejo.

Betti, Colleen (The University of North Carolina, Chapel Hill)**[67]** *Porcelain Dolls and Marble Balls: The Role of Toys and Play in the Gendered Socialization of Enslaved Children*

Children comprised a large portion of the enslaved population on plantations in the American South, but their lives are often overlooked or ignored in archaeological studies of plantation life and discussions of changes in how children were viewed in American society. Over the course of the 18th and 19th centuries, there was a shift in how children and play were viewed, from miniature adults for whom play was utilitarian, to a separate life-stage where play was children's primary purpose and necessary for proper socialization. This paper examines the inclusion of enslaved children within larger shifts in conceptions of childhood in 18th and 19th century America through manufactured toys provided to enslaved children. Toys recovered from fifty-two slavery related archaeological sites in Maryland, Virginia, North Carolina, South Carolina, and Tennessee, cataloged into the Digital Archaeological Archive of Comparative Slavery (DAACS), show that toys given to enslaved children by white slave owners, and potentially enslaved parents, provided an important source of gendered socialization and are evidence of the inclusion of enslaved children within larger societal shifts in the meaning of childhood

Betts, Matthew (Canadian Museum of History) and Gabriel Hrynck (University of New Brunswick)**[84]** *Introducing COASTAL in Nova Scotia: Community Observation, Assessment, and Salvage of Threatened Archaeological Legacy*

While the technological and methodological challenges facing archaeologists seeking to address the coastal erosion issue are noteworthy, the responsibility to formulate ethical, engaged, and collaborative research methodologies is equally pressing. The impact of coastal erosion and sea level rise on archaeological sites creates significant challenges for Indigenous peoples engaged in reclaiming their own histories and rights. Archaeologists studying threatened sites must therefore also be deeply engaged with Indigenous partners, whose history is literally being swept out to sea. Our paper outlines the goals and aims of the COASTAL archaeology project, which seeks to develop a shared-authority partnership with Indigenous collaborators. We also outline methodological challenges and opportunities of working on Nova Scotia's coastlines, and highlight the need for tailored strategies to address the erosion issue. Consultation with local informants and collaborators, as well as public archaeology events, are critical for locating sites and saving precious survey resources. We also describe the advantages of using manual subsurface probes to delineate site deposits rapidly and accurately.

Bevan, Andrew [29] see Schauer, Peter

Bey, Bridget and Véronique Bélisle (Millsaps College)**[270]** *A Look at Local Populations during Wari Expansion: Bioarchaeology and Funerary Contexts at Ak'awillay, Cusco, Peru*

Although the climate and rich cultural history of Peru frequently offers a perfect setting for bioarchaeological analysis, the pre-Inca peoples of the central Andean highlands often lack full representation within that analysis. Yet, excavations at Ak'awillay, a village in the Cusco region, between 2006 and 2016, revealed 79 bodies. Most of the remains recovered from the site date to the Middle Horizon (AD 600–1000); however, previous analysis of the architecture and artifacts at the site suggest that this population did not emulate Wari lifestyle. This paper provides a profile of a substantial part of the local population of Ak'awillay, shedding light on living and health conditions in Cusco during the Middle Horizon. This profile includes both the demographic make-up and the skeletal pathology of this population, as well as an evaluation of grave goods and cultural modifications done to the bodies before and after death. Preliminary analysis indicates that the people of Ak'awillay maintained unique cultural practices but led a rigorous lifestyle. Since this population was not heavily touched by either violence or sacrifice, our analysis documents a large sample of individuals who died of natural causes and provides a rich comparative dataset for Middle Horizon Peru.

Bey III, George J. [162] see Kohut, Betsy

Beyin, Amanuel [103] see Lanza, Christopher

Bezerra, Marcia (PPGA/UFGA)**[63]** *Is There a Public Archaeology?: An Approach from Brazil*

This presentation aims to discuss Public Archaeology (PA) from a Brazilian approach. Based on a study that includes a bibliographical survey, and the analysis of the papers presented at scientific meetings in Brazil, I examined: a) the role of PA in the contemporary agenda of the archaeology in Brazil; b) the connections between PA, Heritage Education (HE), and the development projects, and c) its relationship with the decolonizing perspective of the discipline in Latin America. In addition, I also recognize gender issues in the domains of PA in the country, which is mostly linked to women, either as authors of academic literature or as coordinators of events, actions, and projects of PA (or HE). Finally, I critically analyze my own work within Public Archaeology in Amazon. Such questions have made me reflect about the concepts and goals that legitimate the category "Public Archaeology".

Bicho, Nuno (Universidade do Algarve), Célia Gonçalves (ICArEHB—Universidade do Algarve) and João Cascalheira (ICArEHB—Universidade do Algarve)**[124]** *GIS Tools for Intra-spatial Analyses: The Portuguese Mesolithic Cabeço da Amoreira Case Study*

The case of the Portuguese Muge shellmounds (Tagus valley, central Portugal), and specifically the case of the Cabeço da Amoreira site, is one of the most interesting regions to study the last hunter-gatherers in Western Europe. However, these sites, are very large with long and complicated sequences and, until recently, had very little excavation control and thus data were not appropriate for spatial analyses. During the last decade, our team used new and precise excavation techniques resulting in high resolution provenience data for all types of artefact classes. This paper focus on the Cabeço da Amoreira data, representing at least 7 time horizons, based on GIS analyses of intra-spatial distribution of different categories of artifacts. The use of the ArcGIS software was essential for the analysis of quantitative and qualitative data, allowing the establishment of intrasite spatial relationships through the use of statistical procedures such as the Average Nearest Neighbor and the Kernel Density Estimation. Distributions and correlations of artifacts allowed the identification of different functional areas, the use and organization of space, and the interpretation of relevant site formation processes.

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Bicho, Nuno [221] see Gomes, Ana

Bickenheuser, Cathy [106] see Clark, Jorie

Biehl, Peter (SUNY Buffalo)

[247] *Chair*

Biers, Trisha and Marta Mirazón Lahr (Centre for Human Evolutionary Studies, University)

[143] *Innovation and Curation: Conservation and Access of University-Held Collections for Research*

The Duckworth Collection is one of the world's largest repositories of human remains, numbering approximately 18,000 individuals. These range from blood samples, to hair bundles, single bones, complete skeletons, mummies, and decorated skulls, and are widely used for scientific research. Throughout the 19th and 20th centuries, anthropological and biological research gave us a greater understanding of human diversity, much of it based on anatomical evidence. Cambridge was at the forefront of this endeavour, and the result was the Duckworth Collection and Laboratory. Following best practice guidelines in the document Guidance for the Care of Human Remains in Museums by the Department of Culture, Media and Sport (DCMS) in October 2005, the Duckworth Laboratory created its own Policy for the Curation and Conservation of Human Remains. However, the past few years has seen a surge in biomolecular analysis of archaeological remains including human bone, teeth, tissue, hair, and dental plaque; innovative projects that require destructive analysis. A new position of Collections Manager for the Duckworth was created to facilitate this research whilst maintaining the integrity of the Collections. This presentation highlights the recent challenges in balancing both academic demand for sampling and the curation of human remains in the UK.

Biffano Marcial, Gloria [260] see Brizuela Casimir, Alvaro

Bigelow, Gerald F. (Department of History, Bates College), Michael E. Jones (Department of History, Bates College) and Casey Oehler (Department of Archaeology, Durham University)

[167] *Coastal Geocatastrophes as Agents of Change on Multiple Time Scales: A Case Study from the Shetland Islands, UK*

The coasts of northernmost Britain and neighboring North Sea countries offer numerous examples of sand environments that have been both settled and completely abandoned by humans at various times. These areas' rich archaeological records reveal many examples of once-thriving human settlements that were challenged and eventually terminated by burial in aeolian sand over periods ranging from days to decades. The origins and socio-ecological dynamics of these geocatastrophes may reflect important patterns of human adaptation or mismanagement conditioned by large, inter-regional forces such as climate change and international politics, down to local phenomena that operated at the community or even individual landholder level. This paper reports on interim findings of research by the Shetland Islands Climate and Settlement Project on a prosperous farming community that was permanently destroyed by drifting sand in the late 17th century CE, a period of dramatic climatic and political changes that also offers a broad range of documentary, archaeological and environmental evidence for high resolution dating and interpretation.

Bigelow, Nancy [182] see Reuther, Joshua

Biggie, Michael (Los Angeles Maritime Institute), John Walden (University of Pittsburgh), Jaime Awe (Northern Arizona University), Rafael Guerra (University of New Mexico) and Julie Hoggarth (Baylor University)

[33] *The Shell Game: Maya Cosmology as Reflected in Recent Discoveries at Tutu Uitz Na*

The plaza held special significance to the ancient Maya, and across ancient Mesoamerica. In a reflection of Maya cosmological beliefs, the plaza was seen as a representation of, and a portal to the primordial sea, the watery underworld from which all things originate. This connection is evident in various ways throughout the region, from special dedicatory deposits to decorative architecture and iconography. This presentation explores that cosmological salience through the recent excavations at Tutu Uitz Na, a large intermediate elite residential and ceremonial group situated in the Belize Valley, in the hinterland of the Late-Terminal Classic (AD 700–900) polity of Lower Dover. Tutu Uitz Na rose earlier, during the Middle Preclassic (1000–400 BC). The initial founding of the group saw the placement of a consecratory ritual deposit of artifacts associated with the watery underworld: figurines, marine shell, and an estimated 26 million river snails, all laid beneath the plaza. Excavations at a nearby commoner patio group have revealed a similar Middle Preclassic deposit beneath the patio. This paper explores the importance of this deposit and seeks to situate it within other case studies from Mesoamerica, to establish a distinct pattern of intent on the part of the ancient Maya.

Biggie, Michael [82] see Walden, John

Blittner, Katie (MacEwan University)

[317] *Discussant*

Bikoulis, Peter [303] see Murphy, Shaun

Bilgen, Zeynep [146] see Cercone, Ashley

Billadello, Janine (CUNY Graduate Center) and Anarrubenia Capellin Ortega (CUNY Graduate Center)

[86] *Testing Methods of Microbotanical Analysis on Samples from the Copan Valley, Honduras*

The Copan Valley in western Honduras has been the subject of a number of studies concerning human-environmental interaction, with particular emphasis on questions of ancient sustainable practices and whether or not land-use mismanagement contributed to the end of the Maya dynasty at Copan. The current PARAC project seeks to identify the range of foods consumed by the inhabitants of the Copan Valley during the Late Classic to Postclassic period. This paper will describe analyses conducted on artifacts recovered from residential contexts at the Late Classic site of Río Amarillo. The extraction of residues, as well as microbotanical analysis of ceramics and groundstones was used to test for the presence of comestibles processed using these implements. The results of this work are compared with the analysis of macrobotanical samples from local middens, thus providing a multivariate perspective on ancient foodways in this region.

Billeck, William

[337a] *Repatriation at the National Museum of Natural History, Smithsonian Institution*

Repatriation at the National Museum of Natural History is conducted under the National Museum of the American Indian (NMAI) Act of 1989, as amended in 1996, and involves the return of affiliated human remains, funerary objects, sacred objects and objects of cultural patrimony. In the 28 years since the passage of the NMAI Act, the museum has affiliated over 6,000 individuals and thousands of objects and completed over 120 repatriations to Native Alaskan, Native Hawaiian and Native American tribes. Repatriation has led to increased interactions with the Native American community and has changed the way that the museum works with community members and collections. Over time, the Repatriation Office has become

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a primary contact point for Native Americans interested in the museum's collections and records. This paper and the following session will discuss the changes and developments in repatriation at the museum over the past two-and-a-half decades.

[280] *Discussant*

[337a] *Chair*

Billman, Brian (UNC & MOCHE, Inc.), Patrick Mullins (University of Pittsburgh) and Jesús Briceño

[165] *Rooms, Houses, and Neighborhoods: Drone-Mapping and GIS Analyses of the Household Architecture at Cerro la Virgen, Moche Valley, Peru (AD 1100–1470)*

Here we explore the spatial patterning of the Small Irregular Agglutinated Residences (SIAR) at the Chimú town of Cerro la Virgen (1100–1470 AD) in the Moche Valley, Peru. Few examples of “Andean Households” are as enigmatic and iconic as SIAR, which were closely associated with the florescence of the Chimú Empire. Large barrios consisting of SIAR architecture are found at the Chan Chan (the Chimu capital) and at all Chimu provincial centers throughout the empire. Cerro la Virgen once lay in the rural hinterland of Chan Chan at the distal end of a vast system of state fields, which are believed to have supported royal activities at Chan Chan. At the site, well-preserved residential architecture covers 14 ha. We created a 3-D rendering of all the SAIR architecture at the site by processing aerial drone photography. Recent SAIR excavations at the site were used to identify room types, which were then employed in a quantitative analysis of household and community spatial patterning. As a result, we were able to identify household units, household clusters, and neighborhoods. Based on this study, we propose new quantitative methods for analyzing households, communities, and neighborhoods in the Andes and other regions.

Billman, Brian [165] see Hudson, Jean

Billstrand, Nicholas [129] see Freiwald, Carolyn

Binimelis, Alonso (Student)

[65] *Sistemas de arquitectura local e incaica durante el Periodo Tardío en las tierras altas de Arica y valle de Lluta, Chile*

Durante el Periodo Intermedio Tardío en las tierras altas de Arica, las influencias altiplánicas se encontraban en la sierra y valles altos, caracterizados por arquitectura funeraria (chulpas) y la cerámica, representando relaciones de poder y estatus social dentro de las comunidades locales. Durante el Periodo Tardío, con la introducción de elementos incaicos al altiplano boliviano, el área dominada por los pueblos altiplánicos fue influenciada por la cosmovisión y tecnología incaica, lugares como Tambo Incahullo (Sierra de Arica), Molle Pampa (Valle de Lluta) y Tambo Sabaya (Altiplano Boliviano) son sitios con una composición arquitectónica similar, pero con diferentes emplazamientos y materiales de construcción, destacando elementos como Chulpas, Plazas y un recinto circular aislado. Este estudio identifica elementos locales y de influencia incaica a través de la descomposición del sistema arquitectónico utilizando fotogrametría y mapeando estos sitios presentes en distintos pisos ecológicos y cambios desde el periodo Intermedio Tardío hasta el Periodo Tardío Inca para enfocarse en el sitio Molle Pampa (Valle de Lluta) y la identificación de Chulpas y elementos característicos de las influencias altiplánicas-incaicas adaptados a los sistemas arquitectónicos locales de este valle costero, entendiéndose como dinámicas sociales que pueden estudiarse a través de la arquitectura.

Binning, Jeanne (California Department of Transportation)

[140] *Prehistoric Tool Stone Acquisition and Use in the Central Mojave Desert*

Diverse rocks of the Precambrian to the Late Cenozoic are exposed across the greater Mojave Desert Region. In the central Mojave, locations with concentrations of knappable materials are prevalent. Most of these sources are deflated alluvial fan deposits; less than five percent are outcrops. Over the last 13,000 years people have been using the area, percussion biface reduction dominated at both the material extraction sites and habitation and special activity sites. Igneous materials were preferred by people using the area during the early Holocene and chert was preferred during the middle and late Holocene. The size of bifacial cores remains consistent throughout most of the Holocene; however, about 1500 years ago, there is a significant reduction in the size of these cores. Finally, there is evidence that much of the stone, after being tested, was found to be undesirable and left at the extraction sites. Explanations for these patterns are presented.

Birch, Jennifer (University of Georgia)

[119] *Migration, Dispersion, or Purposeful Relocation?: Flexibility as an Adaptive Settlement Strategy in Northern Iroquoia, ca. A.D. 1300–1650*

Flexibility is a defining characteristic of the Iroquoian settlement landscape. Population movement, amalgamation, coalescence, dispersal, resettlement, incorporation, and abandonment occurred at the local and regional scales throughout Iroquoian history. Even those groups that persisted within more or less the same territories from A.D. 1300 through the contact era had complex and dynamic settlement histories. This paper considers patterns of settlement relocation in Northern Iroquoia with an eye to clarifying how these processes relate to or differ from contemporaneous cultural transformations in the Midwest and Southeast. In particular, I consider how periods of collapse or instability in other parts of eastern North America coincided with periods of increased stability and complexity in Iroquoia. Data from recent Pan-Iroquoian social network analyses are employed as a means of characterizing the relationships between sending, host, and migrant communities. I posit that the flexibility inherent in Iroquoian settlement patterns and socio-political organizations conferred a degree of resilience on these populations that persisted into the historic era.

Birch, Jennifer [190] see Conger, Megan

Bird, Darcy (Utah State University) and Jacob Freeman (Utah State University)

[105] *Rates of Change in Radiocarbon Date Frequencies and Population Collapse*

Recent analyses of large samples of radiocarbon dates shows a change in radiocarbon date frequencies between 3000 BP and 800 BP. There is either an exponential or super-exponential increase in radiocarbon date frequencies followed by a sudden decline. The goal of this poster is to test a population ecology model as to whether or not the degree of population overshoot can predict the degree of population collapse. We want to analyze if the rate of increase in radiocarbon date frequencies over time can predict the rate of the subsequent decline. We compare a global sample of radiocarbon curves, controlling for latitude, elevation, and distance to the coastline.

Bird, Douglas (Penn State University) and Rebecca Bliege Bird (Penn State University)

[114] *The Emergence of Dreaming Landscapes: Indigenous Disturbance and Representation of Ecological Homelands in Australia's Western Desert*

Martu are Traditional Owners of expansive estates in Australia's Western Desert. They maintain distinct networks of social interaction, mobility, and economic organization through which emerge novel ecosystemic relationships. Such networks in the Western Desert involve trophic interactions between people and many other species, and are sustained in patterns of consumption and renewal, especially anthropogenic disturbance via landscape burning for the purposes of hunting and sharing small game. Martu homelands are constructed in the weave of these interactions, and are represented in patterns that have clear archaeological signatures. Here we illustrate ways that Martu hold and represent their ecosystems and archaeological landscapes, especially in values of disturbance and consumption. We attempt to show how some notions of “conservation” (defined in

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terms of archaeological heritage or otherwise) can work at cross-purposes with values of disturbance maintained by many remote-living Martu. We then discuss broader implications of Indigenous ecological representation for the ways in which our discipline typically investigates diachronic changes human-environmental interaction.

Bird, Douglas [92] see Zeanah, David

Birge, Adam (University of Texas at San Antonio)

[100] *Movement, Inka Ceques and the Sajama Lines of Bolivia*

When the Inkas encountered them, the Carangas ethnic group in western Bolivia were highly mobile through lifestyles that relied on camelid pastoralism, caravanning, and ritual movement. Examples of Inka sites are known in the region, but it is not fully understood how they impacted movement through the Sajama lines—a network of ritual pathways that stretches over 16,000 kilometers. This poster compares new data from 2017 to previous work in the Sajama region to examine how movement along the Sajama lines changed over time, from prior to the Inka till recent memory. Through GIS, both archaeological and modern sites are compared to examine proximity to ritual pathways as well as logics of movement through termination points and directionality of geoglyphs. The goal of this research is to provide a comparison between the ceques of Cusco and the Sajama lines to examine how the Sajama lines may have been adapted to Inka understandings of ritual movement.

Birkmann, Joseph (University of New Mexico) and Bruce Huckell (University of New Mexico)

[186] *AZ BB:13:70 A Buried Middle Archaic Occupation in the Tucson Basin, Southeastern Arizona*

Although long known from surface sites, the Middle Archaic record in the Tucson Basin includes very few in buried alluvial contexts. AZ BB:13:70 is a Middle Archaic occupation site located along Brickyard Arroyo, a deeply incised tributary arroyo of the Santa Cruz River. First discovered in 1975, the site was revisited throughout the early 1980's and investigated formally in the summer of 1984 after monsoon rains created an extensive exposure of features and artifacts along the arroyo. The site yielded an assemblage of over 150 flaked and ground stone artifacts, several roasting pits, and the poorly preserved remains of a juvenile bison. We present a description of the site and its stratigraphic context, along with an analysis of the flaked stone and ground stone artifacts recovered. We conclude with a discussion of the importance of the site for current understanding of local and regional Middle Archaic subsistence and settlement.

Birkner, Erica [85] see Libbon, Jonathan

Birkner, Erica [303] see Reed, Karen

Birmingham, Katherine and Christine Ames (Urban Archeology Corps)

[202] *D.C. Urban Archeology Corps: The Surveying is in the Details*

In the summer of 2017, the D.C. Urban Archeology Corps (UAC), jointly managed by the National Park Service, National Capital Parks-East, and Groundwork DC, conducted a Phase I shovel test pit survey at the Frederick Douglass National Historic Site, where Douglass lived between 1877 and 1895. The UAC is a summer program where urban youth learn about the field of archeology and how it applies to local communities and parks. Participants research the archeological significance of local parks, conduct excavations, identify and process artifacts, and create a culminating project to present to the community. The purpose of the survey was to fulfill the requirements of Section 110 of the NHPA. Simultaneously, the program goal was to train UAC participants in the process of conducting a Phase I survey from beginning to end. This paper will focus on the fieldwork findings, but also discuss the utility in teaching the archeological process in the context of a NPS site. The successful completion of the survey and the knowledge and skill sets UAC participants learned and developed along the way were products of this strong program structure.

[202] *Chair*

Birnbaum, Michelle (University of Wisconsin—Milwaukee)

[69] *Prehistoric Ceramic Production Variation during the Early and Middle Woodland at the Richter Site, Door County, Wisconsin*

The Richter site (47DR80) located on Washington Island, Door County Wisconsin was excavated by the University of Wisconsin field school during 1968 and 1973. Large quantities of ceramic materials were recovered. This site was identified as belonging to the Middle Woodland North Bay culture as defined by Mason. Among the body sherds were those with smooth or cordmarked exterior surfaces. Smooth surfaced sherds exhibited breaks along coil lines, indicative of coil construction technique. Meanwhile, coil breaks were not recorded on cordmarked sherds indicating a manufacturing technique based on fusing slabs of clay utilizing a cord wrapped paddle and anvil. The Richter site data indicate that surface finish results from variable manufacturing techniques, and may not be strictly decorative in nature. Furthermore, there is evidence of temporal differences in the two construction methods at Richter. Cord marked slab vessels appear to be associated with Early Woodland period site occupation, while smoothed coiled vessels, which are very similar to those found at Laurel sites, are associated with Middle Woodland occupation at the site.

Bîrzescu, Iulian [130] see Rabinowitz, Adam

Bischoff, Robert (Brigham Young University)

[287] *An Examination of the Role of San Juan Red Ware Vessels in Social Interaction*

This paper evaluates the role that San Juan Red Ware played in social interaction. San Juan Red Ware was widely distributed throughout the Four Corners region between ca. A.D. 750 and 1100. Prior research has identified this ware as a marker of identity and established an association with communal feasting. A study of the distribution of this ware indicates that it was traded through specific social networks, which changed through time. While ceramics may profitably be used as stand-ins for actors in social networks, my focus is to investigate the roles that the ceramics themselves played in social interactions by evaluating how the material characteristics of these vessels helped to transmit and reinforce ideas of identity and community.

Bishop, Katelyn (University of California, Los Angeles)

[171] *Bird Behavior and Biology: A Consideration of the Agentive Role of Birds in Chaco Canyon, New Mexico*

As one of the only classes in the animal kingdom capable of flight, birds are privy to a realm of movement that humans can only partially control. Birds possess specific traits and engage in a variety of behaviors that directly affect the mechanics of capture and use, such as gregariousness and flock size, preferences in nesting and feeding locations, wing strength and readiness to flush, and aggressiveness and territoriality. Human-bird relationships also move beyond the semantics of capture to cases in which birds are kept in captivity as sources of feathers and/or awaiting sacrifice, as pets, and as domestic birds. Chaco Canyon, New Mexico was the center of a large regional system in the Pueblo II period (AD 850–1150). The avifaunal assemblages from one great house, Pueblo Bonito, and two small sites, BC 57 and BC 58, will be examined and compared. I will consider the qualities and behaviors of the avifaunal taxa in these assemblages that would have influenced human-bird interactions. I will then discuss the implications of

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these behaviors and the unique ways that birds may have exerted agentive force and control over the experiences of bird capture, captivity, management, and use.

Bishop, Ronald L. (Smithsonian Institution)
[246] *Discussant*

Bishop, Ronald L. [258] see Reents-Budet, Dorie

Bissett, Thaddeus (Northern Kentucky University), Martin Walker (University of Tennessee), Sean Taylor (South Carolina Department of Natural Resources) and Michael Russo (Southeast Archaeological Center)

[34] *The Utility of Public LiDAR Data for Detecting and Documenting Low-Relief Archaeological Sites: A Case Study from the Pockoy Island Shell Rings, Charleston County, South Carolina*

This paper evaluates the utility of high-resolution LiDAR-derived elevation data for remotely surveying difficult-to-access coastal areas to identify possible archaeological sites, which can then be targeted for further investigation. To determine the effective limits of the elevation data to visualize low-relief structures, locations of previously-recorded Archaic and Woodland-period shell rings along the lower Atlantic coast were examined. Thirty-four rings were identified, including two previously undetectable at ground level without the use of shallow geophysics. To determine if undocumented rings could also be located using this method, the survey was then extended to an area along the South Carolina coast where shell rings were not previously documented, but which is situated a few kilometers from several known rings. In multiple LiDAR datasets, two faint ring-shaped anomalies were identified within the survey area. Fieldwork in May and July of 2017 confirmed that both anomalies represented low-relief Late Archaic shell rings. We conclude with preliminary data from the July fieldwork on the two rings, and contrast site maps produced using the LiDAR-derived data with those from ground-based topographical mapping, subsurface probing, and shovel testing. With moderate processing to filter “noise” in the dataset, high-resolution LiDAR-based maps rival those produced using ground-based methods.

Bissett, Thaddeus [135] see Anderson, David

Bisson, Michael (McGill University)

[219] *Uses and Limitations of the “Sangoan” for Understanding Hominin Mobility and Dispersals: An Example from Northeastern Zambia*

The Sangoan, a late Middle Pleistocene technological tradition widely distributed in Sub-Saharan Africa, follows the Acheulean and is considered by some to represent the earliest manifestation of the Middle Stone Age. It may coincide with the evolution of *Homo sapiens* and the initial appearance of evidence for complex cognition. Unfortunately, this archaeological construct has fallen in and out of favor and remains poorly defined. It has uncertain dates and environmental associations, and ambiguous hominin fossil associations. Using a new Zambian site as an example, the utility of the Sangoan construct to assess hominin mobility and dispersals is discussed.

Bittner, Jessica (College of William & Mary)

[255] *Paying Homage to the Past: Identity, Memory and Place in the American South*

Recent archaeological approaches to identity emphasize landscapes as dynamic arenas in which identities are communicated, generated, and negotiated. Focusing on several Cherokee heritage sites in Georgia and North Carolina, this paper examines the role of historical memory within place-based identity construction. Spatial expressions of identity within the landscape at each of these sites are examined throughout multiple periods of occupation. I trace distinctions in the ways in which Cherokees and local white communities engage with these past landscapes, and illuminate a persistent conflict between Cherokee peoples and white preservation groups over place, heritage, and identity. Paradoxically, for Native and non-Native visitors, these places evoke parallel visions of emplaced heritage. Cherokee heritage sites serve as emblems of the Cherokee Nation’s ancestral claims to their homelands in the American South, and of Anglo-America’s own deep connections to place in Georgia.

Biwer, Matthew (University of California, Santa Barbara)

[211] *Drinking Together: The Role of Foodways in the Wari and Huaracane Colonial Encounter in the Moquegua Valley, Peru*

Food is a unique form of material culture, representing a multiplicity of ethnic, gender, racial, political, and economic identities, that is consumed and reaffirmed through daily practice. In this way, food remains provide a nuanced perspective on a variety of archaeological issues. This paper focuses on Wari imperial expansion and how foodways enabled both Wari colonists and local peoples to negotiate the colonial experience during the Middle Horizon (AD 600–1000), Peru. Using paleoethnobotanical data, I present data from the Wari site of Cerro Baúl and the Huaracane site of Yahuary Alta in the Moquegua Valley, Peru. I investigate not only how Wari incursion impacted Huaracane foodways, but also how local environmental and social conditions shaped Wari food practices. A consideration of food remains will not only distinguish what can be considered uniquely Wari or Huaracane cuisine, but also how foodways may have developed on either side of the colonial encounter. More specifically, this study begins to characterize: 1) the alcoholic beverage chicha de molle as a medium of Wari culture that could be consumed by local communities; and 2) how the selective adoption and internalization of Wari chicha de molle by Huaracane communities may have shaped the colonial encounter.

Bizot, Bruno [88] see Ardagna, Yann

Bjorkman, Matt [334] see Whitehead, Mike

Blaber, Thomas

[266] *Pipe Assemblages of St. Catherines Island, GA*

Excavations over the last four decades on St. Catherines Island, GA have recovered over 200 pipe fragments and a dozen nearly complete pipes. These pipes are both historic and native made which cover a wide range of sites through occupational periods on the island. In this paper, I will present the results of recent and previous analyses and consolidate this information to explore the island-wide distribution and temporal trends of pipes on St. Catherines Island. In addition I will examine several of the nearly-complete pipes and discuss the iconography and symbolism presented.

Black, Michael [172] see Hoffman, Christopher

Black, Stephen L. (Texas State University, San Marcos) and Charles Koenig (Texas State University, Shumla Archaeological Rese)

[8] *Sand, Chute, Carts, and Waddles: Eagle Cave and Bonfire Shelter Restoration Project*

Eagle Nest Canyon, a box canyon draining into the Rio Grande in the Lower Pecos Canyonlands of southwest Texas, houses Bonfire Shelter, the oldest and southernmost bison jump site in North America. Bonfire was excavated in 1963–64 and again in 1983–1984, leaving open a 3m-deep excavation block. Nearby Eagle Cave was excavated in the 1930s and again in 1963, leaving the central trench unfilled. In 2015–2016, the Ancient Southwest Texas Project of Texas State University re-excavated the 4-meter deep trench bisecting this massive rockshelter to document and sample complex stratigraphy spanning 10,000+ years. In 2017, the ASWT project “restored” Eagle and Bonfire. At Eagle Cave the challenge was refilling the

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wide, 4-meter-deep trench bisecting the shelter. Most original backdirt had washed down the canyon decades earlier, so we added 20 dump truck loads of Rio Grande alluvium via a complex chute and cart system. At Bonfire Shelter the still-open excavation block was badly impacted by exposure and water erosion, as was the talus cone where bison fell. We stabilized the talus cone and installed erosion control features across much of the site to protect the extant deposits and allow time for new investigations before Bonfire is completely backfilled.

Black, Valda (Washington State University), Ricky Nelson (Mesa Community College), Ivanna Robledo (University of California- Santa Barbara) and Danielle Kurin (University of California- Santa Barbara)

[270] *Non-metric Traits and the Influence of Cranial Modifications: A Case Study from the South-Central Andes*

Non-metric cranial traits and craniometric scoring are often used as a quicker and cheaper alternative to genetic markers when analyzing biological distance within and between populations. However, in populations with intentional artificial cranial modifications, the only option is scoring non-metric cranial traits since the craniometrics are too heavily affected by the modifications. Studies have shown that although non-metrics are the best alternative, some traits cause a bias that can differ based on the broad modification categories of annular and tabular. This study aims to add to these data by assessing the influence of the sub-categories of oblique and erect within the annular modification category and the degree of modification. The sample population consists of individuals from the Chanka cultural group located in the South-Central Andes of Peru during the Late Intermediate Period (AD 1000–1400). A total of 33 non-metric traits were scored on 102 individuals, 88 of which have modified crania. Analyzing the influence of sub-categories and degree of modification can point to a finer scale analysis of how and why certain traits are influenced by cranial modifications. These data can then be used in future studies to avoid collecting biased traits when assessing biological distance.

Blackman, Benjamin K. [137] see Wales, Nathan

Blackmore, Chelsea (University of California, Santa Cruz)

[110] *Racial Justice Matters: White Privilege and the Spectre of Scientific Objectivity*

We volunteer and engage with the public because we believe that history matters; that visibility of the everyday, of peoples and pasts marginalized and made invisible should be central to what we do. We can use our work, pre- and post-contact, as a means for public engagement and to dismantle political discussions rooted in ahistorical notions of human behavior and morality. But in serving the public interest, how do we also serve our membership, both in protecting their rights as human beings and as professionals? What responsibilities do we and the SAA have to our colleagues, students, mentors, and friends? In particular, how do our actions continue to marginalize people of color within our membership as well as minimize the importance of racial justice actions? This paper examines how white privilege and calls for scientific “objectivity” ignore the structural violence that continues to impact our practice as well as our participation in current political and social activism.

[191] *Moderator*

Blackwood, Emily and Kate Pontbriand

[84] *Seasonal Analysis of Four Coastal Archaeological Sites in Eastern Maine Using Mollusks*

Analysis of archaeological clam shells can provide important indicators of the seasonality of an archaeological site. To address the question of seasonality at four Woodland period archaeological sites along the coast of Maine, we have collected monthly modern samples of the soft-shelled clam *Mya arenaria* from nearby clam flats to establish a baseline to which excavated samples can be compared. The analyses of modern shells will show how seasons are recorded in the target species in Maine; analyses of the archaeological shells will provide a proxy for season of occupation at these archaeological sites. Two methods will be used with these shells. One method will utilize acetate peels to determine seasonal growth increments of modern and archaeological shell samples. The other will determine isotopic ratios of O16 and O18 to track temperature fluctuations at the collection sites. These data are integral to our understanding of the context of Native peoples’ subsistence and behavior patterns and will allow us to test theories regarding coast to inland seasonal movement along the coast of Maine.

Blair, Elliot (University of Alabama)

[275] *The Individual and the Group at 17th Century Mission Santa Catalina de Guale*

The individual as an entity in the past and an object of anthropological and archaeological study has often been debated. In this paper I consider the presence and role of the individual as an actor within colonial contexts. Using the methods of social network analysis, I explore the relationship between groups, individuals, and objects at 17th century Mission Santa Catalina de Guale, a Franciscan mission located on St. Catherines Island, GA. I argue that the methods of social network analysis can be used to identify and explore the roles that individual mission neophytes played in colonial interactions. Using these methods I examine how objects and individuals were involved in the material manifestation of social identities as pluralistic native communities aggregated in the Spanish missions of La Florida. Further, I consider the role of the individual in relation to broader frameworks of colonial interaction, examining how individuals engaged in sociopolitical negotiations and interactions within the processes of ethnogenesis and colonial identity formation.

Blair, Elliot [154] see Wright, Kevin

Blair, James (Mellon/ACLS Public Fellow and International Campaign Advocate, NRDC)

[195] *Splintered Hinterlands: Public Anthropology, Environmental Advocacy and Indigenous Sovereignty in Resource Frontiers of the Americas*

This paper analyzes the role of public anthropology in socio-ecological justice movements by examining conflicts over natural resources and indigenous sovereignty through policy-oriented research. It considers the Natural Resources Defense Council’s (NRDC) international projects to protect “special areas” and wildlife in the Western hemisphere, specifically rivers in Chilean Patagonia, and the boreal forest in Canada. Despite geographical, historical and cultural differences, these two priority campaigns involve a shared focus on developing communications strategies, as well as financial and corporate advocacy methods, in order to advance stronger environmental protections in alliance with social movements. Working with Mapuche indigenous leaders, international scientists and local environmental activists in the Aysén region of Chile, the NRDC has raised awareness to persuade public officials and investors to seek more sustainable energy alternatives to proposed hydro-electric dam development projects. In Quebec and Ontario, Canada, the environmental group has collaborated with members of the Waswanipi Cree First Nation and paper product consumers to halt forest degradation, which threatens woodland caribou habitats and exacerbates climate change. Taking an engaged anthropological approach to these projects, this transnational study sheds light on how different public advocacy strategies condition or limit possibilities for environmental justice and indigenous sovereignty across the Americas.

Blakeslee, Donald (Wichita State University)

[36] *Uncovering Etzana: A Megalith on the Southern Plains*

In 1601 CE, Juan de Oñate visited a large community in southern Kansas that natives described as taking two or three days to walk through. The location of the remains of the town was first clearly demonstrated in 2015. Since then, surface survey and work with collectors continues to document the scale of the community. Excavation in 2017 by Wichita State University and the University of Colorado in what was thought to be a midden mound

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instead encountered a dense concentration of features that reflects the presence of one of the house clusters described by the Spanish visitors. A Spanish horseshoe nail from one of the pits is the third Oñate era artifact to have been found at the site.

Blakey, Michael (College of William and Mary)

[166] *The WAC Origins of the New York African Burial Ground Project*

This paper concerns the development of an interdisciplinary Project which studied 419 human remains at the 18th century cemetery for Africans enslaved in New York. The first World Archaeological Congress (1986) and Inter-Congress (1989) facilitated conversations among archaeologists and Indigenous peoples that would inspire change in archaeological practice. The African Burial Ground Project carried forward specific ideas of that encounter, joined with the activist scholarship and interdisciplinary habits of anthropologists from the African diaspora. The African Burial Ground Project (1992–2009) followed the first ethical bioarchaeology in the United States (enforced by NAGPRA in 1990) but concerned populations worthy of ethical treatment which were left uncovered by the law. By force of public pressure and scholarly cooperation, it became the first large and most visible example of publicly engaged archaeology. The results were affection between its scientists and “descendant community,” an international conversation about slavery, national linguistic transformation, sophisticated bioarchaeological reports, new methods, and a National Monument.

Blancas, Jorge (IIA, UNAM), Lisa Overholzer (Department of Anthropology, McGill University), Luis Barba (Instituto de Investigaciones Antropológicas, UNAM), Agustín Ortiz (Instituto de Investigaciones Antropológicas, UNAM) and Eos Lopez (Instituto de Investigaciones Antropológicas, UNAM)

[248] *Archaeological Prospection at Cerro Coyotepetl, Tepeticpac, Tlaxcallan: Preliminary Results from the 2017 Field Season of the Proyecto de Arqueología Cotidiana de Tepeticpac*

In this paper we present the preliminary results of our field season this past summer in the Cerro Coyotepetl neighborhood of Tepeticpac, a señorío of Tlaxcallan. Archaeological prospection methods and remote sensing included magnetometry, electrical resistivity and photogrammetry by drone. Though our work is ongoing, and another geophysical survey season is planned, results were confirmed by excavations on one domestic terrace. These excavations revealed the remains of four rooms whose occupation spans the late pre-Hispanic and early Colonial periods. We reflect on the success and limitations of our methods in identifying the modification of the tepetate bedrock creating a habitable space, and in our ability to detect walls, hearths, and other domestic features.

Blancas, Jorge [293] see Barba, Luis

Blank, John, Matt Chmura and Sarah Gilleland

[13] *Style vs. Function in Polynesian Fish Hook Shank Variation*

Polynesian i'a makau, or fishhooks, may stand in for ceramics for the purpose of generating culture-historical units, facilitating relative dating of the three Hawaiian assemblages under scrutiny (Allen 1996). Artifact assemblages at Waiahukini, Makalei, and Pu'u Ali'i contained over 1000 intact or partial fishhooks and fragments of shaped pig bone representing unfinished manufacture. Allen's (2015) conceptual style-function model of hook attributes necessitates a focus on stylistic shank variation, which reflects manufacture choices rather than fishing efficiency of the object. To test whether these attributes are actually stylistic choices, we propose a tensile strength test of experimental artifacts. To negate biases conferred by heterogeneity in the material or in manufacturing skill, we generate three-dimensional recreations of shank variation observed in the site assemblages. These models are subjected to conditions they would experience during use, given the physical properties of modern pig bone. If differential performance of shank “style” is quantifiable, then aspects of shank variation must be considered functional attributes.

Blankenship-Sefczek, Erin (Ohio State University) and Joseph Ball (San Diego State University)

[258] *Dentition, Kinship, and Status in the Mopan-Macal Triangle: Small-Sample Insights into Classic Maya Social Organization in Central Western Belize*

Classic Maya social status is more complex than an elite versus non-elite dichotomy. Research suggests that a “middle” status group exists. However, the social segment from which they arise is unknown. This study focuses on individuals from the urban center of Buenavista del Cayo who are below the ruling elites in the “middle” rungs of social status, and those from the neighboring farming community of Guerra who are recognized as nonelites. Previous research suggested that no biological affinity existed between the ruling elite and the “middle” status groups. Thus, we hypothesized that there would be a biological connection between the “middle” status group and the nonelites at these sites. Our study used a bio-cultural approach to interpret social connections by comparing dental characteristics (crown size and trait expression) and archaeological evidence to assess whether there was biological affinity between these two social groups. Our results indicate that there was shared affinity, suggesting that middle status individuals maintained biological and cultural ties with the nonelite group. Thus, the evidence in this study suggests that kinship, or biological affinity, was the basis for the social structure, organization, and membership patterns of these Maya communities during the Classic period.

Blanton, Richard [31] see Marino, Marc

Blewitt, Rosemarie, Susan Myers (North Carolina Office of State Archaeology), Mary Fitts (North Carolina Office of State Archaeology), Lindsay Ferrante (North Carolina Office of State Archaeology) and Sam Franklin (North Carolina Office of State Archaeology)

[231] *Managing Digital Data at the North Carolina Office of State Archaeology: Challenges and Directions*

The North Carolina Office of State Archaeology (OSA) was created by the North Carolina General Assembly in 1973 to coordinate and implement a statewide archaeological preservation program. Central to this program is the OSA's management of records, including those documenting the more than 50,000 archaeological sites located in the state's 100 counties, and a library of nearly 8,000 associated reports. The OSA Research Center curates tens of thousands of artifacts and their associated records from across North Carolina.

While there are computer databases for the site forms, bibliographic entries, maps, and artifacts, there is variability in the extent to which all records have been added to these databases. Arduous and labor intensive, the process of digitizing our records has evolved with the available technology and been limited by staffing. Our goal is to have this data in GIS and electronic databases accessible to researchers and easy to query. We will discuss our efforts to reach this goal and the potential benefits of digitizing our records.

Bliege Bird, Rebecca [92] see Zeanah, David

Blinman, Eric (NM Archaeology), Marvin Rowe (NM Archaeology) and J. Royce Cox (NM Archaeology)

[74] *Plasma Micro-sampling in Radiocarbon Dating: Approaching a Non-destructive Model*

The development of low-energy plasma oxidation as a sampling technique has created new opportunities for applying radiocarbon dating. Plasma oxidation can be carried out at energies below the threshold of carbonate and oxalate dissociation, dramatically reducing the need for pretreatment and subsequent loss of sample volume. Radiocarbon sample size can be reduced toward the minimum of the 40–100 millionths of a gram of carbon that is actually needed for standard AMS dating. This allows the dating of remarkably small samples, and it results in the imperceptible removal of carbon from more traditionally-sized samples, such as a charred maize kernel (the botanist will never know a dating sample has been removed). A surface-

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active technique, plasma oxidation preferentially samples carbon molecules from object exteriors, allowing repeated stratigraphic sampling through accumulations such as soot on fragments of cave or rockshelter ceilings and the interpretation of sequential dates. Masking techniques can focus sampling on only portions of artifacts, and other innovative applications include the dating of organic pottery pigments, residues on artifacts, and organic binders in mineral pigments. Low temperature plasmas allow superficially non-destructive sampling of museum specimens, while higher plasma energies can sample carbide from the surfaces of historic metals.

Blinman, Eric [74] see Cox, J. Royce

Blitz, John (University of Alabama) and Lisa LeCount (University of Alabama)

[129] *Groundstone Manos and Metates as a Measure of Ancient Maya Political Economy at Actuncan, Belize*

Understanding the political economy of ancient Maya communities requires reconstructing the forms and scales of exchange, the articulated nature of exchange modes, and the degree to which elites controlled commoner access to goods. These issues are examined at the site of Actuncan, Belize, by documenting the chronology, morphology, raw material, and social context of a large sample of groundstone manos and metates distributed across structures ranging from a palace to large houses to patio groups. Results show no restricted access by context for mano and metate morphological types or material sources, including non-local stone, and thus no evidence that elites restricted access to groundstone. A significant chronological change in metate and mano shapes occurred, with flat and trough-type metates and square-type manos appearing at the Late Classic to Terminal Classic transition. Basalt manos and metates from distant sources also appear at this time, along with the ceramic comal. We interpret these changes in food-processing implements as marking the introduction of tortilla production. Using these data, we will examine continuity and change in exchange modes from Preclassic to Postclassic periods at Actuncan.

Bloch, Lindsay (Florida Museum of Natural History, UF), Neill Wallis (Florida Museum of Natural History, UF) and George Kamenov (Department of Geological Sciences, UF)

[81] *Analysis of Surface Treatments on Weeden Island Red Vessels via LA-ICP-MS*

One of hallmarks of Late Woodland period Weeden Island in Florida is the proliferation of ornate ceramics associated with ceremonial contexts. Recent elemental and petrographic analyses of Weeden Island ceramic pastes have established that despite visible standardization, these wares were traveling significant distances from large production centers, but also being made locally. This widespread movement of people and pots across the landscape provides a valuable context for exploring the spread of specialized technological knowledge. To better understand the production of these wares, we focused on the applied red surface on Weeden Island Red vessels, which previous analyses identified as among the most likely Weeden Island ceramics to have been locally made. In particular, we sought to define the recipe for this surface treatment, whether iron-rich ore or clay, and to identify the degree of recipe standardization across the ware type as reflection of shared production knowledge. LA-ICP-MS was used to independently analyze the elemental composition of the red surfaces of these vessels, complemented by NAA and petrographic analyses of paste composition.

[278] *Discussant*

Bloch, Lindsay [51] see Neiman, Fraser

Blom, Deborah (University of Vermont), Kelly J. Knudson (Arizona State University), Nicole C. Couture (McGill University) and Carrie Anne Berryman

[87] *Caring for Children in the Ancient Andes: Bioarchaeological and Biogeochemical Data from the Andean Middle Horizon (AD 500–1100) Tiwanaku Polity*

Bioarchaeological approaches can contribute much to our understanding of how children were cared for in the past. Here, we examine social, cultural, and physical care of children in the Tiwanaku polity of the South Central Andes between approximately AD 500 and 1100. Using multiple lines of evidence, we reconstruct patterns of childcare practices as well as the formation of different social identities at archaeological sites in the Moquegua Valley of southern Peru and the Bolivian Lake Titicaca Basin. More specifically, we use data from ethnographic and ethnohistoric sources, bioarchaeological data on cranial modification, paleopathology, and mortuary behaviors, and biogeochemical indicators of paleodiet, including weaning patterns, and paleomobility. By recreating individual life histories and lived experiences in the past, we examine how Tiwanaku-affiliated communities cared for their children in the past.

Blomster, Jeffrey (George Washington University)

[288] *Public Space, Sacred Place: Early Monumental Architecture and Corporate Identity in the Mixteca Alta, Oaxaca*

The Early Formative evinces the emergence of public space, and more complex communities, in Mesoamerica. Previous archaeological research at the site of Etlatongo, Oaxaca, Mexico, identified a large village during the late Early Formative/Cruz B phase (1200/1150—850 BC), including an area tentatively identified as early public space. The Formative Etlatongo Project has concluded three seasons, from 2015—2017, of large-scale excavations, confirming the identification of public space in the southern portion of the site. More specifically, this public space was focused during the Cruz B phase on two iterations of a ballcourt. We interpret the constructions of this ballcourt as a kind of public space that both linked emerging communal identity with socio-political complexity. Very specific kinds of materials were deposited in this public space; both these deposits, as well as the probable activities that occurred, transformed this into a sacred place, one that resonated beyond the Cruz B phase. The construction, subsequent maintenance and renovations reflect the collective effort of different social actors and corporate entities in the transformation of society at Early Formative Etlatongo.

[288] *Chair*

Blomster, Jeffrey [288] see Oliveira, Diogo

Blomster, Jeffrey [288] see Salazar Chavez, Victor Emmanuel

Blong, John (Newcastle University)

[126] *Terminal Pleistocene and Holocene Adaptive Strategies at the Paisley Caves, Oregon*

There are key questions about the timing of the initial settlement of the northern Great Basin, how settlers adapted to the pluvial lake and wetland landscape they encountered upon arrival, and how these adaptations changed in response to Holocene climate change. The Paisley Caves in south-central Oregon provide a unique opportunity to investigate these questions. The caves produced the earliest evidence for human settlement of the Great Basin including coprolites containing human DNA dating to 14,300 calendar years BP, as well as an assemblage of morphologically human coprolites from terminal Pleistocene through late Holocene contexts. These coprolites provide an important resource for a diachronic study of human occupation and subsistence in the region. This paper presents the preliminary results of pollen, phytolith, and plant macrofossil analyses of coprolites from the Paisley Caves. The goal of these analyses are to identify human coprolites in the cave deposits, and test models emphasizing a broad-based wetland-focused subsistence economy in the terminal Pleistocene and early Holocene with increasing reliance on plant resources in the middle

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Holocene. This research is part of a broader project investigating site formation processes and human occupation of the caves using biogeochemical, plant micro- and macrofossil, and sediment micromorphological analyses.

[126] *Chair*

Blumenfeld, Dean (Arizona State University)

[242] *Lithic Economy of Epiclassic Los Mogotes*

This study examines the flaked stone economy at the Epiclassic site of Los Mogotes, located north of the Basin of Mexico in central Mexico. We quantified obsidian and chert artifacts based on form and material in order to examine the nature of the lithic economy during this time. The findings suggest that the inhabitants of Los Mogotes were not primary producers of obsidian tools but were dependent on long-distance exchange for already manufactured goods. Despite being closer to high quality obsidian sources in Pachuca, Hidalgo, Los Mogotes relied on grey obsidian from sources located farther away (such as Ucareo, Michoacan). The lack of evidence of primary obsidian production suggests a down-the-line model of exchange of obsidian tools, many of which were later reworked into secondary or tertiary items. This pattern contrasts with evidence of primary production using more locally available chert. These findings conform to broader regional trends observed at contemporaneous sites during this time. Our interpretations focus on how the broader political economy shaped access to resources and the institutions necessary for their distribution.

Bobolinski, Kathryn (University of Montana) and Ashley Hampton (University of Montana)

[239] *Continuity or Change: A GIS Analysis of Artifact Distributions from Pre-colonial Housepit 54*

Housepit 54 at the Bridge River pithouse village in south-central British Columbia provides a glimpse into the complex cultural practices that occurred within this area in the past. This village, which includes approximately 80 semi-subterranean structures, was occupied during four time periods that together span from approximately 1800—45 cal. B.P., firmly placing the site within both a historic and a pre-Colonial context. Geographic Information Systems (GIS) will be used to explore the spatial distributions of artifacts from a subset of Housepit 54's pre-Colonial floors. This study should result in a more in-depth understanding of the structure's household organization and the past human behaviors that affected the creation of the assemblages under examination. Ultimately, if there were activity areas being used during the occupation of the Housepit 54 floors, then clusters of cultural material and possibly clusters of material types are expected. In addition, this study will also be looking for evidence of shared space and materials as well as trends through time, such as the continuous use of one area of the housepit for a specific activity. This should reveal more about how the housepit's organization and social structure changed over time.

Bocinsky, Kyle (Crow Canyon Archaeological Center)

[279] *Discussant*

Bocinsky, Kyle [221] see Gillreath-Brown, RPA, Andrew

Boczkievicz, Roberta [165] see Hudson, Jean

Bodenstein, Nicole

[89] *Comparing a NextEngine 3D Scanner with Casting Mediums for Making Positives of Cord-Imprinted Pottery*

In this paper, I compare using latex and Sculpey molds with a NextEngine 3D scanner in creating positive copies of upper midwestern, Late-Woodland, cord-imprinted pottery for analysis. Making cast positives of these impressions in casting mediums present different hazards to the sherd. A NextEngine 3D Scanner may present fewer hazards to sherds, while allowing for digital copies that are easily manipulated and measured. It is also portable and relatively inexpensive compared to other 3D scanning technologies. I list the benefits and problems of each method based on tests of a small number of sherds from the UWM-ARL collections. Pressure exerted on sherd, whether or not residues are removed, manipulability of final product, shrinkage, and clarity of the impression structure will be recorded and compared. I will also compare cost, time consumed, and ease of use. I will include how long it takes to learn how to use the NextEngine Scan Studio as well as how long it takes to manipulate the scans in Meshlab. I will then make separate illustrations based on the molds and 3D scans that are blown-up representations of the textile structure and compare the ease of illustration for each.

Boehm, Andrew (Museum of Natural and Cultural History, University of Oregon) and Erik R. Otárola-Castillo (Department of Anthropology, Purdue University)

[103] *The Energetics of Butchery*

Animal butchery is an important aspect of human evolution. While it provides obvious nutritional and non-nutritional benefits, the choice to butcher an animal involves costs. These costs are primarily time, energy. Most research investigating these costs has focused on time alone. By creating ranking schemes using post-encounter return rates, researchers usually hypothesize which animals or body parts hunters should butcher. Yet, the energetic cost of butchery and its effects on these rankings remain unknown. To shed light on this problem, we measured the energetic and time costs of butchers during butchery of domestic sheep using stone tools. We used a heart rate monitor to measure the energetic expenditure for each segment of butchery while documenting time during the event, and verifying it by reviewing video recording. These data were analyzed using basic Heart rate variability techniques using the RHRV package (v. 4.2.3) of the R computing environment. Adding energetic cost, an important yet often omitted variable, to quantifying the butchery sequence provides a basis to better understand the costs and trade-offs of processing animals. These data are applicable to all archaeological events involving the human butchery of medium-to large-sized mammals.

Bofill, Maria [298] see McNamee, Calla

Boileau, Arianne (University of Florida)

[217] *Testing the Stratigraphic Integrity of Shallow Deposits through Zooarchaeology at Lamanai, Belize*

Identifying formation processes of shallow archaeological sites can be difficult. At Lamanai, Belize, the main problem consists of distinguishing between pre- and post-Spanish contact deposits buried at a depth of 10 to 60 cm. Evidence of interaction with the Spanish includes a few European objects and two Christian churches. However, identifying pre-contact deposits is more challenging. Maya archaeologists typically rely on ceramic typology to establish chronology, but the main pottery type in use at Lamanai before Spanish arrival continued to be widely used after contact. Diachronic changes in the distribution of other archaeological correlates for pre- and post-contact assemblages, including structure features and lithics, are subtle and do not effectively demarcate deposit type. Here, I use the taphonomic study of animal remains to assess the integrity of the stratigraphic levels identified during excavations and determine whether these levels represent pre- or post-contact accumulations. The methods employed include bone counts, species composition, skeletal part distribution, refits on dry and green bone, and vertical distribution of elements. As Lamanai is one of few known locations of Maya and Spanish interactions in the southern lowlands, identifying pre- and post-contact deposits is essential for studying the impact of Spanish arrival on the Maya society.

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Boisvert, Richard (NH Div. of Historical Resources)**[294]** *Collaborative Research as an Adaptive Strategy among New England Archaeologists*

NH SCRAP (State Conservation and Rescue Archaeology Program) was created in 1978 principally to train and certify the general public in the conduct of archaeology in New Hampshire. While engagement in fieldwork draws many volunteers, generates substantial recognition, and serves to promote archaeology well beyond the borders of the state—analysis and publication have always been integral parts of the program. Outreach to undergraduate students, graduate students, and avocational archaeologists has produced a remarkable body of research and publication. Foremost has been the advancement of Paleoindian studies in the Northeast though hardly to the exclusion of other research. Accomplishments by SCRAP researchers are reviewed and the unique aspects of the program are elaborated.

Boivin, Nicole (Max Planck Institute for the Science of Human History)**[161]** *Who Owns the Anthropocene and Does It Matter?*

While there is little doubt that we currently live in an era in which humans have become the dominant force shaping climate and environments globally, the question of when we entered this era has become a contentious one. Many archaeologists argue for an early start date, but have been largely excluded from geology-driven discussions by the Working Group on the Anthropocene. Does this matter? This paper will explore this question, and consider more broadly the place of archaeology in shaping environmental discussion, action and policy today.

[137] *Discussant*

Boivin, Nicole [310] see Nayak, Ayushi

Bolender, Douglas (University of Massachusetts Boston) and Eric Johnson (Harvard University)**[170]** *Marginal Lives and Fractured Families. The Hidden Archaeology of Household Debt and Instability in Medieval Iceland*

Archaeologists generally assume that the absence of market exchange implies an absence of financial debt as a mechanism of exchange and social control found in more “advanced” economies. This implicit logic is reproduced in contexts where identifying market exchange largely relies on tracking the circulation of specialized and imported goods, as is the case in medieval Iceland: a society largely made up of subsistence tenant farmers where archaeological indicators of market exchange virtually disappear after the Viking Age settlement of the island. But David Graeber urges us to look deeper for sophisticated systems of value and material exchange in societies that have been traditionally considered to have primitive economies. His work also calls attention to the ways that debt, as a social and economic phenomenon, structures relationships and the juridical status of individuals. Reevaluating medieval Iceland with this lens, we see the disappearance of imported goods following the Viking Age not as evidence of a primitive subsistence economy but rather the development of an entrenched system of financial debt that had profound implications for the juridical and personal status of individuals as a failure to pay debts frequently resulted in the fracture of the family and household.

Bolender, Douglas [167] see Welch O'Connor, Lauren

Bolin, Annalisa (Stanford University)**[201]** *Friends and Enemies: Heritage Ethnography in the Shadow of the State*

Engaged archaeology and public anthropology depend on the goodwill, or at least tolerance, of numerous publics. This is frequently understood to mean local communities and nearby residents, but projects can live or die according to the will of groups less often discussed as part of the target public: authority structures such as permitting agencies or even national governments. How do such organizations figure into the “public” of public scholarship? What happens when research is pressured to produce the narratives that authority structures desire? Is it possible to practice engaged and ethical research in these contexts, and if so, what practical accommodations can we reach—or must we abandon the project altogether?

This paper investigates these questions in the context of post-genocide Rwanda, where social science research has become increasingly constrained. Some researchers have found themselves on semi-official “enemies lists”, while others encounter pressure to be “friends of Rwanda” who can be counted on to produce complimentary accounts of the country. Drawing on my experiences as a heritage ethnographer in Rwanda, I examine the ethical and practical difficulties of conducting research under the eye of a powerful and sensitive government, and negotiating responsibilities both to communities and to scholarship itself.

[201] *Chair*

Bollerup Overgaard, Susanne [63] see Erlingsson, Christen

Bollwerk, Elizabeth (The Thomas Jefferson Foundation—Monticello), Lynsey Bates (DAACS/The Thomas Jefferson Foundation—Monticello), Leslie Cooper (DAACS/The Thomas Jefferson Foundation—Monticello) and Jillian Galle (DAACS/The Thomas Jefferson Foundation—Monticello)**[286]** *What to Do with All Those Digital Data: Examples from the Digital Archaeological Archive of Comparative Slavery (DAACS)*

The Digital Archaeological Archive of Comparative Slavery (DAACS) is a Web-based initiative designed to foster inter-site, comparative archaeological research on slavery throughout the Chesapeake, the Carolinas, and the Caribbean. The goal of DAACS is to facilitate research that advances our historical understanding of the slave-based societies that evolved in the Atlantic World during the eighteenth and nineteenth centuries. In this paper we argue that the digital methods encapsulated within DAACS enable archaeologists to conduct innovative analysis at scales that would be impossible to achieve using analog methods. These methods consist of: 1) entering archaeological data into the DAACS Research Consortium (DRC) Database Application using well-defined classification and measurement protocols, 2) serving that data for free through the DAACS website (www.daacs.org), and 3) providing training and assistance for those who conduct research with the data. We offer three case studies to demonstrate how these methods enable collaborators to address old research questions using legacy collections, answer new questions with data from recent excavations, and adapt the system to incorporate data from different regions. These case studies illustrate how DAACS has balanced the need to maintain rigorous data entry standards and reproducible methods with the needs of an expanding user base.

Bolorbat, Tseveendorj [41] see Gillam, J. Christopher

Bond, Julie [135] see Dockrill, Stephen

Bond, Stanley**[193]** *Discussant*

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Bondura, Valerie (Columbia University)**[259]** *Ceramic Ecology as Deep Ecology in Northern New Mexico*

"This landscape is animate: it moves, transposes, builds, proceeds, shifts, always going on, never coming back, and one can only retain it in vignettes, impressions caught in a flash."

—Ann Zwinger, Downcanyon

We might think of ceramics as landscape "caught in a flash", a bringing together of different geological places into newly combined forms. Ecological thinking in Northern Rio Grande Pueblos frames this bringing together as a fluid gathering of forces that flow in and out of one another. "Deep ecology" is one current term the social sciences for this relational field of human and non-human interaction in the landscape—for Pueblo potters, it is how the world is.

This paper outlines a deep ecology of pottery from a Spanish land grant community and a neighboring Tiwa Pueblo. I present ongoing research on the composition of ceramics from these two places, a study that gives insight into how different communities engaged with the landscape. Comparative ceramic ecology offers a framework for thinking about historical relationships that includes but also moves beyond questions of ethnicity and identity to a focus on how people locate themselves within socio-environmental systems.

Bongers, Jacob (UCLA Cotsen Institute of Archaeology), Juliana Gómez Mejía (Universidad de Caldas) and Colleen O'Shea (Fine Arts Museums of San Francisco)**[66]** *Modeling Late Prehistoric Mortuary Practice in the Middle Chincha Valley, Peru*

This paper presents a model for mortuary practices associated with above-ground and semi-subterranean tombs known as chullpas, which date from the Late Intermediate Period (A.D. 1000–1400) to the Colonial Period (A.D. 1532–1825) in the middle Chincha Valley, Peru. Mortuary practices involve living-dead interactions that transform the status of the deceased. Historical sources and archaeological research suggest that chullpas in the south-central Andean highlands featured protracted living-dead interactions. Few investigations, however, have examined these tombs on the Peruvian coast. Here, we use data from five seasons of archaeological fieldwork and analysis to model sequences of chullpa mortuary activities in the middle Chincha Valley, located on the Peruvian southern coast. These data indicate multi-stage processes comprising tomb entry and reentry for depositing, manipulating, and re-depositing human remains, and making offerings of varying types to the dead. Throughout these sequences, local groups performed elaborate forms of postmortem body manipulation. Our model supports and nuances previous scholarship on chullpas by characterizing chullpa mortuary activities as part of a dynamic and extended program for curating and venerating the dead in the study area. This research contributes to Andean mortuary archaeology by expanding our understanding of variation in chullpa mortuary practice.

Bonneau, Nicholas (University of Notre Dame)**[204]** *An Accounting of the Dead: Historical Epidemiology and Big Data in the Arch Street Project*

As of the beginning of September 2017, the remains of over 250 individuals were recovered from the building site at 218 Arch Street. While the presence of bodies in what was once the First Baptist Church of Philadelphia burial ground should not surprise us, contemporary documents and written histories of the congregation state that all burials had been moved to the Mount Mariah Cemetery in the mid-nineteenth century. The abundance of human remains left on the original site raises questions for historians, archaeologists, and others concerned with the legacy of interments.

To create a foundation from which historians and archaeologists alike might explore these questions, I combine methodologies of big data management and analysis with more traditional historical research. This involved the collection of burial records for over 2,000 individuals interred in the cemetery and burial records for over 5,000 interred in other cemeteries in Philadelphia. I compare patterns of mortality in the larger Philadelphia community and those listed in the parish burial records, with data gathered from individual remains at 218 Arch Street. This allows us both the identification of the disease environment in which the burials occurred and suggests why connections with descendants may have faded.

Bonomo, Mariano [7] see Castro, Juan

Booher, Ashley (Rice University) and Brett A. Houk (Texas Tech University)**[173]** *Processional Architecture at Chan Chich, Belize*

Chan Chich is one of the dozen largest Maya ruins in Belize, reaching its apogee during the Late Classic period, ca. A.D. 750. The site has a number of notable site planning characteristics, including a massive public plaza, and two wide, radial causeways, that show connections to neighboring sites and suggest common ideas about city building. Some of these shared planning ideas reflect top-down design concepts related to specialized political and ritual functions for various buildings and features. Although plazas, buildings, and causeways may have had multiple functions, we use excavation data, comparisons to other sites, and depictions in Maya art to argue that the Late Classic rulers of Chan Chich designed some of their monumental architecture to function in part as the theater for public rituals and spectacles, including processions. The processional architecture at Chan Chich included the radial causeways, two possible terminus shrines, a massive range building, the ball court, and the main plaza. We suggest that the political need to host public spectacles as a way to create social connections between the non-elite and the ruling family drove many site planning decisions at Chan Chich and other sites in the region during the Late Classic period.

Boozer, Anna**[181]** *Material Collaborators: Making and Unmaking Roman Imperial Power at Trimithis (Dakhleh Oasis, Egypt)*

Egypt's Dakhleh Oasis preserves a Roman city, its hinterland, and a Romano-Egyptian house known to be occupied by a city councilor. We can do more than simply read these material remains as physical symbols of Roman political power. The intimate collaboration between imperial agents and the material world allows us to interpret the making and unmaking of Roman imperial power on the local level. This paper explores fluctuations in imperial power at Trimithis (Roman Amheida) through the changes inscribed in domestic, urban, and extra-urban material residues. This explicitly multi-scalar approach demonstrates how the entanglements between power, agents, and things reverberated throughout Romano-Egyptian society. Ultimately, I suggest that the same material worlds that collaborated in imperial power are also implicated in its collapse.

Borck, Lewis (Faculty of Archaeology, Leiden University), Corinne L. Hofman (Faculty of Archaeology, Leiden University), Manfred Schäfer (Computer & Information Science, Konstanz Univ.), Angus A. A. Mol (VALUE Foundation/Prince Claus Fund) and Daniel Weidele (IBM T.J. Watson Research Center)**[83]** *Fingerprints of Community: Decolonizing Archaeological Data Analysis through Networks*

This paper uses the Nexus 1492 database, built over approximately 30 years of fieldwork, to examine ceramic attribute variability throughout the Antillean Islands. Regional ceramic analyses often focus on the construction of ceramic typologies that are then used to compare typological proportions, differences, and similarities at various spatial resolutions across temporal periods. Long-standing critiques of the use of typologies and taxonomies in archaeology (*sensu* Brew 1946; Gnecco and Langebaek 2014; Henry et al. 2017; Wylie 1992) focus on the reifying power of their fixed

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nature. Essentially, typologies become the epistemologies within which we examine the archaeological record, and create the historical narrative. This can become an issue when we also acknowledge that we interpret the past through our modern framework. Thus, in order to more fully separate ourselves from the analysis of the archaeological record, or to decolonize the analysis of archaeological data (sensu Rizvi 2015), we use a networked approach to examine the distribution of ceramic attributes within and between the Antillean Islands. Our goal is to approach a more emic understanding of how communities of practice emerged and to help construct an indigenous social history prior to, and after, the violent arrival of Europeans.

Borck, Lewis [287] see Athenstädt, Jan

Borejsza, Aleksander (Universidad Autónoma de San Luis Potosí), Arthur Joyce (University of Colorado at Boulder), Jon Lohse and Isabel Rodríguez López

[59] *Yuzanu 36, a Late Archaic Site in the Mixteca Alta*

We report the discovery and excavation of a site radiocarbon-dated to 3000 BC near the village of Yanhuítlan in Oaxaca. The site is buried under alluvium at a depth of 5m. At the time of its occupation it was situated on the floodplain of a large seasonal stream. The excavation of 30m² revealed several superimposed features, including hearths, small refuse pits, and a bell-shaped pit. Debitage of different varieties of chert is ubiquitous, as is heat-spalled rock of different lithologies. Several observations suggest that the site was repeatedly occupied by large groups of people performing multiple activities. In the course of its existence, the function of the excavated area of the site seems to have changed from primarily residential to one that involved the periodic burning of the floodplain vegetation and churning of the soil, most likely in preparation for the planting of crops. Exposures of the same palaeosol at other nearby locales suggest that the site spans several hectares. In contrast to the majority of excavated Archaic sites in Mesoamerica, which seem to represent short-term occupations focused on very specific activities, Yuzanu 36 is a good candidate for a multi-purpose riverine basecamp occupied during several months of the year.

[59] *Chair*

Borejsza, Aleksander [59] see Lohse, Jon

Borrazzo, Karen (CONICET-IMHICIHU & Universidad de Buenos Aires)

[200] *'To be or not to be...' A Taphonomic Perspective on Pseudoartifacts*

An anthropocentric perspective governs most of archaeological research into lithic assemblages. Hence, spatial and morphological trends in the lithic record are interpreted primarily in terms of human technological behavior without a systematic assessment of unintentional and/or non-human factors as sources of variation. Surprisingly, controversies on the natural vs. anthropic character of several lithic assemblages or 'industries' did not prompt the adoption of taphonomic approaches by lithic analysts on a regular basis. Here I argue that archaeologist's lack of knowledge about the effects of taphonomic mechanisms -whether natural or cultural- on stone and other knappable materials is the main obstacle towards a more comprehensive analysis of lithic assemblages. Furthermore, I propose that the study of taphonomic patterns (or background noise) in non-archaeological contexts is a mandatory task that researchers need to undertake in every region to achieve a more thorough understanding of lithic assemblage formation processes and trends. From the perspective advocated here both naturalistic and experimental constituents of actualistic taphonomic research are key to identify the agents involved in the formation of any fossil record. I present case studies from Patagonia (Southern South America) to illustrate the main contributions of lithic taphonomy to assess pseudoartifact components in the surface record.

Borrero, Luis Alberto [7] see Martin, Fabiana María

Borrero, Mario (University of California, San Diego)

[30] *The Archaeology of the Southern Belize Region in Context*

The region of Southern Belize is part of the Maya lowlands, an area that is geographically circumscribed, and located in-between several larger regional centers such as Tikal to the west, Caracol to the north, and the sites of Copán and Quiriguá to the southeast. The general history of archaeological investigations for this area are presented, along with site-specific studies from the Southern Belize Region. The current archaeological data of four major ancient polities of this region are described: Pusilhá, Uxbenká, Lubaantun, and Nim li Punit. The review of this archaeological history consolidates the data to consider questions of regional economic and political integration, in light of a region that shared many common cultural and architectural attributes. Finally, I conclude by exploring the possible internal regional dynamics of the Southern Belize Region, and what might have connected it to its neighboring areas. A brief discussion of potential future research to be carried out in the area by the author is shared.

Bos, Kirsten [143] see Mann, Allison

Bos, Kristen (University of Toronto)

[272] *Another Indigenous Feminist on Settler Colonialism in Archaeology*

This paper addresses the ongoing phenomenon of settler colonialism that permeates even the best intentioned "decolonizing" efforts. This paper gives the same credence to Indigenous and non-Western laws, stories, and epistemologies; practices what Sara Ahmed (2014) calls "citational rebellion;" and puts substantial weight into the lived experiences of Indigenous peoples in order to argue that when white archaeologists capitalize on Indigenous, Black, or People of Colour's (BIPOC) things, bodies, and stories to further their research or theories (i.e., the ontological turn), their work just recenters whiteness (Tuck and Wang 2012).

Bostwick, Todd [91] see Wright, Aaron

Boswell, Alicia [265] see Carpioux, Natalie

Boucher, Anthony

[35] *Referencing the Archaic on a Woodland Landscape on Florida's Northern Gulf Coast*

During a period of uniformity in ceremonial practices, coastal dwellers of the Lower Suwannee diverged from the architectural norm. Although these coastal people were under the larger influence of Woodland-period traditions, their construction efforts continued to follow ancestral ideals in the form shell rings and ridges. Here I argue that differences in terraforming practices along Florida's Northern Gulf Coast were a citation to a revered and observed local history formulated by natural features of their aquatic landscape. I do so by drawing on concepts borrowed from theories of landscape and memory as practice with a case study of Shell Mound, a Woodland-period civic-ceremonial center, which until recently has been overlooked due to its coastal qualities.

Boucher, Brandon [21] see Cottreau-Robins, Catherine (Katie)

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Boudreaux, Sarah Nicole (University of Texas at San Antonio), Laura Levi (University of Texas at San Antonio) and Christian Sheumaker (University of Texas at San Antonio)

[37] *Provisioning the Household: Exploring Domestic Economic Integration within Two Lowland Maya Communities*

It is now well recognized that Late Classic Maya communities varied politically, economically, and environmentally. The corollary, however, that community and household variation went hand-in-hand in the Maya area often goes unrecognized or under problematized. Research that explores differences in household provisioning practices across a range of communities should help to rectify this situation. Referencing data from two large prehispanic Maya sites in northwestern Belize, this paper asks the question, "How were households integrated into their broader communities?" Those who study sources of household variation often invoke one of two determinants: either that 1) proximity to resources or 2) relationships to leadership dictated household subsistence and crafting activities. To understand how both positions might have value and relevance with respect to the same bodies of data, this study will explore how aspects of household provisioning were correlated with different kinds of community organizations, environmental contexts, and structures of leadership.

Boudreaux, Sarah Nicole [28] see Levi, Laura

Boulanger, Matthew (Southern Methodist University)

[186] *Cultural Transmission in the Paleoindian of Eastern North America*

The Paleoindian (ca. 13,000–11,000 calBP) record of eastern North America has long been characterized as exhibiting a remarkable variety of fluted-point forms. The temporal, spatial, and cultural significance of this variety remains poorly understood owing to a sparse radiocarbon record as well as to inconsistencies in nomenclature and traits used to define point forms. Building on previous studies, paradigmatic classification is used to create replicable fluted-point classes from a large database of eastern finds. Outline-based geometric morphometrics is used to define and explore the morphospace of these classes, and character- and morphological-based phylogenetics are used to propose historical and spatial relationships.

Bourke, James [156] see Frazer, William

Bourne, Stephen [135] see Pentney, Sandra

Bouslog, Heather

[251] *Oakley Cabin: Revisited*

This presentation will give an overview of the past and present investigations of this African American archaeological site in the heart of Montgomery County, Maryland. Particular attention will be given to Oakley Cabin's historical context as a "geography of resistance."

Bovy, Kristine (University of Rhode Island), Virginia L. Butler (Portland State University), Sarah K. Campbell (Western Washington University) and Michael A. Etnier (Western Washington University)

[10] *Analysis of Sorting Errors of Animal Remains from Shell Middens: Lessons Learned from the Čixwicən Project*

Zooarchaeologists routinely analyze assemblages that were initially sorted into major animal type (birds, mammals, fish, invertebrates) by students or lab technicians with little experience in zooarchaeology. Sorting errors are likely made, which affect taxonomic representation and understanding of human-animal relationships. Recent study of the immense faunal assemblage (over 500,000 NSP) from Čixwicən, a 2800-year-old Lower Elwha Klallam village located on the coast of Washington (USA), allows us to systematically analyze trends in sorting errors. For example, 22.6% of the bird bones included in our sample were initially mis-sorted into other classes, primarily mammal (13.1%), but also fish (7.5%) and shell (2%). Fish bones were less frequently mis-sorted, but certain taxa with unusual elements were affected (e.g. ratfish dental plates, dogfish spines, skate dermal denticles, cod otoliths). 34% of all mammal bone chips (from tool production) were mis-sorted. Failure to recognize and mediate these errors could lead to significant biases. Projects should recognize the potential for sorting error at the beginning and train lab technicians in the kinds of faunal remains they will be encountering, including distinctive elements. Collaborative researchers need to develop protocols for transferring specimens, and those working with "legacy collections" should not assume the collections were sorted correctly.

Bowekaty, Carleton (Pueblo of Zuni)

[96] *Discussant*

Bowen, Corey (University of Illinois at Chicago)

[222] *Archaeology AskHistorians: Public-driven Inquiry and Outreach in the Digital Age*

With over 640,000 subscribers and 1.6 million unique monthly views, AskHistorians is the Internet's largest public history education forum. AskHistorians' simple Q&A format connects people with questions about the past to those with expert-level knowledge in the topic at hand, be it armored snails or erotic Moche pottery. Users of the popular, if controversial, social media site reddit post questions to the AskHistorians forum, and receive responses from a diverse panel of volunteers selected solely on demonstrated proficiency, not on outside credentials. AskHistorians is also an experiment in the public as a driver of historical education and research: users ask the questions, they vote on questions to increase visibility, and any user may answer, provided it meets the rigorous standards of scholarly quality. AskHistorians allows anyone with Internet access to set the course for the research and discussion of the past. This poster discusses the public experience, understanding, and misunderstanding of archaeology as represented in 6 years of AskHistorians, as well as the role of internet forums and social media in public archaeology. We examine how publicly directed engagement can inform our approaches, particularly in online context. Lastly, we evaluate social media strategies to connect with an alienated, misinformed public.

Bowers, Jordan

[229] *Space, Place, and Landscape at Cividade de Bagunte*

The Cividade de Bagunte is located on a prominent hill near the confluence of the Rivers Ave and Este. During the Iron Age, there likely would have been panoramic vistas that stretched well over 15 kilometers on a clear day, though this is mostly unnoticeable at ground level in modern times due to dense foliage. From the few areas that do not have trees and in combination with technology to 'see' through the trees, it is clear the site's viewshed includes several other Iron Age castros, as well as the hinterlands through which the two rivers run. This presentation uses landscape phenomenology and GIS to explore the sensory affordances granted to the inhabitants of Bagunte and investigates these factors in juxtaposition with other nearby settlements. The goal of this research is to highlight unique features of the settlement that may have allowed for exploitation of these sensory aspects to create an advantageous environment for the development of Bagunte into one of the largest settlements in the area.

Bowser, Brenda (CSU Fullerton)

[220] *Living Things in the Landscape: Gendered Perspectives from Amazonia*

Santos-Graneros writes about persistent places in Amazonia, places that have been used by generation after generation of people, because of their special qualities—waterfalls, mountains, caves. The current interest in the ontology of objects, inspired by the work of Ingold, Latour, Gell, and others

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has opened the door for archaeologists to consider how we can investigate the meanings of places and objects in these ways, as living things. Like objects, places are alive. The headwaters of the Tigre River in the Ecuadorian Amazon provides a dynamic context for understanding the meanings of ancestral places in terms of Native ontologies and the complex relationships underlying memory, materiality, landscape, history at multiple scales, cultural transformation, and identities. Reflecting on long-term ethnoarchaeological research in the Ecuadorian Amazon, I consider how gendered perspectives on living things in the landscape contribute to a greater understanding of the material record and these complex phenomena, including ancestral claims to places of the past.

Boyd, Carolyn (Texas State University)

[180] *Soul Expression: Speech-Breath in Pecos River Style Rock Art*

Pecos River style rock art was produced in the Lower Pecos Canyonlands of southwest Texas and Coahuila, Mexico during the Archaic beginning around 2700 BC. This style is characterized by finely executed anthropomorphic and zoomorphic figures arranged in highly-ordered, complex compositions. Pecos River style anthropomorphs are frequently portrayed with a series of dots emanating upwards from an open mouth. Zoomorphic figures of felines and deer are also represented with this pictographic element. "Soul Expression" explores the significance of this recurring motif in Pecos River style rock art and proposes that it is a graphic representation of breath, soul, and speech. In ancient Mexico, breath was believed to be a manifestation of one's soul. Breath soul, when expressed in ritualized speech or song, was a powerful force engaged in both creation and maintenance of the cosmos. Graphic representations of breath soul and speech first appear in Mesoamerica during the Middle and Late Formative periods (900 to 100 BC) as volutes or scrolls issuing from the mouth of anthropomorphic and zoomorphic figures. The speech-breath motif in Pecos River style rock art may represent the oldest graphic expression of the vitalizing breath soul.

[214] *Discussant*

Boyd, Carolyn [73] see Cox, Kim

Boyd, Carolyn [180] see Roberts, Jerod

Boyd, Charles (Radford University), Donna Boyd (Radford University Forensic Science Institute) and Marta Paulson (Radford University)

[223] *How Experimental Research in Forensic Archaeology Informs Archaeological Practice: Differentiating Perimortem Fracture from Postmortem Breakage*

Often perceived as a highly specialized and peripheral subfield of archaeology, forensic archaeology contributes to our understanding of not only forensic anthropology and forensic science, but also traditional archaeological practice. Forensic archaeologists' extensive knowledge of postmortem taphonomic effects on material objects has led to more precise interpretations of postmortem interval, environmental (including scavenger-induced) scattering and alteration of human remains, and site formation processes. Experimental taphonomic research has formed the core of these advances in site interpretation, particularly through its focus on differentiating perimortem (at or around the time of death) from postmortem events. This concept is illustrated through RU Forensic Science Institute (RUFISI) research aimed at differentiating perimortem bone fracture from postmortem breakage. A sample of 300 *Sus scrofa* ribs underwent controlled Blunt Force Trauma in the RUFISI at known periodic perimortem and postmortem intervals, ranging from 0 to 112 days of environmental exposure. Resulting rib fractures were analyzed macroscopically and microscopically to define signature fracture morphology across time periods. These results allow differentiation of perimortem fracture versus postmortem breakage and inform period of exposure and contextual history of field remains. Forensic archaeology research can therefore play an integral role in interpretations of traditional archaeological method and theory.

Boyer, Zachary

[43] *Nine Gal Tavern Faunal Analysis*

Over 400 pieces of bone and eggshell were collected during excavation at the Nine Gal Tavern site (11CH541) located in western Champaign County, Illinois in 1987 and 1991 by a team led by archaeologist Lenville Stelle. The majority of the remains analyzed were recovered within feature context in the immediate vicinity of the established Nine Gal Tavern structure. The purpose of this paper is to describe the identification of these faunal remains which are housed at the Anthropology Program at Parkland College. The identification of these remains was carried out as part of an Honors Project under the supervision of Steven Kuehn, Zooarchaeologist at the Illinois State Archaeological Survey (ISAS).

Boyles, Nathan

[289] *Discussant*

Boytner, Ran [130] see Kansa, Sarah Whitcher

Boza Cuadros, Maria Fernanda (Syracuse University)

[40] *Places, Ports and Their People: The Rise of the Peruvian Post-Colonial State in the Arequipa Coast*

In this paper I provide insight into the earliest decades of the Peruvian post-colonial state (1821–1879) from the vantage point of the Arequipa coast. The Andean south, with its center in Arequipa, had a traditional mercantile basis that favored improvements in trade, particularly those that resulted in the rapprochement of the city of Arequipa to the sea. After independence (1821–1824), new ports were established; the operation of certain coves sanctioned; and extractive activities shaped the region. The ports on the Arequipa coast supplied markets across the Andean south and Bolivia, and were a necessary and desired stop for European and North American ships sailing the Pacific. The economic networks that operated throughout the Arequipa coast encompassed a vast portion of the population. The region was strategic for the mercantile classes across the Andean south, the national government and foreign dignitaries in charge of the Peruvian trade. Utilizing archaeological, cartographic and documentary sources, and modeling in Geographical Information Systems, this presentation outlines the ways in which ideas of development global commodity trade impacted the configuration of the southern coastal landscapes, from the extraction of guano to the establishment of new ports and the construction of railroads.

Bracewell, Jennifer (McGill University)

[219] *A GIS Approach to Understanding Post-sedentary Hunter-Gatherers: A Case from Northern Finland*

This paper considers post-sedentism in hunter-gatherers: how the fact of having previously been sedentary affects the behaviour of societies that increase their mobility in response to changing environmental conditions. The case-study in question is the transition in Northern Finland from a sedentary Sub-Neolithic, supported by high concentrations of marine resources in the river estuaries of the region, to an increasingly mobile adaptation in the Early Metal and Iron Ages. Although village sites disappear, the tradition of building cairns and other stone monuments continues, and there is evidence of re-use of the older monumental landscape. The shifting patterns of monument construction, situation and clustering at the regional scale are analyzed using GIS techniques, and interpretations draw on resilience theory to try to understand the specific constraints a less-mobile history has on post-sedentary societies.

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Bracken, Justin (CUNY Graduate Center)

[252] *Preclassic Fortified Spaces: Within and Beyond the Ramparts at Muralla de León*

A third season of fieldwork at the fortified site of Muralla de León has expanded the scope of coverage for the project by mapping and excavating nearby hilltop occupations on the shores of Lake Macaniché. The work serves to contextualize the space contained by the site's enceinte, a physical barrier that serves also as a boundary feature. Earlier investigations into the site interior and the ramparts of the enceinte itself begged for a comparative data set, as the significance of a barrier apparently built to keep people out relies in part on an understanding of what existed outside of it.

The hilltop excavations uncovered a sequence of occupation containing multiple periods apparently corresponding to the chronology of Muralla de León. Further, evidence in support of dating the defensive architecture at the site to the early phase of occupation there emerged from one of these centers, where a possible rampart wall was uncovered beneath later construction volume and set atop bedrock. Regardless of the implications for their role in conflict, these walls represent concern with controlling the movements of individuals at a monumental scale, and with physically restricting movement into a space.

[252] *Chair*

Bradbury, Andrew (Cultural Resource Analysts, Inc.) and Philip Carr (University of South Alabama)

[90] *Flintknapping Experiments and Middle-Range Theory*

The manufacture of stone tools in the present and careful recording of resulting flake debris over the past thirty years typified middle range theory building and allowed new insights into past human behavior, especially regarding mobility systems. Walter Klippel, best known for contributions to zooarchaeology, encouraged our going down a rocky path of middle-range theory building. Flintknapping experimentation has generated a great deal of individual data sets but the promise of "big data" achieved in many other fields has not been reached by lithic analysts. Here, we examine various flintknapping data sets and the possibility of a flake debris meta-analysis.

Bradley, Betsy (Goucher College)

[201] *We All Need to Talk about Archaeology in the CRM Power Nexus*

The archaeological component of the National Historic Preservation Act Section 106 consultation embodies an intersection of power that has privileged archaeologists and their work at the expense of accomplishing all legal mandates and has elevated the practice of archaeology as a science above any need for negotiation for project-specific approaches. This cross-disciplinary conversation is necessary as the current situation increasingly affects the ability of other Cultural Resource Management professionals to serve the public and conveys a sense of insufficient reflexivity and disinterest in change from within the discipline of archaeology. The intersections of power and ethical framing of proposed work in this arena must include reflection on past and current practice and incorporate the expectation for flexibility that the regulations articulate. A complicated (non)negotiation of an archaeological program for an urban-renewal scale federal project in a legacy city illustrates the fault lines and power plays in historic archaeology practice. The difficult challenges include the consideration of both ethically and equitably providing mitigation for the loss of resources for the current, as well as some future, sectors of "the public."

Bradley, Bruce (University of Exeter)

[79] *Legends of the Dinsmore Hilton*

Learning to be an archaeologist is a craft that comes in many forms from formal academic training, field and lab work, to informal unstructured experiences. These become known through academic degrees, peer reviewed publications, project reports, conference presentations and interactions with peers, colleagues, the public and even the media. Formal training is listed in detail in personal vitae and may be measured and judged by the outputs but how we do archaeology as individuals is also the result of our personal experiences, not least of which are the projects we work on and the people with whom we work and interact. Legends of the Dinsmore Hilton chronicle these experiences. To date, these are primarily in the form of oral tradition as many of the participants are still extant and written versions might be subject to civil suits. As time passes my memory becomes ever more selective and inventive. Never the less, working for and with Dennis on the High Plains of Eastern Colorado in the mid-1970s has had a fundamental influence on who I have become as an archaeologist and person.

Bradley, John [180] see Steelman, Karen

Bradshaw, Kayla

[193] *Discussant*

Bradshaw, Ryan (California State University, Sacramento), Martijn Kuypers (California State University, Sacramento), David Zeanah (California State University, Sacramento) and Robert Elston

[92] *Technological Organization of Two Prearchaic Sites in Grass Valley, Nevada*

The research presented here works from the proposition that patterns in lithic assemblages reflect human organizational strategies. Preliminary investigations of 26La4434, a single component Prearchaic site in Grass Valley, reveal a pattern of large game exploitation in proximity to a Pleistocene shoreline. Standard metric, morphological, and edge-wear analysis of the flaked stone assemblage is used to evaluate whether the site facilitated access to local wetland resources and large game intercept hunting. We compare these results with the Knudtsen site (26La781), a dense site with a diverse assemblage that suggests a broad range of tasks and site functions. We argue that the observed technological organization is conditioned by several factors, including the local environment, raw material availability, and group mobility.

Bradshaw, Ryan [92] see Elston, Robert

Brady, Ashley and Tanya Peres (Florida State University)

[102] *Stones in the Shell: A Lithic Analysis of a Woodland Shell Ring in Florida*

The ability to manufacture and modify tools was an essential skill for the people of the past. Each tool manufactured served at least one purpose, and often multiple purposes. This includes flakes from tool modification and reworking. This poster represents the results of analysis of flakes and debitage from the Woodland period (ca. 2400 rcy BP) shell ring site of Mound Field (8Wa8), along the north Gulf Coast of Florida. Over 2,000 flakes, tools, and other modified lithics recovered from shell midden and feature contexts were analyzed as part of this research. The lithic data are integrated with the preliminary zooarchaeological, feature, and ceramic data to allow for a more robust interpretation of tool use and function.

Brady, James (Cal State L.A.)

[258] *Joseph Ball and the Reformulation of the Protohistoric: Revisiting Critical Issues*

At the 1985 Maya Ceramic Workshop, Arthur Demarest noted the intense interest in the Protohistoric. Indeed, ceramists with only a mammiform support and a handful of sherds would pause to speculate on the significance of a statistically insignificant number of sherds. During the 1990s, Joseph Ball and I doggedly worked to reexamine every aspect of the Protohistoric issue. Aided by contributions of a number of colleagues, the resulting

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document attempted to strip the Protoclassic of association with a specific temporal period and specific culture-historical events, reducing it to a simple ceramic stage. In the wake of the publication, a number of attempts have been made to reestablish a Protoclassic. This presentation discusses the flaws in those proposals and clarifies points made in the original publication.

[134] *Chair*

Brady, Liam (Monash University)

[113] *Referencing the Relational in 'Saltwater' Rock Art, Northern Australia*

Over the last decade, a major challenge for archaeologists has focused on understanding the relationship between people, things and the sea. As part of this effort archaeologists have increasingly focused their attention towards rock art as a symbolic means to referencing a maritime identity. At one level, identifying this connection can be relatively straightforward via marine-themed imagery (e.g. watercraft, marine animals) but what else can we draw upon to understand the nature and depth of this relationship? In this paper, we turn to the ethnographic record as a lens to explore how specific motifs and sites from two locations in northern Australia (western Arnhem Land's Wellington Range, and the Sir Edward Pellew Islands in the southwest Gulf of Carpentaria) are embedded in complex social and cultural networks for Australia's 'saltwater people'. At the core of our argument is the need to recognize how aspects of the ethnographic record such as song, kinship, cosmology and memory can play a pivotal role in accessing the meaning and symbolism of 'saltwater' rock art as well as how these images encode or communicate information about people's social identities.

[113] *Chair*

Brady, Niall [98] see Connell, Samuel

Bragdon, Kathleen (William and Mary)

[22] *Re-evaluating Wampum: Wearing Wealth in Native Southern New England*

For more than fifty years, scholars have been debating the role of the shell "currency" known as wampum (wampampeag), which began to circulate among the Native societies of New England in the seventeenth century, stimulated by the Dutch and English fur trade in the region. Following an assessment of current scholarship on the Dutch in New England in the early contact era, this paper further explores the role that wampum played within Native societies as a symbol of wealth, as well as its tangible embodiment. In particular, the rich embellishment of clothing using wampum, especially among Native elites and documented in many sources is considered in light of recently revived phenomenological theories of value.

Braje, Todd (San Diego State University)

[161] *A Meaningful Anthropocene?: Golden Spikes, Transitions, and Boundary Objects*

Despite opposition by a number of anthropologists, archaeologists, sociologists, and other historical and social scientists, a proposal to designate a geologic epoch of humans, the Anthropocene, is moving forward with a proposed starting date sometime in the last 50 years. The Anthropocene Working Group (AWG) and other, mostly, geological scientists have focused on the stratigraphic signatures for the boundary marker in lieu of understanding the long-term processes that have resulted in human domination of the Earth. As a growing number of papers that explicitly reference the Anthropocene are published, a theme that ties them together is the general lack of continuity on how we should define an Anthropocene. While the AWG strives to reach a consensus definition, we argue that the Anthropocene is best viewed as a 'boundary object,' where it can be adaptable enough to incorporate multiple viewpoints but robust enough to be meaningful within different disciplines. In doing so, we can maintain the original intent of an Anthropocene epoch, as a call-to-arms for future sustainable management of local, regional, and global environments, and fundamentally reconfigure established boundaries between nature and culture and the social and natural sciences.

[161] *Chair*

Bramstäng Plura, Carina (Swedish National Historical Museums) and Petra Nordin (Swedish National Historical Museums)

[23] *Archaeological Traces of Consumption of Colonial Goods in Eighteenth Century Gothenburg on the West Coast of Sweden*

The fortified city of Gothenburg was established around 1620, constructed when the Swedish trade intensified its involvement in the world sea commerce. Parts of the fortification, a Garrison Cemetery and two old country estates have been archaeologically excavated as a result of large-scale development of infrastructure in the city.

The excavation results give new perspectives on the garrison and its cemetery. Osteological analysis contributes to the interpretation of everyday life among garrison soldiers and their families. Indications of social change in the population were discovered. Exotic commodities had become available and popular through world sea commerce; rapidly adopted by the gentry of the town. A widespread increase in consumption of colonial goods such as sugar, coffee and tobacco is evident.

During the 1800th century some of the old country estates developed large-scale specialised cultivation of a mono-cultural and industrial kind, for example growing tobacco. Knowledge of new commodities, such as colonial products, brought status and provided households with the possibility to advance in social position.

Branam Macauley, Kelly (St. Cloud State University)

[166] *An Ethical Anthropology—What This Cultural Anthropologist Learned from Larry Zimmerman*

From American Indian representations in film, to working with descendent communities and sacred sites, to understanding families experiencing homelessness, Larry Zimmerman's scholarship, guidance, and way of being an anthropologist has greatly influenced the intellectual and professional development of many cultural anthropologists. It is an ethical anthropology that transcends any one subfield of anthropology, which includes owning one's disciplinary history and identity, learning from it and changing the discipline from the inside by not just the work you do, but how you do the work, that is the focus of this paper. As my faculty mentor at IUPUI, Larry always led and taught by example, and I witnessed his ethical anthropology in constant practice. Part discussion of my own intellectual history, part analysis of pedagogy, and part examination of method, I discuss Larry's ethical anthropology and his contributions to not only archaeology but to four subfield anthropology.

Brandes, Ulrik [287] see Athenstädt, Jan

Brandl, Michael (Austrian Academy of Sciences, (OREA)) and Daniel Modl (Universalmuseum Joanneum, Graz)

[140] *The Rein Basin Chert Mine, Styria, Austria: A Neolithic Center for Tabular Chert Quarrying*

Since 2009, the Neolithic chert quarrying site in the Rein Basin in Styria (Austria) has been the focus of a multidisciplinary research project. A mining area for tabular chert, approximately 10 hectares in size, was established at this locale in the course of a series of archaeological excavations, core soundings and a geophysical prospection. At Rein, tabular chert occurs in residual loams and mined in up to four meter deep shafts. According to this evidence, the site is only the second archaeologically traced Neolithic chert mine in present-day Austria.

The extracted raw chert plates suitable for chipped stone tool production were either worked on-site or shaped into bars, and subsequently transported into the settlements for further processing. Radiocarbon dates from charcoal samples derived from the prehistoric backfilling of the shafts indicate the

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Rein chert mine was in operation between 4500 and 3800 BC.

Additionally, the raw material was petrographically and geochemically characterized, allowing for accurate provenance studies of artifacts from prehistoric sites produced from Rein chert. These analyses revealed prehistoric distribution networks indicative of extensive contacts between Neolithic groups in the southeast Alpine realm, and afford the investigation of socio-economic developments on a supra-regional scale.

Brandt, Steven (University of Florida), Alice Leplongeon (Muséum national d'histoire naturelle, France) and Clément Ménard (Université Toulouse-Jean Jaurès, France)

[198] *Hunter-Gatherer Responses to the "Early" African Humid Period ~15–12 ka*

Recent paleoclimate studies indicate rainfall increased dramatically over many parts of northeastern and eastern Africa at the end of MIS 2 and the hyper-arid LGM ~14.7 ka, thereby marking the beginning of MIS 1 and the "African Humid Period" (AHP). These studies also suggest that not only should the "early" AHP be decoupled from the start of the Holocene some 3000 years later, it should also encompass the cooler, more arid Younger Dryas (12.9–11.7 ka). This paper explores two key questions: 1) can we identify archaeological evidence for hunter-gatherer activities in this region during the early AHP ~15–12 ka; and 2) if so are there technological, settlement, dietary and other behavioral changes that can be linked to climatic change or other possible causal mechanisms? A preliminary review of the early AHP archaeological record shows that despite a small data set and a limited number of chronometric ages, there appears to be few sites in the Nile Valley, while in eastern Africa there are substantially more. We conclude by discussing how a richer understanding of the early AHP archaeological record might better prepare and inform us of the significant human responses to the later part of the AHP ~12–5.5 ka.

Brannan, Stefan (New South Associates)

[5] *Settlement Scaling in the Eastern Woodlands of the United States, ca. 3500 BC to AD 1700: Size, Monumentality, and Public Space*

The concept of settlement scaling is increasingly being utilized in archaeology to empirically evaluate mathematical properties of urban and non-urban settlements. However, principles based on settlement scaling theory have yet to be tested in the Eastern Woodlands of the United States despite the existence of a robust sample of settlements, including those containing monumental architecture. As part of a broad regional study, I collected spatial data on settlement size, monuments, and public spaces at 70 sites located in the Eastern Woodlands occupied between 3500 BC and AD 1700. In general, sites exceeding 20 hectares exhibit distinct characteristics related to monumental architecture and public space when compared to smaller examples. A central question is whether these larger settlements possess fundamentally different scaling relations or if the former merely represent scaled-up versions of the latter. This paper explores the relationship between those attributes to determine quantitative patterns and qualitative differences between small and large settlement patterns. The results are used to develop a generalized theory of settlement scaling in the Eastern Woodlands which is then employed to explain the patterns of aggregation and dispersal in the lower Chattahoochee River valley of the United States, ca. AD 1100–1500.

Brannan, Stefan [266] see Coker, Adam

Branscome, Mason [88] see Gidusko, Kevin

Braswell, Geoffrey (UC San Diego)

[176] *Discussant*

[258] *Chair*

Braun, David R. (George Washington University), Matthew Douglass (University of Nebraska-Lincoln), Benjamin Davies (University of Auckland) and Jonathan Reeves (George Washington University)

[200] *Whole Assemblage Behavioral Indicators: Expectations and Inferences from Surface and Excavated Records at Elandsfontein, South Africa*

Large scale surface surveys represent singular insights into the landscape scale variation in behaviors. Detailed investigations of the spatial distribution of artifacts across large spatial extents allow archaeologists to investigate a landscape as a single site. Surface assemblages have the advantage of large sample sizes and large aerial extents. However, biases associated with the formation processes of surface assemblages often undermine our confidence in the behavioral inferences derived from these records. Here we investigate patterns of behavior recorded in several whole assemblage behavioral indicators for seven assemblages recovered from the Acheulean dunefield site of Elandsfontein (800 ka -1 Ma) from the Western Cape in South Africa. Large surface and excavated assemblages of stone artifacts from similar locations allow us to investigate the impact of deflation processes on behavioral inferences. We use agent based models to develop expectations about the spatial variation in behaviors across this ancient landscape. Results suggest that the processes that created deflated surface assemblages have varied impacts on whole assemblage behavioral indicators. Some of these proxies of behavior appear to provide faithful representations of patterns derived from excavated assemblages. We compare these behavioral inferences to contextual data collected from excavated contexts.

Braun, David R. [41] see Beaudoin, Ella

Braun, David R. [41] see Hlubik, Sarah

Bray, Tamara (Wayne State University), Leah Minc (Oregon State University) and Sergio Chavez (Central Michigan University)

[100] *Recent Research in Copacabana, Bolivia, the Intinkala Sector*

Copacabana has been a pilgrimage destination and a site of extraordinary reverence from Formative times to the present. Together with the Islands of the Sun and Moon, it formerly comprised one of the most sacred ceremonial complexes in the Inca Empire. Recent archaeological research in Copacabana has focused on the Intinkala sector located just east of the modern basilica. The principal aim of the first season was to ascertain the nature of Inca engagement with this powerful locale as evidenced through spatial and material patterns and practices. Fieldwork conducted in 2016 included a geophysical survey of the area, photogrammetric documentation of the cutstones, topographic mapping of the site, and excavations. The excavations produced evidence of both large and small rectangular structures associated with the above-ground sculpted stones and outcrops, as well as an Inca midden. Subsequent analyses have focused on 3D spatial rendering of features identified, compositional study of the variety of Inca ceramics recovered using INAA, and comparative assessments. The study ultimately aims to provide insights into the ways in which topographies of the sacred are constructed; how attachments to place are formed and transformed over time; and how power, place, and identity are materially and mutually constituted.

[181] *Discussant*

[181] *Chair*

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Breault, Sarah**[288]** *Ceramics and Community: A Yucuita Phase Ceramic Cache at Etlatongo*

Feasting is a well-documented phenomenon in Mesoamerica as a means of community integration and interaction. Ceramic analysis of Op. B, Pozo 20, Feature 1 from the site of Etlatongo may point to one such feasting event at the site. This Yucuita phase (500–300 BC) feature was a primary refuse deposit of ceramic, lithic, and faunal artifacts intermixed with extremely ashy sediment, probably from a specific event. An overview of the stratigraphy of the feature and an inventory of the assemblage will be given, with a particular focus on ceramics, with a summary of primary data that considers pastes, forms, and slips of vessels as well as details of technological style such as wall thickness and angle, as part of an ongoing effort to explicate the full range of Yucuita phase pottery. Patterns will be compared with other Yucuita phase collections in order to verify if these patterns occur throughout the region or are specific to particular deposits and/or the site of Etlatongo. A consideration of possible depositional events will follow, based primarily on frequency of vessel forms as compared to other Yucuita contexts from both this site and the site of Yucuita.

Breiter, Sarah (Northwestern University)**[167]** *A Long Relationship: The Reuse of Monastic Stones after the English Reformation*

The English Reformation had a swift impact on the people of the rural landscape. The movement away from the Catholic church altered the relationship that people had to the physical manifestation of church authority. During the Dissolution of the Monasteries, Church landholdings were sold off to private owners, and the architectural core was repurposed for secular use. Most of the research on the Dissolution focuses on how the new landowners reused the land, or converted churches into manor houses. However, people who lacked the means and resources to make large-scale changes to the former monasteries still found a way to express their new relationship through removing and reusing the stone in the farms and villages near the monastery. At Thornton Abbey, multiple agricultural and village properties were surveyed for monastic stone. The stone was reused as building material, garden decorations, and, more recently, as gifts. How the stone is used appears dependent on the variety and the age of the property, indicating that the stone was interpreted in different ways based on the individuals and their social context. People continue to reuse the stone, marking the enduring presence of the Church on the landscape.

Brenner, Mareike [124] see Conard, Nicholas

Brenskelle, Laura [217] see Emery, Kitty

Breske, Ashleigh (Virginia Tech)**[70]** *Politics of Repatriation, Formalizing Indigenous Cultural Property Rights*

This theoretically-oriented project engages discussions of historical arguments for the repatriation of indigenous cultural property that ultimately led to the creation of the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990. I will investigate how institutions and cultural values mediated changes in repatriation policy both nationally and internationally. By examining ownership paradigms and institutional power structures, it is possible to understand the ramifications of formalizing repatriation. The current binary of cultural property nationalism/cultural property internationalism in relation to cultural property ownership claims does not represent the full scope of the conflict for indigenous people. Inclusion of a cultural property indigenism component into the established ownership paradigm will more fully represent indigenous concerns for cultural property held in museums and other collections. Looking at the rules, norms and strategies of national and international laws and curatorial policy within museum institutions, I will also argue that there are consequences to repatriation claims that go beyond possession of property and a formalized process (or semi-formalized approach internationally) like NAGPRA can aid in addressing indigenous rights.

Bretzke, Knut (University of Tuebingen)**[227]** *A Probabilistic Approach to Study Diachronic Patterns in Human Behavior: A Case Study from the Paleolithic Sequence at Jebel Faya, UAE*

Jebel Faya is a key Paleolithic site in Arabia. The site provides important data on the history of human occupation of desert environments during the Late Pleistocene. One central question is if the observed diachronic pattern of occupation is largely driven by climatic change, as often assumed, or if other factors such as adaptation processes play significant roles. Based on the assumption that survival in the often unpredictable environments of SE Arabia requires increased behavioral flexibility and risk minimizing strategies this paper examines Jebel Faya's Paleolithic stone artifact assemblages with regard to economization of lithic raw material and the intensification of social relations. Attributes such as production efficiency and re-use potential represent raw material economization, while technological complexity, occupation intensity and raw material provisioning are used to deduce an indirect estimate for the intensity of social relations. To assess the degree of economization and social relation, the archaeological assemblages are compared to data modeled under optimality assumption using a probabilistic approach based on Naïve Bayes classifier. These results were used to track changes in social relations and raw material economy through the archaeological sequence from Jebel Faya to see if these data provide meaningful information on differences in social learning.

Bretzke, Knut [124] see Conard, Nicholas

Brewer, James T. [305] see Delaney, Colleen

Brewer, Katherine (University of New Mexico)**[115]** *A Comparative Analysis of Historical Artifacts Recovered from Room 28*

Historical artifacts from Room 28 in Pueblo Bonito provide a unique opportunity to investigate what the Hyde Exploring Expedition, Moorehead, and National Geographic Society excavations left behind during their excavations between 1896 and 1927. Using the 2013 UNM excavations in Room 28 as a starting point, analysis of the historical artifacts found in excavation and stabilization over the last century provides an important perspective on how those early excavators discarded their own material culture in the rooms of Pueblo Bonito. As a whole, this analysis provides an archaeology of the early "archaeologists" of Pueblo Bonito.

Brewington, Seth (Hunter College, City University of New York)**[34]** *Fowling and Food Security in the Faroe Islands*

Seabird fowling has long played an important role in the traditional domestic economy of the Faroe Islands, a small North Atlantic archipelago. Direct evidence for seabird exploitation in the earliest period of Faroese prehistory has been lacking, however. In this paper, I present new archaeofaunal evidence for substantial and sustained seabird exploitation in the Faroe Islands from the 9th through 13th centuries CE. The data suggest that seabirds represented a significant resource in the Faroese subsistence economy from the earliest Norse settlement onward. Fowling thus represented one component of a broad-based subsistence regime that was aimed primarily at decreasing vulnerability to food shortfalls, particularly those caused by failures in the agro-pastoral economy. When compared to typical contemporaneous archaeofauna from Norse Greenland and Iceland, the role of fowling in the Faroese domestic economy is quite large. The Faroe Islands in this respect appear more similar to some northern insular communities of the British Isles, and the Outer Hebrides in particular.

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Bria, Rebecca (University of Minnesota—Twin Cities)**[297]** *Interlinking Practices and Community Assemblages: Agriculture and Ritual in Ancient Hualcayán, Peru*

This paper combines assemblage theory with ritual economy in the study of long-term community formation at prehistoric Hualcayán, in highland Ancash, Peru. In particular, it explores how the people of Hualcayán interlinked and coordinated their practices of building, food production, and ritual consumption to assemble a Recuay community during the Andean Early Intermediate Period (AD 1–700). It traces the archaeological evidence of how religious ideologies, social group divisions, and agricultural technologies shifted together during this process of community formation, including how ritual and food production practices and materials were integrated into particular events and local spaces. It concludes that the integration of these practices was essential to establishing common goals, consent, and material dependencies between a community of builders, ritual participants, and food producers. Ultimately, the paper argues that to examine community is to inquire into the overlapping ritual and labor practices that constitute social interaction and create meaningful relationships between people and non-human actors such as land, plants, animals, and supra-human beings.

[297] *Chair*

Bria, Rebecca [292] see Walter, Doris

Briceño, Jesús [297] see Bardolph, Dana

Briceño, Jesús [165] see Billman, Brian

Briceño, Jesús [165] see Hudson, Jean

Bridgman Sweeney, Kara [24] see Sweeney, Alex

Briggs, Emily [304] see Melton, J. Anne

Briggs, Rachel (University of North Carolina-Chapel Hill)**[220]** *The Mississippianization of Women in the Black Warrior Valley of Alabama, A.D. 1120–1250*

By A.D. 1120 in the Black Warrior Valley of west-central Alabama, a Mississippian identity, predicated on the dissemination and subsequent adoption of maize, had firmly begun to take root at what would become the ritual-ceremonial center of Moundville. Traditionally, researchers have modeled the origins of Moundville within a political-economic lens: the growing aspirations of elites, who are implied to be male, are supported and fueled by stores of and feasts of maize, which is treated primarily as a resource to achieve their ambitions. However, through a careful analysis of the early landscape of practice of the hominy foodway of the Black Warrior Valley, I suggest that during this early period, it was not the activities of men, but instead those of new and endemic women to the area that first sparked and then united the early Moundville landscape. This analysis further suggests that what has largely been interpreted as a homogenous cultural expression for all people regardless of gender within the area was instead more heavily driven by, and had a greater impact on, female gendered activities.

Brighton, Stephen (University of Maryland)**[296]** *The Materiality of Cultural Resilience: The Archaeology of Struggle and Transformation in Post-famine Ireland*

Cultural resilience or collapse has been the focus for the study of prehistoric and proto-historic societies. Little, if any work in historical archaeology, or the archaeology of the modern world, has linked the impact of traumatic natural events and social, economic, and political structures to how cultural groups respond. In this paper, cultural resilience theory is employed to discuss the capacity of a culture to maintain and transform its world-view, cultural identity, and critical cultural knowledge. In this context, extreme events, challenges, and societal or cultural stressors inhibit or test the structure of a culture. Such is the context of the decades following Ireland's Great Hunger. This presentation details the on-going research on Ireland's cultural resilience in terms of the impact of the mid-nineteenth century Great Hunger. This paper focuses on the author's archaeological research in Skibbereen, County Cork seeking to find the material manifestation of cultural resilience in the decades following the Great Hunger. The aim is to use the material remains to illustrate how Ireland's cultural structure once on the brink of collapse was resilient enough to transform after losing half its population to either emigration or death.

Brinkman, Adam (UMass Boston)**[104]** *Ollas and Inequality: Reflections on Space, Ceramics, and Power Relationships at the Sanchez site.*

Spanish exploitation of Indigenous people's labor was a foundational component of the initial colonization of New Mexico. Pueblo Indians and enslaved Plains peoples worked on Spanish public infrastructure projects, built Spanish Missions, tended friar's livestock, and helped with the daily operations of outlying estancias. At the Sanchez site, evidence of daily labors can be seen in broken manos and metates scattered around the site, the presence of the adobe structures that were built by Pueblo Indians, and the distribution of Pueblo Indian ceramics in the Spanish home and adobe barn. By studying the spatial distribution of these materials throughout the Sanchez Site, this poster seeks to explore how labor exploitation was reinforced and perpetuated throughout the early colonial period.

Brinkmann, Robert (Hofstra University)**[215]** *The Sustainability Lessons from the Archaeological Work of Lynne Goldstein: The Curious Environmental Stories of Aztalan, Fort Ross, and Michigan State University*

Sustainability can be defined as meeting the needs of the present without depleting natural resources for the future. With such a time focused definition, there is no doubt that the meaning of sustainability changes over time and by culture. An examination of three of Lynne Goldstein's field sites, Aztalan, Fort Ross, and Michigan State University, provides an opportunity to dissect our modern take on sustainability. At Aztalan, sustainability of Native American culture comes into question as there is evidence that social equality did not lead to sustainable conditions. At Fort Ross, environmental conditions created problematic challenges for a pioneer settlement. At Michigan State, economic and environmental changes caused rapid constructions of what it means to be sustainable. Each case highlights the significance of the three pillars of sustainability (environment, social equity, and economic development) in analyzing past and present cultures. When taken together, the three sites challenge today's thinking about the meaning of sustainability and how it can be achieved.

Britt, Krystal (University of Illinois at Chicago), Claire Barker (Arizona State Museum), Samantha Fladd (University of Arizona, University of Cincinnati) and Danielle Soza (University of Arizona)**[218]** *Sunset at Rock Art Ranch: Human Use and Occupation of the Middle Little Colorado River Valley before the Homol'ovi Settlement Cluster*

From 2011–2016 the Rock Art Ranch (RAR) field school, directed by E. Charles Adams and Richard Lange, surveyed about 17 square kilometers and conducted excavations at three sites to understand how groups utilized the prehistoric landscape of the Middle Little Colorado River valley. Research at RAR, located near the modern town of Winslow, Arizona, sheds light on over 10,000 years of human settlement and contextualizes over three decades of work by Adams and Lange at the nearby Homol'ovi settlement cluster. During six seasons, the RAR field school documented 220 sites

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representing use beginning with mobile hunter-gatherer populations through Ancestral Puebloan communities of the Pueblo III period. Additionally, ceramic evidence indicates that visits by Hopi people continued through the early Historic period—demonstrating the continued importance of this area.

The intensive survey and excavation data collected by the RAR field school is regionally significant as very little of the surrounding landscape has been investigated outside of the Homol'ovi settlement cluster of the Pueblo IV period and the extensive rock art from which the ranch derives its name. In this paper we summarize our findings, which help to contextualize the social and physical landscape prior to aggregation at the large Homol'ovi pueblos.

Brittingham, Alexander (University of Connecticut), Michael Hren (University of Connecticut), Gideon Hartman (University of Connecticut), Keith Wilkinson (University of Winchester) and Daniel Adler (University of Connecticut)

[177] *Organic Molecular Proxies for Fire in Archaeological Sediments*

A number of different direct and indirect proxies are used to identify fire at archaeological sites. We propose a new organic molecular proxy for identification of anthropogenic fire in archaeological sediments, polycyclic aromatic hydrocarbons (PAHs). These molecules are a byproduct of the incomplete combustion of organic biomass, and are preserved well on deep time scales. We applied this proxy to Lusakert Cave, a Middle Paleolithic site in the Hrazdan Gorge, Armenia. From these same samples, we also extracted n-alkanes, the molecular remains of the epicuticular waxes of terrestrial plants. We analyzed the δD and $\delta^{13}C$ values of the n-alkanes to measure vegetation and hydrological changes at the site during its occupation. This coupled record of climate and fire from sediments containing archaeological material gives insight into the ability of Middle Palaeolithic hominins to control fire through changing ecological regimes.

Britton, Emma [95] see Schleher, Kari

Brizuela Absalón, Álvaro [42] see Vargas, Amilcar

Brizuela Casimir, Alvaro and Gloria Biffano Marcial

[260] *El sitio arqueológico de Barrigón. Un cementerio precolombino del Gran Chiriqui*

We present a review of the data obtained during the "Proyecto de Rescate Arqueológico Estí (PRAE)" that took place between 2000–2003 in the context of the environmental mitigations of the Estí hydroelectric project; and with special attention to the Barrigón site.

Barrigón is a cemetery site from prehispanic times localized near to the Gualaca city in Chiriqui province (Panamá). This kind of "necropolis" was placed in the flat top of a little hill a few meters from the Barrigón river. We identify a typology of graves and explore at least two of each one, several artifacts were recovered in acceptable conditions in order to made conservation or restoration actions whit diffusion meaning. AES Panamá (the project promotor) build a little local museum in Gualaca fist square, to present this legacy at the region and national community.

The material cultural that has been rescued, both ceramic and lithic, has been identified as Aguas Buenas (Bugaba) tradition.

Brochado De Almeida, Pedro

[229] *The Cividade de Bagunte Archaeological Project*

The Cividade de Bagunte is the most publicized archaeological site of the Municipality of Vila do Conde and is classified as a Portuguese National Monument. Located on a mound with great visibility over the territories to the north and south of the Ave River, approximately 30km north of Oporto city, it called the attention and interest of various archaeologists such as Ricardo Severo and Martins Sarmiento, in the end of the 19th century, and F. Russell Cortez in the 1940s. F. Russell Cortez organized excavation campaigns at the site that uncovered a mixture of Castrejo and Roman type buildings and structures, distributed into orthogonal spaces that already have the seal of a Roman influence in the region. The urban reorganization of the town happened in the 2nd half of the century, with the Flavian dynasty. Since the 1990s, the Municipality of Vila do Conde is running a project to preserve, study and provide public access to the archeological site. This presentation is a way to publicize, in an international environment, the achievements made by this effort.

[229] *Chair*

Brock, Terry (The Montpelier Foundation)

[215] *Mentorship, Professionalism, and the MSU Campus Archaeology Program*

In 2008, Lynne Goldstein founded the Michigan State University Campus Archaeology Program. I had the opportunity to serve as the first Campus Archaeologist, a position that I thought would give me much needed experience in conducting and leading archaeological excavations. In addition to this, I ended up learning more about becoming a complete professional and public archaeologist, the intangible skills that are so difficult to teach, but that Dr. Goldstein has bestowed upon many of her students and staff through this program. This paper will talk about the importance of the Campus Archaeology Program, the early years of its development, and how Dr. Goldstein's mentorship allowed me to learn about the elements of being a professional archaeologist that are so often ignored, go untaught, or viewed as being in the way of pure academic scholarship.

Brodie, Laura (University of WI-Madison)

[260] *Settlement Locations and Soil Fertility in the Volcán Barú Region of Panama*

Analyses of settlement locations (such as hamlets and farmsteads) within the Volcán Barú region of Panama and their associated periods of occupation suggest that during certain times, such as the Chiriquí Period, soil fertility was an important factor in determining the location. However, during other periods, it does not seem to have been significant. There also is a centralization of the population during the late formative, or Late Bugaga Phase, which correlates with previous findings of Barriles and Pitti-Gonzalez getting larger during that phase. Soil fertility does not appear to have been an essential feature of the first settlements in the region.

Brody, Rachel (Boston College) and Rebekah Mills (Barnard College)

[23] *Castles in Communities: Recent Findings in the Field*

The archaeological and anthropological field school Castles in Communities, organized by Foothill College, completed its third field season this past summer at the site of Ballintober Castle, County Roscommon, Ireland. The construction of Ballintober Castle (early 14th century) is attributed to the Anglo-Norman Richard de Burgh, Earl of Ulster. Shortly after its Anglo-Norman occupation, the castle came under Irish control (1381) and has been the property of the O'Connor family ever since. After being attacked in 1642, the castle was abandoned as a residence. The castle now lies in ruins, portions stand 4m high. Extensive non-invasive field survey and excavation have been performed, not only on the site of the castle, but within its surrounding landscape and adjacent fields. This paper will present the findings exposed in excavations conducted in the north-east tower of the keepless castle. Excavation has shown a complex stratigraphy and multi-phased building construction. It will be postulated that the identified different phases in castle construction can be linked to changed hands in ownership, reconstruction in response to outside attack, and period remodeling efforts.

[23] *Chair*

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Broehl, Kristen (California State University, Chico), Colleen Milligan (California State University, Chico), Kelsie Hart (California State University, Chico), Karin Wells (California State University, Chico) and Vanessa Reeves (California State University, Chico)

[179] *Paleopathology and Non-specific Indicators of Stress from Point San Jose*

Paleopathology encompasses the understanding of disease processes that affect skeletal remains as well as the timeframe and context in which they occur. Although most such studies focus on changes observed at an individual level, the Point San Jose assemblage provides a challenging perspective on paleopathology because it consists of separate skeletal elements lacking association with whole individuals. Consequently, our focus is on the types of bony changes seen rather than specific diagnoses of the etiology of those changes. A total of 240 (12%) bones of approximately 2,000 observable elements show changes in bone shape, bone loss, bone formation, trauma, non-specific infection, or joint disease. Among the elements displaying pathology, the highest prevalence involves bone formation (68%, 163/240) associated primarily with traumatic and degenerative processes. Although bone formation is also associated with shape changes and trauma, joint disease accounts for the majority of bone formation (60%, 97/163). Of the elements that demonstrate trauma, most (83%, 20/24) are appendicular elements. In addition, all periosteal reactions from infection occur on appendicular elements, most commonly associated with fractures.

Brooks, Alison (George Washington University) and John Yellen (National Science Foundation)

[227] *Social Learning Among recent Hunter-Gatherers: Jun/wasi Examples*

While interest in the role of social learning in the Paleolithic has focused extensively on stone artifacts, very little attention has been paid to social learning in living forager populations. In this paper we report on many years of fieldwork among the Jun/wasi of northwestern Botswana and Namibia. We argue that most cultural transmission in relation to domains such as technology, language and food acquisition was informal, and was acquired in the context of close daily relationships between children (including ours) and Jun/wasi adults, as well as between younger and older children in the context of play groups as children grow. We will also discuss the transmission and acquisition of new technologies from contacts outside the Jun/wasi community. These ethnographic data have direct implications for interpreting the archaeological record, particularly the spatial patterning of culturally transmitted material cultural remains.

Brooks, Alison [227] see Ranhorn, Kathryn

Brooks, Allyson

[151] *Discussant*

Brother, Janie-Rice [94] see Henderson, A. Gwynn

Brother, Rosemary

[38] *From Features to Figures: Quantitative Analysis of California Native American Baskets*

There are only a few recognized experts on California Native American basketry and their informed opinions establish the current state of knowledge. It takes years of experience under the guidance of a knowledgeable mentor and examination of hundreds of baskets to develop such expertise. While analysis by the few experts may be quantitative, scientific, and exacting, designation of a basket's ethnic identification continues to be subjective. In some instances, authors cite little but their own research. This raises the question whether statistical analysis of basketry attributes can be used to identify a basket's ethnic origin.

To answer this question, baskets of selected northeastern California Native American groups, will be statistically compared to test whether ethnic origin is indicated in the results, and whether linguistic affiliation or geographic propinquity best account for differences and similarities between basket weavers. The analysis will include sixty-five different basketry attributes from each of one hundred fifty to two hundred individual baskets. The potential for seeing previously unknown associations between ethnic groups is likely. Newly recognized associations have the potential to influence future research on population migration, genetic studies, and linguistics.

Brouwer Burg, Marieka

[133] *Certainty about Uncertainty: Lessons Learned from Modeling Human Land Use and Decision Making*

A cornerstone of William Lovis' career has been the investigation of human land use dynamics, with strong emphasis on methodological rigor and statistical analysis. He has led a generation of students to consider these issues in the Great Lakes and beyond. The modeling of past human decision making is useful as a heuristic for exploring goals and motivations, about which there is certainly a tremendous amount of uncertainty. Instead, modeling past behavior is inherently an exercise in balancing this uncertainty with assumptions, existing knowledge and theory, data (and their limitations), and technology. This paper will explore the role William Lovis played in inspiring and driving research in this vein. In the end, only deeper and broader insight about past natural and social-behavioral dynamics is to be gained when we push our research to the edge of uncertainty.

[235] *Discussant*

[133] *Chair*

Browman, David [335] see Baka, Abby

Brown, Alexander (Researcher- ArchaeoTek Archaeology)

[85] *The Archaeology of Gossip: Delineating the Space of Interpersonal Performance*

Much of the literature on performance in cultural and political spheres in archaeology over the last 4 decades has focused on social memory. This paper shifts that discussion from the arena of public commemoration and cultural rites to the de facto performances of the domestic sphere. Private, interpersonal interactions are important in the transmission and creation of social memory as well- they place an individual's social world in the context of shared social memory, and vice versa. Gossip is cited with frequency in ethnographic accounts and anthropological analysis as containing a wealth of sociocultural meanings; is it possible in archaeology to gain perspectives from such "immaterial" interactions?

This study identifies and interrogates the physical environments in which gossip would have occurred, entertainment and congregation spaces in domestic contexts, by modeling Roman domestic space as a performative space in which interpersonal influence was crucial. In the Roman Empire, gossip was a notoriously influential sociopolitical practice that was enacted and documented in many public forums with great performative flair, and thus provides an excellent case for comparison of the material conditions of this practice with written accounts.

[85] *Chair*

Brown, Clifford (Anthropology Dept., Florida Atlantic University)

[263] *Nonlinear and Multiscalar Dynamics of Migration*

The quantitative model of diffusion traditionally studied in archaeology uses Gaussian statistics and Brownian motion to envisage a slow wave of advance. It originates from Fisher's model for the diffusion of advantageous alleles across the landscape, but was then applied in archaeology to the

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diffusion of agriculture from the Near East into Europe. More recently, Lévy flights, which are random walks with step lengths derived from power-law distributions, have been proposed as models for human movement, especially for foragers. The archaeological signatures for these two dynamical processes—Brownian motion versus Lévy flights—are potentially quite different, making them useful and practical to consider. It seems likely *prima facie* that both processes are good models for different kinds of prehistoric migrations, and, moreover, in each case tuning the parameters of the model yields different patterns. In this paper, I discuss historical and archaeological evidence for these two different dynamical regimes of migration models and their implications for our interpretations.

Brown, David (University of Texas at Austin), Mark Willis (Blanton & Associates, Inc.) and Chester Walker (Archaeo-Geophysical Associates, LLC)

[324] *The Late Prehistory of Ecuador from Above and Below: Remote Sensing in the Northern Highlands*

Remote sensing, including both low level aerial photography and subsurface geophysical methods, has become an increasingly key element in archaeological fieldwork over the last few decades. During that time, our team has used various techniques to accurately map late prehistoric Ecuadorian sites and to search for buried features. In the last two years we have used drone aerial photography, ground penetrating radar, and magnetometry to aid in investigations at the monumental site of Cochasquí. Photogrammetric processing of aerial photos has allowed us to create precise topographic maps, three-dimensional models of architectural features, and to calculate volumes of constructed features and adjacent quarry areas. Concurrent geophysical investigations have revealed numerous subsurface features, allowing the excavation team to selectively focus on appropriate loci for study.

Brown, Gabriel (VCP Alexandria) and Guillian Hurte Sr. (VCP Alexandria)

[326] *Forensic Photography and the VCP—Teaching Veterans and Capturing History*

One of the unique opportunities given veterans within the Veterans Curation Program (VCP) is professional training in high quality digital artifact photography that far exceeds the quality of photography practiced by most Cultural Resource Management firms. A representative sample consisting of 10% of every collection processed by VCP is photographed by the veteran technicians and subsequently combined with the finalized collection. These digital images are reviewed and a selection is eventually uploaded to the Digital Archaeological Record (tDAR), an international digital repository for the records of archaeological investigations. The process of training veterans with little or no background in photography relies primarily on well-established step-by-step methods, ongoing personalized training and mentoring, and an accessible reference guide designed specifically for the VCP. With the skills and experience acquired through the VCP, many veterans have discovered the value of photography not only as a therapeutic and satisfying hobby, but also as a possible career choice.

Brown, Ian

[291] *The Reuse of Indian Mounds as Historic and Modern Cemeteries*

Stephen Williams had strong interests in the history of archaeology, prehistoric Indian mounds, and historical archaeology. This paper combines aspects of each of these interests. Cemeteries associated with Indian mounds commonly occur in the Ohio and Mississippi valleys. Numerous reasons have been put forth over the years as to why early Anglo-American settlers decided to bury their dead on mounds, ranging from flooding issues, to avoidance of valuable farmland, to a preference for burying on high land. The fact that a number of mound sites along the bluffs of western Mississippi also have non-Indian cemeteries on them, despite even higher land occurring nearby, suggests that the story is far more complex than perceived. I suggest here that the use of mounds for burial purposes may be related to early nineteenth-century Anglo-American populations having made symbolic power statements over land that was still either being occupied or claimed by Indians. The erection of gravestones on prehistoric mounds targeted what were clearly the most visible and curious monuments of this contested landscape.

Brown, James (Northwestern University)

[133] *Discussant*

Brown, Kelly (VCP Augusta), Alison Shepherd (VCP Augusta) and Josh Wackett (VCP Augusta)

[326] *The Tombigbee Historic Townsites Project: A New Look at a Previously Excavated Collection*

With the curation crisis growing more prominent in the realm of archaeology, research focus is slowly being shifted to previously excavated collections that are under analyzed and underreported. Many of these previously excavated collections are overlooked by potential researchers because of the perceived difficulties of re-establishing provenience and quantitative control for artifacts that have been long separated from their original archaeological context. Since 2009, the Veterans Curation Program (VCP) has rehabilitated 231 at-risk United States Army Corps of Engineers (USACE) owned archaeological collections. The Tombigbee Historic Townsites Project is one such collection. Completed in 1983, this project aimed to salvage data from three of the earliest towns situated along the Tombigbee River in the eastern region of Clay County, Mississippi. This paper will provide an overview of the research and educational opportunities that can be derived from the analysis of transferware in a previously excavated collection.

Brown, Linda A. [40] see Jackson, Sarah

Brown, M. Kathryn (The University of Texas at San Antonio) and Jason Yaeger (The University of Texas at San Antonio)

[129] *The Shifting Political Landscape of the Mopan Valley: A Diachronic Perspective*

The Mopan River valley of Belize is home to five closely spaced Lowland Maya ceremonial centers with extensive settlement occupying the landscape between. From south to north, the ceremonial centers are Arenal, Early Xunantunich, Classic Xunantunich, Actuncan, and Buenavista del Cayo. Archaeological evidence suggests that each of these centers was initially occupied by the Middle Preclassic, but they had distinct histories, evolving into ceremonial/political centers at different times, from the Middle Preclassic to the Late Classic. Additionally, the decline, collapse and eventual abandonment of these ceremonial centers occurred at different times and with varying impact on nearby hinterland communities. In this paper we present archaeological data from the Mopan Valley in order to place the site of Actuncan within this regional history. In doing so, we highlight the changing political organization of the Mopan valley, as political authority became more centralized and the institutions of divine kingship developed, flourished, and eventually collapsed.

Brown, Ryan (Superior National Forest)

[106] *Following the Voyageurs Highway: Cultural Resource Management in the Boundary Waters Canoe Area Wilderness*

Wilderness areas are generally managed as unpeopled landscapes, in the words of the Wilderness Act, "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." However, wilderness areas do have human histories, and these historical narratives and the archaeological record they left behind can greatly enrich the visitor experience. In the Boundary Waters Canoe Area Wilderness in northeastern Minnesota, visitors portage canoes over the same trails and paddle the same routes used by voyageurs and Native

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Americans centuries before, creating a tangible link with the past. This continuation of historical landscape use for modern recreation creates challenges for cultural resource management by concentrating visitor impacts on areas of high archaeological probability and significance. Of 2080 designated wilderness campsites, approximately 40% are collocated with identified archaeological sites. These sites are at risk of degradation through visitor induced erosion and campsite maintenance activities. Due to the remoteness of the area, only a small number (approximately 13%) have been surveyed to current standards. However this remoteness and the designation as a wilderness area has also served to help preserve the archaeological resources of the Boundary Waters region.

Brown, William (Department of Anthropology, University of Washington)**[118]** *Formal Theory in Demographic Temporal Frequency Analysis: Decomposing the TFD Data Generating Process*

John Rick's 1987 paper in *American Antiquity* presented the first systematic overview of theory underlying the "dates as data" approach (i.e., demographic temporal frequency analysis, dTFA), describing the general outline of a data generating process (DGP) linking paleopopulation dynamics to temporal distributions of archaeological materials (temporal frequency distributions, tfds). While research pursued in the dTFA framework has gained momentum over the intervening decades, questions regarding its reliability if not legitimacy have also emerged. Arguably, this critical pushback is the result of the tacit but persistent reluctance both of advocates and critics to give full formal expression to dTFA's core theory. In turn, this reluctance has led to the inadvertent conflation of the program's foundational principles and its special-case conditions, as well as to vague impressions regarding the degree to which non-demographic forces obscure demographic information in tfds. In response, I explicitly formalize Rick's framework as a functional decomposition of the tfd DGP. Features of this formal theory are highlighted that can be productively leveraged in the service of demographic inference, specifically in the context of inverse uncertainty quantification (e.g., backward uncertainty propagation and sensitivity analysis). Both paleopopulation size and growth rate estimation are considered.

Browne Ribeiro, Anna (University of Louisville Kentucky)**[254]** *My Grandfather's Castanhal: Plants, Community, Territory, and Memory in the Brazilian Amazon*

In contemporary Gurupá, a rural municipality in the Brazilian Amazon, life is largely shaped by movement of, and among, plants. Plants here are mobile, but spend most of their lives stationary. In this paper, I examine the relationship between people and plants—as living, but nonetheless spatially rooted elements of the landscape—in these agroextractivist communities. I explore the significance of planting and plant life in regulating territorial use and notions of rights, access, and possession, as well as social relations and family ties. Through *trabalho de campo* (field labor), both communal and solitary, Gurupaenses continually transform this forested landscape into a mosaic of greenery of varying sizes, shapes, shades, and meaning. The work of tending, weeding, cutting, and harvesting shapes gardens, dooryards, trails, and interstitial spaces, simultaneously configuring identities and social relationships within and beyond kinship groups. The present landscape is the result of generations of management of plants, as gardens, fields, stands, or trees—which are, importantly, individuated and associated with specific community members or families. These features regulate and communicate access to the spaces and fruits, literal and metaphorical, of *trabalho de campo*. Simultaneously, they materialize social relations, history, memory, and genealogy.

Browne Ribeiro, Anna [240] see Ellis, Grace

Brumbach, Hetty Jo (University at Albany) and Robert Jarvenpa (University at Albany, SUNY)**[220]** *A Comparative Ethnoarchaeological Approach to Gender and Landscape: Livelihood and Viewshed*

The sexual division of labor in many societies situates women and men in livelihood activities which differ markedly in their locations, facilities, and relationship to other features in both the built and non-built environment. The repeated juxtaposition of these behaviors and elements over time result in rather distinctive female and male viewsheds or vistas and, ultimately, gendered perceptions and interpretations of the landscape. Consider the perceptual field of a woman scraping hides on the side of a storage cache as contrasted with that of a man tending fish nets on a nearby lake. How do key livelihood strategies contribute to variable viewsheds and interpretations of the landscape by women and men? Under what conditions are these experiences and interpretations likely to change? Such issues will be addressed with data from a comparative ethnoarchaeological investigation of gender and subsistence in four circumpolar hunter-fisher and hunter-herder societies: Canadian Chipewyan, Siberian Khanty, Finnish Sami, and Alaskan Inupiaq. Suggestions will be offered for applying viewshed dynamics in living cultural systems to ancient archaeological landscapes.

Brunner, Kyle (New York University)**[196]** *Urban Spatial Relationships during the Early Islamic Period: Reassessing Investigations into the Market and Mosque at Sīrāf, Iran*

There has been much debate on what defines an Islamic city (*madīna*) and what made cities become "Islamic" after the Islamic conquest. These studies have often marginalized the Islamic period, associating street encroachment and overall shifts away from the "classical" model as signs of decline. Scholars have relied on western notions of what defines a city and have used strict urban typological models, which do not conform to the region or period. In addition, these studies have neglected to include examples of cities (*shahristan*) from the Sasanian empire and other regions of the Islamic world. This paper will use archaeological evidence to investigate the spatial relationship between the mosque and market at the site Sīrāf in southwest Iran. This case study furthers our understanding of the cultural forces that went into this shift from the *shahristan* to the *madīna*. By comparing Sīrāf to contemporary sites in Iran and Syria-Palestine, we see a similar spatial-layout where the congregational mosque is placed at one of the main entrances to the market, and shops are incorporated into the architecture of the mosque. Such a design allowed for the religious and economic systems of urban life to flow into a central zone.

Bruno, Maria C. (Dickinson College), Christine A. Hastorf (University of California-Berkeley) and Jewell Soriano (University of California-Berkeley)**[297]** *Landscapes and Agricultural Rituals on the Taraco Peninsula, Bolivia*

Generations of ethnographers have documented the many levels of ritual that contribute to Andean food production, from subtle coca offerings to community-scale canal cleaning festivals. Here, we discuss a ritual conducted on a yearly basis in the community of Chiripa on the Taraco Peninsula, Bolivia to ward off crop damage by hail. This ritual involves a group of community leaders specifically charged with protecting the agricultural lands and yields. They walk two specific routes and burn offerings at several sacred locations. Through audio, video, and spatial documentation of these routes, we examine the physical manifestations of this ritual, how it links agricultural practice to key natural elements of the landscape, and reveals the local understanding of where risk comes from and how to mitigate it. We will consider some of the ways this ethnographic case study can inform our understandings of past ritual ecologies in this landscape.

Bruno, Maria C. [334] see Jones, Makensie

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Brunswig, Robert (University of No Colorado), Pawel Valde-Nowak (Institute of Archaeology Jagiellonian University) and Michael Kimball (University of Northern Colorado)

[29] *European and North American Mountain Archaeology and the Concept of Transhumance Applied to the Prehistory of Colorado's Southern Rocky and Poland's Tatra Mountains*

Significant advancements have been made in mountain archaeology throughout the world in recent decades. A central and rapidly expanding research theme has been that of seasonal transhumance, movement of human groups between lower to higher mountain-foothills-piedmont environmental zones in order to exploit annual economic resource variability. Emerging European mountain records suggest human transhumance, based in seasonal variability of both economic plants, migratory game species, and, much later, as pastoral nomadism, began as early as Neanderthal times, ca. 60,000 BP. The lead author, over three decades, has documented more than 12,000 years of persistent hunter-gatherer transhumance in the Colorado Rocky Mountains and, in collaboration with co-author Polish mountain archaeologist, Pawel Valde-Nowak, and co-author Michael Kimball have begun a project to investigate prehistoric hunter-gatherer and pastoral livestock transhumance in Poland's Tatra Mountains of the western Carpathians. This paper describes background, methods, and early results of the Tatra project which draws on the investigators' mutual and complementary experience in the Northeastern European Tatras and Colorado Rockies.

Brush, Emily (University of Wyoming)

[303] *High Elevation Land Use in the Cougar Pass Region of the Absaroka Mountains of Northwest Wyoming*

Historically, high elevations have been considered as peripheral to past human cultures. Indeed, high elevation areas are somewhat marginal given their increased energy demands and generally low productivity; yet, archaeological evidence shows that human use of high altitudes reaches far into prehistory. Here I present an analysis of human land use through time and its relationship to major environmental and climatic shifts to determine the conditions under which humans make more or less intensive use of high altitudes. The case study comes from the Cougar Pass Region of Wyoming's Absaroka Mountains and contains fifteen distinct archaeological sites situated near six permanent ice patches that have preserved dateable artifacts and paleobiological specimens. Projectile points also provide a means of determining occupation in broad chronological categories. Through the comparison of various artifacts and associated dates, the relationship between high elevation land use by prehistoric people and the environment can then be determined. This research has the potential to be applied to other, environmentally similar regions.

Bryant, Katherine [227] see Stout, Dietrich

Bryant, Mary (Texas A&M University)

[290] *Is Traditional Pollen Analysis Obsolete?*

For more than 100 years, palynologists have relied on the traditional method of pollen analysis to provide essential information on paleodiets, paleoenvironments, archaeology, and other research such as forensics. The past traditional method has focused on the use of light and scanning electron microscopy and then used those results to obtain information and values which palynologists can use to interpret those. During the past decade, some scientists have turned to using other techniques such as DNA and isotopes of pollen grains to gain information about the above research goals. This paper investigates if these new techniques can in fact replace traditional pollen analysis. Ultimately, the current state of DNA and isotope research technology is unable to provide some of the most crucial information provided only by utilizing microscopic pollen analysis. Currently, the molecular and microscopic methods are complimentary. However, the relationship between the microscopic and molecular methods will need to be reevaluated as new technologies are developed.

Bryant, Vaughn (Texas A & M University)

[126] *Coprolite Analysis: The Early Years*

Volney Jones was one of the first to examine coprolites found in Eastern Kentucky caves. By today's standards, his technique was primitive, but it did provide information about early human diets. During the mid-1950s Eric Callen pioneered the study of coprolites when he looked at coprolites from the site of Huaca Prieta de Chicama in the coastal region of Peru. Later, in the early 1960s Callen worked in Mexico with Richard MacNeish at Tehuacan. Callen worked in isolation at McGill University in Canada where he was little appreciated for his coprolite work. By 1970 he joined Richard MacNeish in Ayacucho, Peru for the first major coprolite study in South America but died there unexpectedly of a heart attack. After his death others refined Callen's techniques leading to a slow expansion of coprolite analysis from different areas new ways to sample and analyze coprolite contents. Soon, studies included pollen, phytoliths, plant microfossil, faunal and insect remains as part of the analysis. Those studies advanced our knowledge of diets and laid the groundwork for the future of the discipline, which now includes not only the basic studies but also additional searches for isotopes, DNA, steroids, amino acids, parasites, and more.

[290] *Discussant*

Bryce, Joseph (Brigham Young University) and Spencer Lambert (Brigham Young University)

[10] *Fremont Fishing: New Data from Recent Excavations in Utah Valley*

The Utah Valley, with easy access to montane, lacustrine, and riverine resources, is the location of some of the largest known Fremont habitation sites. Two of these sites have recently been excavated resulting in a wealth of new data. While many aspects of Fremont diet have been explored in depth, the role of fishing is often understudied due to poor preservation of fish remains and fishing tools. In this poster we report the analysis of the fish bones and the recovery and analysis of bone and antler harpoons. We attempt to better understand the fishing practices of the Fremont in Utah Valley and analyze the differences between Fremont sites at varying distances from Utah Lake.

Bryce, William [27] see Tsouras, Theodore

Brzezinski, Jeffrey (University of Colorado Boulder)

[190] *Producing Community and Communal Production: Examining Evidence for Collective Practices at Complex B, Cerro de la Virgen, Oaxaca, Mexico*

Recent research in the lower Río Verde Valley of Pacific coastal Oaxaca, Mexico has indicated that, during the Terminal Formative Period (150 BC—AD 250), public buildings were loci of communal practices such as feasting, collective labor, cemetery burial, and object caching. Idiosyncrasies in these practices among Terminal Formative sites in the valley suggest that political authority and community identity was constituted on the local level. While the best evidence for these practices comes from ceremonial features, recent research at the secondary center of Cerro de la Virgen suggests that public buildings were also the setting for economic production. This poster examines evidence from Complex B, a public building located in the ceremonial center at Cerro de la Virgen. Research conducted in 2016 indicates that Complex B was the location of a "masonry workshop," where residents produced large, faced granite stones to be used in building foundations and terrace walls. The complex also exhibits evidence for mortuary ceremonialism and the use, maintenance, and discard of obsidian prismatic blades and groundstone axes. Overall, the evidence from Complex B suggests that the communal practices that defined local communities extended beyond the ceremonial to include those that were economic in nature.

Brzezinski, Jeffrey [9] see Wedemeyer, Rachael

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Bubp, Rebecca**[81]** *Put What? in Your Pipe and Smoke It*

Holly Bend, a prolific and successful early 19th century plantation owned by Robert Davidson in Mecklenburg County, North Carolina has seen multiple excavations and research over the past several years. In particular, a collection of ceramic tobacco pipe fragments that have been excavated are analyzed to better understand the local smoking culture. Several methods are used, including X-ray fluorescence spectrometer analysis to determine local sourcing of the ceramic elements, residue analysis providing plant and material content of the pipe fragments, and a pipe typology identification. Residue analysis yields late 18th and early 19th century plant and material species associated with smoking and plantation life. Pipe typology identification provides the stylistic and economic elements attributed to smoking cultures.

[81] *Chair***Buchanan, Brian (Durham University and Eastern Washington University), Sarah Semple (Durham University) and Sue Harrington (Durham University)****[40]** *People, Place, and Identity: Funerary Landscapes and the Development of the Early Medieval Kingdom of Northumbria*

Early medieval Britain witnessed dramatic changes to the socio-cultural landscape due to the withdrawal of Roman authority, climatic change, and the arrival of migrants from the continent and from different regions of Britain. The analytical and scientific analysis of the burial record, from a landscape perspective, allows an investigation of key questions related to the scope and nature of this migration, the development of social identity, and how portions of Britain expanded from small polities into a series of large and powerful kingdoms ruled by dynastic lineages. Northumbria was one of the largest kingdoms of early medieval Britain and at its greatest extent incorporated modern-day lowland Scotland and northern England. The Leverhulme Trust-funded People and Place: The making of the kingdom of Northumbria 300–800 CE project is undertaking a full reassessment of all known funerary evidence from the kingdom. The project is combining scientific assessments of skeletal and artefactual evidence, archival research, and spatial analysis in a multi-scalar GIS to refine chronologies, characterize communities, and investigate the results from a landscape perspective. This paper presents the preliminary findings of the project and how these results are reshaping our understanding of the formative processes in this period.

Buck, Paul (Nevada State College/Desert Research Institute), Sachiko Sakai (CSU Long Beach) and Cheryl Collins (Desert Research Institute)**[164]** *Prehistoric Population Aggregation of the Mt. Trumbull, AZ area*

More than 20 years ago Margaret Lyneis published a thorough review of the Virgin Anasazi, summarizing what was known at the time about chronology, settlement, subsistence, spatial aggregation, exchange, and other topics. Her summary raised a number of key issues needing resolution. Among these was the nature of aggregation in the Plateau area of the Virgin Anasazi. She noted, despite evidence from other places in the Southwest of increasing residential aggregation in PII, there seemed to be little evidence of this from the Mt Trumbull area. In this paper, we present evidence from two sites (Zip Code and Zip Code 2) suggesting a pre-aggregation phase in BMIII or PI times. These sites are interesting because, although they are quite large, extensive sites, they appear to be early in age because pottery is almost entirely unpainted and non-corrugated, projectile point styles also seem to pre-date PII, and radiocarbon and OSL dates suggest a BMIII or PI age. Other large sites at Mt Trumbull appear much more aggregated than the Zip Code sites, and have been identified as PII based on pottery styles, radiocarbon and OSL dates. It is likely populations were increasing and more densely clustering together in PII.

Buck, Rex**[253]** *Responsibilities to the Ancient One*

The tribes and bands of the Columbia Plateau have an inherent responsibility under our religious beliefs and practices to care for the ancestors buried within our homeland. The Confederated Tribes of the Colville Reservation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes and Bands of the Yakama Nation, the Nez Perce Tribe, and the Wanapum Band of Priest Rapids (Claimant Tribes) have stood by our knowledge and traditions which told us the Ancient One is our Ancestor. Annual ceremonies with the Ancient One ensured he knew he was not forgotten. The practice of guaranteeing the ancestors return to the earth and continued journey is an integral part of Plateau culture and tradition. In accordance with our spiritual and cultural practices we work together to achieve repatriation goals.

[322] *Discussant***[253]** *Chair***Buckley, Brendan (Lamont-Doherty Earth Observatory), Rosanne D'Arrigo (Columbia University), Caroline Ummenhofer (Woods Hole Oceanographic Institute), Michael Griffiths (William Paterson University) and Kyle Hansen (Columbia University)****[213]** *Climate Change (Global and SE Asia)*

We have developed millennial length reconstructions of regional hydroclimate using multiple collections of tree cores from throughout Southeast Asia. Several published records of seasonal hydroclimate from Vietnamese cypress represent the most robust and well-replicated tree ring records from the global tropics, and allow for detailed analyses of the regional hydroclimate for multiple seasons. We demonstrate zonal changes in the mean climate over the past millennium with strong linkages to the El Niño-Southern Oscillation phenomenon and the equatorial Pacific Ocean, with a high degree of decadal scale variability. We are actively pursuing improvements in the metrics used for climate reconstruction through ecophysiological measurements from rare Southeast Asian conifer species, such as Blue Light Intensity as a proxy for lignin content, which is strongly correlated with seasonal rainfall. While tree rings yield annual to subannual resolution, recent development of speleothem records add greater temporal depth over the region. This information, taken collectively, can be used to explore ecosystems health across mainland Southeast Asia in the face of a warming climate, and to analyze the arc of human development under dynamical changes of the regional climate over the recent Holocene.

Buckley, Gina (The Pennsylvania State University), David Carballo (Boston University), Daniela Hernández Sariñana (Boston University), Kenneth Hirth (The Pennsylvania State University) and Douglas J. Kennett (The Pennsylvania State University)**[184]** *Bayesian 14C Chronology of Tlajinga, Teotihuacan Compounds 17 & 18*

A high-resolution chronology of two residential compounds (17:S3E1, 18:S3E1) recently excavated in the Tlajinga district of Teotihuacan has been developed using high-precision AMS 14C dating and artifact seriation datasets. The Tlajinga district is located along the southern Street of the Dead and was a possible entrance for migrants and visitors to the densely populated urban center of Teotihuacan during the Classic Period. Ceramic evidence suggests this district was occupied during the height of the city from the Early Tlamimilolpa period (A.D. 170–250) until the collapse of the city in the Metepec period (A.D. 550–650). With over 30 14C dates with measurement errors below ± 25 14C yr from both human bone and charcoal specimens, Tlajinga is now one of the most dated districts at Teotihuacan. Combining high precision dating with ceramic evidence and utilizing the Oxcal Bayesian framework, this project explores the rise and decline of Teotihuacan's southern neighborhoods providing insights for apartment compound construction events and population dynamics during the apogee of the city's occupation.

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Buckley, Michael and Muxin Gu (University of Manchester)**[43]** *Machine Learning Species Identification with ZooMS Collagen Fingerprinting*

The creation of a robust method of species identification using collagen fingerprinting, also known as ZooMS (Zooarchaeology by Mass Spectrometry) has been useful for objectively defining the composition of the fragmentary component of archaeological assemblages. The method usually works through the measurements of the sizes of collagen peptides following enzymatic digestion, which yield a fingerprint that can be genus or even species-specific. However, even these peptide biomarkers have been determined with a level of subjectivity, largely influenced by those most peaks that are commonly observed. In some taxa, particularly the domesticates, sequence data can be used to confirm this variation but ZooMS is being increasingly applied to a greater range of wild taxa. In the absence of sequence information, peptide biomarkers are proposed through observations from reference material, but often with less confidence. Here we apply machine learning to our assemblage of >10,000 Pin Hole Cave (Creswell Crags, UK) fragmentary Late Pleistocene microfaunal remains, demonstrating that an objective manner of biomarker determination can be achieved which builds upon those already determined manually. Most importantly, machine learning approaches appear able to rapidly identify not only known species but can reveal taxa beyond the expected, widening our knowledge of a faunal assemblage.

Buckley, Michael [16] see Frasier, Brenna

Buckley Vargas, Lilly [134] see Poister, Nicholas

Budar, Lourdes (Universidad Veracruzana)**[128]** *Dioses de Agua y Montaña. El paisaje ritual y las deidades enmascaradas de la costa este de Los Tuxtlas*

El corredor costero al este de Los Tuxtlas, delimitado por los Volcanes de Santa Marta y San Martín Pajapan, el mar del Golfo de México y las Lagunas de Sontecomapan y del Ostión, es una zona que se caracterizó por la multiculturalidad y la variedad de patrones debido a la presencia de un sistema portuario que estuvo activo desde el periodo Formativo medio hasta el Clásico tardío (1200 aC-1000 dC). Así mismo, la presencia de estos elementos naturales que lo delimitan fue y sigue siendo el escenario perfecto para el desarrollo de un complejo paisaje administrativo, político y ritual. Entre la gran diversidad de patrones existentes en la zona, dos llaman nuestra atención para fines de esta presentación: la ausencia de figurillas cerámicas y la presencia de un complejo escultórico pétreo que corresponde a la representación de deidades antropomorfas que portan máscaras en la parte superior de sus cabezas y que hemos denominado sencillamente como: "dioses enmascarados". En este trabajo se analizarán tres aspectos esenciales de estas representaciones que presentan una larga duración en la región: 1. el análisis formal de estas esculturas, 2. su contexto arqueológico y 3. el paisaje administrativo, político y ritual en el que se desarrollaron.

[192] *Discussant***[93]** *Chair*

Budar, Lourdes [93] see Becerra, Gibránn

Budd, Jon [44] see Seikel, Katherine

Budd, Tommy (Arizona State University)**[185]** *Biological Kinship and Cemetery Organization in Eastern Zhou Period China*

The social significance of large kinship structures such as clans and lineages has been demonstrated throughout Chinese history, and kinship has in part determined social ties and participation in various social activities. Clan emblems appear on artifacts from as early as the Shang Dynasty, and kinship remains an important element of social identities in modern China. In relation to mortuary practices, kinship identities may affect factors such as mortuary assemblages and burial location. This study focuses on biological kinship as it relates to burial location in an Eastern Zhou Period (771–256 BCE) cemetery. This study utilizes a sample of 45 individuals from the site of Tiancheng in Xinzheng, Henan Province, China. Cervical odontometric data were collected, and measures of biological distance were calculated to examine the relationship between geographical and biological distances among the individuals interred across the site to address the question of whether burial location was influenced by biological relationships. Results are presented, and their significance with regard to an understanding of ancient Chinese kinship and burial practices is discussed.

Bueno, Marilyn (California State University, Los Angeles)**[134]** *The Role of Rockshelters among the Lowland Maya*

Because of Maya religion's heavy focus on the sacred Earth, subterranean spaces tend to be seen as sacred landmarks. Caves in particular have been shown to be the most promising context for the archaeological study of Maya religion (Brady and Prufer 2005). Rockshelters, however, have received less attention and appear to have identities and meanings that are negotiable across the lowlands. Recent rockshelter excavations have uncovered skeletal remains (Bonor 1995; Glassman et al. 2005; Saul et al. 2005), suggesting that some of these features may possess the only true Pre-Columbian cemeteries in the Maya lowlands. As such, rockshelters are non-normal burial locations. Discussions thus far have not engaged Maya attitudes towards death and the afterlife in attempts to explain why such cemeteries were formed. As research on rockshelters move forward, it is imperative to establish a Maya cosmological model that incorporates religious beliefs. This paper will address such questions.

Buffington, Abigail (The Ohio State University) and Smiti Nathan (New York University)**[121]** *Transformative Trees: The Social and Ecological Impact of Woody Taxa in Prehistoric Southern Arabia*

While trees are often integral to the ecology of certain landscapes, the propagation of specific woody taxa can also reflect significant social aspects imbued on anthropogenic spaces. Following the seminal work of Rita Wright, we are utilizing a comparative approach in this paper. We examined woody vegetation management by early food producing societies in two regions of southern Arabia: southeastern Arabia (modern-day northern Oman) and southwestern Arabia (modern-day southeast Yemen). Despite their nearby geographic position, the trajectory of food production is distinct in these two regions. Nonetheless, both agrarian landscapes are impacted and developed by certain woody taxa. Using a niche construction framework, the concept of a "keystone species" is reenvisioned by utilizing archaeological, anthracological, and ethnographic datasets. These proxies enable us to investigate the social and ecological impact of the date palm (*Phoenix dactylifera* L.) in southeastern Arabia and the fig tree (*Ficus* spp. L.) in southwestern Arabia. This paper explores the modern social value of each tree type, the role of these woods in the agrarian history of each respective region, and how the southern Arabian landscape has been shaped and modified by association to these trees.

Buikstra, Jane E. (Arizona State University) and Jason King (Center for American Archeology)**[215]** *The Missing Years: Continuity and/or Change in Woodland Funerals in the LIV*

Lynne Goldstein has significantly advanced knowledge of ancient peoples in many theoretical and empirical domains, including her seminal studies of ancient cemeteries, especially their spatial organization and interpretation through the judicious use of ethnographic sources, critically evaluated. The senior author has had the pleasure of collaborating with Dr. Goldstein in several of these ventures, some under challenging conditions of heat and cold, which were bearable only due to Lynne's remarkable energy and good humor.

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In this paper, we address a long intractable issue for Lower Illinois Valley (LIV) mortuary archaeology, in a region that anchored Dr. Goldstein's long and productive career. While Middle Woodland (Hopewell) and late Late Woodland mounded tumuli are well represented in the archaeological record, not so for cemeteries from the several intervening centuries. Relying on data from the archaeological record, primarily radiocarbon dates, variation in cemetery structure, mound location, and material culture, we address this issue. Possible explanations range from the simple, depopulation and regional cultural discontinuity, to nuanced, complex interpretations of funerary activities and interment facilities from throughout the Middle and Late Woodland periods. Our perspectives are also enhanced through the judicious use of ethnographic and ethnohistoric sources.

[298] *Discussant*

Buikstra, Jane E. [66] see Fletcher, Brittany

Bukhsianidze, Maia [41] see Coil, Reed

Bull, Ian [126] see Whelton, Helen

Bullion, Elissa [185] see Hansen, David

Burger, Rachel (Southern Methodist University), Ian Jorgeson (Southern Methodist University) and Michael Aiuvalasit (Southern Methodist University)

[103] *Raising a Rafter: A Cost-Benefit Analysis of Ancestral Pueblo Intensification of Turkey Husbandry in the Northern Rio Grande Region, New Mexico*

Zooarchaeological research in the Northern Rio Grande shows that turkey husbandry became increasingly important to the Ancestral Pueblo during the Classic Period (AD 1350–1600). During this time, immigrant and local communities coalesced into increasingly larger villages and towns, with abundant evidence for turkey husbandry. Turkeys served as a critical resource for both subsistence and ritual uses. Yet, it remains uncertain at what scale (household, sub-community, or community) turkey management was organized. We develop cost-benefit models for the intensification of turkey husbandry, incorporating ethnographic and archaeological data with research into animal sciences on turkey raising. These socio-ecological models are then tested against the archaeological record of Sapa'owingeh (LA306), one of the largest Ancestral Pueblo communities in the region.

Burger, Richard (Yale University), Lucy Salazar (Yale University) and Michael D. Glascock (University of Missouri)

[46] *New Evidence of Inca Ceramic Production and Exchange in the Cuzco Heartland*

INAA analyses of ethnographic and archaeological ceramics from the Cuzco heartland yield new insights into the patterns of production and distribution of Inca pottery in the Cuzco heartland. Multiple centers of production existed in this region and significant levels of exchange in imperial pottery occurred between the Sacred Valley and the Cusco Basin. Possible centers of production are suggested on the basis of the new results.

[178] *Discussant*

Burgess, Don [218] see Lyons, Patrick

Burgio-Ericson, Klinton (University of North Carolina-Chapel Hill)

[139] *Revisiting the Rubber-Sided Museum: A Case Study in Collections-Based Research*

Archaeological repositories abound in significant but overlooked collections. This paper presents a case study based in one such collection: the Hendricks-Hodge Expedition to the ancestral Zuni pueblo of Hawikku, NM (1917–1923), which accumulated 25,000 artifacts now in the NMAI, many remaining unstudied. Drawing on current interdisciplinary research into its seventeenth-century Spanish mission, this paper considers challenges of extracting new interpretations from older collections. Research revisiting underutilized collections proffers opportunity for new questions, expanding insight, and refining disciplinary history. In particular, Hawikku's mission remains and primary sources indicate its residence was a working and living space for Native laborers alongside Spanish Franciscans, comprising an everyday arena of cultural negotiation. Revisiting overlooked collections also furnishes occasion for collaboration with source communities, often excluded from the original research. Multi-level engagement with Zuni Pueblo informs this research project, increasing its relevance to community concerns, and enriching Smithsonian collections data for future use. When financier Harmon Hendricks wrote in 1918 that the Museum of the American Indian should build expanding rubber walls to contain the large collections from Hawikku, he exposed the expedition's acquisitive motive but also presaged their rich and ongoing potential for research a century later.

Burgis, Harley (Indiana University of Pennsylvania) and Lara Homsey-Messer (Indiana University of Pennsylvania)

[52] *Using Microartifacts to Investigate Prehistoric Cooking Methods at the Archaeological Site of Dust Cave*

Microartifacts—generally considered to be artifacts measuring less than 6.35 mm (¼ inch)—have traditionally received little attention in North American archaeology. We argue that microartifacts are not simply smaller versions of larger artifacts, but rather provide different and complimentary data. This study investigates microartifacts from the archaeological site of Dust Cave (10,650–3,600 BCE), located in northwest Alabama, in order to better understand prehistoric diet and cooking technologies. Our goals are twofold. First, we examine microartifacts from four different feature morphologies (which vary in shape and size) to see if the micro debris reflects differences in what was cooked and/or how foods were cooked over time. We then integrate the microartifact data with previously published faunal and experimental results. Second, we advocate for taking a more robust approach to microartifact data analyses to include ubiquity and diversity measures in addition to the more commonly used density measures of comparison. Preliminary results suggest that while some features were multipurpose in function, others were more specialized for processing particular kinds of foods using cooking methods ranging from broiling, to steaming, to parching. Finally, cooking technologies appear to remain surprisingly homogenous through time until the Middle Archaic.

Burgos, Rafael [37] see Plank, Shannon

Burgos Morakawa, Walter (CUNY) and Brent Woodfill (Georgia State University)

[37] *Understanding Maya Rituals of Power in the Candelaria Caves, Guatemala: A View from the Polychrome Ceramics of the Early Classic*

The Candelaria Caves System, with its approximately 18 km of passageways, forms the second largest underground karstic complex in the Maya Area. As a result of their location at the highland-lowland transition and close to Great Western Trade Route, it was an important pilgrimage center for people of different cultural and geographical regions. The Early Classic period (A.D. 250–500) marked the introduction of polychrome ceramics, mainly Dos Arroyos-group ceramics, which played an important role in ritual activity in practically all caves used during the same time. Ceramic analysis and its relationship with context have allowed scholars to understand certain patterns in rituals related to power and prestige as expressed through the use of specific vessels. On one hand, these ceramics are related to public rituals that took place in great chambers close to the cave entrance that would have been visible to an audience. On the other hand, although their production was standardized, there are at least two distinct ceramic traditions or

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proveniences. In this paper, the authors present some conclusions related to these polychrome ceramics and their significance in regional ideology and interregional exchange.

[37] *Chair*

Burham, Melissa (University of Arizona)

[11] *Minor Temple Groups, Water Management and Community Formation at Ceibal, Guatemala*

Recent investigations of reservoirs associated with minor temple groups at Ceibal, Guatemala shed light on the role of water management in intermediate-level sociopolitical organization in ancient Maya society. Over the course of the Late and Terminal Preclassic periods (ca. 350BC-AD200), as Ceibal grew into an urban center, minor temples were built at regular intervals around the site core. These temples were the centers of local communities that were integrated primarily through ritual practices. Many temple groups are associated with reservoirs or other sources of water. As many scholars have noted, reservoirs would have been important locations for day-to-day interactions, and crucial to supporting local populations. In this way, water management was also central to local community formation and organization. This study examines water management at the community level by focusing on 1) excavation data and field observations of five reservoirs; 2) geospatial analyses that explore the distribution of reservoirs in relation to residential zoning patterns around minor temples; and 3) analysis of pollen in soils collected from the reservoirs. Overall, this research suggests that water catchments were managed at the household and local community level, and supports decentralized models of social and political organization in ancient Maya society.

Burke, Adam

[244] *Reevaluating Florida's Chert Quarry Clusters: An Update on Sampling Strategies, Methodological Approaches, and New Results from Northwest Florida*

This paper presents preliminary results from an ongoing study of Coastal Plains chert from Florida. Past research has demonstrated that Florida cherts can be coarsely differentiated into various quarry clusters on the basis of microfossil inclusions, and more recent research has suggested that geochemically characterizing these cherts may further improve provenance determinations. New methodological approaches include using a combination of microfossil analysis, NAA, and LA-ICP-MS to provide accurate qualitative and quantitative descriptions for Florida cherts. Additionally, the sampling and description of previously unstudied prehistoric quarry sites is improving our understanding of the geochemical and microscopic variability inherent in Florida cherts. By intensively sampling both terrestrial and inundated sites on a cluster-by-cluster basis, our characterization resolution will be significantly enhanced on regional and local levels, and new conclusions can be drawn about past human mobility within an improved geographic and temporal framework. Current advances in chert provenance studies will form the core of future research on Paleoindian lithic technological organization in Florida, and using modern analytical techniques on new and existing collections will greatly benefit this research.

Burke, Ariane (Université de Montréal)

[219] *Discussant*

Burke, Chrissina C. (Northern Arizona University), Katie K. Tappan (Northern Arizona University), Gavin Wisner (Northern Arizona University), Julie Hoggarth (Baylor University) and J. Britt Davis (Northern Arizona University)

[147] *To Eat, Discard, or Venerate: Faunal Remains as Proxy for Human Behaviors in Lowland Maya Terminal or Problematic Deposits*

Deciphering middens, feasting, ritual, or terminal deposits in the Maya world requires an evaluation of faunal remains. Maya archaeologists have been and continue to evaluate other artifact classes, but often simply offer NISP values for skeletal elements recovered from these deposits. To further understand their archaeological significance, we analyzed faunal materials from deposits at the sites of Baking Pot and Xunantunich in the Upper Belize River Valley. We identified the species, bone elements, bone artifacts, taphonomic signatures, and quantitative ratios recovered to test whether a deposit can be identified as a midden, part of a feasting ritual, terminal ritual, or other rituals significant to the Maya. Our analyses allow us to begin building a system for using faunal remains as a proxy for interpreting the significance of these deposits. In this paper, we present our results and hope to open the conversation for future evaluations of faunal remains in similar deposits.

Burke, Chrissina C. [7] see Wisner, Gavin

Burkholder, Jo (University of Wisconsin—Whitewater)

[335] *Continuity and Change: What the Late Intermediate Period at Pisanay Can Tell Us About Middle Horizon Arequipa*

Data from excavations at the site of Pisanay, a Late Intermediate Period "sanctuary" with some remains of Early Intermediate Period ceremonialism, can be used to frame a sort of "before and after" picture of Middle Horizon developments in the Sihuas Valley of Arequipa and the changing nature of cultural ties to the region. Most striking of these is the shifting pattern of materials ties impacted by the intervening influence of the Wari cultural horizon, seen in the ceramics and textiles associated with funerary sites. At the same time, there is evidence for in situ development of funerary and other ceremonial traditions, only minimally influenced by the Wari culture.

Burks, Jarrod (Ohio Valley Archaeology, Inc.)

[190] *New Magnetic Gradient Survey Results from Two Intermediate-Sized Earthwork Clusters in Southern Ohio: Junction Group and Steel Earthworks*

Ohio is home to hundreds of Woodland period (ca. 300 BC- AD 400) earthwork sites. Most contain mounds and ditch-and-embankment enclosures in geometric shapes. Site size and complexity varies widely, from small, lone circles (often surrounding a mound) in the Early Woodland to the mega-large Middle Woodland Newark Earthworks. How and why earthwork construction moved from small to massive are enduring questions yet to be solved. Recent magnetic survey in southern Ohio at two sites of moderate size, Junction Group (33Ro28) and Steel Earthworks (33Ro62), provides mounting evidence for an intermediate level of size and complexity. Both sites contain a range of geometric shapes, including some that are unique. Enclosures are clustered in their spacing and orientation, suggesting growth through time. And at least three kinds of architecture were in use: traditional ditch-and-embankment enclosures of varying size, small enclosures demarcated by narrow trenches (perhaps without embankments), and circles of posts lacking ditches or embankments. Earthwork sites of intermediate size provide a link in time, complexity, and perhaps space between the small sites of the Early Woodland and the immense complexes of the Middle Woodland. They also signal a change in the organization of people and activities on the landscape.

Burks, Jarrod [190] see Ruby, Bret

Burley, David [189] see Wildenstein, Roxanne

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Burnett, Paul (SWCA Environmental Consultants)**[103]** *Bears Ears Archaeological Probability Models*

Currently encompassing over 1,300,000 acres, Bears Ears is notable for abundant cultural resources and is in a renewed spotlight following the 2017 recommendation by the Interior Secretary to reduce its acreage. Archaeological probability models were recently developed for lands within the jurisdiction of the Bureau of Land Management, Monticello Field Office, which encompasses the Bears Ears National Monument. Regardless of the outcomes of that process, these models were developed to help land managers make well-informed decisions and implement its multiple use mission, including managing for recreation, grazing, and oil and gas. Modeled site types include up to four prehistoric site types and two historic site types. Given available site data, certain site types are not modeled for all areas. Stepwise logistic regression is used to combine significant environmental variables to produce probability maps with values ranging from 0 (low) to 1 (high). Certain site types are modeled more effectively than others. For example, prehistoric sheltered and rock art sites are more precisely modeled than open-air sites. The site type models were also combined into a composite sensitivity model, which shows that high and moderate probability areas cover much of the National Monument.

Burnette, Dorian (University of Memphis), David Dye (University of Memphis) and Arleen Hill (University of Memphis)**[291]** *Stephen Williams and The Vacant Quarter Phenomenon*

Stephen Williams proposed the idea of a Vacant Quarter based on the abandonment of numerous Mississippian polities throughout much of the Midsouth and Midwest. The unprecedented, large-scale depopulation of an approximately 130,000 square kilometer area has been linked with population movements as well as interpolity conflict. By taking a dendroclimatological approach we evaluate the role of climate change in this process, while also being cognizant of social processes. We postulate a staggered process of depopulation with distinct polity histories resulting from both climatic and social variables characterized by numerous, small-scale abandonments and regional population movements.

Burnette-Egan, Polly (Cornell University)**[189]** *Zooarchaeology and Spatial Analysis at Tepe Farukhabad: New Life for Legacy Data*

This poster presentation presents a reanalysis of legacy faunal material, collected by Henry Wright and the zooarchaeological analysis conducted by Richard Redding, during the 1968 excavation on the Deh Luran Plains in southeastern Iran at the 4th-millennium site Tepe Farukhabad. It behooves all researchers to give more attention to the existing data sets already collected and available for research. In that vein, this study re-evaluates the faunal data sets at Tepe Farukhabad and looks for patterns in architectural spaces during the Uruk period at Tepe Farukhabad. The Uruk Phases are isolated for the purpose of this study, as this is a period of major changes in social and political complexity. These spatial data are coded and the faunal material is organized by these zones, then is sorted by taxa, element, side, and the relative status of species and meat-cut to illuminate the lifeways of the people who lived and worked in this early town on the Deh Luran Plain. The research situates the zooarchaeological findings at Urukian Deh Luran in the wider context of the Uruk phenomenon in southern Mesopotamia

Burnor, Luke and Claudia Garcia-Des Lauriers (California Polytechnic University Pomona)**[118]** *Los Horcones, Offering 1: 3D Imaging, Analysis, and Reconstruction*

The three dimensional imaging of artifacts discovered at the Los Horcones site in Southern Chiapas Mexico has enabled archaeologists to approach artifacts in a brand new way. With the use of a 3D scanner hardware and 3D program software, objects and features of various sizes are scanned to create a proportional and scale digital version. The scanning of artifacts allows for minimal handling of the objects decreasing the likelihood of wear, damage, deterioration, and contamination, effectively lending to conservation. This technology facilitates a full range of examination capabilities in a manipulable high resolution digital format that is easily transferrable and portable. In addition, digital formats enhance teaching pedagogy and public outreach. The potential of 3D scanning promotes a new kind of research that provides a practical interactive interface to websites, e-books, and research papers that contributes an entirely new dimension to responsive learning. Furthermore, in conjunction with 3D printing, the data can be physically reproduced inexpensively and fairly quickly to provide a tangible object that can be used for a variety of research, educational, and demonstrative purposes.

Burns, David, Luisa Aebersold (UT Austin), Fred Valdez (UT Austin), Samantha Krause (UT Austin) and Anastasia Kotsoglou (Cornell University)**[243]** *Excavations at Two New Operations at Colha*

Colha, an ancient Maya site located in northern Belize, has undergone archaeological research interests since the 1970s. Previous investigations demonstrate a long occupational history at the site that spans from the Late Archaic (ca. 3400 BC) to the Early Postclassic (AD 1200). Building upon previous research, a primary goal of the 2017 season was to explore the transition between the Archaic (3400 BC) and Preclassic (1000 BC) periods while focusing on technological and social continuity. This paper reports on the general excavation strategies, results, and avenues of future research pertaining to two main excavation areas. The 4000 sector of Colha, located within the larger settlement zone of the site, focused on defining the Archaic-Preclassic transition. While excavations within the 2000 sector, situated within the main site plaza, concentrated on investigating an Early Middle Preclassic village that was partially exposed in previous seasons. Notable artifact assemblages and features include burin spalls and associated shells, an early hearth, a ceramic cache, and diagnostic lithic tools. The data from these excavations, as well as associated ongoing analyses, work towards the goal of developing a more holistic, diachronic understanding of the cultural history of the site.

Burns, Jonathan [334] see Swisher, Christopher

Burrell, Jennifer (University at Albany SUNY)**[109]** *Ethnographic Perspectives on Debt & Political Economy: Contributions to a Conversation on Graeber*

This paper contributes contemporary ethnological perspectives and a case study on debt, moral economies, financial citizenship and human rights to a conversation among and between archeologists considering these perspectives in Mesoamerica.

Burrillo, R. E. (SWCA Environmental Consultants)**[39]** *The Mikesboy Site Complex: Historic Archaeology and the Utes of Bears Ears*

In 2016, SWCA Environmental Consultants conducted a limited Class II cultural resource inventory in the Bears Ears area in order to test a predictive model generated on behalf of the Monticello Field Office of the BLM for a Class I report. A historic stone-and-timber sheep corral with nearby rock inscriptions was located and mapped on the Butler Wash side of Comb Ridge during these efforts, and determined to be a historic Ute site with Navajo cultural elements. Subsequent revisits to the site revealed that it was part of a much larger site complex, including a second sheep corral, a temporary camp and wood-cutting area, and the remains of a hogan with badly-weathered inscriptions on an adjacent rock face that included the name "Mikesboy." This talk presents the results of research on Mikesboy and historic archaeology of the Utes of Bears Ears.

[96] *Discussant*

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Burt, Nicole (Cleveland Museum of Natural History)**[205]** *Public Perception of the Ethics of Physical Anthropology*

The history of physical anthropology contains figures and movements that improperly used science to hurt or diminish other groups or was utilized by such movements after publication. This haunted past can manifest as a bumpy future for modern practitioners working under a shadow of racial typology, eugenics, and other horrific applications of their science. Anthropologists continue to be haunted where our peers in anatomy or biology are not, due in part, to our theoretical approach as a biocultural science, which used both culture and biology as a weapon. Scholars have begun to confront the past in student training and working with research participants (Weiss, 2006; Marks, 2017). In this talk, I approach the subject as a museum curator, who is engaging with the public about research and the science of physical anthropology. The encounters range from very supportive to hostile. The public perception of the ethics of the field can be a huge hurdle in engaging and educating. Physical anthropologists need to communicate the modern ethics of the field effectively while remembering and acknowledging that the history of the field cannot and should not be ignored. This presentation focuses on what has and has not worked for public engagement.

Burton, Margie [172] see Levy, Thomas E.

Burt, Amanda (Indiana University)**[212]** *The Diet of Dogs: Dental Microwear Texture Analysis to Interpret the Human-Canine Connection in Prehistoric North America*

The archaeology of dog-keeping by indigenous Native North Americans enriches our understanding of ways people conceptualized their environments in the past. Finding new ways to investigate this topic contributes to broader anthropological knowledge about relationships among humans and the natural world. In this paper, I present exploratory research to examine ways that domestic dogs were maintained and the assumed value of dogs among Native Americans who lived in the Ohio River valley, in Plains Villages, and in the foothills of the Rockies during the Late Prehistoric period. I employ Dental Microwear Texture Analysis (DMTA) to examine human-canine connections and dog feeding/provisioning strategies. Analyzing the diets of domestic dogs (*Canis familiaris*) provides a proxy for human intentions to sustain canine companions. Baseline data from members of the Family Canidae provides comparative microwear textures and a more contextualized insight into the dietary behavior of dogs that lived with humans in geographically and culturally distinct areas of North America.

[212] *Chair*

Bury, Rick [214] see Ryan, Christopher

Bush, Dominic**[7]** *Animal Use in the Last Maya Kingdom*

The archaeological site of Flores is a small, lacustrine island located in Northern Guatemala. Despite lacking in physical size, the island has a lengthy occupational history, dating from the Preclassic Maya period through the present. Flores, which became a provincial capital during the late Postclassic, was able to resist Spanish rule until 1697 AD, making it the last Maya holdout. Given this distinction, the island has been under much archaeological scrutiny and the subject of many publications. However, there has yet to be a thorough, diachronic study of animal use at Flores, and how the site compares to other Maya lowland settlements. Due to its proximity to freshwater, Flores was in an area of great floral and faunal resource abundance. This study aims to not only taxonomically identify faunal remains recovered on Flores, but also searches for patterns possibly tied to shifts in the social, economic, and political landscapes, especially as it relates to the Classic Maya "Collapse" and the arrival of the Spanish. By understanding the history of animal exploitation and past ecological conditions, part of the answer to why Flores outlasted its contemporaries in regards to resistance to the Spanish is teased out.

Bush, Jason [299] see Solinis-Casparius, Rodrigo

Bussiere, Lauren (Texas Archeological Research Laboratory, University of Texas at Austin) and Nadya Prociuk (University of Texas at Austin)**[21]** *Northern Gulf Coast Trade in the Mesoamerican Postclassic: The Evidence from Brownsville*

The Postclassic period (ca. 1000–1520 CE) in the coastal Gulf of Mexico was characterized by an increase in trade and interaction between groups moving along the coastline and larger inland polities such as the Aztec empire. While exchange between Mesoamerican groups is increasingly well documented, the extent of interaction between people in Mesoamerica and those living further northward is poorly understood. Evidence of the nature and strength of cultural ties between the Huasteca of the Gulf coastal lowlands and more northerly coastal peoples exists in several collections from south Texas sites, namely those of the Brownsville Complex in the Rio Grande Delta. Although they appear superficially to be a marginal culture isolated from the larger interaction spheres of both the Aztec tributary polities to the south and the Toyah and Rockport cultures of Texas, the people of the Brownsville Complex may in fact represent the northern periphery of Mesoamerican interaction. This paper reviews the evidence for Brownsville Complex connections to the Huasteca and other coastal peoples and characterizes the relationship between these groups within the greater context of Postclassic interaction along the Gulf Coast and beyond.

Bustamante, José (PRALC—Universidad del Valle de Guatemala)**[337]** *Early Political Changes in La Corona: Architecture and Function in the Palace Complex*

Over the past decade, the La Corona Archeological Project has been investigating the site's palace complex, focusing primarily on its final construction phases. The focus is common in lowland Maya archaeology because of the relative ease of conducting extensive excavations on terminal phase architecture. However, at La Corona, major tunneling efforts have also explored the earlier architectural phases of the palace. As a result, the project has identified three construction phases that date to the Early Classic, two of which date to before the beginning of the site's long-lived political alliance with the Kaanul kingdom. In this paper, we discuss the architectural patterns of an Early Classic palace in the Maya lowlands as well as demonstrate how this palace was modified after the La Corona rulers became Kaanul's vassals.

Büster, Lindsey (University of Bradford, UK)**[29]** *Death, Dying and Horlicks: Structured Deposits as Problematic Stuff in European Prehistory*

Personal possessions are inherent in the construction and maintenance of social identity. In some prehistoric cosmologies, artefacts may even have been integral to an individual's personhood. As such, they can become culturally and ritually charged objects within a community. What happens then to this social remnant of an individual when they die? Objects that are on the one hand redundant but on the other too problematic to be casually discarded. In the increasingly materialist and consumerist societies of the modern west, the 'stuff' we leave behind can be difficult to deal with. This is demonstrated, for example, in the establishment of dedicated 'house clearance' firms, while in other cases it becomes the focus of family feuds. In prehistoric societies, when the number of objects associated with specific individuals was far fewer, it is likely that such items carried even greater symbolic charge and that the problematic nature of the material residue of the deceased was further amplified. Can we detect these tensions

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archaeologically? This paper argues that the 'structured deposits' of European prehistory represent the 'problematic stuff' of the past, and can provide greater insights into individual and communal experiences of death, dying and bereavement among past societies.

Butler, Virginia L. [10] see Bovy, Kristine

Buttles, Palma (Carnegie Mellon University/Software Engineering Institute) and Fred Valdez (The University of Texas at Austin)

[243] *Colha, Northern Belize: A History and Record of Research*

The northern Belize prehistoric Maya site of Colha was first archaeologically documented by the Corozal Project in the early 1970s. The most significant archaeological research at the site was conducted as The Colha Project (1979–1983), with subsequent projects of specialized interests (1994–2017). Though known primarily for its lithic dimension as a major production and distribution center of stone tools, many other aspects of Maya society have been identified from the numerous seasons of research. A brief review of Colha's research history is presented along with general comments on significant findings as well as continuing interests and potential.

Buttles, Palma [243] see Sullivan, Lauren

Button Kambic, Emily (National Park Service) and Lauren Hughes (National Park Service)

[202] *Retracing Reconstruction: America's Second Founding in Archaeological Perspective*

The National Park Service's release of a theme study on Reconstruction and the creation of Reconstruction National Monument in Beaufort, SC, mark the agency's commitment to scholarly and public engagement with the complex and continuing legacies of the post-Civil War period. The National Capital Region and the Organization of American Historians are conducting a historic resource study of Reconstruction sites in the region, including urban sites in Washington, DC, and small town and rural sites in parts of Virginia, West Virginia, and Maryland. This paper will discuss how spatial and archaeological perspectives on Reconstruction can enrich historical and political narratives. First, previous archaeological excavations at National Park Service units have uncovered insights into the conditions and challenges of daily life for rural and urban African Americans that can now be considered comparatively as part of a regional understanding of Reconstruction. Second, mapping the distribution of preserved and no longer extant historic and archaeological sites can help visualize regional trends and differences in African American community and institution building. It can also build connections to the present by revealing how urban development and demographic trends correspond with differences in site preservation across the region.

Bybee, Alexandra

[88] *Historical and Bioarchaeological Investigation of the Evansville State Hospital Cemetery (12VG598), Vanderburgh County, Indiana*

In 2014, Cultural Resource Analysts, Inc., conducted the archaeological relocation of graves from the Evansville State Hospital Cemetery. At the request of Beam, Longest, and Neff, LLC, on behalf of the City of Evansville and the Indiana Department of Transportation, the graves of 31 individuals who were patients at the reform-era hospital between circa 1890 and 1928 were relocated in advance of construction of a pedestrian bridge. The population consisted primarily of young to middle adults, with roughly even numbers of males and females. Numerous skeletal and dental pathologies were identified (e.g., osteoarthritis, degenerative joint disease, and healed bone breaks, along with dental caries, calculus, hypoplasias, and antemortem tooth loss). Other skeletal and dental pathologies that may have been associated with the admittance to or retention of a patient at the hospital were also identified, including deformities consistent with metabolic or other genetic issues. This paper provides a historical context for the treatment of mental health issues in the region during the nineteenth through early twentieth centuries, along with information about the health of the population and their treatment after death.

Byers, David (Utah State University), José M. Capriles (The Pennsylvania State University), Adolfo Gil (IANIGCA/CONICET—Grupo Vinculado San Rafael), Judson Finley (Utah State University) and Jacob Freeman (Utah State University)

[105] *PEOPLE 3K (Paleoclimate and the Peopling of the Earth): Investigating Tipping Points Generated by the Climate-Human Demography-Institutional Nexus over the Last 3000 Years*

One of the least understood aspects of paleoscience is the interplay between climate, human demography, and how changes in population influence resource management strategies. With the goal of understanding such processes, we created the PEOPLE 3000 research network to study trade-offs inherent to the climate-human population-institutional adaptation system over the last 3000 years. We propose that strategies reducing variation in food production and institutions for protecting those strategies generate ever more complex socio-ecological systems (SES). The growth of complexity, accompanied by a loss in social and subsistence diversity, can result in major reorganizations due to external or internal changes that drive a SES across a critical threshold. We explore this proposition using case-studies from the Great Basin, northern Chile and western Argentina. We compare radiocarbon SPDs with records of palaeoecological change, and changes in the diversity of subsistence and social strategies. The results show that population increased from 2000 to 800 BP in all three locations, and populations declined and societies reorganized between 700–550 BP. Our analysis reveals possible trade-offs associated with simultaneous adaptation to population growth and climate change and provides a more informed position to understand relationships between social-ecological parameters and threshold changes in modern SES.

Byers, David [105] see Robinson, Erick

Byrd, Brian [84] see Kaijankoski, Philip

Caballero-Miranda, Cecilia [293] see Soler-Arechalde, Ana

Cabana, Graciela [14] see Fleskes, Raquel

Cáceres Gutierrez, Yasmina [275] see De Juan Ares, Jorge

Cagnato, Clarissa (University Paris 1-Panthéon Sorbonne)

[293] *Macro- and Microbotanical Results from Select Archaeological Contexts in the Plaza of the Columns Complex, Teotihuacan, Mexico*

Paleoethnobotanical analyses provide significant information regarding past human behaviors, which include the selection, production, and consumption of plant resources, among others. This paper focuses on select archaeological contexts, domestic and ritual in nature, which have been investigated from a paleoethnobotanical perspective at the urban center of Teotihuacan, and more specifically in the area known as the Plaza of the Columns Complex. The recovery of macrobotanicals such as maize (*Zea mays*), amaranth (*Amaranthus* sp.), and tobacco (*Nicotiana* sp.), as well as starch grains belonging to chili peppers (*Capsicum* sp.) and manioc (*Manihot esculenta*) among others, indicates not only a wide range of plant taxa utilization, but also that the inhabitants of this particular sector of Teotihuacan had access to a variety of plants resources from both local and possibly

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more distant landscapes. These new data will be briefly compared and contrasted to those obtained by previous investigations, in particular to the well-studied apartment compounds situated in different parts of the city.

Cagnato, Clarissa [337] see Ponce, Jocelyne

Cagney, Erin and Joe Dent (American University)

[239] *Of Palisades and Postmolds*

The fieldwork conducted in Tyler Bastian's 1969–1970 salvage trench at Biggs Ford revealed a unique window into two Late Woodland villages, a Montgomery Complex and a Keyser Complex. The post mold patterns observed in the initial analysis of the trench may indicate the footprints of both complexes. Linear post mold arcs and a ring of pits may be consistent with other known Montgomery Complex sites, namely the Winslow site in Montgomery County. Additionally, post mold patterns in the extreme eastern and western portions of Bastian's trench indicate possible palisade arcs, analyzed with CAD to reveal a consistency in spacing and diameter with at least three other Keyser Complex sites in Maryland. Since 2013, much more extensive fieldwork has been conducted, revealing the presence of more post molds at the site. This paper will utilize the site data collected from field sessions between 2013 and 2015 to further analyze the post molds and potentially determine the existence of patterns that can indicate the layout of both the Montgomery Complex Village and the Keyser Complex Village at Biggs Ford.

Cain, Tiffany (University of Pennsylvania)

[173] *Kept Out or Closed In? An Analysis of Civilian Fortification Strategies during the Maya Social War*

In this paper, I explore the ways in which albarradas, or the dry-laid enclosure walls ubiquitous to Yucatec Maya towns, can be manipulated to become defensive structures under the threat of attack. I discuss the results of a recent study that conducted a construction analysis on a series of wall features in the now unpopulated town of Tela—an auxiliary to and key commercial thoroughway for the burgeoning frontier hub of Tihosuco (since repopulated) during the 19th century. This town was located at the epicenter of the Maya Social War or Caste War of Yucatan (1847–1901). Preliminary archival exploration suggests that it was occupied as a stronghold for at least the first five years of the conflict. The transformation of everyday enclosure walls into blockades, both of roads and house lots, provide one line of evidence for thinking through the impact of this conflict on the daily lives of Tela's inhabitants. After detailing our team's findings, I link this practice back to the present with a brief discussion of the recent blockading of the major highway that passes through Tihosuco as a response to failures of Quintana Roo's state and municipal governments.

Cajigas, Rachel (University of Arizona)

[21] *The Early Agricultural Period at La Playa, Mexico, A Geoarchaeological Investigation*

La Playa (SON F:10:3), in Sonora, Mexico, has the remains of an irrigation canal system associated with the Early Agricultural period (2100 B.C.–A.D. 50), a period characterized by the development of agriculture in the southwest United States and northwest Mexico. Satellite imagery analysis and magnetic gradiometry surveys covering over 53,000 m² of the site, document almost 8,700 m² of agricultural fields, 15 km of irrigation canals, and over a dozen circular structures. Irrigation canals were excavated and examined for stratigraphic, textural, and hydraulic information. Finally, a dating strategy utilizing both AMS 14C on ecologically specific, short lived, semi-aquatic succinids and single grain Optically Stimulated Luminescence on canal sediments was used to constrain the timing of canal use. The environmental and geochronological data have been synthesized to gain an understanding of the changing depositional conditions on the La Playa floodplain throughout the Early Agricultural period. These data contribute to a comprehensive chronology of the archaeological site within the greater context of the origins of early agriculture in the Southwest U.S./Northwest Mexico region.

Cakirlar, Canan (Groningen University Institute of Archaeology), Francis Koolstra (Groningen University), Christian Kuchelmann (Groningen University) and Salima Ikram (Yale University)

[34] *Marine Turtle Consumption: From Ancient Taboo to Conservation Management*

Remains of marine turtles occur regularly in the archaeological record. They provide insights into ancient subsistence and community practices. They also contain crucial information that can be used to create baselines for conservation. Their explanatory power is increased when the species exploited are identified. Here we describe an osteomorphological method which allows us to analyze fragmented postcranial elements of common Cheloniidae (*Caretta caretta* and *Chelonia mydas*) to species and reconstruct species-specific exploitation patterns. We focus on two case studies from the Eastern Mediterranean (Turkey and Lebanon) which demonstrate that humans were selective in which sea turtle species they exploited. These multi-period case studies, in combination with published information about marine turtle exploitation in the region, also indicate long discontinuities in the archaeological record, which may be related to food avoidance. Size and sex reconstruction point at differing capturing techniques. Results have interesting implications for understanding human-marine turtle interactions with deep-time perspective.

Calfas, George [238] see Baxter, Carey

Callaghan, Michael (University of Central Florida), Brigitte Kovacevich (University of Central Florida), Rachel Gill (University of Central Florida) and Karla Cardona (Universidad del Valle, Guatemala)

[33] *Preclassic Maya Ritual at Holtun, Guatemala: Analysis and Interpretation of the E-Group Architectural Compound*

Recent research in the Maya lowlands has shown that "E-Group" architectural complexes were intricately tied to the development of complex society during the Middle Preclassic period (900 BC—300 BC). First identified at the site of Uaxactun, Guatemala, E-Group complexes consist of a western radial platform and eastern range structure. For many years Maya archaeologists believed E-Groups functioned primarily as celestial observatories. However, recent data have shown E-groups were the locus of many activities, most importantly early ritual and religion. In this presentation we share the results of excavations in Group F at Holtun, or the "E-Group" ceremonial complex, from the 2015–2017 field seasons. Archaeological data suggest Group F served as a focus of ritual from the Middle Preclassic through Terminal Preclassic periods (800 BC—AD 300). In this presentation we discuss how finds from Group F, including monumental stucco masks, caches, burials, and the most extensive collection of Preclassic-period Maya graffiti, inform our knowledge of the development of complex society at Holtun, and offer insights into the basis of Preclassic Maya political power.

Callaghan, Michael [28] see Crawford, Dawn

Calonje, Michael (Cycad Biologist)

[150] *Discussant*

Camacho-Trejo, Claudia [223] see Barket, Theresa

Cameron, Catherine (University of Colorado)

[119] *Discussant*

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Cameron, Catherine [27] see Ellyson, Laura

Caminoa, Jose [154] see Cattaneo, Roxana

Camp, Stacey (Michigan State University)

[201] *Public Archaeology in Remote Places*

Public outreach and engagement has long been perceived as a cornerstone of historical archaeology. Many of the earliest public archaeological projects in the discipline concerned sites that had a significant preexisting audience, such as an urban environment. This paper looks at what it means to do public archaeology in remote settings, and it will explore how archaeologists engage the public when their sites are places of intentional displacement. How do public archaeology strategies and tactics shift in cases where a site remains physically accessible to most members of the public?

Campan, Patricia [155] see Belardi, Juan

Campbell, John (Memorial University of Newfoundland)

[199] *Revisiting Contact Interactions of the Keji'kewe'k L'nuk, or Recent People, and Europeans in the Mi'kma'ki*

The recent emergence of ontological applications in archaeological theory has developed the idea to "reject representationalism", where present archaeological taxonomic labeling comes into question. By adopting the "local" perspective of an indigenous group through the guise of "Amerindian perspectivism," archaeologists can integrate a holistic view of the Mi'kmaq pluriverse. Through perspectivist approaches of the ontological lens, the author will explore sensory worlds, and how sensory should be considered archaeological material. A proposal of investigating cultural landscapes during the Protohistoric Period (1500–1630), on intra and inter-site scales, not only illustrates continuity and change in land usage but also how sensory may perform as a deterrent or incentive in Mi'kmaq/European trade networks. Through examining the early fur trade during the Protohistoric Period via materiality, cultural landscape, and ethnohistoric documentation, archaeologists can interpret sensory worlds of cultural interactions through the perspective of the indigenous population.

[199] *Chair*

Campbell, Sarah K. [10] see Bovy, Kristine

Campbell, Wade (Harvard), Matthew Magnani (Harvard) and Alex Wesson (SWCA)

[36] *Reanalyzing "The Rise": A Gobernador Phase Navajo Habitation Site in Northwest New Mexico.*

In 2003, a master's thesis project examined a multicomponent Navajo habitation site dating to the 17th-18th centuries in the Dinéyah region of northwest New Mexico. The initial survey program carried out a number of activities, including site mapping, surface collection, and artifact analyses; however, certain questions were left unanswered. A new phase of research initiated in the summer of 2017 aims to better characterize the site and explore the possibility of a pastoral adaptation on the part of the site's Diné inhabitants. This talk presents several findings from this new investigation alongside a detailed reanalysis of the ceramic and lithic assemblages collected in 2003.

Campetti, Casey (AECOM)

[148] *Discussant*

Campiani, Arianna (UC Merced)

[172] *Analytical Models for At-Risk Heritage Conservation and 3D GIS*

In the period 2011–2017, scholars from the University of California Merced and Cardiff University recorded the fragile earthen architecture of Çatalhöyük, Turkey employing cutting-edge conservation technologies to monitor the site and gather new data. Our goal was to model and analyze the site decay and plan conservation interventions. Tools and methods for this initiative include blending site monitoring data and digital documentation data from environmental data loggers, terrestrial laser scanning, micro unmanned aerial vehicles, ground photography, structure from motion, and thermal infrared imaging. Our workflow produced a comprehensive set of information that quantitatively describes the rate of decay of Çatalhöyük's buildings overtime and underpins potential causes. This paper discusses our recent effort to integrate our extensive corpus of digital information into a GIS for analyzing the state of preservation of the site. In particular, this paper proposes new methods in predictive modeling for conservation enabled by spatial analysis in 3D GIS. Our predictive models offer an opportunity of building a comprehensive view of the site in its current state and serve as the basis of a new best practice methodology that can be employed in the conservation of other heritage sites.

[172] *Chair*

Campiani, Arianna [172] see Lingle, Ashley

Campos, Cinthia M. (California State University, Los Angeles), José Luis Punzo Díaz (Instituto Nacional de Antropología e Historia-Mich) and Carlos Karam (Instituto Nacional de Antropología e Historia-Mich)

[55] *Ritual Human Sacrifice among the Tarascans*

This study reports on osteological remains excavated from the Great Platform at Tzintzuntán, the Postclassic (A.D. 1300–1522) Tarascan ceremonial capital. The osteological deposit was first uncovered by Alfonso Caso in 1937–1944, re-visited by Rubín de Borbolla and Roman Piña Chan during the 1960's, by Efrain Cardenas in 1992, and most recently in 2011 by the Proyecto Especial de Michoacán. In 1992, 194 skull fragments (MNI=40) and 28 modified femur fragments were recovered while the most recent project recovered 529.88 kg of human bone. Both samples contained males, females, and sub-adults. Multiple thin transverse-cut-marks were identified on 19 skull fragments near temporal muscle attachments. Microscopic analysis shows that cut-marks were postmortem and reflect distinct patterns of cranial de-fleshing, starting from the mastoid process, and pulling back towards the occipital. Seven obsidian blades were identified, some matching the dimensions of the cut-marks. No grave goods were encountered. The archaeological data support ethnohistoric descriptions of postmortem scalping, flaying, and decapitation. The context suggests that individuals recovered at Tzintzuntán were casualties of ritual violence. This analysis combines osteological, archaeological, and ethnohistorical data to generate a broader discussion about the significance of ritual sacrifice and postmortem body treatment in Postclassic Tarascan society.

Canaday, Timothy (Salmon-Challis National Forest)

[106] *Multi-method Geophysics in the Frank Church–River of No Return Wilderness, Idaho*

The Frank Church—River of No Return Wilderness in central Idaho contains numerous prehistoric archaeological sites being impacted by recreational use. Sites located along the wild and scenic portion of the Middle Fork Salmon River are especially at-risk because of the thousands of visitors who regularly camp along the river within sensitive site areas. Non-ground disturbing methods were needed to determine whether the sites retain sub-surface integrity. Eight sites have been investigated using geophysical methods such as fluxgate gradiometry, earth resistance electrical resistivity, magnetic susceptibility, multi-depth electrical conductivity and handheld portable XRF for soil chemistry. The objective of this work is to develop long-

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term management strategies for the protection of at-risk sites using minimally invasive methods to protect the archaeological sites while still allowing current levels of recreational use. Results of the multi-method geophysical investigations are presented.

[106] *Chair*

Cannon, Aubrey [189] see Wildenstein, Roxanne

Cannon, Danielle (Kutztown University) and Carly Plesic (Kutztown University)

[239] *Using ArcMap to Create a Database for an Historic Cemetery in Northeast Pennsylvania*

As a program designed to integrate and analyze geospatial data, ArcMap has the potential for broad archaeological application. Here we employ ArcMap to create a database for research and management of the historic cemetery at Stoddartsville, a 19th century milling village built along the upper Lehigh River in northeast Pennsylvania. Specifically, we use ArcMap to integrate: (1) spatial data from a total station survey of individual grave markers and cemetery boundaries; (2) descriptive data from grave marker inscriptions and attributes; (3) personal data for buried individuals from archival research; and (4) geophysical data from a ground-penetrating radar survey of the cemetery. As we demonstrate, this map and database provide a useful research tool for examining the Stoddartsville cemetery as a microcosm of the associated historic site, allowing us to explore the changing social composition of the village, evolving funerary customs, and demographic trends. Additionally, we have shared this interactive map and database with the Stoddartsville Preservation Society to aid in their preservation and management of the cemetery. Finally, we have made this resource available online to potentially serve others interested in learning about Stoddartsville, including descendants of those buried in the cemetery decades ago.

Cannon, Kenneth (Cannon Heritage Consultants)

[90] *Ecology of Bison in the Greater Yellowstone Ecosystem*

Bringing the geologically historic record to bear on questions of ecosystem evolution is a goal emphasized in recent National Research Council reports. Within this context one species has become significant, the bison of the Greater Yellowstone Ecosystem. Recent expansion of the population, and its subsequent migration outside federal lands, has created concern among federal managers, local ranchers, and conservation groups. However, much of what is known about pre-management herds is based on historic records and modern studies. While both are invaluable sources, they have limitations. For example, historic studies are often anecdotal and modern studies are based largely on small, isolated herds. The purpose of my research is to develop a longer-term historical perspective on the mammalian community of the GYE. The lack of knowledge of the mammalian community is notable considering all that is known about the glacial, climate, and vegetative history. An initial step in this research is the study of bison ecology through the application of stable isotope signatures (carbon, nitrogen, oxygen, and strontium) derived from discrete downturn samples of modern and prehistoric bison. The third molars from 14 adult bison were selected from archaeological assemblages providing a detailed time-resolution record of each individual.

Cannon, Molly, Kenneth Cannon (Cannon Heritage Consultants), Kenneth Reid (Idaho State Historical Society), Joel Pederson (Utah State University) and Houston Martin (Cannon Heritage Consultants)

[305] *Implications of Integrative Science Approaches for Site Documentation at Bia Ogoi*

Deep in the Washington Territory amongst American expansionism, one of the nation's most devastating conflicts occurred. On the frigid morning of January 29th 1863, the California Volunteers under the command of Patrick Connor attacked the Shoshone village at Bia Ogoi in response to ongoing hostilities between whites and Native groups, resulting in the death of at least 250 Shoshone and 21 soldiers. Over the course of the past 150 years, extensive landscape modification has occurred from both natural and human agents, obscuring the events of this fateful day. This poster presentation highlights an integrated science methodology to identify and record key landmarks including traditional on-the-ground geomorphic studies, historic cartographic reconstructions, and geophysical assay with implications for preservation at the Bear River Massacre Site.

Canseco, Francisco [173] see Hernandez, Hector

Canuto, Marcello (M.A.R.I./Tulane University)

[337] *Preliminary LiDAR-based Analyses of the La Corona—El Achiotal Corridor*

Located in the northwestern Petén, Guatemala, the Maya sites of La Corona and El Achiotal have been investigated since 2008 by a multi-disciplinary US and Guatemalan research project. While a primary goal of this project has been to reconstruct the region's political history, we have also investigated the management of local resources and general human impact on the landscape. In 2016, a LIDAR survey, funded by the Pacunam Foundation and operated by NCALM, was undertaken in a 410 square km rectangular zone encompassing both La Corona and El Achiotal. In the following paper, we present ground-truthing analysis and preliminary interpretations of the LIDAR data-set as it relates to ancient settlement, land-use strategies, and defensive features.

[337] *Chair*

Canuto, Marcello [337] see Barrientos, Tomas

Canziani, Jose (Departamento de Arquitectura—Pontificia Universidad Católica del Perú (PUCP))

[249] *Habitar la diversidad: la transformación del paisaje y la construcción del territorio en el antiguo Perú*

La diversidad de zonas ecológicas que caracterizan a los Andes Centrales, dio lugar desde los procesos iniciales de poblamiento al despliegue de diferentes modos de vida, que se generaron en la interacción de los grupos humanos con estas distintas condiciones de existencia. El territorio es una construcción social que incorpora la historia de las transformaciones del paisaje, y las sociedades modelan su identidad cultural, memoria y cosmovisión en este profundo proceso de habitar el paisaje. Estos procesos, en los que se integran transformaciones sociales y territoriales, adquieren especial trascendencia a partir de la progresiva modificación de las originales características del medio, para favorecer en él los procesos productivos ligados a la agricultura, la pesca y la ganadería, resolviendo con la naturaleza el manejo del agua, de los suelos y del clima. En esta presentación expondremos casos representativos de paisajes culturales que comprometieron la articulación de conocimientos y de especiales formas de organización social, convirtiéndolos en instrumentos de producción de escala territorial. Paisajes que representan no solo un importante patrimonio ambiental y tecnológico, funcional al desarrollo territorial, sino también un referente de trascendencia para las comunidades que los heredaron, en cuanto se refiere a la conservación de su identidad cultural.

Cap, Bernadette (University of Texas-San Antonio), M. Kathryn Brown (University of Texas at San Antonio) and Whitney Lytle (University of Texas at San Antonio)

[173] *The Axis Connecting Classic Maya Economy and Ritual at Xunantunich, Belize*

The ancient Maya formalized avenues of movement between and within urban centers through the construction of sacbeob that both defined space and connected places on the landscape. In this paper, we discuss the ways in which a formally constructed sacbe at Xunantunich functioned as an axis connecting economic and ritual activities. The architectural arrangement of Classic Xunantunich emphasizes a north/south directionality. The site's

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sacbe, however, was constructed on an east/west alignment. This site plan emphasizes a cruciform pattern, which we argue was intentional, and may symbolically represent the axis mundi. In the west, the sacbe is associated with a marketplace and ballcourt. The openness of this area reflects public participation in economic and ritual activities. As the sacbe narrows towards the east, access becomes more restricted. The sacbe terminates at a hilltop group (Group D) where excavations revealed evidence for repetitive ritual activities. We argue that the Xunantunich sacbe may have served as a processional route for periodic rituals that would have reinforced the connection between economic and religious activities, while at the same time legitimized hierarchical relationships within the society.

Capellin Ortega, Anarrubenia (Graduate Center, CUNY)

[76] *Investigating Ancient Maya Foodways in the Copan Valley, Honduras: Macrobotanical Analysis from Late Classic to Postclassic Middens in the Rio Amarillo East Pocket*

Within the Copan Valley a dearth of macrobotanical assemblages have been analyzed, and most that were focused on the area within or close to the Acropolis. As part of a larger project investigating ancient practices of sustainability within the Copan Valley, macrobotanical remains recovered through flotation from two commoner communities, Site 29 and Quebrada Piedras Negras, Group C, in the Rio Amarillo East Pocket have been analyzed. Due to acidic soil in the area both bone and other types of botanicals have not survived well, thus charred materials offer the best opportunity for gaining insight into past food practices in this area.

Capellin Ortega, Anarrubenia [86] see Billadello, Janine

Capo, Rosemary [106] see Canaday, Timothy

Caporaso, Alicia (Bureau of Ocean Energy Management), Kristine DeLong (Louisiana State University), Douglas Jones (Bureau of Ocean Energy Management) and Michael Miner (Bureau of Ocean Energy Management)

[68] *The Submerged Cypress Forest and the Paleolandscape of the Gulf of Mexico*

Submerged Paleo-geologic features with probability for associated prehistoric sites on the Gulf of Mexico shelf include coastal plain and fluvial valley-fill deposits (e.g. terrace and floodplains) preserved landward of the 60-m bathymetric contour, the approximate late Pleistocene (~12,000 ka) shoreline location. A site ~15 km offshore Alabama was discovered with exposed remains of a previously-buried bald cypress forest with stumps in growth position rooted in an organic-rich paleosol. It has been suggested that exposure resulted from seafloor scour during Hurricane Ivan in 2004. Results from radiocarbon dating and OSL analysis place the timing of tree growth and burial at ~40–60 ka. We hypothesize that rapid floodplain aggradation associated with upstream response to sea-level rise led to burial and preservation. Though much older than expected Paleoindian occupation in this region, this rare find provides an opportunity to study in situ formation and preservation processes of an extent and easily accessible sub-sea preserved Pleistocene landscape surface and paleosol. These results will be used to create a conceptual model to aid in developing geophysical/geological survey techniques to identify buried paleolandforms that could contain archaeological remains from the earliest human occupations along the Gulf of Mexico coast when sea level was lower than today.

Capriles, José M. (The Pennsylvania State University)

[105] *A Review of Paleodemographic Changes in Prehispanic Bolivia Using a Countrywide Assessment of Radiocarbon Dates*

In this poster, I introduce a new database containing the most updated and comprehensive series of geo-referenced radiocarbon dates collected from archaeological sites located within the entire country of Bolivia. The resulting Bolivian Radiocarbon Database reviews and incorporates data from previous syntheses as well as a number of additional dates mostly available in rare publications and recent research. Using recommendations posted in previous studies, I discuss some of the potential and limitations of the resulting series, including geographical and temporal biases. I then select a dataset of representative dates to generate a series of different sum probability curves for different ecological regions (highlands, inter-Andean valleys, and lowlands) and compare them to different sequences of paleoenvironmental change. I discuss the results in light of the questions and hypotheses posted by the PEOPLE 3K Working Group, including the impact of global scale processes of climate change such as the Medieval Warm Anomaly and the onset of the Little Ice Age to different food production systems, and their influence on trajectories of demographic change.

Capriles, José M. [105] see Byers, David

Capriles, José M. [105] see Gayo, Eugenia

Capron, Ranel [261] see Loosle, Byron

Caramanica, Ari

[64] *Reconstructing the Environmental History of El Paraíso, Chillón Valley*

By Late Preceramic Perú (3000–2100 BC) lomas environments were largely abandoned in favor of riparian and littoral ecozones, and hunting and gathering subsistence strategies were increasingly replaced by agriculture. This change coincided with the emergence of several hallmarks of complexity: monumental architecture, specialization, and hierarchical organization. The role that environmental degradation or climate change played in this transition remains a subject of debate. This paper presents microbotanical data from the Late Preceramic site of El Paraíso on the Central Coast of Peru and reconstructs the environment at the site-scale. In particular, the micro-remains indicate an ENSO event and a strong trend toward increasingly saline wetlands over time. These environmental factors are considered in the context of the occupation of the site.

Carballo, David (Boston University)

[293] *Activity Areas and Political Economy at Teotihuacan's Plaza of the Columns: Investigations in Front E*

Front E of the Project Plaza of the Columns Complex comprises the southern sector of this large civic-administrative complex, located in the heart of Teotihuacan. In initial project planning, its surface topography suggested the presence of open spaces and low structures that could have been used for activities of economic significance and/or as residential spaces for individuals not of high elite rank. Excavations over two seasons in Front E prioritized horizontal exposures in order to assess these possibilities. They confirm the presence of open plazas and residential structures in the south of the front, and larger, decorated structures of likely ceremonial function to the north, defining the central precinct of the Plaza of the Columns. In this paper we review the excavation contexts, architecture, preliminary artifact analysis, and working hypotheses concerning the diverse functions of the area, changes over time, and what both contribute to better understanding the political economy of Teotihuacan. Significant finds include sculptural motifs, elaborate drain features, a large domestic midden, and evidence of intensive obsidian blade use.

[129] *Discussant*

Carballo, David [48] see Mark, Andrew

Carballo Marina, Flavia [155] see Nuevo Delaunay, Amalia

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Carbone, Catherine**[223]** *Preliminary Study in Skeletal Weathering in the Southwest Llano Estacado*

Skeletal weathering is rarely addressed in archaeological contexts, despite its importance to archaeology, and other fields of research. Experimental studies in taphonomy should be completed on regional scales, because changes in the microclimate will cause taphonomic agents to express differently on skeletal remains. This research quantifies and calibrates the skeletal weathering cycle for the southwest Llano Estacado region of eastern New Mexico, by placing faunal remains in full sun, shade, and partial shade. Pig metapodials were used to represent human remains, while other faunal remains were selected to simulate indigenous fauna found in the archaeological record. Specimens are documented daily, or as needed, and one sample from each species will be collected at each weathering stage, until a full cycle has been completed. DNA viability will be tested at each stage, as DNA analysis plays an important role in both archaeological and forensic research. Raman spectroscopy is used to determine the microstructure of bone at each weathering stage. Once the skeletal weathering cycle is calculated for the region, forensic specialists and archaeologists will be able to determine the post-mortem-interval, or the time-of-exposure of subaerial remains, understand the expected macro and micromorphology, as well as DNA viability for each weathering stage.

Card, Jeb (Miami University)**[33]** *Reassessing Classic Maya Identity and the Southern Edge of Mesoamerica*

Certain classes of material culture found in Honduras and El Salvador have long been recognized as being related to "Maya style" artwork and artifacts from Copan and Classic Maya cities to the north and west. These objects have been framed through questions of "influence", ethnicity, and boundaries. The recent re-analysis of a ceramic flask from Tazumal, with an unusual inscription tying the object to a Copan king and imagery of tribute, suggests a more distinct political lens through which to view influence and interaction on the southeastern edge of the Maya world. The nature of other "Maya" objects found south and east of Copan not only clarifies possible political and cultural relationships in this region, they also isolate aspects of what may have been recognized and performed by people of the first millennium CE in Central America as the entity later labeled as "Maya". By examining the kinds of objects used to perform or express "Mayaness" on a potential boundary area, the nature of "Mayaness" comes into view.

[117] *Discussant*

Cardona, Karla [33] see Callaghan, Michael

Cardona Rosas, Augusto [335] see Barnard, Hans

Carey, Mia (National Park Service)**[77]** *Artifacts Addicts Anonymous: The Road to Recovery from Negative Data*

Have you recovered thousands of artifacts, but none from the time period of interest? Have you spent weeks or months in the field, with absolutely nothing to address your research questions so you keep digging? This is the phenomenon of negative data. While this can be a scary thing, it is okay. Archaeologists suffering from artifact addiction have developed an unhealthy obsession with the recovery, analysis, and interpretation of material culture. This addiction can result in delayed reports, articles, and dissertations. In this paper, I argue that the road to recovery begins with reassessing our purpose as archaeologists and looking beyond our data, reports, and artifacts as our cultural products. Overcoming this addiction may be challenging, but is possible using this novel perspective. Are you willing to acknowledge your negative data?

[191] *Discussant*

Carleton, Chris [118] see Collard, Mark

Carlson, David (Texas A&M), Michael Waters (Texas A&M) and Joshua Keene (Texas A&M)**[103]** *Intrasite Spatial Analysis at the Debra L. Friedkin Site, TX*

The Debra L. Friedkin site, located in central Texas along Buttermilk Creek, provides evidence of human occupation in Texas during the past 15 thousand years within a deposit approximately 1 meter thick. Excavation Block A consisted of 52 contiguous 1x1 m units excavated between 2006 and 2009. Excavations since the initial publication of the site include 14 units adjacent to the south end of the block and 32 units just northeast. Each 1x1 m unit was excavated in 2.5 cm levels. Currently we are analyzing the horizontal and vertical distribution of diagnostic artifacts and debitage to identify paleosurfaces across the excavation block. Four independent lines of evidence are being used. First, four OSL columns provide one basis for identifying contemporaneous layers across the blocks using Bayesian depositional analyses of each core. The slope of the modern surface and the basal bedrock surface provide a second line of evidence of the slope of the buried components. Third, the distribution of diagnostic artifact types, especially Clovis, Folsom/Midland, Golondrina, Angostura, and Ensor provides a way of identifying surfaces using robust linear regression models. Finally, analysis of debitage densities horizontally and vertically provides yet another approach to identification of paleosurfaces.

Carlson, John (Center for Archaeoastronomy, College Park, MD) and John Hoopes (University of Kansas, Lawrence)**[263]** *Chacmool or Not Chacmool? Was a Mesoamerican Monumental Stone Sculptural Tradition Adopted in Eastern Costa Rica?*

The unique monumental stone sculptural form known as a "Chacmool"—a reclining human with an offeratory bowl on its abdomen—first appeared in the late Epiclassic period in Mesoamerica, most notably at the Toltec site of Tula in Central Mexico and the Maya site of Chichen Itza in the Yucatan. The form is known across Mesoamerica in archaeological contexts from Michoacán, Mexico to Guatemala and El Salvador. It persisted in Central Mexico to the time of the Aztec empire and European Contact, when a Chacmool was a major feature at the Templo Mayor in Tenochtitlan. Carlson has identified the uniquely posed male human form as having derived specifically from the stance of a Mesoamerican ballplayer. Subsequent research has demonstrated clear associations between Chacmool sculptures and ballcourts. Several examples of a similar sculptural form have been found at the site of Las Mercedes in the Caribbean lowlands of Costa Rica. This paper evaluates the examples from Costa Rica with respect to possible Mesoamerican connections and the geographical limits of the rubber ballgame in the Isthmo-Colombian Area.

Carlson, Kristen [21] see Bamforth, Douglas

Carmen, Mayra (Pontificia Universidad Católica del Perú) and Krzysztof Makowski (Pontificia Universidad Católica del Perú)**[132]** *Styles, Technology and Identities: Origins and Uses of Provincial Inca Ceramics in Pueblo Viejo-Pucará, a Huarochiri's Mitmaquna Settlement in the Lurin Valley*

Distribution analysis of provincial Inca pottery in different layers of the residences of Pueblo Viejo-Pucará, including the palace of the curaca, will serve as a starting point to define the differences in access to diverse vessel forms and observe the contexts of use in domestic, funeral, public and ceremonial areas. The excavations in residential and ceremonial architecture carried out in Pueblo Viejo-Pucará, a Late Horizon (1470–1560 A.D.) urban settlement, provided rich and varied evidence of the privileged participation of this mitmaquna population in the distribution network of artifacts that are considered sumptuary. We will contrast evidence of ceramic production to the manufacture of metal artifacts. Previous studies of clays - regarding its origins, pastes and pottery types- suggest that the source materials for provincial Inca ceramics were obtained from the neighboring Rimac valley along with a large number of workshops that also produced ceramics in local styles. The coexistence of architecture, agricultural

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technologies, pastoralism and funerary behaviors that are typical of the Huarochiri highlands, along with the coastal ceramics and elements of the Inca imperial material culture, demonstrates the complexity of acculturation processes, with multiple identities unfolding during the Inca period.

Carmody, Stephen [5] see Weitzel, Elic

Carpenter, John (Centro INAH Sonora)

[131] *Archaeology and Ethnohistory in the Sahuaripa Region of Eastern Sonora*

There is little doubt that there exists cultural continuity linking the Río Sonora tradition and the Ópata (a term referring to an amalgamation of several groups, generally including Eudeve, Teguíma and Jova-cf. Yetman 2010; Spicer 1962). The socio-political organization of the late prehispanic Río Sonora archaeological tradition remains controversial though little studied. Carroll Riley (1982, 1987, 1999, 2005; see also Doolittle 1984, 1988, 2008) proposed that they constitute “statelets”, based principally upon the interpretation of the ethnohistorical and Río Sonora archaeological site settlement pattern data. Although, we have long been outspoken critics of this concept, supposedly, the renowned cacique Sisibotari counted some 70 settlements within his dominion (Spicer 1962:92), and requested Pérez de Ribas send missionaries to his people; we suspect that when Pedro Méndez established missions in Bacanora, Sahuaripa and Arivechi, these localities fell within Sisibotari’s dominion, and would seemingly indicate a semi-complex level of socio-political organization. This paper presents recent archaeological investigations in the Sahuaripa region. These data, along with the ethnohistorical accounts, indicate that this region was densely populated and figured prominently in regional and long-distance exchange systems in Northwest Mexico and likely served as the principal route followed by the early Spaniards.

[131] *Chair*

Carpenter, John [59] see Sanchez Miranda, Guadalupe

Carpenter, Lacey (University of Michigan)

[82] *Neighborhood Organization in Early States: Exploring Spatial Variability at El Palenque*

The late Formative polity centered at the El Palenque site, near San Martín Tilcajete, Oaxaca, Mexico was a densely populated settlement. The site was founded in the late Monte Albán I phase (300–100) during a period of hostility and violent conflict. The settlement at El Palenque consists of a 1.6 ha civic ceremonial plaza, a 28 ha core area of residential occupation, and an additional 43.5 ha with more dispersed evidence for residential occupation. There may be a number of factors influencing the structure and distribution of neighborhoods across the site including social and political status, a need for defense, kinship organization, and specialized economic production. In this paper, I investigate the underlying processes shaping neighborhood organization and composition in the residential sectors of the site. I use a combination of surface collections and excavated household data to define and compare neighborhoods at El Palenque. Specifically, I analyze the distribution of house foundations, the density of different materials collected during surface collections, and house size and architecture. Through this combination of artifact and architectural data I evaluate different models for neighborhood organization and identify the underlying processes at shaping neighborhoods at El Palenque.

Carpenter, Michelle (University of Texas at San Antonio)

[241] *Indications of Faunal Starvation in Jamestown Colony*

The interpretations surrounding the first English colony founded in Jamestown, Virginia has developed through analyses of historical documents and excavations of the archaeological record. Continued excavations have provided an analysis of fauna within the colony affected by the diminishing food stores during the starving months of 1609 and 1610. Faunal remains were sampled from two archeological water wells in Jamestown dating to 1607–1610 and the second well from 1650. Based upon the preliminary results of collagen extraction by IRMS, fauna from the starvation months indicate an increase of $\delta^{15}\text{N}$ within the bone. These findings could be the result of extreme dietary distress expected to be consistent with $\delta^{15}\text{N}$ levels of the starvation period. Bioapatite was also analyzed for the overall diet of fauna sampled from the starvation months and the 1650 deposition. Due to the aqueous burial context, samples were analyzed for preservation by ATR-FTIR and IRMS. Faunal remains were compared to the 1650 archaeological well for dietary stability and preservation of hydroxyapatite crystals within the bone samples.

Carpioux, Natalie (University of Wisconsin—Milwaukee), Alicia Boswell (Bard Graduate Center), Jessica Walthew (Cooper Hewitt, Smithsonian Design Museum) and Gabriel Prieto (Universidad Nacional de Trujillo)

[265] *Burial Garments of a Chimu Child Sacrifice from Pampa La Cruz, Huanchaco, Peru*

The site of Pampa la Cruz, located in Peru’s northern coast in Huanchaco, is situated just north of the ancient Chimu capital of Chan Chan. A multi-component site with occupations from the Salinar, Gallinazo, and Chimu eras (400 BC—AD 1470), excavations in 2016 recovered Chimu child sacrifices. Each body was interred wearing multiple garments, including mantles, loincloths, and tunics. Environmental and soil conditions enabled the preservation of these textiles. In July 2017 students in the MOCHE Inc Conservation Program completed a preliminary study of these textiles and carried out stabilization measures. In this poster we analyze a set of clothing one child sacrifice was interred in. The set includes a hat, head wrappings, a mantle, a loincloth, and a tunic. Through an analysis of the weaving technology of this set of clothing and comparison to other Chimu textiles, this research provides insight into Chimu sacrifice practices.

Carpio, Edgar

[37] *Contribution of Stephan F. de Borhegyi to the Archaeology in Guatemala: Investigation in the Borhegyi’s Archives at the Milwaukee Public Museum*

Archaeologist Stephan Borhegyi contributed significantly to the development of archeology in Guatemala in the late 1950s and early 1960s with his investigations both in the highlands and on the Pacific Coast. He was a pioneer in underwater archeology at Lake Amatitlán and carried out studies at other sites around the lake. He also made important entries on different archaeological sites in the Highlands and on the Pacific Coast, particularly on the Bilbao site. In Guatemala, his works were published in the journal *Anthropology and History of Guatemala*. He has an important role in the organization of the collections of the National Museum of Archeology of Guatemala. At the Milwaukee Public Museum are his field notes, as well as other valuable documents related to his research work in Guatemala. There are also some samples of ceramic objects and other objects on display, from Amatitlán and the Pacific Coast. Our interest is to recognize his important work in the archeology of Guatemala.

Carpio, Edgar [176] see Andrieu, Chloé

Carr, Christopher (University of Cincinnati)

[238] *Potential Method for Structure Alignment by the Ancient Maya*

It is well established that the ancient Maya favored certain orientations for the buildings in their major urban centers. In the southern Maya lowlands, an orientation of 14° clockwise from the cardinal directions is particularly common. How did the ancient Maya find this orientation? What was their surveying technique? Lidar from many sites shows that this orientation was not limited to major constructions. The smallest residential structures and patio groups, structures spread throughout the site, also were orientated to specific directions. The method of orientation had to be relatively simple, accessible to all levels of society, workable on all parts of the landscape (not just where the horizon is visible), and, most likely, usable at any time of

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year (e.g., not just at solstice or equinox). A first step in orientating a construction to a particular direction would be to establish the cardinal directions (separately, constructions also could be orientated to features on the horizon). Two methods to determine the cardinal directions are presented here: the north method and the Gnomon E-W method. With the current lack of knowledge of ancient Maya astronomical instruments, examples from other ancient cultures are considered.

Carr, Kurt (The State Museum of Pennsylvania)

[328] *Paleoindian Research in the Middle Atlantic Region*

Paleoindian studies in the Middle Atlantic region have been at the forefront of Paleoindian research in the Eastern Woodlands. William Gardner's research in the Shenandoah Valley of Virginia in the 1980s emphasized a focus on micro-cryptocrystalline lithic sources in the settlement system; smaller territories on the order of 40 to 150 km in diameter and a flexible social organization during the seasonal round involving a pattern of changing micro- and macro-bands. These issues continue to be important in the analysis of Paleoindian adaptive strategies and now include more controlled examinations of community patterning; microwear analysis; refitting studies; and lithic sourcing based on trace element analysis. New sites have been discovered resulting in the definition of site clusters and sites associated with paths. Improved chronological controls have enabled researchers to speculate on changing settlement systems within the Paleoindian period. These studies have resulted in the definition of at least two different Paleoindian adaptive strategies in the Middle Atlantic region.

Carr, Philip (University of South Alabama)

[94] *Team-Based Learning in AN 101: Introduction to Archaeology & Biological Anthropology*

Team-Based Learning (TBL), a powerful pedagogical tool, has several essential elements: forming permanent teams; flipping the classroom; a specific sequence of individual work and teamwork; and immediate feedback. As a polar opposite of the traditional "sage on the stage" pedagogy, there are advantages and disadvantages for implementation of TBL in a moderate-sized (50+ students) introductory course. Specifics of the implementation are discussed for this first time use of TBL in AN 101 and lessons learned are reviewed. Comparison between student work from the traditional and TBL class are discussed. Expectations are that TBL will create a motivational framework in which students increasingly hold each other accountable for coming to class prepared and contributing, which will result in higher class performance.

[94] *Chair*

Carr, Philip [90] see Bradbury, Andrew

Carrasco, Michael [128] see Englehardt, Joshua

Carrasco, Michael (Florida State University)

[150] *Moderator*

[150] *Discussant*

Carreon, Samuel (Cal State Dominguez Hills), Rita Austin (University of Oklahoma) and Sabrina Sholts (Smithsonian Institution)

[143] *Caries from a Museum Skeletal Collections*

Studying teeth in museum archaeological collections allows us to address questions about diet, health, and the environment. One common health indicator is the rate and frequencies of pathological indicators such as carious lesions (cavities) within a population. Changes in the amount of caries over time in a population show the changes in diet which may reflect cultural or environmental changes. Through museum collections we are able to look at caries and assess the relationship between oral pathologies and the environment. This presentation will discuss an effective example of collections based research to document the prevalence of carious lesions among ancient inhabitants of the Santa Barbara Channel region. Specifically, we aimed to build on previous research that showed prehistoric declines in the sexual differentiation and overall frequency of caries in the region, related to a dietary shift from terrestrial plants to marine animals. We found that over time there were less caries in the Santa Barbara Region hinting towards an increase in the dietary reliance of marine mammals. It is through the museum's collections that we are able to conduct research on previous human populations and assess their health and diet.

Carrillo, Vanessa [106] see Stanton, Christopher

Carroll, Jon (Oakland University)

[133] *Assyrians at the Gate: Rethinking the Siege at Tel Lachish*

Sennacherib's destruction of Tel Lachish, Judah (now Israel) in 701 BC was accomplished using state-of-the-art technologies and tactics. We know through the Lachish reliefs once located at Nineveh and now housed at the British Museum, that the Assyrians used a siege ramp to conquer the city. Unfortunately, the ramp was partially destroyed by archaeologists in the 1930's and comparatively little is known about its original dimensions and use in the siege. Computational technologies including the use of drone-acquired aerial imagery are used to reconstruct the landscape and evaluate competing interpretations of the assault on the city.

Cartagena, Nicaela, Sheldon Skaggs (Bronx Community College), Mike Lawrence (Pacbitun Regional Archaeological Project) and Terry Powis (Kennesaw State University)

[256] *Groundstone Production and Community Development at the Ancient Maya Site of Pacbitun, Belize*

The archaeological site of Pacbitun is one of the ancient sites that was inhabited by the Maya for approximately two thousand years. It is located in west central Belize near the modern Maya village of San Antonio. In 2011, investigations in the periphery of the site core revealed a small group of mounds, of which one contained evidence of groundstone production. This group, designated as the Tzib Group, was targeted because one of the mounds, labelled Mano Mound, yielded numerous mano fragments on its surface. Intensive investigations at Mano Mound revealed a production loci, namely the manufacture of manos made from granite, dating to the Late Classic (600–800 CE) period. Systematic survey immediately around the Tzib Group has produced numerous other small groups of mounds also engaged in mano production. Until the summer of 2017 we believed that this mano producing community was limited to the northwest periphery of the site core. However, recent investigations in the southeast periphery have identified yet another groundstone workshop for the manufacture of granite manos. This paper will contextualize our findings and discuss the role of these granite workshops as it relates to sociopolitical and economic development in the Late Classic.

Carter, Alison K. (University of Oregon), Piphall Heng (University of Hawaii), Miriam Stark (University of Hawaii), Rachna Chhay (APSARA Authority) and Damian Evans (l'École française d'Extrême-Orient)

[175] *Urbanism and Residential Patterning in Angkor*

Greater Angkor (9–15th centuries CE) was mainland Southeast Asia's largest low-density urban area. Some of the most visible aspects of this landscape are the large stone temples constructed by Angkorian kings and elites. While many scholars have hypothesized that these temple enclosures were loci of habitation, few have documented this archaeologically. In this paper, we present the results of two field seasons of excavation

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at the temple site of Ta Prohm, part of a broader research program that was the first to intensively study temple enclosures for occupation. We used lidar data to focus our excavations and sample various locations within the enclosure. This work demonstrates evidence for residential occupation within the temple enclosure from the pre-11th century CE to the 14th century. A comparison with previous work exploring habitation areas within the Angkor Wat temple enclosure highlight similarities and differences in mound construction, organization of the internal grid system, intensity of habitation, and dates of occupation. We argue that temple habitation was a key component of the Angkorian low-density urban system and that investigating this unique form of urbanism deepens current comparative research on the diversity of ancient cities.

[246] *Discussant*

Carter, Benjamin (Muhlenberg College)

[141] *Making Bead Makers: Durability and Change in a Community of Practice among the Manteño-Guancavilca of Ecuador*

Shell beads are rarely considered a major artifact category. However, research on bead production among the Manteño-Guancavilca (AD 800–1532) of coastal Ecuador highlights the fundamental importance of this category of artifacts. By recording six measurements and four qualitative observations for each of 7651 beads from six sites (two regions, three stretches of time), this research has been able to recognize two distinct chaînes opératoires. At approximately AD 1200, bead makers shifted from a highly regular production sequence resulting in standardized chaquira (tiny beads) made from the ritually and economically significant shellfish, *Spondylus*, to one that is more opportunistic and results in irregular beads rarely made from *Spondylus*. This “destandardization” is associated with external economic forces, but also highlights the significance of the bead maker community of practice. Bead making endured the near complete loss of a market for chaquira, by becoming more flexible in their production strategy. That is, they tweaked their technological style to fit a new situation. In this way, bead makers retained their identity, as is demonstrated in the inclusion of raw material, production debris and tools in burials. This paper proposes some ways to think about change and durability in a community of practice.

Cartier, Meghan (California State University, Fresno)

[25] *Naked Huastecs, Anxious Aztecs: Male Nudity and Gender Identity in Aztec and Huastec Sculpture*

The relationship between the Aztecs and the Huastecs is complicated and often defined by Aztec reaction to Huastec culture. The Aztecs have often dominated the landscape of Mesoamerica while the Huastecs have been seen as something somewhat separate. At first glance the difference in Aztec and Huastec sculptural tradition might seem to reaffirm this disconnect. By focusing on male figurative sculpture and how it reflects the construction of gender identity we see that despite clear differences there is a core ideology which connects them through shared traditions and worldview. This examination also reveals how Aztec and Huastec depictions of, and reactions to, male nudity indicate how both cultures use shared ideas of gender and identity to address unique social and political concerns within each group. Ideas of maleness reflected in these sculptures reveal the anxiety of the Aztecs as relative newcomers trying assert themselves as a cosmic and political center of the Mesoamerican world while at the same time solidly giving the Huastec a home in that world. Ultimately this examination of Aztec and Huastec sculpture seeks to better situate both groups in terms of interactions with each other as well as their place in the broader Mesoamerican world.

[25] *Chair*

Carucci, James [13] see Gilmore, Kevin P.

Casado Lopez, Ma. del Pilar [42] see Rios Allier, Jorge

Casaly, Allison

[144] *A Distant Perspective: Characterization of Britain and Ireland in Studies of Large-Scale Exchange*

Archaeologists often characterize the Bronze Age by a pronounced expansion in long-distance interaction, which resulted in contact, whether direct or indirect, between disparate geographical areas. The centrality of this notion to the definition of the Bronze Age has resulted in numerous studies addressing such large-scale exchange of material culture and/or ideology. When incorporated into such studies, Britain and Ireland are often lumped together under the moniker of “the British Isles.” This paper examines the rhetoric surrounding discussions of long-distance communication and trade in the Bronze Age, specifically regarding use of the term “British Isles” in the archaeological literature. In particular, it considers whether the studies of long-distance interaction tend to homogenize Britain and Ireland under the umbrella of southern England, resulting in the glossing over of the rest of Britain and Ireland as marginal and insignificant, or in the blanket attribution of southern English characteristics to Britain and Ireland as a whole. Finally, this paper considers whether modern geographical understanding reflects that of groups in the Bronze Age, and how geographical understanding could have influenced the delineation of group identity. Particular attention is paid to methods of transport and communication, and how these may have shaped conceptualizations of geographical features.

[144] *Chair*

Casana, Jesse (Dartmouth College), Austin Chad Hill (Dartmouth College) and Elise Jakoby Laugier (Dartmouth College)

[68] *Drone-Acquired Thermal and Multispectral Imagery as a Tool in Archaeological Prospection*

This paper presents results of recent research at several sites in North America and the Middle East in which aerial surveys have been undertaken using an advanced radiometric thermal camera and a multispectral sensor mounted on commercial-grade drones. While using drone-acquired color photography to produce ortho-imagery and digital surface models has become an increasingly standard practice in archaeology, thermal and near-infrared imaging offers the potential to detect both surface and sub-surface archaeological features including architecture, earthworks, and artifact concentrations. Overviews instrumentation, survey strategies, and processing methodologies, our results from fieldwork at sites including Khani Masi (Iraq), Tlaxcala (Mexico), Poushoquinge (New Mexico), and the Enfield Shaker Village (New Hampshire), demonstrate both possibilities and challenges of this emerging approach to archaeological investigation. Analysis reveals a great deal regarding the surveyed sites, and offers researchers a powerful means to explore the archaeological landscape in a way that is rapid, inexpensive, and non-destructive.

Casanova, Edgar [293] see Ruvalcaba, Jose Luis

Cascalheira, João [124] see Bicho, Nuno

Case, Nicholas (Independent Researcher), William Taylor (Max Planck Institute) and Julia Clark (Northern Mongolia Archaeology Project)

[238] *Digital Archaeology In Mongolia: Visualizing the Data*

This study presents results from data visualizations of archaeological sites in northern and western Mongolia. Unlike traditional site documentation techniques applied throughout the discipline, digitalization of data while in the field presents distinct advantages for the study and preservation of both cultural heritage and archaeological data collections. These methods include the production of digital 3D maps, from both aerial and hand-held photogrammetry, data collection with tablets using project specific and updatable forms, near real-time data entry into a secured locally hosted onsite database, and increasing data integrity through pre-printed unique barcodes for each artifact and sample collected. We implemented these techniques for the Northern Mongolia Archaeology Project located in Darkhad Basin, Khuvsgul province, northern Mongolia, and the Tsagaan Asga Project, located in Bayan-Ulgii province, western Mongolia. By creating high-resolution maps in both visible and near-infrared light combined with the spatially

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aware data collected, the result is a fully digitized site to assist in data organization and analysis so that the focus is less on the data entry and more on the data queries.

Caseldine, Christopher (Arizona State University)

[307] *Irrigation Time: An Assessment of Time as a Factor in Hohokam Irrigated Acreage*

The Hohokam within the lower Salt River Valley, central Arizona, practiced large-scale irrigation that spanned thousands of acres. Previous studies examining Hohokam irrigation assumed that there was a direct correlation between the amount of available water within the lower Salt River and the amount of land that could be irrigated. The amount of available water is necessary for assessing where water was sufficient for successful crops and where insufficient water made agricultural production difficult; however, time is also important. A key component of modern irrigation strategies is the amount of time required to apply sufficient water to fields for successful crop growth. Despite its importance, time has not been included in assessments of Hohokam irrigated acreage. In this paper, I estimate the amount of time it would take to irrigate all agricultural land within Canal System 1, the largest of the four major Hohokam systems. This study will provide a further method for assessing the amount of land the Hohokam could irrigate during key points in the agricultural calendar.

Cassedy, Daniel (AECOM), Matthew Jorgenson (AECOM) and Peter Sittig (AECOM)

[184] *New Data on Archaic Period Chronology and Raw Material Variation from a Stratified Archaic Site in the Appalachian Summit Region*

Excavations completed by AECOM documented deeply stratified Archaic deposits at the Weatherman Site (31YC31) in the Appalachian Summit Region of North Carolina. This site is located at 2,500 feet above sea level (10 miles north of Mt. Mitchell, the tallest peak east of the Mississippi River) and is situated in the floodplain of the South Toe River, which flows west to become the Nolichucky River and eventually the Tennessee River. The youngest Archaic component at the Weatherman Site is a Late Archaic horizon dominated by hearth remnants and dozens of broken and whole Savannah River projectile points made of local quartzites. The oldest and deepest component is an Early Archaic occupation dominated by cherts from East Tennessee, which produced a Kirk Serrated projectile point and multiple radiocarbon dates of circa 9200 calibrated radiocarbon years before present. These dates are among the oldest radiocarbon dates yet obtained in North Carolina. A summary of findings at 31YC31 is presented here and compared with other recent Archaic period site investigations in the Appalachian Summit region, with particular attention to spatial organization and changes in lithic resource utilization over time.

Cassidy, Brendan (University of Central Lancashire), David Robinson (University of Central Lancashire) and Devlin Gandy (Wind Wolves Preserve) (Tejon Indian Tribe)

[214] *Accessing the Inaccessible: Valuing Virtual Reality and Remote Access to Pleito Cave*

This presentation showcases the contemporary value of Virtual Reality as a means to experience difficult to access, sensitive cultural sites for different stakeholder groups including researchers, land owners, and Native groups. Here, we show the enhanced virtual reality environment of Pleito Cave, a fragile world class rock art site with accessibility limitation. We discuss how scientific research can be translated into VR data sets to speak to diverse communities and different needs, providing management tools as well as educational opportunities. As a group presentation, the Wind Wolves Preserve and the Tejon Indian Tribe will have representatives appearing via remote access within the VR environment during the talk.

Casson, Aksel (Slippery Rock University) and James Jablonski (Slippery Rock University)

[52] *A Return to Wolf Creek, PA*

The Wolf Creek Site (36BT82) in Slippery Rock, PA was last excavated in the early 1990s as part of Slippery Rock University's (SRU) Field School Program in Archaeology. In this poster, current SRU students evaluate the hypothesis that the site was an historic Kuskuski indigenous camp through a re-analysis of existing collections and additional research at the site.

Castañeda, Amanda (Shumla Archaeological Research and Education Center), Charles Koenig (Shumla Archaeological Research and Education Center), Karen Steelman (Shumla Archaeological Research and Education Center) and Marvin Rowe (Museum of New Mexico-Office of Archaeological Studies)

[180] *Portable X-ray Fluorescence of Lower Pecos Mobiliary Art: New Insights Regarding Chaîne Opératoire, Context, and Chronology*

Painted pebbles are the primary mobiliary art found in the Lower Pecos Canyonlands of southwest Texas and northern Mexico. Previous studies of these artifacts have focused on stylistic variation of the imagery and interpretation of the role these artifacts played within Lower Pecos societies. The focus of this study is the use of portable X-ray fluorescence on Lower Pecos painted pebbles to conduct elemental analyses, providing insight into the chaîne opératoire of painted pebble production. Using a sample of recently excavated painted pebbles, as well as a sample from a private collection, a total of 257 pXRF measurements were collected on 73 pebbles. We determined that charcoal was used as a pigment for black paintings and that iron-based mineral pigments were used for red paintings. The 30 excavated pebbles range in age from ~8000 cal BP to 550 cal BP, and the stratigraphic and chronological context of these pebbles provides a dataset for analyzing not only the chaîne opératoire of painted pebble production, but also allows us to analyze the potential for changes in production through time. This presentation summarizes the results from the pXRF analysis, and discusses the larger archaeological implications for Lower Pecos painted pebbles.

Castañeda, Amanda [180] see Roberts, Jerod

Castañeda, Francisco [252] see Acuña, Mary Jane

Castanet, Cyril [80] see Nondédéo, Philippe

Castanzo, Ronald (University of Baltimore) and Elgin Klugh (Coppin State University)

[251] *The Archaeology of Historic Laurel Cemetery in Baltimore, Maryland*

Laurel Cemetery was created in 1852 in Baltimore, Maryland, as a nondenominational burial place for African Americans in the city. By the 1930s, after perhaps several thousand people were interred at the site, the cemetery company had become insolvent, and the grounds were no longer being maintained. After the property was sold in the 1950s, the cemetery was demolished in preparation for what would become a shopping center. Approximately 300–400 burials were moved, but it was not known how many, if any, burials remained at the site. The Laurel Cemetery Project, conceived as a public anthropology endeavor, combines archaeology, ethnology, history, and community outreach. The main goal of the archaeology component of the project was to determine if any human remains were still located at the Laurel site. Archaeology fieldwork concluded in the summer of 2017, and involved remote sensing and the excavation of six test units. Wood and metal remnants of several caskets were uncovered in the excavations, in addition to several pieces of human bone. A ground penetrating radar survey, conducted in limited sections of the property, indicates that many burials remain, both in unpaved areas and under the parking lot.

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Castellano, Lorenzo (NYU—Institute for the Study of the Ancient World), Roderick Campbell (NYU—Institute for the Study of the Ancient World) and Yitzchak Jaffe (NYU—Institute for the Study of the Ancient World)

[221] *Climatic Narratives across Eurasia: A Comparative Study of the 4.2k Event in Western and Eastern Asia*

In the last two decades, climatic narratives have returned as a central issue in archaeological discourse. The field has been flooded with publications on paleoclimatic reconstructions and we believe it is time for a critical evaluation—both as means of seeking better science, and for building better archaeological narratives.

Climate history is composed by an overlapping meshwork of long-standing trends, punctuated events and short-term phases, with impacts ranging from the local to the global/hemispherical scale. As pointed out by several authors, the perception of change, understanding within specific cultural framework(s), and reactions to those changes, are crucial elements in the understanding of human-climate relationship. It is in this context that the so-called Holocene Rapid Climatic Changes (RCCs)—must be understood.

Among the various RCCs, the so-called 4.2k event represents a special case-study—being often associated with hypothetical widespread changes in the archaeological record. Together with a fresh look at the 4.2k climatic event, we analyze and discuss the ways in which those ‘climatic narratives’ have been built by comparing the Near and Far Eastern cases. Through it we show that mismatches of scale, archaeological and climatic, have profound impact on the way we reconstruct the past.

Castillo, Karime (UCLA-Cotsen Institute of Archaeology), Patricia Fournier (ENAH) and Roberto Junco (INAH)

[69] *Dehua Porcelain in New Spain: Approaches to the Production of Fine Chinese Porcelains*

In the viceregal society of New Spain, Chinese porcelain objects were expensive objects consumed primarily by people of high status. The white porcelain objects produced in Dehua, located in the Fujian province of China, were incorporated into the household items of palaces and mansions, as indicated by archaeological evidence from Mexico City, Acapulco, Sinaloa, and some rural sites in the Otumba Valley. The production of this fine porcelain, also known as Blanc de Chine, involved complex techniques, particularly in its firing process. This paper will present several aspects related to the manufacture of Blanc de Chine porcelain and the kilns used to fire it based on ethnoarchaeological observations performed in active porcelain production centers in Dehua, where these fine products are still made following millennial traditions.

Castillo, Luis Jaime (Universidad Católica del Perú)

[216] *The Priestesses of San Jose de Moro*

Starting in 1991, more than 20 female elite burials have been excavated among the 800+ burials dug in San Jose de Moro, Jequetepeque Valley, Northern Peru. Female burials tell us stories of the rise to power of females in the Late Moche society, of their singular power, emanating from roles in Sacrificial Ceremonies, but mostly each burial is a representation of the specific life of each one of these females, where more is singular than common and shared. Rather than a repetitive pattern, each female burial allows us to imagine the construction and reconstruction of gendered power identities, the ontologies of self and power and meaning associated with these singulars in individuals.

[321] *Discussant*

Castillo, Nina [153] see Núñez Aparcana, Bryan

Castillo Flores, Fernando, Francisco Javier García Ugalde (Universidad Nacional Autónoma de México), José Luis Punzo Díaz (Instituto Nacional de Antropología e Historia), Alfonso Gastelum-Strozzi (CCADET UNAM) and Dante Bernardo Martínez Vázquez (Escuela Nacional de Antropología e Historia (ENAH))

[55] *Automatic Classification of Digital Images of Archaeological Arrowheads*

Currently there exist several databases composed of hundreds or thousands of digital images of arrowheads made by different ancient ethnic groups around the world. Extracting information or comparing and classifying the elements of these databases in an efficient and automated way, even without the need of arrowhead's metadata, would be of great help in carrying out a comprehensive study on this archaeological subject. This work deals with this problem by developing an image processing computational algorithm that performs the automatic classification of the arrowheads. Particularly, the algorithm was used in the study of a set of Mexican's arrowheads coming from the Michoacán state; these arrowheads were classified and compared with other databases consisting of hundreds of arrowheads from North America. The classifier uses these features: eccentricity of the arrowhead, blade kind (excurvate-incurvate) and base kind (concave-curved, straight, with handle, and concave with handle). Except for the eccentricity, the other features were obtained by the curvature scale space (CSS) method computed on the arrowhead contour. An important aspect of the algorithm is its robustness with respect to the image, as it performs satisfactorily even with images of medium quality and the only general requirement is to have a uniform background.

Castro, Juan (Museo de Ciencias Naturales y Antropológicas “Prof. Antonio Serrano”. Paraná.), Mariano Bonomo (CONICET-División Arqueología, Facultad de Ciencias), Lucio González Venanzi (Centro Regional de Investigaciones Científicas y T), Francisco Juan Prevosti (Centro Regional de Investigaciones Científicas y T) and Silvia Cornero (Museo Universitario, Facultad de Ciencias Exactas,)

[7] *New Records of Pre-Hispanic Dogs (Canis familiaris) in Argentinean Northeast*

Canis familiaris has a limited record in pre-Hispanic archaeological sites of Southern South American, but in the last decade, more specimens were published. In this context, we present new remains of domestic dogs from five archaeological sites along the Paraná and Uruguay Rivers in the Northeast of Argentina, an area with few published records. We also discuss their roles within human societies. The studied sample includes seven cranial and one postcranial specimens corresponding to seven individuals, that comprise adults (n= 6) and youngs (n= 2). Estimated body size indicates that they belong to medium sized dogs (13–23 kg). Some of them show anthropic cut marks (n= 4) and carnivore marks (n= 2). Two specimens were dated, one at 1119 ± 23 14C years B.P., and the other at 1910 ± 29 14C years B.P. It is concluded that in the Northeastern Argentine *Canis familiaris* presents greater age variability and slightly larger sizes than previous records. The 14C dates extend the chronological range known for the region. Its presence is linked to hunter-gatherer-fisher and small scales horticulturalist populations with a marked fluvial adaptation. Evidence of anthropic processing indicates possible human consumption during the late Holocene.

Castro de la Mata, Pamela [141] see Velarde, María Inés

Catanzariti, Antonietta (Smithsonian Institution)

[4] *Ban Qala, a Late Chalcolithic Site in the Mountain Region of Kurdistan, Iraq: A Report from the 2017 Excavation Season*

Ban Qala, a site located in the mountainous valley of Qara Dagh, was first identified by Iraqi archaeologists in the 1940s. In 2015, a survey performed by the Qara Dagh Regional Archaeological Project determined the archaeological relevance of the site, which was then chosen as subject of an archaeological investigation. A step trench on the southern slope of the site verified the presence of LC 1–2 (4800/4500–3850 B.C.E.) and LC 3–5 (3850–3100 B.C.E.) occupation levels. This paper will discuss the data collected and provide interpretations on the implication of the Late Chalcolithic period in the Qara Dagh Valley. The presence of stone tools, particularly obsidian, and the strategic position of Ban Qala on a corridor that leads east to the Shahrzior plain and west to Chamchamal, could suggest that the site participated in some form of trade. Finally, the recovery of several bevelled

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rim bowls in situ suggests that local ceramic production was being carried out within the context of a wide-spread Mesopotamian ceramic tradition.

The Ban Qala excavation is one of the first conducted in the valley and will contribute to our knowledge on its occupational history, providing a regional perspective from the mountainous region of Northern Mesopotamia.

Catignani, Tanya [293] see Sugiyama, Nawa

Catlin, Kathryn (Northwestern University)

[167] *Transforming Marginality in Medieval Iceland: Landscape Reorganization on Hegranes, Skagafjörður*

Eleventh century Iceland was a period of transition. The settlement of the island two centuries earlier set off cascading environmental and landscape changes whose agricultural consequences were then evident, including deforestation, erosion, and wetland alteration. Meanwhile, the rise of a wealthy landowning class altered the economic basis of society from primarily household production towards more centralized structures of rent extraction and tenancy. On Hegranes, a region in Skagafjörður, North Iceland, numerous small settlements on the margins of modern farm properties were abandoned during the 11th century. These sites are in localized areas of deep, dry soils between eroded bedrock and wetland, and while some may represent independent households, others likely served specialized functions in the service of larger farmsteads. After the sites ceased to be inhabited, they were used sporadically for livestock management over the next eight centuries. This rapid reorganization of settlement patterns and landscape use reflects simultaneous and interconnected transformations in ecological and social practice. This paper explores how the changing practices of marginal households both contributed and responded to this moment of transformation, as environmental and political factors came together to alter the material ways in which social inequality was organized and maintained.

[167] *Chair*

Catsambis, Alexis

[78] *Preserving the U.S. Navy's Sunken Military Craft: Transcending Time and Space*

The U.S. Navy maintains a program responsible for the management of its sunken military craft, which are distributed world-wide and extend temporally from the American Revolution through to the Nuclear Age. These multi-faceted submerged heritage sites are managed by the Underwater Archaeology Branch of the Naval History and Heritage Command, which engages in archaeological field research, heritage management, artifact conservation, collections management, and outreach initiatives in furtherance of its mission. This paper will discuss recent research and developments pertaining to the management of sunken military craft, which in addition to representing important heritage sites, may also serve as maritime graves and carry environmental or public safety hazards.

Cattaneo, Roxana, Gisela Sario (CONICET/UNC), Gilda Collo (CONICET/UNC), Andres Izeta (CONICET/UNC) and Jose Caminoa (CONICET/UNC)

[154] *Tracking Quartz: A Methodological Approach to an Elusive Type of Sources Using Chemical Characterization According to Their Geological Origin*

In the archaeology of the Sierras Centrales of Argentina more than one hundred years ago studies reported the presence of a lithic technology centered on the use of quartz as a predominant raw material. However, little effort has been made to try to characterize its chemical composition so as to understand the circuits of mobility or the exchange networks in the archaeological sites of the region.

The results of provenance studies have allowed us to advance in a geochemical characterization of quartz sources and discuss an appropriate set of chemical trace elements useful for comparison between archaeological sites and quarries depending of the geological origin (hydrothermal or pegmatite quartz). We report here a chemical characterization of archaeological and geological samples using thin sections, X-Ray fluorescence and X-ray diffraction.

The detection of trace elements of 100 quartz outcrops and its comparison with archaeological artifacts from 8 sites from the valleys of Ongamira and Copacabana (north of the province of Córdoba, Argentina) are going to be presented, related with samples that belong to different chronological periods (from hunter-gatherer societies—ca. 6000 BP—to more recent occupations—ca. 300 BP).

Cazares, Irma (Zona Arqueologica de Monte Alban, INAH)

[158] *"Teposcolula Viejo, Yucundaa, Oaxaca", Un proyecto Novedoso e Interdisciplinario, Modelo de Co-Participación Gubernamental y Privada en México*

En el año 2004 comenzó el Proyecto: "Teposcolula Viejo, Yucundaa, Oaxaca", en el sitio arqueológico de Pueblo Viejo de Teposcolula, una antigua ciudad mixteca sede de uno de los señoríos más poderosos de la época prehispánica en Mesoamérica, que recibió la incursión de la conquista española y tuvo que transformarse completamente; y esta transición cultural se muestra en los hallazgos arqueológicos.

Este proyecto dirigido por los Doctores Nelly Robles (INAH) y Ronald Spores (Vanderbilt University), conducido por el Instituto Nacional de Antropología e Historia (INAH) de México, contó con financiamiento de la Fundación Alfredo Harp Helú Oaxaca (FAHHO), apoyado por el municipio de San Pedro y San Pablo Teposcolula, Oaxaca, y también tuvo el soporte de Harvard University, del American Museum of Natural History, y de The National Geographic Society, entre otros; de esta manera, se contó con la participación de arqueólogos internacionales, laboratorios modernos y tecnología de punta que permitieron obtener más información de este sitio y este contexto tan particulares, y tan poco conocidos.

Cecil, Leslie (Stephen F. Austin State University)

[112] *Moderator*

Celis Ng Teajan, María Andrea (Andrea Celis Ng)

[19] *Arroyo Pesquero y su "otra" ofrenda*

Desde el descubrimiento de una ofrenda masiva de objetos rituales hallada fortuitamente en un arroyo, el sitio Arqueológico de Arroyo Pesquero enclavado en el área nuclear olmeca ha generado una serie de discusiones acerca de la autenticidad de piezas dispersas en museos y colecciones privadas. Las piezas más representativas son máscaras y hachas de piedra verde con una iconografía propia de la cultura olmeca. Sin embargo, una parte del material del sitio se ha subestimado. Por Medellín Zenil sabemos que se trasladaron otros artefactos de piedra verde erosionados al Museo de Antropología de Xalapa, posiblemente estaban en el fondo del río. Salieron de nuevo a la luz en el 2013 cuando algunos arqueólogos los localizaron en la bodega del museo. El contexto de estas piezas siempre ha sido enigmático, desde la exploración hecha por Manuel Torres en 1969 se perdieron datos acerca de éste. Durante el 2005 comenzaron nuevas investigaciones dirigidas por Carl Wendt y Roberto Lunagómez, que permitieron contrastar información. En esta ponencia nos enfocaremos en el trabajo efectuado sobre estas piezas olvidadas, y ahora trabajadas dentro de un proyecto arqueológico, en las bodegas del museo. Esto nos da la oportunidad de ver "otra cara" de la ofrenda.

[19] *Chair*

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Cercone, Ashley (University at Buffalo) and Zeynep Bilgen (Dumlupınar Üniversitesi)**[146]** *Double Handed Vessels at Seyitömer Höyük in Kütahya, Turkey: The Manufacture, Use, and Trade of Depas Cups*

During the Early Bronze Age, the site of Seyitömer Höyük in Western Anatolia, served as both a center for ceramic production and trade. Through the innovative use of a mold-making technique, as well as a clay coil and wheel combination method, potters were able to produce a standardized diverse ceramic repertoire at a fast rate. Within the site assemblage, a variety of ceramic types are represented, including the depas amphikypellon, a two handled drinking vessel. Depas vessels originating from both local mounds, such as Küllüoba, and foreign locals, like Syros-Kastri, Poliochni, and Kültepe are also present. In addition to these cups, used for both libation and everyday use, zoomorphic rhyta have been uncovered that depict two animals holding a depas cup. This paper reconsiders the daily and ritual uses of the depas cup in light of the Seyitömer Mound excavations and discusses the movement of this vessel type throughout the Aegean islands, Balkan Peninsula, and Anatolian and Syro-Mesopotamian mainlands.

[146] *Chair***Cerezo-Román, Jessica (Cal Poly Pomona) and Kenichiro Tsukamoto (Department of Anthropology University of California)****[37]** *Life and Death of Lakam Elites at the Maya Center of El Palmar, Campeche, Mexico*

During the Late Classic period (A.D. 600–800), Maya non-royal elites frequently appeared in courtly scenes, which are depicted on polychrome vessels and carved monuments. While epigraphic studies over the last two decades have gradually shed light on their political and ritual roles, little is known about their life histories and mortuary practices. One group of these elites held the title of lakam, which has been reported only at three archaeological sites. We detected tangible evidence of their residential cluster at the archaeological site of El Palmar, located in southeastern Campeche, Mexico. A hieroglyphic stairway found at El Palmar's northern Guzmán Group depicts the genealogical list of lakam elites. During the 2016 field season, 10 burials were recovered at the Guzmán Group and subsequently subjected to osteological analyses to document their biological profiles and life histories. By combining the osteological results with archaeological and epigraphic data, we attempt to reveal socio-political circumstances of these relatively unknown elites in Classic Maya society.

Cerling, Thure [198] see Chritz, Kendra

Cervantes, Gabriela (University of Pittsburgh)**[82]** *The Sican Capital: Neighborhoods and Urban Organization in Pre-Columbian Peru*

Cities which become capitals of large states provide unique information on the sociopolitical political organization and the nature of power, as they are home to a society's leaders and central institutions. In the Andes, scholars have highlighted the existence of cities dominated by a centralized single governing institution, like the Moche capital of Pampa Grande; while others have drawn attention to the empty ceremonial centers, such as Cahuachi, main settlement of the Nazca society. A different urban organization model based on extended, low density population has been studied for Mesoamerica but never for the Andes. I present recent work arguing that the capital of the Sican State (800–1375 AD) on the North Coast of Peru presents a dispersed urban pattern with several nuclei. The city is composed by the "Sican Core" that has a monumental center for political-religious activities and the "Greater Sican" forming a dispersed urban pattern with several neighborhoods each with public architecture and residential occupation.

[82] *Chair*

Cesaretti, Rudolf [105] see Johnson, Amber

Cesario, Grace (The Graduate Center, CUNY)**[167]** *Zooarchaeology of Marginality: An Investigation of Site Abandonment in Hegranses, North Iceland*

The settlement of Iceland, a previously uninhabited landscape, began a series of human-induced environmental changes that have had lasting effects on not just the land but on social organization as well. As land claims were made for household farms, hierarchy developed and some were pushed to settle on the margins. In Hegranses, a region in Skagafjörður, northern Iceland, the sites that are on the margins are often much smaller than the others and may not have been farms at all but rather specialized activity areas. Examining marginal and non-marginal sites through a zooarchaeological lens can help decipher patterns of resource use which can act as a proxy for understanding environmental and social change. Current work on Hegranses has shown that the archaeofaunal assemblages from marginal sites are nearly always comprised of over 50% wild resources throughout the site's short occupational history, while those from proper farms are dominated by domesticates. These marginal sites also follow a pattern of abandonment by the year 1104 A.D., while many of the larger farms are still functioning to the present. This paper will examine the social and environmental variables of abandonment by using zooarchaeology to understand site function and status.

[167] *Chair***Chacaltana Cortez, Sofia (Universidad Antonio Ruiz de Montoya)****[100]** *A Local Perspective of Inca Imperial Influence in Coastal Colesuyo of the Southern Andes*

The effects of the Inca empire across the Andes were multiple and diverse. Relying on their sophisticated institutions, the empire originated a strong physical, political, and economic connectivity across the pre-Hispanic Andes that on occasions went beyond imperial boundaries or political borders. People, things and ideas travelled across the empire provoking a cascade of interactions some of which were not directly intended by the center of power. The multi-component site of Tacahuay located in the coastal region of southern Peru was inhabited before and during the influence of the empire (1,100–1540 a.C) at this region. This site resembles an Inca tambo, presents high frequencies of Inca-altiplanic sherds and chullpas (altiplanic funerary structures); however, it was not part of the Inca imperial system. Instead, Tacahuay was an enclave established by elites from the altiplano and coastal populations that allowed elites to have access to foreign resources and political benefits, respectively.

[216] *Discussant*

Chacaltana Cortez, Sofia [257] see Nuñez, Claudia

Chacon, Ricardo [140] see Hurst, Stance

Chadwick, William (Indiana University of Pennsylvania)**[331]** *Geophysical Survey as an Exercise in Applied Archaeological Education*

Graduate and undergraduate students from the course "Geophysical Applications in Archaeology" conduct a geophysical survey related to a potential archaeological site or cemetery each year. The survey is undertaken as a final small group project composed of two to three students. The purpose of the survey is to determine if there is geophysical evidence of potentially buried archaeological features or burials within the survey area. Each individual group surveys a single 20mX20m geophysical grid using ground-penetrating radar and a gradiometer. The individual groups then process and interpret the geophysical data using standard processing software and geospatial technologies. The students present the methods, results, and interpretations as a final project in the class and produce a final technical report for their individual geophysical grid. The overall goal of the exercise is to provide students with field experience in establishing a geophysical grid, executing geophysical survey, post processing geophysical data, and producing a

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technical report of the results and interpretations. A composite processing and analysis by the instructor provides the students with an overall “picture” of the results of their combined surveys. Here examples and results of this process will be presented.

Chamberlain, Andrew [88] see Procopio, Noemi

Chan Soe, Nyien [56] see Iannone, Gyles

Chandler, Susan (Alpine Arch Consultants Inc.)

[1] *Discussant*

Chang, Melanie (Portland State University) and April Nowell (University of Victoria)

[41] *The Scientific Method in Paleolithic Archaeology*

Paleoanthropological hypotheses are often qualitatively different from questions asked by scientists studying the evolution of other living groups. They are frequently complex and very specific. Rather than seeking to illuminate basic evolutionary processes and mechanisms, they focus on precisely reconstructing events in human prehistory. They are often driven, at least in part, by public interest. These characteristics can enhance paleoanthropological studies because they foster novel research approaches, but they may also encourage the formulation of hypotheses that are essentially untestable given the available data. Perhaps for these reasons, explicit hypotheses are sometimes omitted or never clearly stated in paleoanthropological research papers, and many studies are essentially inductive or descriptive.

We conducted a survey of Paleolithic studies published in 10 archaeological journals since 2000. We evaluated each study according to three criteria: (1) Is an explicit hypothesis stated? (2) Can the hypothesis be tested given the data that were examined? (3) Do the methods actually used in the study adequately test the hypothesis? We examined chronological trends throughout the study period and compared results for different journals. We examine our overall findings and specific examples to elucidate the nature of Paleolithic archaeological studies and their status as a hypothetico-deductive discipline.

Chapa, Reymundo

[332] *Applying Continuous Process Improvement Methodologies to Evaluate and Rebuild the Air National Guard Cultural Resources Management Program*

The Air National Guard (ANG) Cultural Resources Program oversees historic preservation and tribal consultation for 160+ installations throughout the United States and its Territories. One government official and one CEMML Cooperator manage the program centrally from Joint Base Andrews, MD, but the volume of work has prevented officials from managing resources in a proactive and systematic way. As such, managers are applying the Continuous Process Improvement/Lean Six Sigma methodology to focus efforts on improving work flow, enhancing customer value, and eliminating non-value added activities. This methodology has been used primarily by private industry to minimize waste by reducing and controlling variation, but the method also complements cultural resources management practices by eliminating redundancies, clarifying tasks and obligations, identifying solutions to complex problems, and quantifying ambiguities in order to garner understanding and support from key management officials.

[232] *Discussant*

Charles, Michael [71] see Twiss, Katheryn

Charlton, Sophy [219] see Stevens, Rhiannon

Charolla, Breeanna (University of Colorado Denver) and Jamie Hodgkins (University of Colorado Denver)

[304] *Zooarchaeological Analysis of a Late Pleistocene Cave Site in Northwestern Italy, Arma Veirana*

Italy serves as a critically important region for better understanding the late Pleistocene as it was home to Neandertals and other hominins. Archaeological excavation in northwestern Italy at the cave site of Arma Veirana, with layers dating back to 44 ka, intends to provide insight into this ambiguous period in prehistory. Preliminary data from zooarchaeological analysis of 1,414 specimens indicate that Neandertals primarily hunted medium-sized bovid/cervids, including *Capra ibex*, *Cervus elaphus*, and *Capreolus capreolus* to transport back to the site for butchering: 11.6% of faunal remains display cut marks and percussion marks. A number of these remains also show sign of burning (14.2%), and charred fat deposits have been found in micromorphological samples. This zooarchaeological analysis will help highlight behaviors used by hominins at this cave over time, and contribute to a better understanding of Neandertal subsistence behaviors shortly before their extinction ~40 ka.

Chase, Adrian (Arizona State University)

[82] *Understanding Infrastructural Power, Collective Action, and Urban Form: Situating Neighborhoods and Districts at Caracol, Belize*

Ancient Maya cities possessed a unique urban form characterized by two factors: mixed agricultural land use within residential areas and dispersed households consisting of extended family groups. These two factors contributed to the low-density nature of Maya cities, and conditioned urban form and the structure of neighborhoods and districts. The requirements of top-down administration resulted in the creation of districts to delineate areas of provisioning for the city's urban services. However, a variety of interactions between top-down and bottom-up processes create neighborhoods, especially when they occur in areas of frequent, repeated face-to-face interaction between residents. The use of neighborhoods and districts as scales of analysis permits analysis of various concepts, including: urban infrastructural power, collective action among urban residents, household autonomy within the city, and other concepts that span the spectrum from top-down to bottom-up administrative processes. While districts at Caracol can be reconstructed through the spatial distribution of architectural features that would have provisioned urban services, no such architectural features occur uniquely at the neighborhood scale. As such, Caracol's neighborhoods have been reconstructed through spatial methods utilizing the concept of frequent, repeated face-to-face interaction. These reconstructed spatial units help define the unique characteristics of ancient Maya urbanism.

[321] *Discussant*

Chase, Arlen and Diane Chase (University of Nevada, Las Vegas)

[147] *Final Moments: Contextualizing On-Floor Archaeological Materials from Caracol, Belize*

Excavations within various locales at Caracol, Belize have recovered artifactual materials on the floors of epicentral stone buildings that were associated with the latest occupation of the site epicenter. These deposits are the result of both “de facto” refuse and rapid short-term abandonment processes. In many cases, complete vessels and other artefactual remains were recovered from the floors of Caracol's epicentral buildings. Other terminal deposits comprise thin sheet-like layers of broken ceramics, stone artifacts, and faunal materials that potentially indicate a break-down in garbage collection during Caracol's final days. Human remains were recovered from epicentral plaza and building floors, including both whole bodies interpreted to be the result of a sudden violent episode during Caracol's final days. Other cases are suggestive of ritual offerings of human remains. Still other contexts yielded isolated human long bones and teeth. This paper reviews terminal deposits from Caracol and places these deposits within the broader context of Maya archaeology.

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[256] *Discussant*
 [213] *Chair*

Chase, Brad (Albion College), David Meiggs (Rochester Institute of Technology) and P. Ajithprasad (Maharaja Sayajirao University of Baroda)

[297] *Kinship and Cattle in Harappan Gujarat*

Pastoralism, the production and management of livestock, was integral to the lifeways practiced by the peoples of the Indus Civilization (2600–1900 BC), South Asia's first experiment with urban society. The integration of Gujarat (India) into the interregional flows of people, goods, and ideas that knit together the Indus Civilization, for example, is associated with the widespread adoption of pastoralism in a region that was formerly characterized by small-scale horticulturalist-hunting communities. Here, new data generated from recent faunal and isotopic studies are interpreted to infer the organization of pastoral production, circulation, and consumption. While economic and ecological models offer valuable insights into the adoption and practice of pastoralism in Gujarat, a comprehensive understanding of this process must incorporate consideration of the possible roles that livestock, especially cattle, played in the ritual life of local communities. Specifically, it is hypothesized on the basis of ethnographic analogies from South Asia and elsewhere that livestock may have circulated as ritual prestations between families associated with the creation, maintenance, and manipulation of kinship networks in this socially dynamic borderland region.

Chase, Diane (University of Nevada, Las Vegas)

[213] *Sustainability and Climate Change in the Ancient Maya Area: Evidence from Remote Sensing and Long-Term Land Use*

The sub-tropical forests that once covered the ancient ruins of much of Mesoamerica are being rapidly removed due to modern subsistence practices. Yet, archaeological and ecological research shows that this is not the first time that extensive human-caused deforestation has occurred in this region, minimally representing the third iteration of such an event. Analyses of lake-cores and remote sensing imagery provide evidence for extensive land clearing around 1000 BCE and again after CE 250, with the central Maya area reverting to the tropical forests seen today after CE 1000. LiDAR data also reveal successive built landscapes associated with the earlier deforestations in the central Maya region, potentially correlated with substantial changes in rainfall. The LiDAR data also demonstrate how the ancient Maya terraformed their environments to manage the flow of water and engage in sustainable agriculture. At Caracol, Belize, archaeological data show that a successful urban system was created through the construction of integrative causeways to link public architecture and the purposeful spacing of residential groups among hundreds of built reservoirs and thousands of constructed agricultural terraces. This built environment fostered agricultural productivity, health, and long-term sustainability throughout the Classic Period (C.E. 250–900).

[213] *Chair*

Chase, Zachary [66] see Ericksen, Connie

Chastain, Matthew (Massachusetts Institute of Technology), Jianli Chen (Peking University) and Xingshan Lei (Peking University)

[177] *Identifying the "Why" Of Ancient Engineering Choices: Materials Performance and the Production of Ceramic Bronze-Casting Molds in Zhou-Period China*

Bronze ritual vessels from Shang- and Zhou-period China display a combination of features—complex, three-dimensional forms; exquisitely fine surface detail; and monumental size—that was achieved by casting in multi-part ceramic molds. The ceramic material used to form these casting molds is soft, powdery, and silica rich, making it altogether different from pottery clays in both its physical qualities and its production sequence. Why was such a material chosen? Which specific materials properties did foundry workers seek out in order to ensure adequate performance of their casting molds?

Casting molds and other ceramic artifacts from three bronze foundry sites (c. 1100–771 BCE) in the Zhouyuan area of Shaanxi province were chemically and microscopically analyzed to identify differences in processing and composition between object types. The consequences of these production choices for materials performance were then assessed by measuring mechanical and thermal behavior of lab-made facsimiles. On the basis of the results, this paper reconstructs the priorities that informed the selection of production techniques practiced at these sites.

Chatelain, David (Tulane University)

[337] *A Millennium of Sociopolitical Transitions in the PRALC Region: The View from La Cariba*

Excavations at minor centers provide us not only with a wealth of information about those sites, but they can also illuminate sociopolitical shifts over time within the broader region. The minor center of La Cariba, located four kilometers southwest of La Corona, has been investigated since 2009. A broad dataset including architectural, epigraphic, osteological, and artifactual evidence has provided a detailed narrative of political and demographic changes over a millennium at La Cariba. The site's origins in the Late Preclassic demonstrate the establishment of a communal ceremonial place with a substantial investment in labor, despite a strikingly low population density. Around the transition into the Early Classic, a notable demographic increase corresponded with a major construction episode at La Cariba. After a possible abandonment for a few centuries, during the height of Kaan influence in the region, La Cariba was once again renovated, this time with minimal effort, with architectural evidence implying a strong relationship between La Cariba and La Corona. Epigraphic evidence links La Cariba's Early and Late Classic occupations to two enigmatic periods in La Corona's history, greatly enriching our understanding of these important periods, both of which involved major sociopolitical transitions in the region.

Chauca, George [335] see Morrisset, Sara

Chaussee, Anna (University of Winchester)

[62] *Discussant*

Chavez, Sergio [100] see Bray, Tamara

Chavez, Stanislava (Wayne State University)

[181] *Objects of Power and Power of Objects: Tiahuanaco Burial Assemblages in Cundisa (Copacabana, Bolivia)*

This paper explores roles played by objects in forging and cementing local and state identities at a Tiahuanaco cemetery at Cundisa in Copacabana, Bolivia. The cemetery consists of 98 Tiahuanaco burials excavated by the Yaya-Mama Archaeological Project. The majority of tombs contain a single individual. Most of the complete objects associated with these burials belong to classic Tiahuanaco style of decorated pottery, but there is also another peculiar pattern of unfired clay miniatures and large pieces of broken utilitarian pottery in the same burials. I propose that this dichotomy helped to reaffirm the participation of people who buried their dead at Cundisa in the broader Tiahuanaco cultural influence sphere, while at the same time cementing and/or underlying a separate local cultural identity (Copacabana lies within the Tiahuanaco hinterland, but relatively far away from the capital). Fancy Tiahuanaco-style pottery, used in life, during the burial ceremony, and accompanying the deceased in their tombs, helped to underline

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or maybe even create ties with the larger Tiahuanaco polity. On the other hand, the pattern of unfired miniatures is rather unique within Tiahuanaco contexts. Hence, these objects might have played a role forging or highlighting a unique local identity of the local population.

Chazin, Hannah (Columbia University)

[297] *Ordinary or Extraordinary? Analytical Disjunctures between Production and Rituals in Pastoralist Societies*

This paper considers the connection between the quotidian practices of pastoralism and the role of herd animals (and their material remains) in ritual practices in the Late Bronze Age in the South Caucasus. Zooarchaeological and isotopic analysis of faunal remains from Late Bronze Age (1500–1100 BCE) sites in the Tsaghkahovit Plain, Armenia have revealed new, if perplexing, evidence about everyday practices of production, distribution, and consumption of pastoralist products and the incorporation of animals in ritual practices in walled sites and mortuary assemblages. Specifically, this paper examines the incorporation of isolated skeletal elements into ritual spaces, contextualizing this practice within the broader scope of Late Bronze Age human-animal relationships. Avoiding analytical reduction to tokens of economic transactions or singular items of ritual value, this approach situates both ritual and production as material efforts to stabilize the fluid and multiple connections between activities taking place within fortress sites and the suite of quotidian and extraordinary practices that constituted social worlds lived primarily beyond the confines of walled sites.

Chechushkov, Igor (University of Pittsburgh)

[75] *Winter Is Coming: Is 'Fortification' Always Fortification?*

The case study comes from the southern Urals, Russia. Since 1970's the walled settlements of the Sintashta archaeological culture (2000–1700 BC) have been interpreted as the fortified towns and centers of social life for the religious and war leaders of the local communities. However, settlements' primary locations on the bottoms of the rivers' valleys, as well as lack of other evidence for the warfare, cause doubts about such interpretation. Analysis of natural environments (e.g., local wind, precipitation, water tables) and strategic features of locations allows a different interpretation. With the equal chance, the Sintashta 'fortified' settlements can be artificial ecological niches that allowed pastoralists to keep and maintain livestock in the harsh winter conditions. If this was the case when the original interpretation is not fully correct, and at least in some cases we should be more critical about our understanding of warfare landscapes.

Cheek, Charles

[33] *Male Court Dress on Late Classic Maya Vases*

Dress is an object made up of other objects. I combine a practice approach with the chaîne opératoire and behavior chains methods to analyze technical and social acts involving dress objects. The analysis starts with one segment of the actions involving dress—the actual act of dressing. The study includes only court scenes that appear to memorialize historic events, although some of the observations and conclusions can be applied to other kinds of scenes and other media. After identifying the elements of dress, we can see how the Maya combined them into ensembles and then how these ensembles interacted with non-dress objects and social acts in the Maya court. Maya artists used dress and non-dress objects to help the Maya audience understand what the scenes on the vases were depicting. This paper will address three aspects of male dress as depicted on the polychrome vases commonly used for drinking various beverages. Head gear and material objects provide evidence for three propositions. Dress ensembles 1) were shared throughout the Maya Lowlands; 2) were connected to known titles; and 3) were used to represent a hierarchy of social positions within the court.

Chen, Jianli [137] see Liu, Siran

Chen, Peiyu (University of Pittsburgh), Ali Altamirano-Sierra, Carlos Osoreo Mendives and Jhon Cruz Quiñones

[64] *Fishing, Shellfish Collecting, Hunting and Planting from Late Preceramic to Initial Period: A Case Study from Huaca Nagea, Viru, North Coast of Peru*

By studying fauna and botanic remains unearthed from Huaca Negra Archaeological Project, this presentation seeks to understand subsistence system and daily life in Late Preceramic Period, and how it might have changed in later Initial Period.

Huaca Negra is a fishing village located in the northwest of the Virú Valley and is 1.2 kilometers from the current shoreline. The site was occupied between 5,000–3,200 CalBP, from Late Preceramic Period to Initial Period, which witnessed the transitions from non-sedentary activity to a settled village, from sedentism to the construction of the mound, and finally from the usage to the abandonment of the mound.

Along with these social changes, the long-term occupation provides a unique opportunity to study early coastal life. The comparison of four activities (fishing, shellfish collecting, hunting, and planting) and its diachronic change help to reveal the nature of subsistence system in both Late Preceramic and Initial Period. The preferred catchment zones, change of coping strategy and the implication of social change will also be addressed.

Chen, Xinzhou

[336] *Material Assemblage and Social Changes in Central Tibet, the Second and the First Millennium B.C.*

Compared to the relatively well-researched area of Eastern Tibet Plateau, the archaeology of Central Tibet has long been neglected. This paper offers a review of academic debates concerning the site of Qugong and analyzed the newly found materials in Bangga and Changguogou site. Based on the available materials and 14C dating data, I here propose a primary chronological framework in Central Tibet and revealed the cultural affiliations of Central Tibet with Central Asia, as well as the cultural change pattern throughout second to first millennium B.C.

Cheng, Wen Yin and Chen Shen (Royal Ontario Museum, University of Toronto)

[24] *Two Mould Types for All the Vessels: Correlating Casting Mould Forms to the Vessel Forms Produced during the Shang Dynasty*

Through the previous research on the Royal Ontario Museum's mould fragments, three main types of moulds were identified. In order to extend our knowledge beyond the moulds themselves and associate the moulds to the bronze vessels this paper brings both the moulds and bronze vessels into the same discussion by looking at the correlation between the mould types and the bronze vessel forms they were made to produce. The correlation can further our comprehension into the reason of produce the mould forms the way they were made.

[24] *Chair*

Cheong, Kong (American University), Linda Howie (HD Analytical Solutions / The University of Western Australia) and Terry Powis (Kennesaw State University)

[256] *If Ocarinas Could Talk: The Biographies of Ceramic Wind Instruments Used in a Late Classic Maya Funerary Ceremony at Pacbitun, Belize*
The Classic Maya crafted a wide variety of music instruments from clay and other materials. Numerous depictions of musicians on vase paintings and murals attest to the important role of music in ceremonial occasions. Music instruments were also interred with the deceased during funerary ceremonies; although their comparative rarity in burials suggests that their inclusion was not a common practice. At the site of Pacbitun, music instruments have been recovered from multiple Classic period burials, yet the complement of instruments, their placement within the grave and other characteristics is unique in each case. In this paper, we employ a biographical approach to examine the life histories of a group of ceramic wind instruments interred with a Maya woman who was laid to rest in a Late Classic residential building at Pacbitun. By integrating contextual data with the results of detailed macroscopic and petrographic analyses, we trace and compare the manufacturing origins, use lives and final treatment of these

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instruments. We investigate the nature of their transition from objects used by the living to possessions of the dead and examine what they reveal about the life of the deceased and the funeral rites that were conducted upon her death.

Cherico, Peter [256] see Powis, Terry

Cherkinsky, Alexander [74] see Loftis, Kat

Cherkinsky, Alexander [35] see Napora, Katharine

Chesson, Meredith S. (University of Notre Dame), Isaac Ullah (San Diego State University), Nicholas Ames (University of Notre Dame), Hamish Forbes (Nottingham University) and Paula Kay Lazrus (St. Johns University)

[54] *Full of Water, Full of Life: Water, Resilience, Sustainability, and Built Heritage in the 19th to 21st Centuries San Pasquale Valley, Calabria, Italy*

In the early 1800s wealthy landowners acquired lands in the San Pasquale Valley, located 50 km from the provincial capital of Reggio Calabria in southern Calabria, Italy. Internal migration of farmworkers to establish commercial bergamot, olive, grape, and mulberry orchards in this valley created a large and thriving community of farmworker families who built the landowners' villas, the overseers' and farmworkers' houses, and the farming infrastructure of wells, cisterns, aqueducts, mills, canals, roads, sheds, barns, and animal stalls. Today, crumbling infrastructure, lack of governmental investment, and dwindling population in San Pasquale Valley mark a steep decline in the sustainability of the community, especially in the last 50 years. Our research tracks the birth, florescence and decline of community life in the last two centuries to investigate how people establish, nurture, and fight the decline of community through decades of political, social, and economic crises.

Chesson, Meredith S. [54] see Ullah, Isaac

Chhay, Rachna, Piphah Heng (University of Hawaii), Visoth Chhay (Ministry of Culture) and Yukitsugu Tabata (Waseda University)

[175] *Changing Angkorian Stoneware Production Modes: Bang Kong Kiln and Thnal Mrech Kiln*

Stoneware ceramic production began in the 9th century CE in the Angkorian core region, and its cross-draft kiln technology, paste types, and vessel forms changed during its multi-century tradition. This paper compares kiln morphology, ceramic technology and vessel form from two Angkorian kiln sites: the 9th-11th century Bang Kong site, and the 10th-12th century Thnal Mrech. The sites are located in discrete geological regions: one in the Phnom Kulen hills (Thnal Mrech), and the other on the Angkorian plain (Bang Kong). Bang Kong was one of the earliest ceramic kiln centers for green glazed and unglazed stoneware, and employed both below-ground and above-ground, and contrasts markedly with kiln technology, vessel form, and paste variability in stonewares fired at Thnal Mrech.

Chhay, Rachna [175] see Carter, Alison K.

Chicoine, David (Louisiana State University), Gabriel Ramón (Pontificia Universidad Católica del Perú) and Martha Bell (Pontificia Universidad Católica del Perú)

[333] *The Berkeley Schools of Geography and Andean Studies*

This paper explores the legacy of the "Berkeley School of Andean Studies" and its relations to the eponymous "Berkeley School of Geography." We examine the relationships between the key founding figures of both schools including John H. Rowe and Carl O. Sauer, but also their students, disciples, and other scholars influenced by their seminal research. Through a review of the interactions between members of the two schools, as well as academic genealogies and writings, our paper has three main goals: (1) define both schools and their Andean manifestations and ramifications, (2) examine the personal relationships and rapport between anthropologists, archaeologists, and geographers influenced by the Berkeley tradition, and (3) review intellectual cross-pollination including methodological insights, geographical, archaeological and anthropological perspectives, and bibliographic influence.

Chicoine, David [82] see Helmer, Matthew

Chilardi, Salvatore [85] see Iovino, Maria Rosa

Childs, Terry (Department of the Interior)

[149] *Moderator*

[149] *Discussant*

Chilton, Elizabeth [294] see Doucette, Dianna

Chilvers, Stuart [106] see Heide, Gregory

Chinchilla, Oswaldo (Yale University)

[176] *Natural Corridor or Challenging Route? Rethinking Pre-Hispanic Communications across the Pacific Coast of Guatemala*

The Pacific coast of Guatemala has long been regarded as a natural corridor that facilitated travel and trade, and served as a route of migration and invasion, connecting eastern Mexico, the Guatemalan highlands, and El Salvador, with further regions of Mexico and Central America. At first glance, the natural configuration of the coast seems to provide unobstructed passage, especially when compared with the rugged terrain of the adjacent highlands. The maps in many publications feature vague arrows marking trade or migration routes, giving the false impression that the coast was a broad unimpeded passageway. They generally omit details of topography and hydrography, and make no distinction among different parts of the coast. A closer look reveals important distinctions in the feasibility and comparative advantage of communication routes along the coastal piedmont, the coastal plain, and the Pacific littoral. The torrential rivers that cut across the coast posed important restrictions for east-west traffic, and in some cases, for north-south access from highland and piedmont sites to the coastal plain and littoral. In this talk, I will use ethnohistorical and geographic data to argue for finer assessment of coastal communication routes.

Chinique De Armas, Yadira (Department of Anthropology, University of Winnipeg)

[323] *New Insights into the Consumption of Cultigens for "Archaic" Age Populations in Cuba: The Archaeological Site of Playa el Mango, Rio Cauto, Granma*

The use of cultigens and wild plants by pre-historic populations has been well established for many regions of the circum-Caribbean and Greater Antilles. However, in the case of Cuba, the largest island in the Caribbean, the evidence is scarce. In this paper, we examine the population of Playa El

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Mango (Cauto Region, Eastern Cuba), traditionally understood by Cuban archaeologists as “fisher-gatherers”, to examine subsistence practices using a combination of starch evidence from dental calculus, aided by carbon and nitrogen isotopic-based probability analyses (Stable Isotope Analysis in R; SIAR). This dual analysis suggests that C3 (beans, root cultigens) and C4 plants (maize) were part of their diet since at least cal. 2110–2081 BP, along with wild plant species and various readily available estuarine, marine and terrestrial animal resources. This evidence demonstrated the use and management of cultigens for indigenous populations from Eastern Cuba since “Archaic” times.

[323] *Chair*

Chiou, Katherine (University of Alabama)

[297] *Meat, Transport, Fertilizer, and Meaning: Considering the Role of Camelids and Ritual in Moche Food Production*

Camelids (i.e., llamas and alpacas) were domesticated in the Andean region of South America over 6000 years ago. Since then, camelids have occupied a place of central importance in Andean lifeways over the longue durée. Nevertheless, while camelid pastoralism in the landscape of the highland Andes has been well documented ethnographically, ethnohistorically, and archaeologically, the intimate relationship between people and camelids in the Andean coastal valleys is less understood. In this paper, I consider the social dimensions of camelids and their ties to food production using case studies primarily from the Moche (AD 200–800) sphere, including recent data from elite ritual and household contexts from the Late Moche (AD 600–800) sites of San José de Moro and Cerro Chépén in the Jequetepeque Valley of the North Coast of Peru. In doing so, I examine the unique role that camelids played in rituals related to the production and consumption of food—rituals that may have taken on heightened significance during episodes of social conflict stemming from environmental stress and diminished food production.

Chiriboga, Carlos [252] see Acuña, Mary Jane

Chirinos Ogata, Patricia (University of California, Santa Barbara)

[273] *Building Statehood: Wari Architecture and Colonial Strategies in Cajamarca*

Wari expansion across the Central Andes involved the construction of colonies, serving as nodes in the state network from Cajamarca to Moquegua. Each colony, even considering local adaptations, was built following a precise sequence and setting up predetermined types of spaces. Monumental architecture exhibiting Wari features and design became an expression of power by itself, a symbol of Wari hegemony physically inscribed in the local social landscape. Large amounts of work were invested in the construction of colonial installations, as well as the roads that connected them with the other nodes in the system, and the agricultural infrastructure that supported the local communities. In this paper I examine the architecture of the two known Wari colonies in the Cajamarca region—El Palacio and Yamobamba—, and compare their construction and trajectories to other excavated Wari sites, to evaluate their role in the state hegemonic project. Research at these sites shows different motivations for their construction, as well significant changes in their use over time, providing evidence of a dynamic Wari agenda in the North Highlands.

Chisholm, Amelia (The Lost Towns Project)

[251] *A Cultural Landscape Study of Generals Highway*

Generals Highway (MD-178), a major roadway that stretches from Annapolis to the Severn River in Anne Arundel County, was paved in the early part of the twentieth century, but portions of the original colonial roadbed still exist. Anne Arundel County’s Cultural Resources Division, in partnership with Maryland State Highway Administration, conducted a multi-year investigation to identify, locate, record, assess, study, and share with the public the range of archaeological and cultural resources within a one-mile buffer of General’s Highway. This landscape study will assist the State and the County in responsible stewardship of those resources should there be future plans for road modifications as well as to ensure that it is appropriately managed, protected and made accessible to the public for the benefit of the citizens of Anne Arundel County. The work conducted during this period included historic resources survey, architectural documentation, archaeological field surveys, and intensive historic and archival research on the corridor, as well as more targeted investigation of individual cultural or landscape features that played an important role in shaping the corridor as it exists today. The results of this investigation clarify areas of significance which speak to the historic and physical development of Historic Generals Highway.

Chiykowski-Rathke, Tanya (Santa Clara University)

[287] *Deposition in Death and Domestic Contexts at Cerro de Trincheras, Sonora Mexico*

How sherds ultimately enter the archaeological record reflect the roles and beliefs regarding the discard, reuse and repurposing of pottery across the Southwest US and Northwest Mexico. This paper examines the deposition of whole vessels and ceramic sherds from Cerro de Trincheras, Sonora, Mexico. It compares two contexts: the debris of domestic spaces, and the careful internment of vessels as part of mortuary ritual. The ceramic deposition practices of Trinchereros (Trincheras Tradition peoples) reveal the life history of the pots themselves. Despite the ubiquity of pottery by 1300 AD, Trinchereros treated their vessels with great care and consideration, vessels were mended, repurposed and included in burial assemblages showing the cumulative effects of their life histories. These insights provide context for understanding domestic refuse. While sherds help date the site and track migration, archaeologists have incomplete knowledge of how Trinchereros used pots in their daily lives. In this paper, I will discuss the deposition of Trincheras funerary ceramics as they relate to household assemblages.

Chmura, Matt [13] see Blank, John

Choi, Jeong-Heon [200] see Nightingale, Sheila

Chouin, Gerard (William & Mary)

[171] *Unthinkable Opportunities: Managing Mass Mortality and Transforming Society in the Context of the Second Plague Pandemic in Late Medieval Sub-Saharan Africa, ca. 1300 to 1500 AD*

The sudden emergence of deadly infectious diseases compels societies to improvise ways to manage the dead, explore causations, and save lives. Such overwhelming demographic events are sources of trauma but also opportunities for individual survivors and for the social fabric as a whole. Sub-Saharan Africa, like many other parts of the Old World where past mass mortalities were not documented, has been omitted from the debate about the impact of pandemics on deep historical trajectories. This paper suggests that the second pandemic of plague—the infamous fourteenth century Black Death—was responsible for demographic crises south of the Sahara, which in turn created opportunities for new elite groups to emerge. I will discuss possible short- and long-term impacts of and responses to the plague crisis in the 14th century by different communities living in the forest environment of West Africa, as manifested in the archaeological and oral historical records of southern Ghana and south-western Nigeria. I will argue that these responses led to major socio-political upheavals that are relevant to our understanding of the rise of Atlantic Africa in the late 15th century.

Chovanec, Zuzana (University Albany)

[77] *The Organic Residue Analysis from the Early Bronze Age Site of Sotira Kaminoudhia in Cyprus*

This paper presents the final results of organic residue analysis from the Early Bronze Age settlement and associated cemeteries of Sotira Kaminoudhia. A total of twelve pottery samples were analyzed using Gas Chromatography/Mass Spectrometry (gc/ms) as part of a larger research program that aimed to identify prestigious, organic substances that would have been utilized on the eastern Mediterranean island of Cyprus during the

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prehistoric Bronze Age. Three categories of prestigious substances were targeted: 1) psychoactive substances that generate variable altered states in consciousness, 2) medicines, herbal infusions and other preparations that improve health, and 3) perfumes, ointments and other preparations that are hygienic in nature. This report confirms but also revises earlier reported preliminary results. Analytical methods, interpretative strategies, and anthropological implications will be discussed.

[77] *Chair*

Christensen, Kim (University of California Berkeley)

[331] *Countermapping, Data Visualization, and Archaeological Pedagogy: What Happened Here?*

Data and spatial visualization programs afford archaeologists various ways of showcasing their research. Programs, such as the Knight Foundation's free StoryMap JS, and Esri StoryMaps, are of particular use when sharing our research results with the public and, I argue, are useful for conducting collaborative research with communities. In this paper, I detail the experience of using online StoryMap programs in the creation of local history maps created by undergraduate students in collaboration with the Anti-Eviction Mapping Project (AEMP) of San Francisco. By combining information gathered from archaeological reports, oral histories, and historical documents, StoryMaps created through these collaborations showcase diverse histories such as the history of social movements on the UC Berkeley campus landscape, and the "life history" of city blocks in the SoMa neighborhood of San Francisco. These projects are situated in the rich tradition of counter-mapping, which juxtaposes maps created by or to showcase the perspectives of non-hegemonic actors with authorized 'official' maps. In creating these maps, students gain experience in conducting primary and secondary research, writing for public dissemination, and gain mastery of the histories beneath their feet.

Christie, Jessica (East Carolina University)

[132] *Inka Economic and Ritual Landscapes in the Cañete Valley: Strategies to Align the Lunahuana and Guarco*

I will assess strategies employed by the Inka state in interactions with local populations in the Cañete Valley and adjacent valleys. The Spanish found two señorios in the lower Cañete Valley: the Lunahuana, whom they described as well organized and inclined to submit to Inka rule and the Guarco who lived on the shore, offered fierce resistance, and were brutally subdued. The Inka built Inkawasi in Lunahuana territory, envisioned as one copy of Cusco. Inka presence in Guarco territory is documented at Cerro Azul, a primary Guarco center. Its protected bay served as harbour for a society whose economy was based on maritime resources, associated with documented fishing rituals, as well as on irrigation agriculture. The Inka built Cusco-style structures on the cliffs bordering the port, including a wall covering the rocky cliff surface with a staircase descending to the sea. My discussion will assess this exceptional wak'a in relation to Inka cults of the Sun, water, and stone ideology as well as in relation to other Inka installations in nearby valleys, such as Pachacamac, Cerro Bandurria, and El Salitre. The strategic position of Cerro Azul in the Inka road system will also be considered in the analysis.

Chritz, Kendra (Smithsonian Institution), Elisabeth Hildebrand (Stony Brook University), Thure Cerling (University of Utah), Elizabeth Sawchuk (Stony Brook University) and Ndiema Emmanuel (National Museums of Kenya)

[198] *Local Responses to Global Events: Regionally Distinct Dietary Changes among Eastern African Herders at the Close of the African Humid Period*

Changing human diets in eastern Africa across the end of the African Humid Period (AHP) have been inferred indirectly from cultural and faunal remains at archaeological sites. Stable isotope analysis (SIA, specifically $\delta^{13}C$) can measure diets directly, yet few studies have conducted SIA on human remains from this region. We present 25 new $\delta^{13}C$ values from human tooth enamel recovered from archaeological sites around Lake Turkana (northwest Kenya) and on Lukenya Hill and Rigo Cave (southern Kenya), whose material culture suggests economic strategies ranging from fishing-hunting-gathering (FHG) to herding. These data show pronounced regional dietary variability even after herding took hold. All samples from the Turkana Basin, including both FGH (GeJi11) and herding (GaJi4, GeJi9, GbJj1) sites, range from -4 to -8‰, indicating strong intake of either C3 plants or animals that consumed them. In contrast, samples from southern Kenyan herding sites of Lukenya Hill (GvJm202) and Rigo Cave (GrJh3) range from -2 to -4‰, suggesting more input from C4 grasses or herbivores feeding upon them. Overall, individuals from northern Kenya sites exhibit greater dietary variability than those from the south. Results suggest that post-AHP environments differed substantially within the eastern African Rift, fostering localized economic strategies by early herders.

Chrysoulaki, Stella [298] see Prevedorou, Eleanna

Chu, Alejandro

[132] *Inka and Local Elite Interaction as Reflected at the Inka Site of Incahuasi, Cañete, South Central Coast of Peru*

Incahuasi, located at the mid-valley of the Cañete river, is the largest Inca administrative center reported from Peru's Central Coast. Although first built as a military base by the Inca Tupac Yupanqui in his war against the Guarcos, the site was completely transformed into an administrative center with an extensive and prominent storage facility. Recent research at the site has focused in Sector B, described as an elite residential complex. Excavations have found a significant number of finished khipus and elements for their manufacture, which would suggest that khipus were knotted within these compounds. Although khipus are assumed as clear evidence of Inka state exerting accounting and administrative activities at Incahuasi, neither the cultural material nor the architecture at the site are of Inka style, suggesting that a local elite was mainly in charge of the administration and operation of the site. This new evidence from the Cañete Valley adds a new perspective on our thinking about state/local relations in the Inka empire.

[132] *Chair*

Chuchiak IV, John (Missouri State University)

[109] *Human Plunder: The Role of Maya Slavery in Postclassic and Early Conquest Era Yucatán, 1450–1550*

Upon initial contact with the lowland Yucatec Maya, the Europeans discovered that a significant number of Maya slaves existed within the Maya communities that they encountered. War captives, orphans, and forced and enslaved sexual servants from the lower classes, Maya slaves and their possession became by the late Postclassic and early colonial period the major source of wealth and power of the traditional Maya Nobility. Divorced from control over specified traditional patrimonial landholdings (which many recent scholars have shown did not exist for the precontact Yucatec Maya), and alienated from most other sources of wealth, Maya slaves and forced servitude became transformed into the most important system of patrimonial wealth and power for the Maya nobility. This paper will examine the political economy of Postclassic Maya slavery, its scale, nature and cultural practices in an attempt to understand the political and economic impact of indigenous slavery, and the continued role that Maya slaves and slavery played in the early development of the conquest credit system that led to the financing of the expeditions of conquest organized by the conqueror Francisco de Montejo and his family in Yucatan (1527–1545).

Church, Warren (Columbus State University, GA)

[178] *A Record of Changing Pulses and Pathways of Interregional Interaction from Manachaqui Cave in the Northeastern Peruvian Cloud Forest*
Results from analyses of deep, stratified cultural deposits excavated at Manachaqui Cave (3,620 m) in the ancient Chachapoyas region provide a "window" on changing patterns of interregional interaction in Peru's northern ceja de selva. Located beside a pre-Hispanic paved road, the rock shelter accommodated mobile foragers, cultivators, travelers, and llama caravans moving through networks connecting societies north, south, east, and west.

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Despite several chronological gaps, Manachaqui's sequence extends from the Terminal Pleistocene through the Late Horizon. Diachronic analysis of Manachaqui's assemblages revealed two major patterns of movement and cultural connections. Early interregional interaction connected societies in regions north and south. By ca. AD 200–400, interaction involving llama caravans pivoted west toward highland societies. This new east-west network overlay, but did not replace north-south interaction that persisted throughout the latter centuries of the sequence. To evaluate subsistence self-sufficiency, it is more useful to examine data from the settlement complexes clustered to the east around 2,800 m in the forested Montecristo valley. Evidence from Manachaqui attests to the presence and intensity of interaction crisscrossing the ceja de selva. Mounting archaeological data from the Montecristo valley, and elsewhere along the ceja is revealing understudied, unique cultural developments unlike those in the Andean highlands.

[178] *Chair*

Clasiano, Gianfranco [285] see Rivera, Luz Stephanie

Cibrian-Jaramillo, Angelica (LANGEBIO, Cinvestav)

[150] *Discussant*

Cicchetti, Jared [91] see Crawley, Andrea

Cinquino, Michael [73] see Hayward, Michele

Ciofalo, Andrew (Leiden University) and Devon Graves (Leiden University)

[323] *Cookware and Crockery: A Form and Functional View from the Southern Bahamas*

Recent archaeobotanical research on the Palmetto Junction archaeological site located in Providenciales, Turks and Caicos Islands, provides new insights into the livelihoods and subsistence practices of the peoples who inhabited this coastal region from c. AD 1200–1500. Significantly, the plant microbotanical remains, identified as primarily seeds and tubers provide evidence for a continuation in the consumption and manipulation of plant resources. During the late precolonial period people used domesticated plants such as maize, as well as plant processing techniques that permitted the consumption of otherwise inedible geophytes. Some of the earthenware may have been used as serving vessels, others such as Palmetto-style griddles for cooking. Interpretations of foodway dynamics in this region will serve to build a unique Caribbean perspective of food patterns. In this regard, this research contributes to modern day global appreciations of ancient food ways, which offer significance and meanings to both socially learned practices and other life-ways. An in-depth analysis covering the style and form of the Palmetto Junction ceramics in conjunction with information from ancient starch grains creates a fuller interpretation of how the interrelationships amongst past human societies, plants, and material culture were entangled.

Ciofalo, Andrew [323] see Donner, Natalia

Cioffi-Revilla, Claudio (George Mason University—Center for Social Complexity) and Niloofar Bagheri-Jebelli (George Mason University)

[4] *A Computational Approach to Initial Social Complexity: Göbekli Tepe and Neolithic Polities in Urfa Region, Upper Mesopotamia, Tenth Millennium BC*

Extensive archaeological field work and multidisciplinary research in recent decades shows that communities of sedentary hunter-gatherers during the tenth millennium BC built the earliest presently known monumental structures during the PPNA (ca. 9600–8800 BC) at the ceremonial site of Göbekli Tepe and nearby PPNB settlement sites in present-day Urfa province, southeastern Turkey. However, the earliest evidence of agriculture dates to a later period (early PPNB, ca. 8750 BC, terminus post quem) or began further south (e.g., the Levant). We present a novel computational analysis of initial social complexity in these early Anatolian communities, based on Canonical Theory of politogenesis, evolutionary dynamics, and lines of evidence drawn from Göbekli Tepe and related Urfa sites. Theory and data are then used to create an agent-based model simulating the emergence of worship sites, other diffused cultural patterns, and the emergence of cultivation as may have occurred in the region during the PPNA and initial PPNB periods. The model is implemented in NetLogo. Along with other computational models of early social complexity, it aims to contribute to multidisciplinary understanding of prehistory, origins of civilization, and long-term culture change. Extensions of the model to other regions of politogenesis are also discussed. Dedicated to Klaus Schmidt.

Ciolek-Torello, Richard (Statistical Research, Inc.), Jeffrey Altschul (Statistical Research, Inc.), B. Gunchinsuren (Institute of History and Archaeology, Mongolian Ac), T. Amgalantugs (Institute of History and Archaeology, Mongolian Ac) and John Olsen (University of Arizona)

[24] *Baibalyk: An Early Fortified Town and Trading Center in a Nomadic Pastoral Landscape on the Mongolian Steppe*

Mongolia is well known for its history of nomadic pastoralism and Bronze and Early Iron Age burials and monuments. It wasn't until later in the Iron Age that the first large fortified towns and urban centers were built by the Uygher and Khitan Khanates. One of these, Baibalyk is believed to have been established in 758 CE by the Uyghur khagan, Bayanchur Khan, as a ceremonial and trading center in the fertile and strategically located Selenge Valley. Later in the 17th Century, Baibalyk is known to have been the site of a Buddhist monastery. Although prominent on the Mongolian landscape, Baibalyk has received little systematic attention from archaeologists. To address this deficiency, members of the Mongolian International Heritage Team have recently begun a long-term program of investigation to gain a better understanding of the role centers such as Bai Balik played in a nomadic pastoral economy. Preliminary investigation suggests Baibalyk has had a long history of use including Uyghur, Mongolian Empire, Buddhist, and recent historical occupation. In this presentation, we compile existing knowledge concerning Baibalyk and provide the results of a recent reconnaissance of the site and its environs.

Cisceneros, Santos [225] see Lopez, Escee

Cissé, Mamadou [210] see Womack, Andrew

Ciuffo, Roger [332] see Chapa, Reymundo

Ciugudean, Horia [29] see Beck, Jess

Civitello, Jamie A. [269] see Van Vlack, Hannah

Claassen, Cheryl (Appalachian State University)

[122] *Ashes in Western US Rockshelters*

Following the analysis of Newt Kash Kentucky shelter and other ash and sandal shrines in the eastern US as menstrual retreats, the author examines a number of caves and shelters around the Great Basin paying particular attention to their ash and sandal content. Both items may constitute fertility

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petitions left at retreat and medicine shelters such as Cowboy Cave, Hogup Cave, and High Rolls. The ash may represent the burning of fertility offerings, including menstrual pads and diapers.

Clark, Alexis (George Washington University)

[288] *Designing Influence: Aesthetic Choices and Group Identity in Decorated Ceramics of Late Postclassic Etlatongo, Oaxaca, Mexico*
During the Late Postclassic (A.D. 1200–1520) in the Mixteca Alta of Oaxaca, Mexico, aesthetic qualities of ceramics were utilized as both decorative values and tools for negotiating the creation of group identities and ideologies within communities. Through a stylistic analysis of Yanhuítlan Red on Cream type ceramics recovered from excavations at the site of Etlatongo, in the Nochixtlán Valley, I explore how these vessels and the motifs depicted on them were used during the creation of identity-based meanings that were easily recognized during public ceremonies. Since these ceramic types were broadly accessible and relatively abundant, I compare the frequencies of design motifs to others found on at sites throughout the Mixteca Alta, including Yucuita, Chachoapan, and from survey data within the Tamazulapan and Teposcolula valleys. I argue that the stylistic qualities of Yanhuítlan Red on Cream wares were directly involved in dialogic social processes that promoted ideologies shared by elites and commoners within the site.

Clark, Amy (University of Arizona)

[124] *Knapping for the Thrill of It? The Non-conservation of Raw Materials at Middle Paleolithic Sites*
Open-air Middle Paleolithic sites in France are characterized by dense piles of lithic material surrounded by low density “empty” areas. Spatial analysis can be used to segregate lithic artifacts based on whether they are located in the high or low density zones. This analysis is supported by the spatial tracking of refitting sets. The results indicate that high density zones likely correspond with knapping locations and low density areas contain lithics selected from the knapped material for use. The dense knapping piles contain many lithic pieces thought of as manufacturing debris, but also many optimal blanks. This suggests that the conservation of raw materials was not a priority for Middle Paleolithic knappers at these sites.

[124] *Chair*

Clark, Andrew (SUNY-Albany)

[239] *Warfare and Topography in the Middle Missouri*
The Missouri River Valley is a unique landscape for horticulturist settlements. The semi-arid Great Plains have wildly fluctuating weather patterns and resulted in a difficult growing environment with frequent changes in productivity. The terraces of the river valley offered relatively flat areas for village planning, the terrace-forming flood waters refreshed the flood plains with nutrient rich sediment for village gardens, and the terrace breaks provided protection from both wind and invaders. While archaeologists have inferred the relationship between topography and warfare among village dwelling farmers living in the Middle Missouri Subdivision of the Great Plains (A.D. 1000–1830), this concept has not been explored systematically. Topographic Position Index (TPI) is one measure that has gained popularity over the last decade as a tool to investigate an array of geographic variables. Using a pre-dam DEM, I calculated a TPI for the Big Bend geographical division to identify landform classifications within the model compared against site locations. The results show a fluctuation in village settlements among differing landforms over time and between taxonomic cultural units along with a positive correlation between topographic prominence and increased fortification construction.

Clark, Geoffrey [13] see Kingrey, Haden

Clark, Jeffery (Archaeology Southwest)

[91] *Chair*

Clark, Jorie (USFS) and Cathy Bickenheuser (USFS)

[106] *Call of the Wild: Historic Preservation in Region 1's Wilderness*
Region 1 of the U.S. Forest Service manages more than 25 million acres in Washington, Idaho, Montana, and North and South Dakota, with more than five million acres designated as Wilderness and Wilderness Study Areas. Because of the Wilderness Act, NHPA Section 106 surveys that would identify potential archaeological sites are generally not undertaken in Wilderness areas. However, a number of known historic structures in these areas have been restored by the Northern Region Historic Preservation Team (NRHPT), which is a unique entity within the U.S.F.S. that completes historic preservation projects throughout Region 1. In particular, the NRHPT directs a wide range of historic building preservation projects, including the use of traditional tools. Several Forest Service employees have been trained by the NRHPT, enabling national forests to plan and implement their own preservation projects with minimal preservation team supervision or guidance. A wide variety of historic properties that might otherwise fall into disrepair or neglect are now maintained for continued agency operations and public use. In this presentation, we will provide examples of restoration projects of historic structures in Wilderness areas in Region 1, underscoring the importance of preserving these structures through this unique resource.

Clasby, Ryan (Central Washington University)

[178] *Through the Forest: North-South Interregional and Intra-regional Interaction along the Eastern Edge of the Andes during the Early Intermediate Period*

This paper will examine the intensification of long distance intraregional interaction networks among eastern slope (also known as ceja de selva) populations during the late Early Horizon and Early Intermediate Period. The centuries following the decline of the Chavín and Chorrera cultures are thought to represent a period of balkanization and (eventual) regionalization throughout much of the Central and Northern Andean coastal and highland valleys as previously established interregional interaction networks were discarded in favor of localized self-sufficiency. However, recent archaeological data from the site of Huayurco in the Jaén Region of the northeastern Peruvian Andes suggests that ceja de selva (and some highland) populations from Ecuador and northern Peru continued to engage in both interregional and intraregional long distance exchange through the end of the Early Intermediate Period. Based on the broad patterning of material culture, these networks were seemingly oriented around the Marañón River and its major tributaries. Through a diachronic comparison of the Huayurco data to artifact assemblages from the ceja de selva and Ecuadorian highlands, I will examine the nature of these intra and interregional exchange networks, the mechanisms that held them together, and their impact on long term cultural change within the Andes.

[178] *Chair*

Clauwaerts, Pauline (Université Libre de Bruxelles)

[216] *Emergence of Female Power on the North Coast of Peru: Exploring Priestesses' Identities and Their Influence within the Funerary Realm in San José de Moro*

After more than twenty years of investigations, the San José de Moro Archaeological Project has found a total of seven funerary chambers pertaining to the Late Moche “priestesses” (AD 600–850) in one of the most important ceremonial centres and cemeteries located on the North coast of Peru. The sudden appearance of that specific character is echoed in the sacred imagery where the priestess is depicted, as a supernatural woman enacting in complex ritual activities with other elite characters. This new imagery introduces an era where powerful women are made visible and contributes to the construction of a normative image of the Moche deity. While the necessary and contingent reasons for their sudden appearance remain unclear, some

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questions still remain regarding the women who were buried as their personification. This paper fits into the broader issues of the emergence of women power in the Moche society, as we assess how identities are negotiated through the priestesses' burials by looking at the related data material, along with the architectural and anthropological data. We also propose to measure the influence of the new cult on contemporary mortuary population. By doing so, we aim to bring new light on those peculiar powerful women.

Clay, Elizabeth (University of Pennsylvania)

[208] *"A Wondrously Fertile Country": Agricultural Diversity and Landscape Change in French Guiana*

As a circum-Caribbean, non-island space on the coast of northeastern South America, French Guiana presents a distinct context in which to explore plantation slavery and Caribbean commodity production. The "sugar revolution" that overtook areas of the Caribbean at various historical moments reached French Guiana during the nineteenth century, yet monocultural production of the crop never took hold. Instead, plantations producing a variety of agricultural commodities including cotton, coffee, annatto, and spices were more typical for the region. Using archival, archaeological, and remote sensing evidence, this paper presents an overview of the diversity of agricultural production in 19th c. French Guiana and specifically explores how and why certain commodities destined for foreign markets came to be produced in this marginal space, how their production impacted the daily lives of enslaved Africans and altered local landscapes, and the contemporary legacies of these social and spatial transformations.

Clay, R. Berle [156] see Hargrave, Michael

Cleary, Megan

[221] *Stress and Sociocultural Reactions to Environmental Change in the Late and Terminal Lima on the Central Coast of Peru*

This project examined evidence of stress in 469 excavated human skeletons of the pre-Hispanic Lima population from Huaca 20 in the Maranga Complex in modern day Lima, Peru dating to the end of the Early Intermediate Period (ca. 200–600 AD) and the beginning of the Middle Horizon (ca. 600–900 AD). This period saw the movement of the populations on both the North and Central Coasts of the Andes inland to areas with greater access to the critical water supply (Shimada, 1994). While the majority opinion is that this transition was related to environmental stressors, their severity, effect, and manifestation in the population is unclear. The main objective of this study is to explore what types of stressors the Lima at the Maranga Complex, one of their principal ceremonial-population centers, experienced and how the population responded to those stressors.

Cleghorn, Naomi E. [99] see Keller, Hannah

Clindaniel, Jon (Harvard University)

[65] *Are Inka Khipu Knots Anything More than Numbers?: A Computational Investigation*

Inka khipus—the knot and cord recording devices of the Andes—have been said to have recorded everything from accounting, to histories and songs. Leland Locke demonstrated in the 1920s that Inka khipu knots often have standard numerical values. However, non-numerical Inka khipu signs remain elusive and undeciphered. Recent work by Gary Urton, however, has identified Inka khipus and individual khipu cords with knots that do not obey the standard numerical rules Locke identified. May Inka khipu knots also have had a non-numerical semiotic function?

Here, I use the Harvard Khipu Database, Python statistical libraries, and Benford's Law to evaluate this claim and potentially identify a non-numerical Inka khipu sign unit. Specifically, I compare knot value frequencies in extant Inka khipus to those expected in a numerical dataset, as predicted by Benford's Law. Benford's Law is used to identify fraud in a variety of disciplines—providing numerical frequencies that are characteristic of a set of empirically observed numerical values as a point of comparison. Thus, if knot value frequencies diverge severely from Benford's Law expectations for any set of khipus, these khipu knots likely functioned as non-numerical signs.

[65] *Chair*

Clinnick, David

[329] *The First East-West Dichotomy?*

Hallam Movius proposed that the Lower Palaeolithic cultures of East Asia and SE Asia were derived from a different cultural trajectory than that of Europe and Africa. The chopper-chopping tool complex of East and SE Asia was argued to be more primitive in many aspects. The type-site assemblages of the Pacitanian and Tampanian cultures are two out of only five assemblages that Movius initially used to define the chopper-chopping tool complex. The Pacitanian was first discovered by Michael Tweedie of the Raffles Museum, Singapore, and Gustav von Koenigswald in 1935 in the Pacitan Regency of Java. Three years later, a scientific team, including Movius, travelled to Java to investigate Tweedie and von Koenigswald's findings. Also in 1938, Michael Tweedie's colleague at the Raffles Museum, H. D. Collings, published an article in *Nature* announcing a discovery of a similar archaeological assemblage in Malaysia that he named the Tampanian. This presentation provides a reassessment of the original Pacitanian and Tampanian assemblages that are still held in Singapore, highlighting reduction strategies that have been overlooked since the 1930's and how the postcolonial history of scientific research in Singapore coupled with the dominance of Movius's analysis may have led to this oversight.

Cobb, Allan, James Brady (California State University, Los Angeles) and Guillermo De Anda Alaniz (Gran Aquífero Maya)

[134] *Demystifying the High Priest's Grave: Investigations in the Cave/Cenote below the Osario*

One of the most enigmatic publications in Maya cave archaeology has been Edward H. Thompson investigation of the High Priest's Grave at Chichen Itza in 1896. Thompson discovered a masonry shaft running down the center of the pyramid that gave access to a cave/cenote beneath the structure. This was the first account of a cave with a pyramid built over it and Thompson suggested that the cave contained seven chambers, hinting at the possibility of a Chicomoztoc. J. Eric Thompson in editing and publishing the report in 1938 notes that there are a number of discrepancies in this early account and over the years, archaeologists have grappled with the meaning of the discovery.

The Gran Aquífero Maya project undertook a restudy of the pyramid, shaft, and cave. The stone floor at the base of the shaft was found to be the top of a small platform that predated the construction of the pyramid. Evidence suggests that the cave had been subjected to a termination ritual and no Chicomoztoc configuration was found.

Cobb, Charles (Florida Museum of Natural History)

[283] *Ancestral Chickasaw Migration and the Makings of the Anthropocene in Southeastern North America*

We describe recent investigations of Indigenous communities who vacated the Tombigbee drainage of eastern Mississippi in the mid-fifteenth century A.D. These and surrounding groups migrated into nearby uplands known as the Blackland Prairie. Populations continued to move northward within the prairie and coalesced around what is today Tupelo, MS, in the 1600s. The move from a riverine to upland setting involved a dramatic shift in practices of historical ecology. The rich soils and open terrain of the prairie system at the time of European contact were likely a result of repeated burning and other modifications by ancestral Chickasaw, leading to an early description of the countryside as "pleasant open forests of oak chesnuts and hickory so intermixt with savannas as if it were a made landscape." Our work describes how the historical ecology of migration was an outgrowth of climate change, regional social tensions, and the later arrival of Europeans.

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[255] *Discussant*

[119] *Chair*

Cobb, Charles [119] see Krus, Anthony

Cobb, Charles [119] see Lieb, Brad

Cobb, Emilie, Jess Beck (University of Cambridge), Colin Quinn (Hamilton College) and Horia Ciugudean (National Museum of the Union, Alba Iulia)

[185] *Health and Mortuary Treatment in Early Bronze Age Transylvania*

Copper and gold resources from Southwestern Transylvania played a critical role in the emergence of inequality in European Late Prehistory. Communities in this metal-rich landscape, however, remain poorly understood. Though the highly visible tombs in the Apuseni Mountains where these communities buried some of their dead have been known to local archaeologists for decades, very little is known about the backdrop of health and disease in the region. Here, we present one of the first bioarchaeological analyses of skeletal and dental health for the Apuseni Early Bronze Age, focusing on a sample of human remains that incorporates individuals of both sexes and a range of ages, from very young children to older adults. Our results show relatively low levels of skeletal pathology, with age-related insults such as osteoarthritis predominating. In contrast, dental insults were more common and included caries, calculus, alveolar resorption, and abscesses. We present several case-studies of older individuals affected with particularly severe combinations of dental insults, and discuss the dietary and behavioral implications of handling such pathologies, at both the level of the individual and the community.

Coben, Lawrence (UPENN and the Sustainable Preservation Initiative)

[327] *Community-Based Economic Development: Is It Pragmatic? Should It Be?*

Does pragmatism work in practice? More particularly, does pragmatic philosophy actually contribute to the well-being of stakeholders, especially those from the local community who have historically been marginalized and have not benefitted from archaeological practice? Can archaeological practice be expanded beyond the production of knowledge to include the needs and desires of community members as they themselves express them? This paper will explore these questions, utilizing the community-based economic development programs of the Sustainable Preservation Initiative as a springboard to an inclusive and not self-serving archaeological practice incorporating a reality based pragmatism.

Cobos, Rafael (Universidad Autónoma de Yucatán)

[142] *Discussant*

Cochran, Lindsey (University of Tennessee)

[67] *Geospatial Interpretations of Enslaved Landscapes in the Antebellum Georgia Lowcountry*

This project uses geospatial landscape theory to explore how enslaved people living in settlements on the Sapelo Plantation signaled their African and Caribbean roots through overt and covert materials and landscape patterns in Bush Camp Field and Behavior settlements. Enslaved people at the Sapelo Plantation were likely granted higher levels of relative independence, resulting in a different relationship with the landscape than enslaved people at contemporaneous lowcountry plantations. I hypothesize that the formative factors that created such an intricate network of places on the Sapelo Plantation landscape stem from three major variables: (1) the use of the task system at Sapelo Plantation for organizing labor; (2) the agricultural, political, and economic uniqueness of the late-antebellum Georgia plantations, including the impact of the cessation of the global slave trade; (3) and the impact of the Igbo Landing Rebellion. Throughout the antebellum south, planters defined how certain spaces were to be used by slaves; enslaved people created and cultivated places. The purpose of this research is to identify the location of previously unknown non-tabby slave cabins at Sapelo Plantation to understand how the three variables impacted slaves' use of the landscape leading to ethnogenesis of Gullah Geechee culture on Sapelo Island, Georgia.

[67] *Chair*

Codding, Brian (University of Utah)

[92] *Chair*

Codding, Brian [5] see Weitzel, Elic

Codlin, Maria [293] see Carballo, David

Coe, Michael (Yale University)

[175] *Discussant*

Coffey, Grant (Crow Canyon Archaeological Center) and Mark Varien (Crow Canyon Archaeological Center)

[226] *The Final Frontier: Chaco Great Houses in the Great Sage Plain of Southwestern Colorado*

The expansion of the Chacoan regional system into Southwestern Colorado was relatively late compared to other areas, occurring for the most part from A.D. 1080 to 1140. This poster examines this late expansion by focusing on Chaco-style great houses located in the Great Sage Plain of southwestern Colorado. Information on these Chacoan sites has been compiled during a series of projects that began in the late 1980s and continued with 2017 fieldwork during the Community Center Reassessment Project. We present an inventory of all known great houses, assess their chronological development, document variation in their size, examine their association with other types of public architecture, and identify groups of great houses that occur in distinct clusters. We conclude by examining the connection between these sites and those in Chaco Canyon and at Aztec.

Cofran, Zachary (Vassar College), Reed Coil (Nazarbayev University) and Gabriel McGuire (Nazarbayev University)

[304] *Geoarchaeological Survey of the Irtysh River Basin, East Kazakhstan*

Evidence for the earliest human occupation of Eastern Kazakhstan is poorly known, despite it being part one of the largest countries in the world and flanked along its borders with important paleoanthropological sites in Russia and China. We sought evidence of prehistoric sites by foot and vehicle survey around the Irtysh Basin. At each major point of interest we took photographs geotagged with geographic coordinates, and collected global positioning system (GPS) data. Although much of the area we covered lacked clear evidence of human prehistory, we found several locations that merit further investigation. One exposed soil profile contained a large bovid humerus, a long bone shaft fragment with apparent green fractures, and two stone flakes. In addition to foot and vehicle survey, we consulted with local residents in many of the small villages we encountered. A resident of the village Balgyn led us to a small cave, in which he says he had found "arrowheads." This informant also told us there was a larger cave in the area, which we will investigate next season. Two other caves were found near the town of Ognevka, both following the same small river that drains into the Irtysh.

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Cohen, Anna (Utah State University)**[169]** *Local Political Economies at Angamuco, Michoacán: Insights from Ceramic Archaeometry*

A key goal in the study of ancient artifacts is determining their provenance. Such information can provide insight into the production and consumption of artifacts, but may also inform discussions about local political economies. Our study uses qualitative optical petrography and geochemical analysis (NAA) to evaluate the tempers and paste recipes in ceramic fragments and raw clays from Angamuco, located in the Lake Pátzcuaro Basin, Michoacán. Angamuco was occupied before and throughout the development of the Purépecha Empire (1350–1530 CE) and is thus an important case study for understanding the impacts of political change on urban landscapes. Angamuco appears to have been relatively self-sufficient in pottery production, beginning in the Classic and through the Postclassic, including during imperial incorporation. While we did identify some temporal and spatial variation in ceramic production and consumption, pottery technologies and techniques of manufacture appear to have remained relatively stable over long periods of time. Our data point to multiple small-scale producers, who focused on local clays and tempers, generating numerous, complex paste recipes. The results of this analysis contribute to our understanding of ceramic production processes at Angamuco and may be compared to provenance studies in Western Mexico and elsewhere.

[169] *Chair*

Cohen, David [177] see Patania, Ilaria

Coil, Reed (Nazarbayev University), Martha Tappen (University of Minnesota), Reid Ferring (University of North Texas), Maia Bukhsianidze (Georgian National Museum) and David Lordkipanidze (Georgian National Museum)**[41]** *Photogrammetry, Spatial Patterning, and Site Formation of the Hominin-Bearing Layers at the Lower Paleolithic Site of Dmanisi, Georgia*

The Lower Paleolithic site of Dmanisi, Georgia, is well known for its rich archaeological and paleontological deposits, which include bones from at least five individuals attributed to *Homo erectus*. Taphonomic analyses show that carnivores contributed greatly to the accumulation of faunal material, while contributions by hominins were present, but uncommon. Recent excavations in the hominin-bearing layers of Block 2 at Dmanisi have revealed a complex underlying basalt formation that likely dictated much of the site formation processes, both biotic and abiotic. Combining spatial patterning with a 3D model of the excavation generated using Agisoft Photoscan, we identify several areas where the basalt, and the pseudo-karstic pipe and gully formations, have constrained the deposition of material. 3D bone orientations in many areas show strong correlations to the underlying shape of the basalt formation. In addition, spatial patterning of the lithic and faunal material differs depending on stratigraphic layer, which is also controlled largely by the basalt and pipe/gully formations. The distribution of coprolites, however, is independent of these patterns, possibly indicating spatially discrete carnivore activity.

Coil, Reed [304] see Cofran, Zachary

Coker, Adam (University of Illinois Urbana-Champaign), Kimberly Swisher (University of Michigan), Jennifer Birch (University of Georgia), Stefan Brannan (New South Associates) and Tiffany Yue (University of Georgia)**[266]** *Creating Community at Singer-Moye: Feasting and Craft Production in a Residential Precinct*

During its estimated 400-year history of occupation, Singer-Moye was a focal point of prehistoric settlement and socio-political development in the Lower Chattahoochee River Valley of southwestern Georgia (USA). Between A.D. 1300 and 1400, the site was a focus of regional settlement aggregation that included the expansion of the site's monumental core and the deposition of a dense occupational midden surrounding that core. In 2016 and 2017, excavations at Singer-Moye were focused on investigating geophysical anomalies in an area adjunct to Mounds A and H at the site, in what has been interpreted as an elite or ceremonial precinct. This poster discusses the results of those investigations and presents interpretations of activity patterns in a residential portion of the precinct during a pivotal period in the site's occupational history, including evidence for feasting and specialized craft production.

Colaninno-Meeks, Carol (Southern Illinois University Edwardsville)**[168]** *The Need for Discipline-Based Education Research in Archaeology*

Over the last several decades, STEM scholars have recognized the importance of developing and integrating discipline-based education research (DBER). As outlined by the National Research Council of the National Academies, the goals of DBER are to 1) understand how students learn discipline concepts, practices, and ways of thinking; 2) understand how students develop expertise; 3) identify and measure learning objectives and forms of instruction that advance students towards those objectives; 4) contribute knowledge that can transform instruction; and 5) identify approaches to make education broad and inclusive. Physicists, chemists, engineers, biologists, astronomers, and geoscientists have been among the first to adopt DBER, mostly at the undergraduate education level. Given research that demonstrates the effectiveness of instructional strategies derived from DBER, both at P-12 and undergraduate teaching, I call for archaeologists to adapt DBER, while developing infrastructure that supports and advances avenues of DBER and instructional implementation. Further, I argue that adopting DBER will be vital to sustain our field given current threats and actualized funding cuts.

[168] *Chair*

Colaninno-Meeks, Carol [188] see Van Hagen, Logan

Colantoni, Elizabeth (University of Rochester), Gabriele Colantoni (University of Rochester), Serena Cosentino, Maria Rosa Lucidi (Sapienza—Università di Roma) and Gianfranco Mieli**[29]** *The Copper Age in Apennine Central Italy and the San Martino Site at Torano di Borgorose (Rieti, Italy)*

Excavations at the San Martino site (Torano di Borgorose, Rieti, Italy) have uncovered the remains of a Copper Age settlement, with evidence of a daub structure and possible hearth. The present contribution reports the results of investigations here and situates these results within the broader context of the mountainous interior areas of central Italy, including parts of the Lazio region and especially neighboring Abruzzo. The quantity of data available from Copper Age sites in this geographical area has increased considerably in recent decades, and it seems clear that people were occupying the landscape fully by the third millennium BC. Evidence from excavation and survey includes abundant pottery, lithic assemblages, and bones, sometimes associated with structures. Sites were used for activities connected with pastoralism and are found along lakeshores, on raised terraces and hillslopes, and even at high altitudes. Still lacking are extensive explorations of individual sites, and absolute dating is needed to refine the traditional chronology, based almost exclusively on ceramic evidence. Nonetheless, the amount of information available from places like the San Martino site makes this geographical area ripe for the kind of regional syntheses already long since undertaken for the Copper Age in other parts of Italy.

Colantoni, Gabriele [29] see Colantoni, Elizabeth

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Colclasure, Cayla (University of Alabama), Megan Belcher (University of Tennessee), Jon Russ (Rhodes College), Stephen Carmody (Troy University) and Martin Walker (University of Tennessee)

[86] *Analyzing Late Woodland Pipe Fragments from the Topper Site (38AL23): Exploring the Botanical, Social, and Ritual Intersections of Smoking*

Three pipe fragments uncovered during a 2017 University of Tennessee excavation at the Topper Site (38AL23) in Allendale County, South Carolina have opened a window into the social and ceremonial practices of the site's Late Woodland inhabitants. Morphometric, paleoethnobotanical, and residue analyses have enabled us to explore the societal role smoking played within this community. We compare the form, design, and contents of these fragments to similar artifacts from across the region and explore the multifaceted role smoking played at the individual and civic levels. Paleoethnobotanical and chemical residue analyses have been conducted on the contents of a pipe bowl from the site, the results of which will inform our interpretations and enrich our understanding of smoking's purpose within this Woodland community. Drawing on ethnohistorical accounts and comparative archaeological studies, we consider the known uses of various plant species in smoking rituals within the precontact Southeast. We aim to understand the role of smoking within this community specifically, and to situate this local iteration of the practice within the broader regional context.

Cole, Kasey (Dept. of Anthropology, California State University,) and Kelsie Hart (Department of Anthropology, California State University)

[179] *Faunal Remains from Point San Jose: Analysis of Butchery Patterns and Implications for Site Context*

The analysis of butchered archaeofaunal specimens from historic sites can lend important insight into diet, food preparation, discard practices, and socioeconomic status. In this study, we examine faunal specimens found commingled with human remains from a pit associated with a 19th century historic army hospital located in Point San Jose, California. The specific aim of this study is to relate observed butchery patterns on the faunal remains to diet and socioeconomic status at the site. Patterns of butchering are compared to two other historic assemblages in California, as well as historic accounts of army food rations and butchery practices. The results of this study will provide a deeper understanding of the role of the army hospital pit and the site in general, and has greater implications for interpreting butchery patterns in the archaeological record.

Collar, Anna (University of Liverpool)

[83] *Going Deeper: Can We Use Network Approaches to Reconstruct Memory, Meaning and Emotion?*

Understanding our past needs more than the long lens of nodes, links, and centrality measures: archaeology is bound to people's things and people's places. Although network analysis is concerned with relationships, it has not yet been harnessed to approach the meaning, memory and emotion encoded in our relationships with things and places. We must address this by ensuring that our network analyses incorporate these aspects of lived experience and make meaningful contributions to advancing the archaeological narrative. This paper explores how we might build a methodology for humanised archaeological network analysis in which the lived experiences of people in places and with material culture are considered as an 'entanglement of lines, not a connecting of points' (Ingold 2007: 81). I will focus on the material associated with Syrian cults in the Roman world, using different network approaches at a range of scales in combination to present place as a complex, ongoing result of multiple intertwined networks of experience, emotion, memory, narrative, material and landscape. Network analysis is only part of this project—which begins to look more like Ingold's meshwork or a 'deep map'.

Collard, Mark (Simon Fraser University), Brea McCauley (Simon Fraser University), Chris Carleton (Simon Fraser University) and Andre Costopoulos (University of Alberta)

[118] *Testing Dunnell's Waste Explanation for Monument Building with an Agent-Based Model*

The construction of shrines, tombs, and other monuments is one of the most puzzling human behaviors from an evolutionary perspective. Building monuments is costly in terms of time and energy, and yet it is difficult to see how it contributes to survival and reproduction. In the late 1980s, Dunnell argued that monument building and other apparently wasteful behaviors are in fact adaptive in environments that are characterized by severe and/or unpredictable perturbations. Such behaviors are adaptive, according to Dunnell, because groups that undertake them will have lower birth rates than groups that do not and therefore will be less likely to experience food shortages in bad years. In addition, wasteful behaviors are adaptive because they represent a reservoir of time and energy that can be devoted to subsistence and/or reproduction in times of difficulty. Here, we report the results of a study in which we tested the waste hypothesis with an agent-based model in which the severity and predictability of environmental threats and the agents' propensity to waste time and energy were varied systematically. Our results indicate that the situation is not as straightforward as Dunnell imagined.

Collins, Catherine [51] see deFrance, Susan

Collins, Michael (Gault School of Archaeological Research)

[79] *Dennis Stanford at SI: The Man, The Place, The Career*

Dennis Stanford heads up the Archaeology division at the Smithsonian Institution and its Paleo-Indian Program. From the time he completed his graduate studies (PhD 1974, University of New Mexico), Dennis has held positions in the Department of Anthropology at SI, repository of the major archaeological collection in the United States. In his more than four decades at SI, he has fostered acquisition of archaeological (especially PaleoIndian) additions to the Department's collections, conducted scores of field investigations here and abroad, and produced numerous archaeological exhibits, publications, and films. He is curator of North and South American Paleolithic, Asian Paleolithic, and Western United States archaeological collections. Even though his office is nearly always busy with staff, interns, students, visiting scholars, and kibitzers, it exudes a welcoming atmosphere. Although beset with administrative and public service responsibilities, Dennis has maintained a research program of the highest quality and built the finest PaleoIndian collection in the Americas. His aura reaches far and wide. Our discipline owes him a huge, "Thank You."

Collins, Renee (Northern Arizona University) and Rafael Guerra (University of New Mexico)

[28] *Rising from the Bush: Investigations of Elite Households Adjacent to Site Cores in the Belize Valley*

Since 2010, the BVAR Project has conducted intensive research at the recently discovered site of Lower Dover, located directly across the Belize River from Barton Ramie. A major part of the BVAR investigations is to determine the socio-political relationship between Lower Dover, Barton Ramie, Blackman Eddy, and Baking Pot. Other research questions have focused both on the monumental architecture of the site core, and on plazuela groups in the periphery of site's epicenter. One such peripheral house group, classified as Group G, consists of 5 mounds that enclose a small plaza just north of center's ballcourt. This paper presents the results of our investigations on Group G, compares the development of this household with that of the site center, and discusses the potential relationships between site cores and adjacent patio groups.

Collins, Ryan (Brandeis University)

[162] *Selective Surplus: Material Networks in Formation at Yaxuná, Yucatan, Mexico (900 to 350 BCE)*

Recent investigations of Yaxuná, Yucatan, Mexico have provided evidence to suggest that the earliest permanent spaces, by way of the site's E-group complex, in the Northern Lowlands were roughly contemporaneous with the early developments observed at Central Lowland sites. On the one hand, this data provides an outlet to better explore the large scale social processes impacting the early macro-region of the Maya area. However, material analysis of recovered shell, lithic, and ceramic artifacts assisted by stratigraphic context has revealed that many of the regional characteristics of later

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periods, such as shared religious practices, systems of material value, and networks of exchange were much more distinct at the local level than anticipated in the earliest investigated contexts. As a result, the data make it clear that as time progressed from 900 to 350 BC, while Yaxuná underwent urbanizing processes, the presence of material objects increased while the selection of those materials gradually became focused on more fixed sources. In the same way, the previously recognized diversity of material objects became increasingly limited. This paper will focus on the implications of the Yaxuná data for the development of systems of value and exchange in early Maya society.

Collo, Gilda [154] see Cattaneo, Roxana

Colten, Roger (Peabody Museum of Natural History, Yale University)
[149] *Moderator*

Coltman, Jeremy (University of California, Riverside)

[209] *Chichen Itza and the Early Postclassic International Style*

Chichen Itza has long deserved an approach based on an analysis of the art and iconography of the site for its own merits rather than the continually frustrating analysis that results from attempts to project Late Postclassic religious stories on to the site. Effortlessly blending themes of paradise and militarism, Chichen Itza drew on a wide array of styles that appear in strikingly similar ways indicating the workings of an Early Postclassic International Style that simultaneously integrated old and new, local and exotic. The sheer cosmopolitanism of Chichen Itza makes this site an excellent point of departure for examining how stylistic and iconographic elements came to be shared at such distant sites and in similar ways. While Central Mexican influence cannot and should not be ignored, other cultural areas in the Late Classic period such as Cotzumalhuapa and Ceibal deserve renewed attention as contributors to an Early Postclassic International Style.

[209] *Chair*

Coltman, Jeremy [134] see Verdugo, Cristina

Coltrain, Joan [187] see Werlein, Amanda

Colwell, Chip (Denver Museum of Nature & Science)

[72] *Discussant*

Compton, Mary (University of Western Ontario)

[321] *Discussant*

Comstock, Aaron (Ohio State University) and Robert Cook (Ohio State University)

[266] *Hidden in Plain Sight: Mississippi Plain Pottery as an Indicator of Movement on the Mississippian Periphery*

Shell tempered pottery with smoothed surfaces, widely referred to as Mississippi Plain Pottery, is a ubiquitous but understudied element of Mississippian assemblages throughout the Midwest and Southeast. Along the northeastern Mississippian periphery, shell tempered plain pots and body sherds are present but have not been formally considered. Through analysis and direct dating of early Fort Ancient (c. AD 1000–1300) ceramic assemblages, we suggest that Mississippi Plain pottery appears early at some sites along the Middle Ohio River. Comparing these assemblages to contemporary Mississippian and Fort Ancient sites in the Ohio Valley points to a dichotomy in the early Fort Ancient system. Sites along the Ohio River appear to be more “Mississippian” in nature while sites south of the Ohio River appear to be more “Woodland” in nature. Using ceramic assemblage composition as one line of evidence in a multifaceted project investigating agricultural origins, it is becoming clear that the development of Fort Ancient societies was tied to the movement of Mississippians throughout the river valleys of the Midwest.

Conard, Nicholas, Mareike Brenner (Department of Archaeology University of the Witwatersrand), Knut Bretzke (Department of Early Prehistory and Quaternary Ecology), Christopher Miller (Institute of Archaeological Sciences University of) and Manuel Will (Department of Early Prehistory and Quaternary Ecology)

[124] *Interpreting Small-Scale, Intra-site Spatial Variation of Finds from the MSA Deposits at Sibudu Cave, South Africa*

Sibudu Cave in KwaZulu-Natal, South Africa is a key Middle Stone Age site that provides a high-resolution stratigraphic record of cultural change. The sequence from Sibudu is well-dated and has been the focus of intense geoarchaeological research. This paper examines the spatial distribution of lithic artifacts, faunal remains, worked ochre, burnt materials and botanical finds to see if these distributions provide meaningful information on the changing use of space at the site. The study will focus on deposits overlying the Howiesons Poort and dating to ca. 58,000 years ago, a period when the site was occupied intensely and for which we have documented much short-term technological change. We examine the question of whether or not important behavioral information on the spatial use of sites can be identified through careful analysis of small areas with high stratigraphic resolution.

[174] *Discussant*

Conger, Megan (University of Georgia) and Jennifer Birch (University of Georgia)

[190] *Inferring Iroquoian Architectural Variability from Magnetic Gradiometry*

Magnetic gradiometry is an affordable and preservation-minded method to detect a wide range of subsurface features at historic and prehistoric archaeological sites. Horizontal excavation is the only way to confirm the nature of features detected by magnetic gradiometry, but in some cases may be impossible or undesirable. Excavation-based understandings of local architectural practices can be used to infer the nature of magnetic anomalies, as long as those understandings encompass the full range of architectural variability that may reasonably be expected. Magnetic gradiometry was conducted at three sixteenth- and seventeenth-century Iroquoian villages in Ontario, Canada: Spang, Trent-Foster, and Hamilton-Lougheed. A search of extant excavation records was conducted to characterize the range of architectural variability likely to be found on these sites, including structure dimensions, hearth placement, and wall construction techniques. The different kinds of anomalies that these structural variations might present in magnetic gradiometry data were reproduced, and compared to actual data collected from the three sites. Based on these expectations and the identified anomalies, significant intersite and intrasite architectural variability is inferred. This approach has general methodological utility for interpreting subsurface anomalies in magnetic gradiometry data in the Eastern Woodlands and other areas with similar soil conditions and architectural traditions.

Conlee, Christina (Texas State University)

[335] *Nasca-Wari Relationships on the Greater Peruvian South Coast*

The Middle Horizon was a period of unprecedented interaction and change in the Nasca region. Nasca was one of the earliest places where Wari influence was found, extending back to the pre-imperial Huarpa culture of the Early Intermediate Period. It is also one of the few coastal regions with solid evidence of Wari colonization. However, the relationship was not a simple, unilinear one with Wari the dominant core society and Nasca the passive peripheral society. Instead a bilateral relationship developed in which many things were shared between the two. Wari colonies and foreigners are found in Nasca, along with changes in local settlements, new mortuary practices, and new long-distance prestige goods. Many aspects of Nasca

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culture were incorporated by Wari including ceramic technology, iconography, flexed burial positions, and trophy head taking. The evidence from Nasca suggests a hybrid culture developed that is most evident in the Loro ceramic style and in ritual practices involving trophy head taking. It is possible that it is from the Nasca region that Wari influence, and this new hybrid culture, spread to valleys further south along the coast.

Conlee, Christina [165] see Vaughn, Kevin

Conlogue, Gerald (Quinnipiac University) and Michelle O'Connor (Radiologic Sciences Programme, School of Medici)

[204] *The Role of Radiographer as a Member of the Arch Street Project Team*

The value of a radiographic examination of skeletal remains is unquestionable. Over the past several decades, technical innovations have resulted in more compact equipment making it easier to set up radiography in the field. Digital imaging receptors have replaced film and software has enabled post-processing image manipulation, further simplifying the logistics and efficiency of field imaging studies. Radiography systems are designed to minimize radiation dose in living patients leading to a concurrent loss of resolution. However, anthropological applications aim for optimal resolution with less regard for radiation dose. A radiographer, versed in the science of radiography, can be invaluable in planning field radiographic studies, selecting optimal equipment, and assembling an imaging team. A team should consist of at least three individuals for maximum efficiency. Including radiography students on a team provides an opportunity for classroom theory to be put into practice. It also exposes students to the realities of field research such as needing to modify plans onsite due to unforeseen challenges. The presentation concerns the examination of material recovered from Arch Street Project by a team that put the aforementioned ideas into practice.

Connaughton, Sean (Inlailawatash)

[113] *I Am from the Sea, You Are from the Land*

How does water act as a relational presence when in the field, and how does this relationship inform local Indigenous communities as they look to a future with more authority over their territory and heritage? This paper provides a first look into a Guardian Watchmen program situated on Vancouver Island and explores the ways in which Guardians better understand the social and cultural networks in which they are embedded in both the contemporary world and the places in which the ancestors and their belongings reside.

Connell, Samuel (Foothill College), Kathryn Maurer (Foothill College), Chad Gifford (Columbia University) and Niall Brady (ADCO)

[98] *Castles in Communities Ireland Field Program*

The 200 pound pig slowly turns on the spit for hours while a few feet away students from California trowel through excavations at Ballintober Castle. A marquee is set up as villagers busily prepare for Heritage Weekend, which they pushed up to mid-July to accommodate the field school and 70 people staying in the village. In the next few days there will be storytelling, sports in the castle, tours by the archaeologists, lectures about the geophysical work, and more BBQs. In fact, this sort of thing has been going full stop for five weeks each of the past three summers. All of this happens as part of the Castles in Communities project which is a unique combination of research and community involvement. The following briefly tries to capture the spirit of the program and share its successes.

Connolly, Robert (University of Memphis), Elizabeth Cruzado (Louisiana State University), Natalie Kramm (Louisiana State University) and Dominique Giosa (Louisiana State University)

[168] *Prioritizing the Expressed Community Needs in Educational Projects in Ancash, Peru*

This paper evaluates the efforts to create and implement a diversity of cultural heritage educational programs over a four-year period in the Ancash Region. The initial impetus for the development was in large part viewed as a means for obtaining community support for archaeological research projects and an increased commitment of local stewardship for cultural heritage resources. Over the four-year period, we made a decisive shift from an approach of creating products for the community to one where we worked directly with the community. We determined that a co-creative approach that prioritized the expressed needs of the community resulted in programs with an increased likelihood for being sustained increasingly by the local community. Finally, we consider on a Critical Assessment Framework as developed by Worts to evaluate the success of these programs.

Conrad, Cyler (University of New Mexico), Caitlin Ainsworth (University of New Mexico) and Emily Lena Jones (University of New Mexico)

[125] *A Commensal-Prey Relationship in Early Mainland Southeast Asia? The Case of the Burmese Hare (*Lepus peguensis*)*

Rabbits and hares are often a central part of human subsistence strategies in both the past and the present. However, the Burmese hare (*Lepus peguensis*)—the sole member of the family Leporidae indigenous to mainland Southeast Asia (MSEA)—is rarely eaten today, and its status in the past is unclear. Although this taxon is currently abundant across a wide geographic range, it has a poor zooarchaeological record during the Pleistocene and Holocene. Identified specimens occur sporadically in hunter-gatherer contexts, and increase in presence and abundance during the Neolithic, Bronze and Iron Age. Ecological data suggests that *L. peguensis* prefers anthropogenically modified agricultural environments and can be an agricultural pest. This species may thus represent a potential commensal-prey species for prehistoric agricultural populations in MSEA. In this paper, we use zooarchaeological evidence for Burmese hare and stable isotope analysis of prehistoric and modern specimens to assess whether this taxon represents a commensal species in prehistoric mainland Southeast Asia.

Conrad, Cyler [115] see Hamilton, Marian

Contreras, Daniel [332] see Walder, Heather

Conway, Jessica [334] see Farrow, Clare

Cook, Anita (Catholic University of America)

[335] *Discussant*

Cook, Gordon [29] see Hamilton, Derek

Cook, Jacqueline

[253] *We know that our people have been part of this land since the beginning of time—A Cultural Statement for the Ancient One*

The assumption was made that because the Ancient One was so old, and because the court deemed him not “Native American”, the Claimant Tribes had no connection to him, and, therefore, no concern for him. Those assumptions were proven to be incorrect. Evidence demonstrating the Cultural Affiliation of the Ancient One to the Claimant Tribes can be found within the disciplines of indigenous knowledge, geography, biology, archaeology, anthropology, linguistics, folklore, oral tradition, and historical data. The totality of all evidence demonstrates cultural persistence and adaptive change resulting in the continuum of culture and kinship within Plateau peoples. The evidence clearly indicates the indigenous people of the Columbia Plateau adapted to changing spatial and temporal landscape over millennia. These adaptations encompass the cultural affiliation with the Ancient One’s remains. By virtue of a shared group identity directly connected to places,

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resources, and people within the geographical context of a cultural landscape affiliation always was certain.

This presentation will provide overview and insight into the indigenous knowledge and contemporary scientific knowledge. Our reliance on our teachings, beliefs, and way of life necessitated our petition for his return, allowing us to fulfill our cultural duties.

[337a] *Discussant*

Cook, Katherine and Genevieve Hill (Royal BC Museum)

[130] *Museums as Classrooms: Lessons in Applied Collaborative Digital Heritage*

Tech-centred courses in archaeology are becoming ever more present in university and college training programs, as demands for digital field recording, data management and analysis, and public engagement applications increase. Traditional classrooms and labs may be conducive to methodological training, however experiencing the complicated ethics, politics and logistics of applying these methods to heritage practice is limited in these settings. This paper reflects on a collaborative project that took students from the University of Victoria off campus to the nearby Royal BC Museum (Victoria, Canada) to develop digital applications to engage visitors in a pop-up event in local archaeology. In this rapid design, development and launch process, technical outputs were as important as critical explorations of indigenous archaeology, accessibilities, impact, and message. In applying digital heritage through collaborative practice for public engagement, the museum becomes a classroom at many levels, for students, for academic and museum professionals, and for the community.

[316] *Discussant*

Cook, Michael (Northern Illinois University)

[155] *Geographic Distribution Analysis of Elko Series Projectile Points across the Great Basin*

The Elko projectile point series is diagnostic of the early Archaic period throughout the Great Basin. Within the Elko series, two identified subtypes exist: Elko Eared (EE) and Elko Corner-notched (ECN). While morphologically distinct, both subtypes occur within the same chronological and geographic extents. In this study, I gathered a sample of 37 sites throughout the Great Basin with identified EE and/or ECN points, then developed an index representing the proportion of EE to ECN points in each sampled site. I then created several sets of geographic distribution groups and used Analysis of Variance to look for significant differences in index numbers between tested groups. Each geographic analysis yielded no statistically significant results, indicating no consistent geographic variation in frequencies of EE versus ECN points across the Great Basin. This result suggests that both subtypes were used similarly throughout the Great Basin and observed differences in frequencies at specific sites among these two point types are not indicative of any distinct culture.

Cook, Robert (Ohio State University)

[119] *When and Where Did They Go? More Fully Conceptualizing Fort Ancient's Descendants*

There were two distinct cultural systems in a key part of the Fort Ancient region—Anderson and Madisonville—with the general understanding that one changed into the other in situ ca. AD 1400 and then left the region en masse ca. AD 1650, becoming one of several contemporary Central Algonquian tribes. However, new data raise the possibility that this interpretation needs revision. First, through a biodistance analysis we learn that at least some Anderson and Madisonville groups were not closely related biologically. Second, we know from oral histories that Dhegiha Siouans departed the Ohio Valley at the same time as the Madisonville shift and have recently learned that the Anderson pattern is very similar to several Dhegiha accounts. Hence, it is now possible to question whether the Anderson cultural system relates to Dhegiha Siouans more so than the Madisonville one that may be more closely related to Central Algonquians. Reasons explored to account for the potential for multiple departures include various mixes of environmental and cultural push/pull factors, such as deteriorating climatic conditions for agriculture, increased interest in bison, and increased pressures from Iroquoians who were interested in the region for both the burgeoning fur trade and slave raiding.

Cook Hale, Jessica (University of Georgia)

[244] *Remnant Landscapes, Taphonomic Challenges and Middle Range Theory in Submerged Prehistoric Archaeology*

Submerged prehistoric archaeological sites have increased relevance in archaeology because they retain direct evidence addressing multiple questions, such as human dispersal patterns, use of coastal zones, and human responses to climate change. They also have potential for high degrees of preservation in some cases. However, just as often, they present significant site formation challenges including geochemical and mechanical degradation of artifacts and features, weathering and deflation of sediments during and after submergence, and resulting loss of stratigraphic integrity—all a direct function of coastal and marine processes. These problems must be addressed more thoroughly in the field by accounting for these alterations with appropriate middle range or higher level theory for behavioral versus ecological processes. This is also an issue in grant proposal/peer reviews wherein our “terrestrial” colleagues’ comments and critiques demonstrate they also lack an understanding of alteration of submerged offshore sites. This paper reviews, briefly, the development of investigative strategies for submerged offshore sites that operationalized theory and method for the location and study of submerged sites. We then propose some revision and revamping of these strategies that can more effectively address the unique issues involved in the study of a submerged prehistoric world’s remnants.

[315] *Discussant*

[244] *Chair*

Cooley, Delaney (University of Oklahoma)

[21] *Investigating the Emergence of Ute Culture on the Uncompahgre Plateau, Colorado*

The Numic Expansion (A.D. 900 to 1300) and other explanatory models that have been used to explain the distribution of Numic speakers across the American West often fall short of providing specific methods for identifying peoples, such as Ute, in the archaeological record. This paper expands on previous investigations of this Numic Expansion narrative through the detailed reanalysis of lithics from two excavated sites: Christmas Rockshelter (5DT2) and Shavano Spring (5MN40). I compare lithic procurement and production strategies through time and between the two sites to characterize the degree of cultural continuity (or lack thereof) in the Uncompahgre Plateau, Colorado. I identify changes to projectile point and biface production and raw material selection strategies that are unit to occupations during and after the Numic Expansion. I conclude that these differences represent changes in the region reflecting the movement of people, development of new Ute communities, and exchange of materials, ideas, and knowledge. I argue these differences represent changes in the area and broader region and may reflect the movement of people, development of new communities, and exchange of materials, ideas, and knowledge.

Cooper, Angela

[26] *Mounds, Museum Visitors, and You (the Archaeologist)*

During the 18th century, European-Americans created a myth regarding the earthen mounds found throughout the eastern United States. This myth indicated that a western people, possibly the Lost Tribe of Israel, had inhabited North America and established cities throughout this region. They then succumbed to Native American savagery and brutality and were eradicated. Over time, archaeologists disproved the myth by conducting excavations and demonstrated the cultural similarities between the mound building Native Americans and the Native Americans of the region. Although archaeologists since then have condemned, dismissed, and constantly disproved the myth, this misconception is still prevalent in today’s society. Many people still believe that non-Native Americans built the mounds, and other people recognize that pre-contact Native Americans constructed the mounds

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and cities, but that they disappeared or went extinct. For both groups, they do not recognize the cultural continuity from the mound building people to contemporary Native Americans. My dissertation examines whether museums combat or perpetuate the myth of the mound builders, what preconceptions visitors have of Native Americans and their mound-building ancestors, whether their preconceptions change after visiting a tribal or mound site museums, and what museums can do to begin changing preconceptions of Native Americans.

Cooper, Jago (British Museum)

[283] *A Hundred Years of Human Migration in the Caribbean: Considering the Key Tipping Points of Cultural Transformation between AD1492 and AD1592*

This paper will review some of the ways in which unprecedented human migration and cultural encounter in the 15th and 16th century Caribbean is reflected in the transformative material exchanges made on Isla de Mona. Discoveries made during recent fieldwork on Isla de Mona will be used to illuminate and inform these thoughts by examining the dynamic ideological setting within which they are situated.

[57] *Discussant*

Cooper, Jago [123] see Samson, Alice

Cooper, Zachary (University of Colorado, Boulder)

[27] *Developmental Period Migration in the Northern Rio Grande*

The origin of Tanoan language diversification is inextricably linked to the debate around the origin of the Tewa. While paleodemographic, bioarchaeological, linguistic, and DNA evidence support a thirteenth century Mesa Verde-Northern Rio Grande migration, the lack of clear material culture evidence of this migration is perplexing. Critical to this discussion is the possibility of an earlier, tenth century migration of (presumably) Proto-Tiwa speakers from the Upper San Juan region into the Northern Rio Grande. While scholars generally agree that Proto-Tiwa split from Proto-Tewa no later than AD 1000, the location of this split, and the subsequent movement of Tiwa speakers, remain unresolved. In this presentation, I evaluate the ability of two competing hypotheses to account for the paleodemographic, linguistic, and archaeological evidence underpinning this question. The first hypothesis posits that Proto-Tiwa split from Proto-Tewa in the Upper San Juan region, which would support the idea of a Mesa Verde migration. The second hypothesis suggests a split within the Tewa Basin, which would shift the argument in favor of in situ development. This research represents a small contribution toward a better understanding of the complexities inherent in the study of Ancestral Puebloan migration patterns.

Cootsona, Melanie (Barnard College)

[259] *Animal as Social Actor: A Case Study of a Pre-Colonial Northern Tiwa Structure*

This paper explores the role of animals as social actors, namely the way natural animal behaviors influence human religious settings. The paper focuses on the case study of a floor organization of a formally closed thirteenth century Northern Tiwa kiva in the Northern Rio Grande region of New Mexico. The worldview and beliefs of the Northern Tiwa were deeply shaped by the species and biomes with whom they co-habited. Through the synthesis of material data, ethnographic information and behavioral traits, we can begin to understand how the Northern Tiwa in the thirteenth century may have situated specific species within a landscape-based religion. The animal species highlighted within the case study of the kiva includes the North American porcupine, the American crow, the American bison, and four domesticated dog burials. This kiva at Pot Creek Pueblo (also known as T'aitōna) embodies a moment of heightened meaning, as it includes the floor burial of a young child (who likely suffered a traumatic death).

Corcoran Tadd, Noa (Harvard University)

[85] *Landscapes of Mobility in the South-Central Andes: From Chiefly Networks to Colonial Markets (AD 1100–1800)*

The great silver mining centers of Potosí, Porco, and Oruro in the Bolivian highlands have long formed an important focus for understanding the Spanish colonial world, both for the colonial imagination and for the contemporary historian. In comparison with the contexts of production and exchange based around these mining centers, however, their wider contexts of mobility and logistics within the altiplano and the valleys leading west to the Pacific coast have been comparatively under-investigated by historians and archaeologists alike. This presentation considers these peripheral and 'interstitial' landscapes and the communities they constituted (particularly as they articulated with prehispanic legacies of mobility and infrastructure) within the context of ongoing research in southern Peru and northern Chile. The resulting discussion highlights some of the ongoing tensions between multiple scales of analysis and between textual and archaeological sources of historical data.

Cordell, Ann (Florida Museum of Natural History), Neill Wallis (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)

[95] *Ceramic Petrography of Woodland Period Swift Creek Complicated Stamped Pottery in Florida and the Lower Southeastern United States*

Swift Creek Complicated Stamped pottery from the lower Southeastern U.S. is a premier material for the systematic study of Woodland period social interactions. Petrographic analysis of Swift Creek pottery was undertaken as part of a research program that 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. Over 200 samples have been thin sectioned from more than two dozen sites across Florida and Georgia, dating between AD 200 and 800. 91 clay samples from most of the sample regions were included for comparison. Petrographic analysis documented eight gross temper and/or constituent categories and eight matrix or petro-fabric groups (on the basis of presence/relative frequency of mica and siliceous microfossils). Most gross "temper" and petro-fabric categories are well represented in the sampled clays. The results indicate mostly local pottery manufacture within the northern regional site clusters, which encompass large ceremonial centers. Swift Creek pottery at the southern clusters contain an abundance of non-local vessels, especially at burial mounds. Integrative results indicate that interactions were geographically extensive, but clearly most intensive along particular corridors.

Cordell, Ann [95] see Duke, C. Trevor

Corl, Kristin (University of Texas at San Antonio), Kristina Solis (University of Texas at San Antonio), Robert Hard (University of Texas at San Antonio) and Michelle Carpenter (University of Texas at San Antonio)

[105] *Demographic Change through Analysis of Age Profiles of Burial Data*

A series of mortuary sites on the Texas Coastal Plain provide a dataset useful for analyzing demographic change through examination of age profiles. Other archaeological data suggest that populations peaked during the Late Archaic period (4000–800 BP) and sharply declined during the Late Prehistoric period (800–350 BP). Analysis of the ratio of adults to young individuals has been used to identify rapid population growth among other populations. Hunter-gatherer groups living in the Texas Coastal Plain developed complex and stable human-resource systems that utilized a variety of habitats across the Coastal, Riverine, and Inland Zones. The heterogeneity of available resource rich environments within a short distance enhanced resilience to resource fluctuations. This adaptation appears to have remained relatively stable for much of the Holocene providing the ecological context for rapid population growth. As part of a National Science Foundation grant, we are using burial data from a series of mortuary sites to identify periods of population growth and decline and how they compare to archaeological expectations, Late Holocene climate change, and other factors.

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Corl, Kristin [91] see Whisenhunt, Mary

Cornero, Silvia [7] see Castro, Juan

Corrales-Ulloa, Francisco (Museo Nacional de Costa Rica)

[260] *From Coast to Coast: Recent Research in Southern Caribbean and Osa Peninsula, Greater Chiriquí Region*

I present new data of investigations conducted in two almost unexplored zones on both coasts (Pacific and Caribbean) of the Greater Chiriquí Region. An exploratory survey, and test pit excavations of selected sites in the southern coast of Caribbean Costa Rica, allowed recording materials similar to those found on the Pacific coast. This reaffirms the proposed extension of related groups on both sides of the Talamanca mountain range. I provide comments about the relationships maintained between people of the Sixaola valley and the Bay of Almirante; as well as the establishment of the cultural boundary between the archaeological regions of the Central Caribbean and the Greater Chiriquí.

In addition, explorations near the Tigre River, located in the Osa Peninsula, Pacific coast, have provided evidence of two phases of occupation. Of the sites registered, Cantarero is a main center of the Aguas Buenas period. Recent excavations carried out at Cantarero shed light about the development of complexity in the long and still unknown Aguas Buenas period. The documentation of late sites nearby the gold bearing Tigre River, provides elements to discuss relationships with the Diquís delta, based on long distance control of gold sources.

[260] *Chair*

Correa, Itaci [141] see Vidal-Montero, Estefanía

Correa, Leticia (Leticia Cristina Correa) and Astolfo Araujo (Astolfo Gomes de Mello Araujo)

[2] *Paleoindian Site in Central São Paulo State, Brazil: Bastos Site, Dourado County*

Bastos site, located in central São Paulo State, provided ages between 7,600 and 12,600 cal BP. The lithic industry is composed by flakes on silicified sandstone, with rare unifacial retouch, without formal artifacts. The site probably represents a habitation area in a river terrace, later covered by alluvial fan. Refitting pieces attest the overall integrity of the spatial positioning of the archaeological materials. The site is the oldest found in São Paulo, and is contemporaneous to sites from Lagoa Santa and Pains regions, in Minas Gerais State. However, the lithic industry is unrelated to the ones found in these areas, suggesting the existence of a different Paleoindian group

Cortes-Rincon, Marisol (Humboldt State University), Jonathan Roldan (Humboldt State University), Cady Rutherford (University of Texas at San Antonio), Byron Smith (Humboldt State University) and Walter Tovar Saldana (Humboldt State University)

[18] *Utilization and Field Testing of LiDAR in the Maya Hinterlands*

Airborne LiDAR (Light Detection and Ranging) is an active remote-sensing technique which records the surface of the earth using laser scanning. The recent acquisition of LiDAR data for a portion of the Three Rivers regions in northwestern Belize offered the opportunity for a new way to analyze settlement and landscape utilization by the ancient Maya. This paper will focus on the systematic analysis of the dataset, ground verification, and post-processing methodologies. ArcGIS was used for the interpretation, LAS classification, and tiling of the maps for hand-held GPS (Global Position System) units. Household groups, single mounds, courtyard groups, depressions, and sacbeob were identified and verified during field surveys. Ground truthing took place during the 2017 field season of the Dos Hombres to Gran Cacao Archaeology Project (DH2GC).

Cortes-Rincon, Marisol [30] see Smith, Byron

Cory, Mackenzie (Indiana University)

[331] *Archaeological Field Schools Beyond Buzzwords: Engaging with Critical Pedagogy while Connecting with Administrative Goals*

Although archaeological field schools are widely accepted as a prerequisite for employment in the field, a disconnect has developed between universities sponsoring these courses and the instructors who teach them. Field schools are unique experiential learning opportunities, the value of which can be difficult to communicate to university administrators who set course minimum enrollments and summer tuition rates. Instead of just thinking of field schools as a means to teach skills necessary for future employment, archaeology instructors should engage with critical pedagogies that help us better translate the utility of field schools in an era of financial shortfalls and Responsibility Centered Management budget models in higher education. In this presentation, I discuss how the Bighorn Archaeology Field School (Indiana University) not only trains students in field techniques but also embraces a more critical approach by taking into account students' experiences and preconceptions. The instructors frame discussions of ideology, race, culture, and landscape that shape perceptions of the western plains and mountains where they work, through media, fiction, and experience. In addition, I argue that making use of the unique advantage of undergraduate students' understanding of new social media platforms to engage with the public is beneficial for all parties involved.

Cory, Mackenzie [5] see Herrmann, Edward

Cosentino, Serena [29] see Colantoni, Elizabeth

Coskunsu, Güner [85] see Iovino, Maria Rosa

Costa, August (Moore Archeological Consulting, Inc.), Jonathan Lohse (Moore Archeological Consulting, Inc.) and Stephanie Orsini (Moore Archeological Consulting, Inc.)

[217] *High Resolution Chronology and Paleobiogeography of Bison and Pronghorn Occupation in Southeast Texas and their Implications for Human Paleoecology*

Bison and pronghorn are taxa that have relatively high visibility in the archaeological record of the southern Plains. Understanding when bison and pronghorn were present in regions located in the southern Plains periphery is important for our general knowledge regarding bison/pronghorn ecology, climate, and environmental change in North America, as well as providing insights into human responses during these periods. Previous studies of the extent and timing of bison expansion into the southern Plains of Central Texas suggest this group's presence and absence constitutes a series of events that correlates to specific climatic excursions, with associated human responses. A comparable situation appears to prevail in Southeast Texas where bison are occasionally reported from Late Prehistoric archaeological contexts. Pronghorn, an animal with requirements similar to yet unique from bison, may provide additional insights on the timing and manner of change witnessed in both paleoclimate and human paleoecology in Southeast Texas. Stable and radio-isotopic analyses of bone collagen from bison and pronghorn can provide high precision data on both the timing and effect of different kinds of environmental change on human lifeways. We discuss the application of these techniques and present new direct AMS radiocarbon data on bison from Southeast Texas.

Costamagno, Sandrine [41] see Franklin, Jay

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Costin, Cathy (California State University, Northridge)**[121]** *Technology and Social identity on the North Coast of Peru*

Drawing on nearly three decades of inspiration from and collaboration with Rita Wright, this paper explores the relationship between craft technologies and social identities on the North Coast of Peru over the longue durée. The technologies used to manufacture goods were themselves meaningful, often considered to be divinely inspired and certainly a key element in determining the value and significance of both everyday and esoteric objects. As transformative processes, the methods and techniques of craft manufacture reflected the power of artisans to create and animate the material and social worlds. Importantly, within media distinct technologies were often associated with different genders, classes, ethnicities, and other aspects of social identity. Set within the context of the rise and fall of regional state-organized polities and waves of “contact” and conquest by more distant powers, I discuss how technological stability in some media reflected the persistence of autochthonic identities, “traditional” social structures, and indigenous claims to place, while the episodic introduction of new technologies—some developed locally and some “imported” by more distant conquerors—reflected the assertion of new loci of authority, the restructuring of sociopolitical relationships, and claims to different modes of prestige.

[216] *Discussant***[216]** *Chair*

Costin, Cathy [95] see Lawrence, John

Costopoulos, Andre (University of Alberta)**[219]** *The Impact on Mobility of Regional Variability in Rates of Environmental Change: An Agent-Based Simulation Approach*

I use agent-based computer simulation to evaluate the impact of regional scale variability in rates of environmental change on residential and logistical mobility. Previous regional case studies and simulation work suggest that high variability in regional rates of environmental change (in shoreline displacement, for example) should favour settlement strategies that reduce residential mobility and rely on logistical mobility. Those strategies should select longer-term residential sites that are environmentally relatively stable at a very local scale, and are surrounded by more rapidly changing

landscapes that provide logistical access to a variety of resources. I will test whether this pattern holds up when variability of the rate of change in more than one environmental variable is tracked.

Costopoulos, Andre [118] see Collard, Mark

Cottreau-Robins, Catherine (Katie) (Nova Scotia Museum), Jacob Hanley (Geology Department, Saint Mary's University), Paige Fleet (Geology Department, Saint Mary's University), Christopher McFarlane (Earth Sciences Department, University of New Bruns) and Brandon Boucher (Earth Sciences Department, University of New Bruns)**[21]** *Bay of Fundy Provenance for Pre-contact Copper Artifacts from the Maritime Peninsula, Northeastern North America*

We used non-destructive laser ablation inductively-coupled plasma mass spectrometry (LA-ICPMS) to compare trace element concentrations in 50 copper artifacts from a variety of pre-contact sites in the Maritime Peninsula (Nova Scotia, New Brunswick, Prince Edward Island and Maine), to natural copper samples from 16 geological sources in Michigan, Ontario, Pennsylvania, New Jersey, and the western and eastern regions of the Bay of Fundy. Of particular note is the contrasting composition of Lake Superior copper (elevated arsenic) and Bay of Fundy sources (elevated zinc). A Bay of Fundy provenance is unambiguous for many artifacts analyzed. Importantly, no artifacts have chemical compositions consistent with Lake Superior sources. The results establish the importance of local (Fundy) copper to pre-contact period Indigenous peoples of Nova Scotia and the Maritimes, negating the Lake Superior model. Furthermore, recognition of distinct eastern and western Fundy copper provenance within the artifact collection has significance in the broader context of territorial procurement of copper and trade relationships.

[21] *Chair*

Coughlan, Katelyn [241] see Sawyer, Elizabeth

Coughlin, Sean (ASC Group, Inc.) and Kelly Sellers Wittie (Row 10 Historic Preservation Solutions, LLC)**[90]** *Feeding New Orleans: Where's The Pork?*

In 2014 R. Christopher Goodwin & Associates, Inc., completed the analysis of the faunal remains from archaeological data recovery at the Colton School site (16OR562), Orleans Parish, Louisiana. Analysis of faunal remains from the site revealed a propensity for beef rather than pork, a finding that contrasts Sam Bowers Hilliard's statement on eating trends in the American South ca. 1860 as presented in his 1972 book *Hog Meat and Hoecake*. This article presents the result of this analysis and the journey taken based on those results. In many ways, like any good research project, this data raises more questions than answers and leads to avenues of research that need to be addressed by future research.

Coulthard, Ian [208] see Varney, Tamara

Countryman, James (University of Chicago)**[297]** *Ritual Production, Commodity Production, and Cultivating Agricultural Heritage in Ravni Kotari, Croatia*

Agricultural crops may be selected not only because they “work” from the perspective of agroecology, but also for their value in maintaining religious affiliation, historical memory, and community identity. Drawing on emerging archaeobotanical evidence from the Ravni Kotari region of southern Croatia, this paper discusses the challenges of understanding continuities of cultivation practices over multiple millennia in relation to changing political-economic contexts within which cultivation has taken place. I emphasize the production of *Olea europaea* and *Vitis vinifera*, two non-subsistence crops that emerged as central components of market-oriented production under the Roman Empire, and continue to provide the basis of commercial agriculture in the region today. The long-term transmission of these cultivars is complex. The ritual use of wine and oil within the Christian church may have sustained the cosmological importance of these crops through the geopolitically turbulent medieval period, while their commercial importance diminished. More recently, viticulture and oleiculture have become emblematic of “traditional” folk life and agricultural heritage, their consumption ritualized in new ways through agritourism. Ritual offers a lens for considering both the shifting social meanings of cultivated plants, as well as how and why certain practices can be sustained across social, cultural, and political disjuncture.

Courtright, Scott [268] see North, Chris

Coutros, Peter (Yale University)**[198]** *Flexibility against Fragility at the Diallowali Site System during the 1st Millennium BC*

The first millennium BC was a period of dramatic social and environmental change throughout West Africa. Along the Middle Senegal Valley (MSV), communities experienced rapid and dramatic changes to biospheric conditions accompanied by largescale technological, social, and economic reorganizations. On the western edge of the MSV, the inhabitants of the Diallowali site system developed a network of flexible institutions capable of

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maintaining a thriving community throughout this turbulent period. Despite the rapid and profound changes to the surrounding landscape, varying degrees of reliance upon hunting, fishing, agriculture, and animal husbandry, as well as long distance trade and craft production, contributed to over 700 years (1100–400BC) of intense occupation of the site system. Through an examination of changes in local conditions, and the synchronous shifts in settlement organization and subsistence practices, this paper investigates the social implications of intense and unpredictable climate change on Late Stone Age and Early Iron Age populations along the MSV.

Coutros, Peter [210] see Womack, Andrew

Couture, Nicole C. [87] see Blom, Deborah

Covarrubias, Miguel [37] see Plank, Shannon

Covert, Alexandra (Northern Arizona University)

[27] *From Water to Land: Analysis of Prehistoric Shell from Wupatki Pueblo*

This research focuses on the prehistoric shell artifacts recovered from excavations at Wupatki Pueblo. The shell artifacts from Wupatki Pueblo were analyzed in order to accurately determine the genus and species, artifact types, trade routes, and uses of shell. By looking at manufacturing techniques, this research determined if shell artifacts were traded or brought to Wupatki Pueblo as finished products by the Hohokam or if shell manufacturing occurred at Wupatki Pueblo. To determine the significance of shell artifacts at Wupatki Pueblo, the shell assemblage was compared to shell assemblages of other prehistoric northern Arizona sites and to shell assemblages from Hohokam shell manufacturing sites. Ultimately, this research adds valuable information about trade, migration, and social networks between the Hohokam and the Ancestral Puebloans, which is important to the understandings of function, complexity, ideology, adaptation, resilience, and the foundation of modern Pueblo cultures.

Covey, R. Alan (University of Texas at Austin)

[100] *Rethinking Inca Social Power in the Imperial Heartland (Cuzco, Peru)*

It is commonplace to note that the Inca Empire was the most powerful indigenous state in the Americas before the time of European invasions. Retrospective sixteenth-century Inca accounts played up the scale and intensity of imperial social power, but the ethnohistory and archaeology of the Cuzco region of highland Peru—the Inca capital region—indicate more nuanced networks of power across the imperial heartland. Using Michael Mann's typology for social power as a guide, this poster develops documentary perspectives on networks of ideological, economic, military, and political power in Inca Cuzco. The ethnohistoric review will consider some distinctive features of the Quechua conceptualization of social power, which will then be compared with regional patterns from Cuzco's rural hinterland. Settlement patterns from the Sacred Valley and Xaquixaguana Plain demonstrate some socioecological patterns to the development of Inca social power, as well as some intriguing trajectories for building royal power on local landscapes during the generations of Inca imperial dominance.

[100] *Chair*

Covey, R. Alan [100] see Payntar, Nicole

Coward, Fiona (Bournemouth University)

[83] *'All things being equal'? Multiplex Material Networks of the Early Neolithic in the Near East*

Archaeological network research typically relies on material culture similarities over space and time as a proxy for past social networks. In many cases, a range of different types of material culture are subsumed into reconstructed connections between nodes. However, not all forms of material culture are equal. Different types of objects may be caught up in rather different forms of social relationship—crudely put, 'personal' items such as jewellery may perhaps have more social and cultural significance than commodities, for example functional tools—and may thus be traded/exchanged/gifted in different ways. Analyses including different types of material culture may thus conflate multiple different forms of social relationship and patterns of connection. However, 'significant' and 'functional' are rarely mutually exclusive categories, and are always fluid, culturally and contextually dependent. This paper will investigate the multiple lenses different forms of material culture provide for studying social networks in the early Neolithic of SW Asia. What would a multiplex perspective for archaeological network research look like, and how might it impact on our understanding of past material cultures and social change?

[329] *Discussant*

Cowell, Shannon (New Mexico State University)

[69] *Micaceous Ceramics at Los Ojitos, New Mexico*

Los Ojitos (LA 98907) is a Hispanic New Mexican site occupied between 1865 and 1950 on the Pecos River in eastern New Mexico. Excavators recovered micaceous brownware sherds alongside American goods in household deposits and refuse scatters surrounding historic structures. A single ceramic type encompasses all micaceous wares found in the region: Middle Pecos Micaceous Brownware, dating AD 800–1300. A lack of typological guidelines for distinguishing prehistoric and historic micaceous sherds found at Los Ojitos limits site interpretation and throws into question all previous temporal assumptions about micaceous wares in the Pecos River valley. Research into micaceous ceramics in historic Hispanic contexts sheds light on gendered, multi-ethnic trade economies and the persistence of indigenous ceramics alongside mass-produced tablewares in American-period eastern New Mexico.

[69] *Chair*

Cox, J. Royce (Office of Archaeological Studies, Museum of New Mexico), Eric Blinman (Office of Archaeological Studies, Museum of New Mexico) and Shelby A. Jones-Cervantes (Scripps Institution of Oceanography at University)

[74] *Improving the Effectiveness of Archaeomagnetic Dating in the Southwest*

The theoretical foundations for archaeomagnetic dating are strong, and we enjoy more than 50 years of experience and practice in the Americas. Abundant independently dated burned sediments have supported the progressive refinement of secular variation (dating) curves as observed in the Southwest, improving the precision and replicability of date range interpretations. However, the performance of archaeomagnetic dating has not lived up to its potential as a source of reliable dating information, frustrating client archaeologists. This is in part due to the common use of an outdated statistical approach to deriving date ranges from the SWCV1995 dating curve. Despite curve refinements (i.e., SWCV2000), reliance on the old calibration and the statistical approach have often produced nonsensical date results. We address these issues through the use of a graphical approach to confirm the sensibility of dates and date ranges, and the use of alternative dating curves for some time periods. Further efforts to restore the credibility and extend the contributions of archaeomagnetic dating emphasize precision at all points in the process, including improved field sampling and laboratory measurement techniques, increased use of the recently available DuBois archaeomagnetic archive, and the initiation of new approaches to building and evaluating secular variation curves.

Cox, J. Royce [74] see Blinman, Eric

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Cox, Kim and Carolyn Boyd (Shumla Archaeological Research & Education Center)**[73]** *Using Rules from the Texas Lower Pecos to Interpret Jornada Mogollon Rock Art*

Four principal rules of interpretation for Pecos River Style rock art of the Lower Pecos region of Texas are proposed. These rules were proposed based on a commonality between Pecos River Style and the iconography of historic Corachol-Aztec speaking tribes such as the sixteenth century Mexica of central Mexico and the present-day Huichol of western Mexico. This presentation shows how the same rules can be applied to the interpretation of the rock art of other prehistoric Corachol-Aztec speaking groups such as the Jornada Mogollon of New Mexico, where, for example, their glyph for the Sun contains certain linguistic characteristics that operate outside of mere symbology and are more of a depiction of the name of the Sun than a representation of the Sun itself.

Cox, Maria (California State University, Chico) and Valerie Sgheiza (California State University, Chico)**[179]** *Number Games: MNI and Element Representation in the Point San Jose Collection*

The Point San Jose skeletal collection was excavated from a 19th century medical waste deposit. Remains within the deposit were completely commingled and highly fragmented. As re-association was highly unlikely, careful assessment of the commingled nature of the collection was required. To establish the Minimum Number of Individuals (MNI) represented in the collection, two approaches were used: Max (L,R) and an age-informed MNI. The maximum count per unique element resulted in an MNI of 22 (right talus), the age-informed MNI yielded an MNI of 25. When the Most Likely Number of Individuals (MLNI) was calculated, the results ranged from 19–38 individuals. As this collection originated from a medical waste deposit, the larger estimations cannot be disregarded. To further inform and explain the MNI and MLNI results, element representation was assessed. Frequency counts per element were obtained, as was information on side, distal/proximal, axial/appendicular, and upper/lower limb. As many of the long bones were fragmented, data was collected as to which portion of the bone exhibited damage. The results of this study will enable a better understanding of the use and origin of the deposit, as well as which portions of the body were most likely to be included.

Crabtree, Barbara [90] see Hofman, Jack

Crabtree, Pam (New York University)**[121]** *A Re-examination of the Animal Bone Remains from Rojdi, a Sorath Harappan Site in Northwest India*

The later 3rd and early 2nd millennium site of Rojdi in Gujarat, India was excavated under the direction of the Professor Gregory Possehl over eight field seasons between 1982 and 1995. Rojdi is an agricultural village with substantial stone architecture, most of which dates to the early second millennium (1900–1700 BCE). Significant progress has been made in our understanding of the Sorath Harappan culture, including detailed ceramic studies, analyses of archaeobotanical materials, and additional faunal studies, since the Rojdi excavations were completed in 1995. This presentation will re-examine the zooarchaeological data for herding strategies and hunting practices at Rojdi in light of the new archaeological and zooarchaeological data from the region.

[121] *Chair*

Crabtree, Pam [121] see Green, Adam

Crabtree, Stefani (The Pennsylvania State University)**[83]** *Using Food Web Models to Examine Desert Networks in the American Southwest and Western Australia*

Archaeological studies benefit from rich ecological data, yet linking ecological data to narratives of the past can be difficult. Here I use trophic network modeling to understand both Ancestral Pueblo and Australian Aboriginal food webs, comparing these systems for a greater understanding of human and environmental resilience. Here I show that Ancestral Pueblo people connected themselves into a greater environmental web and use network analysis to examine how the changing network properties of the Ancestral Pueblo food web led to vulnerabilities of the web to environmental stochasticity and anthropogenic change. I then calibrate the results from this study to ethnographic data recently gathered among remote living Aboriginal people in the Western Desert of Australia. I show how food web modeling can help us understand the cascading extinctions of small mammals following the removal of Aboriginal people to outstations in the 1960s. The utility of food web modeling for understanding the ethnographic dataset can then be extrapolated to the Pueblo dataset, indicating where and when the Ancestral Pueblo people became most vulnerable to environmental change. Ultimately I demonstrate that an unstable food web led to decreased resilience of the Pueblo people, forcing migration.

[234] *Discussant***[83]** *Chair***Craib, Alexander (University of Wyoming)****[81]** *Dalton Mobility in the Tennessee River Valley: An Assessment of Raw Material Use and Tool Curation*

Previous research in the Southeast has demonstrated that Dalton groups underwent a process of settling in to the landscape. This has been demonstrated through the identification of raw materials used for the production of Dalton hafted bifaces. A preference for locally available raw materials has been noted in previous studies, a departure from Clovis groups who routinely made use of non-local cherts. This trend has been well established outside of the Tennessee River Valley; however, little research has been done concerning the settling in of Dalton groups in this region. In order to test the hypothesis that Dalton groups in the Lower and Central Tennessee River Valley were also settling in, 187 Dalton points were analyzed for raw material type and amount of curation. All analyzed samples were originally collected by avocational archaeologists and subsequently donated to the McClung Museum of Natural and Cultural History. The collections used (Ernest J. Sims, Smeltzer, Cambron/Hulse) all possess exceptional spatial data with site-specific locational information. Results of this study are consistent with the trends previously identified, demonstrating that Dalton groups in the Lower and Central Tennessee River Valley were settling in.

Craib, Oliver [50] see Admiraal, Marjolein

Cramb, Justin (University of Georgia)**[20]** *Manihiki & Rakahanga: Archaeological Research on a Dual-Atoll Cluster in East Polynesia*

Archaeological fieldwork was completed on the atolls of Manihiki and Rakahanga, in the northern Cook Islands, from May to July of 2015 and from July to November of 2017. This includes survey and mapping on six islets, the documentation of extant and past fish traps and fishponds, lagoon to ocean shovel test sampling, and the excavation of habitation and resource production sites. This work identified village centers on each atoll and preliminary analyses indicate that the coral-cluster landscape of Manihiki and Rakahanga was intensively altered by past human practices. These include the creation of horticultural pits, coral fish traps, fishponds, curbed and paved pathways, marae, residential centers, and potential shoreline armoring. Furthermore, it appears that individual islets and marine areas were used differentially in manners conducive to the inherent production capabilities of each microenvironment. The data that continues to emerge from this ongoing research advocates that a complex human/environmental dialectic shaped these atolls and created the productive landscape present today. Additional research, including forthcoming zooarchaeological analysis and AMS dating, promises to improve our current understanding of these atolls' past, coral-cluster land use, and landscape creation practices.

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Cramb, Justin [13] see Cramb, Sara Lynn

Cramb, Sara Lynn, Justin Cramb (The University of Georgia), Haumata Tepania (Manihiki Atoll, Cook Islands) and Justine Tuatai William (Manihiki Atoll, Cook Islands)

[13] *The Ngake 001 Site: Surface Mapping and Subsurface Investigations*

The Ngake 001 site is located on Manihiki Atoll in the northern Cook Islands. In all, the site covers an area of roughly two hectares and consists of four coral-edged courts, two small coral-edged enclosures, a possible well, part of a lagoon shore path, and a mound and trench system that provides access to the islet's Ghyben-Herzberg freshwater lens. Multiple surveys, by the authors and others, suggest that the Ngake 001 site is situated at the center of a large prehistoric village complex that includes residential areas, marae, and cultivation areas. Furthermore, the site provides access to multiple resource zones including Manihiki lagoon, the ocean shore, and the shallow channel that connects the two. Subsurface investigations, include an ocean-to-lagoon shovel-test survey and multiple excavation units. Preliminary analyses of artifacts, including clam-shell adzes and pearl-shell fishhooks, indicate that Ngake 001 was utilized during the late prehistoric period before the arrival of missionaries in AD 1849 and possibly much earlier. Additional analyses will allow us to provide greater detail on the role of Ngake 001 as a habitation site, population center, and possible seat of chiefly power on Manihiki Atoll.

Crass, Barbara [50] see Krasinski, Kathryn

Crawford, Dawn (Southern Methodist University), Brigitte Kovacevich (University of Central Florida) and Michael Callaghan (University of Central Florida)

[28] *Terminal Classic Residential Groups at Holtun, Guatemala*

Holtun, located in the central lakes region of the Maya lowlands, was occupied from the Preclassic through the Postclassic. To date the Holtun Archaeological Project has mapped approximately 13 groups in the site core and over 30 residential groups in the periphery to the north. The majority of these surface residential structures date to the Terminal Classic and Postclassic. The residential groups excavated to date vary in their proximity to the site core, number of structures, construction investment, structure and plaza size, and patio space elements. Together these features can be used to discern possible socio-economic status of the inhabitants (Ashmore et al. 2004; Chase 1992; Gonlin 2004; Hirth 1993; Marcus 2004; Masson and Lope 2004:197; Robin 2013; Schwarz 2013). This paper presents an overview of the Terminal Classic residential groups excavated to date at Holtun from within the site core and the immediate periphery. Excavations focused on sampling residential groups across the site and cataloging the structures and plaza groups based on the above-mentioned criteria in order to better understand socio-economic status, access to resources, and local production patterns for a wide variety of inhabitants of a single site during the Terminal Classic period.

Crawford, Gary (University of Toronto)

[284] *The Shangshan Culture and Agricultural Origins*

The Shangshan Culture is among the first in China to be associated with at least one domesticated organism: rice (*Oryza sativa*). A decade of research on Shangshan is providing critical insight on events leading to Neolithic developments in the Lower Yangtze Valley. So far, some expectations are not yet confirmed: e.g., the Shangshan ancestors developed from a local Palaeolithic population, and the first farming developed in the rich lowlands. Collaborative research is documenting potential evidence of managed and domesticated rice as early as 11,000 BP and certainly by 8,500 BP. Research focuses on understanding the circumstances of Shangshan's location (upland, intermontane basins), settlement structure, technology, and human-environment interaction. In particular, by 9000–8500 BP sites are relatively large with, at least in some cases, substantial ditches constructed around or through them. The ditches appear to have been an important aspect of the Shangshan niche and they are hypothesized to have played a role in rice's early association with people.

[284] *Chair*

Crawford, Laura (The Ohio State University)

[50] *Ancient Alaskan Firewood Management Strategies and the Role of Selectivity: Preliminary Results*

When historic Alaskans chose a settlement site, access to adequate fuel was as important as the availability of food and water. Despite its importance fuel use in the Arctic and Subarctic has received relatively little attention. Work currently underway aims to clarify the criteria used to select fuel in ancient Alaska by testing two hypotheses. The Efficiency Maximization hypothesis, derived from the prey choice model of human behavioral ecology, proposes that Alaskans ranked woody taxa according to net energy acquisition, and preferentially selected highly ranked taxa. The Firewood Indifference hypothesis proposes that Alaskans were not selective but rather sought to minimize the energy and time expended gathering firewood without regard for the specific properties of different taxa. This pattern is predicted by the prevailing fuel use model, the "Principle of Least Effort" (PLE), but is at odds with ethnography, which indicates that Native Alaskans discriminate between and seek specific wood(s) with preferred properties. This paper reports the results of preliminary statistical analyses designed to determine which fuel-use model best explains the anthracological record for three Alaskan sites. These sites differ in cultural affiliation, ecological setting, and chronological position, and thus illustrate how different constraining variables determined fuel selection strategies.

Crawley, Andrea (New Mexico State University), Fumiyasu Arakawa (New Mexico State University), Jared Cicchetti (New Mexico State University) and Garrett Leitermann

[91] *Classic Mimbres Phase Archaeology: A Contrastive Study of Two Sites at the Headwaters of the Upper Gila River*

Classic Mimbres sites can be seen across the Mimbres Valley and Upper Gila areas. For one tributary of the Gila River, Diamond Creek, there are several of these sites that lay alongside it. As a part of the "Northern Mimbres Project," two sites—Twin Pines Village (a large Classic Mimbres village) and South Diamond Creek Pueblo (a small four room site)—have been excavated by New Mexico State University field schools over the course of three years. Our excavations and research of these sites have led us to better understand the relationship between large and small scale habitation during the Classic Mimbres phase in the Upper Gila. The relationships between these two sites can be observed in the differences in: 1) architectural style, 2) pottery assemblages, and 3) amounts of exchanged items. Based on the results of our field work, we argue that data from the Twin Pines and South Diamond Creek Pueblo sites offer a deeper understanding of the Upper Gila region as well as a broad perspective of the Classic Mimbres culture in the American Southwest.

Creager, Brooke (University of Minnesota)

[197] *Individual Christianity: A Post-Roman Practice in a Changing Landscape*

The individual is often overlooked in reconstructions of ritual activity, particularly within constructed spaces, where the repetitious nature of ritual obscures the signature of individual variance. Ritual actions are attributed to a group, or community, even burials are not the action or pure representation of an individual. The identification of the individual within a ritual practice highlights the variance accepted within a culture. In this case study of Early Anglo-Saxon Britain, individual practice demonstrates the degree of integration between two cultures: the Anglo-Saxons and the Post-Roman British. Ritual continuance from the Roman period is evidenced through Christian practices within the Anglo-Saxon cultural framework. The use of Roman ritual spaces, such as churches, provides insight into the role of cultural continuity, where the remnants of actions can be attributed to a

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small number rather than large groups of practitioners. This paper will explore the evidence for the use of Roman Christian spaces by a few Post-Roman peoples. Continuing ritual practices, in this case study of fifth- and sixth-century Britain, provide insight into the individual's role in maintaining, or rejecting, colonial ritual practices within the new cultural framework.

[197] *Chair*

Creel, Darrell [325] see Baustian, Kathryn

Creese, John (North Dakota State University)

[22] *Iroquoian Longhouses and Sociotechnical Assemblages*

A better understanding of the role of domestic dwellings in shaping past social relations is needed. In this paper, Northern Iroquoian longhouses are studied as sociotechnical systems. This approach allows us to appreciate how social relations were generated and contested in the very activities of building and living in houses. I examine a sample of pre-Columbian longhouses from southern Ontario, Canada. Variation in aspects of house construction, spatial layout, and ritual indicates that sociotechnical networks associated with different houses were variable in scale, durability, and organization. What emerges is the sense that a dynamic, driving tension between forces of collectivization and atomization, inclusion and exclusion, lay at the heart of longhouse life.

Creger, C. Cliff [261] see Pay, Nicholas

Cressler, Alan [90] see Simek, Jan

Creswell, Ebony (University of Wyoming)

[44] *Culture and Disease: Modeling the Spread of Tuberculosis in Wyoming*

Until recently, the development and spread of tuberculosis in humans has been associated with the advent of Old World animal domestication and agriculture. However, recent evidence for the presence of *Mycobacterium tuberculosis* raises the possibility of a Pleistocene era dispersal. Poor bone preservation and small populations make finding Pleistocene-era bioarchaeological evidence of the disease difficult. Coupled with this, epidemiological studies suggest that population numbers were too low for an epidemic to take hold. Reconciling the epidemiological theory with the limited bioarchaeological evidence for the disease requires a closer examination of how behavior would influence transmission. I examine this possibility and report on several agent-based models I created in R to ascertain how tuberculosis may have arisen and dispersed. I incorporate archaeological, ethnographic, and biological data in order to understand how different human cultural behaviors, such as communal hunting, and other factors may have affected the spread of tuberculosis among hunters, gatherers, and foragers. I believe these models can also be modified and adapted to understand the spread and dispersal of other epidemic diseases during other periods in human history.

Creuziger, Adam [77] see Foecke, Kimberly

Creveling, Marian (National Park Service) and Karen Orrence (National Park Service)

[202] *Thinking inside the Box: Research Potential of National Park Service Archeological Collections at the Museum Resource Center*

The National Capital Region of the National Park Service is rich with archeological resources as can be attested by the vast collection of objects stored at the Museum Resource center. However, for many collections, only a basic identification of the artifacts exists. Collections dating from early Native American habitation to the American Civil War to 20th Century Industrialization are available for further research that could lead to Master's Thesis or Dissertations. This paper will highlight some of the collections available for study.

Crews, Christopher (Museum of Indian Arts and Culture), C. L. Kieffer (Museum of Indian Arts and Culture) and Magdalena Wantschik (Museum of Indian Arts and Culture)

[15] *Accuracy of Museum Volunteer Measurements: A Study of Projectile Point Measurements at the Museum of Indian Arts & Culture, New Mexico*

In light of more and more museums relying upon volunteers, this study investigates the accuracy of museum volunteers taking measurements of projectile points for the purpose of documentation. Data collection was done by two archaeologists trained in lithic analysis, one anthropologist previously not trained in lithic analysis, and two retired volunteers with no previous training in lithic analysis. Volunteers received a crash course in measuring greatest length, width, and thickness prior to measuring hundreds of points from the individually cataloged collection at Museum of Indian Arts & Culture. Results of paired T-tests between categories of measurements indicated similar results between the archaeologists. However, statistical analysis between the archaeologists and previously untrained volunteers had various levels of significant statistical differences in various categories of measurements. This study also includes a discussion and analysis of re-measurements after additional training of volunteers.

Criado-Boado, Felipe

[319] *Moderator*

Crider, Destiny [263] see Willis, Kelsey

Crisà, Antonino (University of Warwick, Department of Classics and Ancient History)

[146] *Ancient Tokens, Communities and Cults in Sicily: A New Ongoing Research Project*

We usually consider tokens as 'alternative' coins or gadgets that are used for different purposes. When you visit a museum, you can store your jacket or bag in the cloakroom and then receive a token to claim your item(s) back at the end of your visit. Tokens were also commonly used in the Roman world. Archaeologists are still finding many tokens, also known as 'tesserae', but they often struggle to interpret and understand the tokens' functions and roles within ancient communities.

Luckily, the 'Token Communities in the Ancient Mediterranean' project is currently being undertaken by the University of Warwick to understand the scope of ancient tokens. As a research fellow, I am currently analyzing Hellenistic and Roman tokens discovered in Sicily and now kept in local museums. The scope of my paper is to provide a first-hand outline of this vital research. First, I present the whole project, assessing the archaeological evidence and describing a selection of Roman 'tesserae'. Then, I evaluate Sicilian tokens, offering a detailed account of unpublished finds. Such case studies are crucial for understanding the role of tokens within local communities, and reveal a wealth of information about economy, cults and religion on a regional scale.

Crispino, Anita [85] see Iovino, Maria Rosa

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Critchley, Zachary (Binghamton University)**[49]** *Iconographic Depictions of Spear-Thrower Use in the Ancient Andes*

Spear-thrower devices held a role around the world as a primary weapon and tool before slowly falling out of favor in certain areas for other projectile weapons. While it is widely accepted that spear-throwers were used by the people of the ancient central Andes, comparatively little research has gone into the role that they had as weapons of war, hunting tools, and objects of ceremonial reverence. Many Andean societies have rich traditions of art and iconography, often portraying human and supernatural figures wielding and using spear-throwers in a variety of contexts and with notable associated symbols, such as avian imagery. In addition, the Andes developed a unique style of spear-thrower and have produced many examples of spear-throwers with exceptional craftsmanship, leading me to believe that these tools were given special reverence.

This poster will present the findings of my project, in which I used a review of iconographic depictions of spear-throwers bolstered by physical specimens and associated artifacts to determine the wider significance that these tools played in society.

Crocker, Alicia [241] see Anderson, C. Broughton

Cromartie, Amy**[153]** *Mountain, Steppes, and Barley: GIS Modeling of Human Environmental Interactions In the Armenian Highlands during the Bronze and Iron Ages*

This poster investigates how Bronze and Iron Age communities around Mount Aragats, in central Armenia, managed their grassland environment through their subsistence strategies. I suggest that these distinct social and political societies not only participated in constructing a landscape of domestic cereal grains, such as barley and wheat, but also were participants in the ecology of this open mountain steppe environment dominated by Poaceae, Chenopodiaceae, and Artemisia. I investigate how the challenges of this volcanic mountain steppe such as microclimates, altitude, slope, and aspect may have influenced planting and grazing on this difficult, but fertile, terrain and contributed to the dependence on resilient cereal crops such as barley. To create these models, I combine regional digital elevation models (DEM), satellite imagery, with archaeobotanical datasets from the multi-period sites of Aparani Berd and Tsaghkahovit. I then use modern climate data and paleoclimate proxies to calculate growing degree days (gdd) for these cereal crops and predict optimal planting locations in relation to these sites. In addition, I consider how the unique social and political structures of these communities influenced these decisions and the impact of these choices on the mountain steppe ecology.

Cromwell, Richard-Patrick (University of Nevada Reno), Erin Herring (University of Oregon—Department of Geography—E), Chantel Saban (University of Oregon—Department of Geography—E) and Brianna Kendrick (University of Oregon—Department of Anthropology)**[38]** *Paleoecological Analysis Using Select Coprolites & Sediments Recovered from Paisley Caves, Oregon*

Coprolites recovered from archaeological context provide direct access to understanding past human interactions with their environments. The Paisley Caves of south-central Oregon are notable for the presence of hundreds of preserved coprolites, the oldest confirmed as being human in origin and approximately 14,350 cal. BP years old. Our project focused on analyzing a series of coprolites and their corresponding sediments to look for variabilities in the paleoenvironment in the area immediate to Paisley Caves during the late Pleistocene through the early Holocene. Using palynological, faunal, and parasitological proxies for evidence, the results showed a high degree of variability between coprolite and sedimentary sources, thereby allowing a comparison of mobile environmental signals versus stationary ones but related in temporal context.

Crosby, Hunter [305] see Dalpra, Cody

Cross, Austin (Department of Anthropology, Florida State University) and John Sabin (Department of Anthropology, Florida State University)**[102]** *Predictive Modeling of Early Archaic Bolen Site Distribution in Northwestern Florida, USA*

Site visibility has long been an issue for late Pleistocene/early Holocene research in the southeastern United States, partially due to modern forest cover and partially due to large portions of the Southeast having been submerged by more than 80 meters of sea level rise. However, a large number of Late Paleoindian/Early Archaic Bolen artifacts have been discovered in Jefferson and Taylor counties in northern Florida, including dozens from underwater sites that were inundated post-depositionally. Surface collecting underwater and on land has occurred in this area has also occurred for well over 100 years, which has produced a robust database of site distributions. By using GIS to conduct spatial analysis, we aim to determine what environmental factors led to Bolen site preservation. This model will map out where Bolen points occur in situ to positively weight areas for site preservation and selection and negatively weight extensively collected sites where they have not been found, in order to create a robust model for discovering new Bolen sites.

Cross, Kathryn [84] see Reeder-Myers, Leslie

Crothers, George [52] see Hummel, Rebecca

Crow, Kaitlin (New York University) and Norbert Stanchly (AS&G Archaeological Consulting)**[256]** *Preclassic Faunal Utilization at Pacbitun, Belize*

Archaeological excavations within the Belize River Valley region have produced robust faunal assemblages that have increased our understanding of the Maya use of animals during the Preclassic. At Pacbitun, located on the southern periphery of the Valley, large scale horizontal excavations are providing insights into animal utilization during the Preclassic period at the site (1000 BC—AD 300). These investigations have probed into plaza floors, residential and ceremonial platforms, as well as burials. The resulting conclusions have demonstrated a relatively narrow use of animals at the site as food resources but exemplify a significant use of freshwater and marine faunal resources, with evidence for the widespread use of the latter as raw material for Preclassic shell bead production. We offer varying interpretations for the substantial amounts of freshwater jute shells found at the site and discuss Pacbitun's role in long distance exchange networks to procure marine faunal resources. Investigations at Pacbitun demonstrate numerous avenues for the use of animals and help determine evolving space and social class dynamics over time. Finally, we contextualize faunal use at Pacbitun within the broader patterns of Preclassic animal use seen in the Belize River Valley.

Crow, Kaitlin [256] see Powis, Terry

Crowe, Douglas [177] see Cutts, Russell

Crowell, Aron (Smithsonian Institution)**[16]** *Comparing Archaeology and Oral Tradition at the Tlákw.aan (Old Town) Site, Yakutat Bay, Alaska*

Southeast Alaskan oral narratives describe the epic migration of an Ahtna Raven clan from its interior Copper River territory over montane glaciers to the Pacific coast at Yakutat Bay, where the group founded the village of Tlákw.aan (Old Town) and intermarried with Eyak and Tlingit lineages. The

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multi-cultural origins of the residents are reflected in architecture and artifacts excavated at the site by Frederica de Laguna in the 1950s and during collaborative Smithsonian investigations in 2014. Archaeological data verify many aspects of oral tradition and place the founding of the site in about A.D. 1550, while paleoenvironmental, archaeofaunal, and glaciological evidence also correlate with the traditional narratives. The study suggests that culturally-curated oral histories known as shkalneek in Tlingit, even if centuries old, may possess a substantial degree of demonstrable historical accuracy.

[206] *Discussant*

[16] *Chair*

Crowell, Elizabeth

[328] *Public Archaeology and Outreach in the Middle Atlantic Region*

The current paper will address the history of public archaeology and outreach in the Middle Atlantic region. It will focus on programs that engage the interested public to participate in archaeology. It will also look at the contributions of local and state jurisdictions and organizations to establish avocational archaeology certification programs.

Crowley, Erin (University of Minnesota)

[197] *Performing Feasts and the Use of Animals in Ritual Contexts in Iron Age Ireland*

Activities at large ceremonial complexes are interpreted as regional community endeavors that form group identities and reify social and political structures. Imposing monuments such as Dún Ailinne, Navan Fort, and Rathcroghan have provided tantalizing glimpses into ritual and ceremonial performances of the Irish Iron Age (500 BC-AD 500). Communal feasting has been suggested to be a key practice at these sites during the later periods of use. At feasts, social structure and identity are reinforced, wealth is redistributed, and political alliances are formed. In this way, feasts become a space for community concerns to be negotiated. The large hilltop complexes, however, are not the only ritual spaces in Iron Age Ireland. During the later prehistoric period, there is a proliferation of smaller ceremonial enclosures and barrow burials. Variation in ritual performance at these different sites provide insights into cultural concerns across different scales of society. This paper examines the role of animals and feasting at smaller hilltop enclosures and burial monuments of the later Iron Age in comparison to activities at the large ceremonial complexes, in order to better understand both ritual and ceremonial performance in these more private spaces and the social framework from which these practices develop.

[197] *Chair*

Crown, Patricia (University of New Mexico)

[115] *Room 28 in Pueblo Bonito: Architecture and Ceramics*

A small room in the north-central part of Pueblo Bonito, Room 28 is best known for the large assemblage of cylinder jars discarded in it. The UNM excavations reveal a complex history for the room, including use as an outdoor activity area perhaps under a ramada, construction of walls, remodeling, construction of shelving to hold the cylinder jars, and termination by burning. Ceramics, stratigraphy, radiocarbon and tree-ring dates provide the basis for understanding the sequence of use and abandonment. Backfill encountered in 2013 came from nearby rooms, providing information on construction and use of those rooms as well.

[115] *Chair*

Crown, Patricia [115] see Ainsworth, Caitlin

Cruz Quiñones, Jhon [64] see Chen, Peiyu

Cruzado, Elizabeth [168] see Connolly, Robert

Cruzado Carranza, Elizabeth (Louisiana State University)

[265] *The 2017 Excavations at Pan de Azúcar de Nivín: Insight into the Middle Horizon Occupation of the Middle Casma Valley, Peru*

Pan de Azúcar de Nivín is located 23km east to the city of Casma, in the small town of Nivín, at the right margin of the Casma River Valley in the Department of Ancash, Peru. In June and July 2017, a team of archaeologists from Louisiana State University carried out mapping and excavation operations at this important archaeological complex. Through limited excavations, architectural mapping, surface collection and the analysis of associated materials, the Proyecto de Investigación Arqueológico Regional Nivín (PIAN) explores the cultural prehistory of middle section of the Casma Valley.

Preliminary results of the stylistic analysis of pottery fragments combine with the appearance of the architectural layout indicate the presence of Middle Horizon and early Late Intermediate Period components at the archaeological complex. In this poster, I will introduce the region study, present the methodologies used in the field, and discuss the preliminary results of the analysis of the distribution of the ceramic fragments collected during the surface collection at the different architectural features at Pan de Azúcar de Nivín.

Moreover, the 2017 field work provides an opportunity to compare Pan de Azúcar de Nivín with other neighboring Middle Horizon and Later Intermediate Period groups nearby the Casma Valley.

Cua, Zaakiyah (Indiana University of Pennsylvania, Department of Anthropology)

[334] *Loyalhanna Lake: A Geoarchaeological Approach to Understanding the Archaeological Potential of Floodplains*

Unlike uplands, floodplains generally yield stratified deposits that may include deeply buried landscapes and archaeological sites. Most state specifications for cultural resources surveys require floodplains to be geomorphically evaluated in order to identify buried landscapes. This is most frequently accomplished via trenching, an effective, but timely, costly, and sometimes destructive method. This project reports on an alternative technique utilizing a multi-proxy methodology coupling geophysical survey with auger sampling. These non-invasive and limited-impact methods produce accurate results without causing extensive destruction to cultural resources. The study area, located along Loyalhanna Creek in Westmoreland County in western Pennsylvania, is managed by the US Army Corps of Engineers—Pittsburgh District (USACE). As a federal agency, the USACE is mandated to identify and preserve cultural resources by Section 110 of the National Historic Preservation Act (NHPA). Unfortunately, federal agencies often face limited staffing, resources and funding to address management of cultural resources. In addition to proposing a method for identifying buried landscapes, this project also provides a case study of partnerships between federal agencies and public universities; a mutually beneficial collaboration which provides agencies with data essential to land management while simultaneously providing students valuable opportunities to conduct cultural resource management assessments.

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Cucchi, Thomas (CNRS/NHM Paris), Lior Weissbrod (University of Haifa), Jean-Christophe Auffray (Institut des Sciences de l'Evolution de Montpellier) and Jean-Denis Vigne (CNRS/NHM Paris)

[125] *On the Origin and Dispersal of the House Mouse*

The house mouse is probably our most successful commensal and one of the most threatening invasive mammals to biodiversity. Until recent advances in bioarchaeology methods, the origin and dispersal of this elusive mammal and the history of its co-evolution within the human niche construction was highly speculative. Here, we would like to review our latest understanding on the origin of its commensal relationship with humans and the pace and vectors of its dispersal through western Eurasia; bringing together zooarchaeology, ethnozoarchaeology and evolutionary biology.

Cucchi, Thomas [125] see Hulme-Beaman, Ardern

Cucina, Andrea [176] see Renson, Virginie

Cuevas, Mauricio (Universidad Veracruzana) and Lourdes Budar (Universidad Veracruzana)

[93] *Agua dulce, Agua salada. Diferenciación de actividades pesqueras en el sistema portuario de la costa este de Los Tuxtlas*

El corredor costero al este de Los Tuxtlas delimitado por las lagunas de Sontecomapan, y del Ostión, los volcanes de Santa Marta y San Martín Pajapan y el mar del Golfo de México, fue el escenario prehispánico de una alta densidad poblacional que entre su desarrollo contó con el emplazamiento de un complejo sistema portuario.

Los recursos naturales que ofrecen los cuerpos de agua en esta zona sin duda fueron explotados para su consumo y comercio desde el Formativo Medio hasta el Clásico Tardío. Así lo demuestran los artefactos ligados a la pesca que han sido localizados en los 250 km² investigados sistemáticamente por el Proyecto Arqueológico Piedra Labrada-Sierra de Santa Marta y San Martín Pajapan, Los Tuxtlas, Ver. Entre los objetos registrados pueden observarse una clara distinción entre los contextos de piezas pulidas de basalto y el de guijarros de arenisca reducidos a los costados. En este trabajo se analiza la posibilidad de la delimitación por áreas de explotación que se llevó a cabo en los diferentes puntos del sistema portuario, a partir de la categorización de estos artefactos

Cullen Cobb, Kimberly [139] see Harrison, Ainslie

Culleton, Brendan J. [176] see Renson, Virginie

Cummins, Tom

[206] *"Cosas Extraordinarias": America in Early Modern Royal Spanish Collections*

This talk concentrates on objects from America placed in the Palacio Real in Madrid and the Escorial. They form various parts of several types of collections that in recognizing the heterodoxy of their appearance in display different contexts dispel the overarching notion of the cabinets of curiosity that predominates in histories of collections for this period.

Cuneo, Allison (Boston University)

[110] *Broken Minarets and Lamassu: The Propagandization of Heritage on the Front Line of the War in Northern Iraq*

The armed conflict in Iraq has produced a catastrophic humanitarian crisis, beginning with the take-over of Mosul by the Islamic State (ISIS) in June 2014 followed by their subsequent gains in its northern governorates. Since then millions have become internally displaced or left the country as refugees. These war-wearied Iraqis are struggling with a loss of identity and a lack of control over their lives, and these feelings are further compounded by the destruction of their as a result of the ongoing conflict. Thousands of cultural properties have suffered collateral damaged as a result of intensive armed combat, particularly as a result of aerial bombardment, and more directly by the systematic and overt campaign of genocide and cultural cleansing wrought by ISIS. The conflict has brutally underscored the linkages between cultural heritage, cultural diversity, and human rights. Based on personal fieldwork experiences in northern Iraq and activities with the American Schools of Oriental Research Cultural Heritage Initiatives (ASOR CHI), this talk discusses how the belligerents engaged in the current northern Iraq conflict have responded politically and militarily to the destruction cultural sites, as well as how Iraqi civilians in these war-torn regions are coping with the loss of local heritage.

Cunnar, Geoffrey (WCRM) and Edward Stoner (WCRM)

[87] *Thirty Years On, Considering Kelly's 1988 "Three Sides of A Biface", and Why It Matters for Great Basin Archaeology*

We argue that it is time to reconsider the use of the term biface in Great Basin archaeology and implement more heuristic terms in its place. In most instances, there is only one role or "one side of a biface" and that was to become a projectile point. It is time we recognize bifaces as such and acknowledge that preform morphology can be an indicator of temporal association and of social agents including children. Stage classification alone is limiting in terms of allowing us to broaden our understanding and interpretation of the archaeological record. We suggest projectile point preforms are useful proxies of skill and that the majority of complete preforms left in the archaeological record were terminal artifacts with so many mistakes they could not have been finished; hence they remain as complete preforms in the record. The use of refined terminology along with the implementation of the theoretical framework of the chaîne opératoire, careful technological assessments and recognition of the importance of lithic scatters gives us the opportunity to present more holistic site interpretations. These include the examination of the nurturing of children which will allow for a more comprehensive look and interpretation of ancient group composition.

Cunnar, Geoffrey [38] see Stoner, Edward

Cunningham, Doug [140] see Hurst, Stance

Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution)

[123] *Cultural Interaction and Creolization (or Transculturation or Hybridization or Mestización or Criollización) in the Studies of the Ancient Past of the Caribbean*

Traditionally, the ancient history of the Caribbean is viewed as one where one culture replaces or dominates another through time. These views were highly influenced by the perspective of the early Anthropologists who saw intercultural relations through the colonial lens of dominant cultures and acculturation. Despite this emphasis on cultural "purity," the history of Caribbean archaeology includes several scholars who viewed cultural interaction more as an exchange of ideas and material culture. Although called by other names, these models are similar to what today we call creolization. This paper offers a historical overview of these theoretical perspectives from the traditional Culture-Historic approaches and discusses how they compared with contemporary concepts of creolization and ethnogenesis.

[237] *Moderator*

[123] *Chair*

Cureton, Travis [325] see Arnett, Abraham

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Curley, Allison [139] see Thibodeau, Alyson

Curley, Angelina (Columbia University), Sylvia Wemanya (National Museums of Kenya), Emmanuel Ndiema (National Museums of Kenya), Jonathan Reeves (The George Washington University) and David R. Braun (The George Washington University)

[99] *Quantifying Basalt Artifact Weathering and Depositional Context: Insights from the Koobi Fora Formation, Kenya*

Stone artifact weathering is important for understanding the formational history of surface and in situ assemblages. While much of this work has focused on chert and other crypto-crystalline silicas, the weathering of basalt is under-studied. As a large proportion of the Early Stone Age record consists of basalt, it is necessary to explore the weathering process of this material. Characterizing basalt weathering currently relies on the subjective characterization of both mechanical and chemical weathering properties. This is problematic as the rate at which these processes accrue depends on the depositional context. Thus, it is necessary to systematically understand how various weathering attributes accrue in different contexts. Here, we present a systematic analysis of basalt weathering in a variety of different sedimentary contexts. Taphonomic attribute data was collected from lithic assemblages from the Koobi Fora Formation in different depositional and temporal contexts. Multi-variate analysis was used to determine whether quantitative color estimations, the presence of crystals, and degree of edge and ridge rounding could be used to discriminate basalts from different depositional contexts. A discussion of the preliminary results is presented.

Currie, Elizabeth (Department of Archaeology, University of York, UK) and Diego Quiroga (Universidad San Francisco de Quito)

[63] *How to Invent Your Past. Cultural Appropriation or Adoption of Orphan Cultural Identity?*

In January 2017, members of the indigenous Salasaca community of the central sierra region of Ecuador discovered a cache of pre-Colombian pottery during ditch construction work which passed through a site of ritual significance. The government organisation responsible for managing antiquities removed the artefacts, promising that archaeological investigations would be carried out in due course. They never were.

The cache of artefacts was a strange mixture of authentic ceramic figurines and vessels of a wide geographical provenience, none of which were from the Salasaca area. In the absence of formal excavations, it is unclear how they were deposited there in the first place.

The local community responded enthusiastically, seeing the artefacts as an important connection with their lost ancestral past. Some believed they were mitmakuna—peoples translocated by Inca conquerors in the 15th century from an alternative geographic location to replace rebellious tribes recently conquered. They had some oral traditions, but no ancestral connection with the land they had been brought to, suggesting this cache of artefacts filled a lacuna in their sense of cultural identity.

This paper discusses the importance of archaeology and material cultural in the construction of collective cultural identity and ancestral legitimacy.

Curry, Jessica [179] see Peters, Mallory

Curteman, Jessica (The Confederated Tribes of Grand Ronde), Briece Edwards (The Confederated Tribes of Grand Ronde) and Jon Krier (Oregon State University)

[303] *Storied Landscapes and Cultural Resource identification on Oregon's Paleocoastline*

The significance of cultural resources along Oregon's dynamic coast continues to have a stronger presence and recognition in landscape management. As future projects look to develop off Oregon's coast, there is a need for predictive modeling and analysis of cultural resources in a landscape that today is submerged. Paleolandscapes having high potential for a variety of cultural resources are identified using isostatic rebound adjustments and bathometric data. One such landform is off-shore of today's Tillamook Bay. Through historic documents, oral histories, and stories the distribution of cultural resources is mapped and rated. This gathered information along with off-shore paleolandscape reconstruction can begin to show the landscape's potential through an understanding of cultural practice.

Curteman, Jessica [331] see Edwards, Briece

Curtis, Caitlin (University of Wisconsin-Eau Claire)

[63] *Analyzing Urban and Industrial Threats to Heritage in Turkey Using Remote Sensing and GIS*

In Akçalar, Turkey, the location of the Neolithic-Chalcolithic Aktopraklık site, urban and industrial development present shocking social, cultural, and economic changes to the community. The local landscape is transforming as towering apartment complexes are quickly expanding into areas previously occupied by sprawling fields of crops. As documented ethnographically, these processes have heightened local awareness of the decline of community heritage values, like neighborliness, agricultural livelihoods, and green space. Furthermore, a diachronic ground survey has confirmed these dramatic changes in the previously small village over the last 5 years. Ahead of recent urbanization, industrialization of the area has expanded greatly in the last 20 years, especially in the designated industrial zone that surrounds the archaeological site. Indeed, ethnographic data indicates that factory construction in this zone has previously destroyed archaeological finds in its path. This study triangulates on-the-ground research with GIS and remote sensing analysis of satellite imagery and land use/land cover data to track the rapid development of this previously rural area. In particular, this analysis aids in planning future measures aimed at protecting valued archaeological and community heritage.

Curtis, Matthew [198] see Arthur, John

Cusicanqui, Solsiré (Harvard University)

[249] *Cajamarca: Identity through Movement*

The Cajamarca Valley, located in the northern Andes of Peru, is a space of encounter and movement of material from different ecological areas since early times to the present. This is mainly due to its strategic location within Andean geography as an enclave of natural points of access to different ecological zones (coastal valleys, Amazon rainforest, southern highlands). Cajamarca culture (100 BC—1400 AD) is characterized precisely by the mobility of its inhabitants, as indicated by their white pottery—a result of the use of the kaolinitic clay found in its mountains. Although we know much about this contact from the remains left outside its borders, we know little about cultural motivations and dynamics that took place in Cajamarca and what drove these people to move outside. Here, I will focus on two key points about the nature of this culture: its possible malleability in adapting to different ecological zones due commercial activity, and second, given its nomadic nature through the landscape, the way in which characteristic Cajamarca ceramic style was used as its seal of “denomination of origin”, and as a reminder of identity or political affiliation to the Cajamarca group.

[249] *Chair*

Cutright, Robyn (Centre College) and Carlos Osoro Mendives (Proyecto de Investigación Arqueológica Cerro la Gu)

[82] *A Tale of Two Cities?: Neighborhood Identity and Integration at Ventanillas*

Studies of Andean urbanism have often focused on contrasts: between elite and lower-class compounds or neighborhoods, between rural and urban communities, or between the “true” cities in regions like Mesopotamia and the “special case” of the Andes. Recent work at Ventanillas, a large Late

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Intermediate Period site in the middle Jequetepeque Valley at the frontier of coastal Lambayeque and Chimú polities, was initially designed to contrast what were presumed to be an elite coastal residential neighborhood and lower-class, possibly highland, hillside terraces. However, 2016 excavations on the terraces failed to confirm this easy assumption, and have complicated our view of who lived at Ventanillas. This paper compares subsistence remains, ceramics, and other artifacts across neighborhoods at Ventanillas, with the goal of elucidating similarities and differences between sectors, and, more importantly, exploring the extent to which residents living in different parts of the site participated in a shared cuisine, specialized in different economic activities, and expressed wealth and ethnic or cultural identities. We ultimately hope to speak to the ways in which Ventanillas neighborhoods were (and were not) socially and economically integrated at the community level and in the context of valley processes of social and political change.

Cutts, Russell (University of Georgia), Ervan Garrison (University of Georgia) and Douglas Crowe (University of Georgia)

[177] *Macro- and Microscopic Effects of Heating in Lithics: Potential Indicators of Human-Controlled Fire?*

Outside of clear association of human activities and fire features (e.g., a constructed hearth and artifacts), a perennial challenge persists in linking human/hominin behavior to the control of fire. This particularly vexes ongoing investigations to determine early human-fire interaction(s). Although natural landscape fires can be intense, their tendency to move quickly may limit modifications in lithic material at ground level. Studies examining the effect(s) of heating tool-stone at different temperatures and durations may provide insights on the question of human-controlled fire. As opposed to heat-treating material for improved flakeability, we report here on analyses examining macroscopic and microscopic modifications of various tool-stone (e.g., basalt, chalcedony, ignimbrite, etc.) at 250°, 500°, 750° and 1000° Celsius, and at different durations of exposure. Results indicate that consistent effects in lithics heated in high-energy, discrete, long-duration events (i.e., campfire) may corroborate other lines of evidence suggesting human-controlled fire. In that lithics are both a predominant human artifact and preserve well in the record, these techniques—in concert with other advances in the study of human-controlled fire—may be valuable to archaeologists, and in particular paleoanthropologists investigating potential human-fire features in early sites.

Cutts, Russell [41] see Hlubik, Sarah

Cynkar, Katherine [153] see Lane, Amanda

Czukur, Péter [295] see Duffy, Paul R.

D'Andrea, A. Catherine [210] see Mazzariello, Joseph

Dacus, Brandy [81] see Morrow, Juliet

Daehnke, Jon (University of California, Santa Cruz)

[201] *Sovereignty, Colonialism, and Collaboration: Reflections on Archaeological and Ethnographic Work on the Lower Columbia River*

Over the course of the last two decades I have been actively involved in anthropological research along the Lower Columbia River. This includes archaeological field work conducted within and just outside of the boundaries of the Ridgefield National Wildlife Refuge in Washington, as well as a heritage ethnography completed in collaboration with the Chinook Indian Nation. This research has happened on both federal and private lands and has involved multiple “stakeholders,” including both federally recognized and non-recognized tribal nations. This work has also been conducted in a region where heritage claims and archaeological sites are occasionally contested, and where the cultural connections and “authenticity” of tribal communities are at times questioned. In my presentation I'll reflect on the challenges of navigating my responsibility, and positionality as an anthropologist—especially one committed to “engaged,” ethical, and community-relevant research—in an arena where multiple interests and jurisdictions intersect. I'll argue that although negotiating my position as a researcher can be difficult, a focus on the centrality of tribal sovereignty (both as it's legally defined and enacted by communities), as well as constant mindfulness of the continuing manifestations of colonialism, can offer guidance for an appropriate and engaged research path.

Daggett, Adrienne (South Carolina SHPO) and Lu-Marie Fraser (University of Pretoria)

[32] *Subsistence Technology in Early Iron Age Botswana*

Analysis of the faunal assemblage from Thabadimasego, an Early Iron Age site in northeastern Botswana, contributes to the growing notion that hunting played a larger-than-expected role in the subsistence pattern of the area's communities. Beyond understanding what they ate, what do the faunal remains tell us about the subsistence technology of Botswana's Early Iron Age? Recent studies have focused on metallurgy and ceramic technology, but faunal patterns can provide information on the use of other technologies, including ones that don't usually survive in the archaeological record. This paper will discuss the evidence for the use of ephemeral materials as indicated by Thabadimasego's assemblage, as contextualized by evidence from other regional sites.

[228] *Chair*

Dai, Xiangming

[45] *An Analysis on the Taosi Cemetery from the Late Neolithic in North-central China*

Taosi is one of the largest sites surrounded by the huge fortification during the late Neolithic in the middle Yellow River valley. So far the archaeologists have excavated a large cemetery, and uncovered a number of burials at Taosi. These burials can be divided into a few categories based on their scale, structure and grave goods, representing the different social ranks. The cemetery consists of several sections, which represent the different social groups. During the early Longshan period, some large tombs were arranged in an area according to their sex and status at first, and then the other large tombs were centrally distributed in another area. During the late Longshan period, a group of large tombs appeared in another district, and the largest one of them with very complex structure and abundant luxury goods was located in a special area alone, so that it looks like a king tomb. In general, this paper will discuss the social change of the Taosi site on the basis of its cemetery analyses.

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Dakovic, Gligor (Belgrade University / University of Pittsburgh)

[303] *Preliminary Analysis of Landscape—Social Complexity Relationship Changes from Neolithic to Bronze Age in South Carpathian Basin*
The onset of the Early Bronze Age saw increasing degrees of social inequality and institutionalized leadership in most of Europe. In the Carpathian Basin these changes are most evident in shifts in burial practices and settlements. This research aims to see if these changes are reflected in regional settlement patterns by applying spatial analyses to two periods of a regional settlement dataset. I will examine the landscape and the environmental characteristics of Neolithic and Bronze Age settlements and their respective catchments and compare the settlement pattern to a random distribution to determine the extent to which environmental and sociopolitical concerns shaped human settlement. Shifts in demographic focus from Neolithic tell settlements to Early Bronze Age cemeteries will be tested by examining network properties of 'centrality', and the emergence of new elite controlled trade by looking at the 'betweenness' of the settlement pattern. The importance of warfare during the two periods will be compared by examining defensive features like buffers zones or the utilization of less accessible areas.

Dalan, Rinita [156] see Hargrave, Michael

Dale, Jedidiah [116] see Erickson, Clark

Dallas, Herb

[38] *Revisiting CA-VEN-1 and Millingstone Culture Re-examined*

The concept of Millingstone has long and intriguing history in California Archaeology. Millingstone conjures up visions of early, simple, crude tools, and a confusing legacy. Millingstone Culture is not easy to define, though it is quite consistent throughout its geographic distribution. Millingstone never fit clearly into earlier theoretical paradigms. Millingstone has been variously described as a technology, as a culture, as an adaptation, as a Horizon, as a tradition, as a regional pattern, and as a subsistence strategy. Perception and interpretation of Millingstone sites have often been colored strongly by early investigations of these settlements. Using an updated paradigm of the coastal migration theory can offer some new insights into redefining older interpretations of Millingstone sites. I use newer data from the "Little Sycamore" site to show how broader research questions and newer data collection methods can shed new light on Millingstone and its interpretation.

Dalpra, Cody and Hunter Crosby

[305] *Historic Evidence of Social, Economic, and Gender Issues at Petrified Forest National Park: Variability in the Archaeological Signature of Historic Homesteads*

The archaeological "wealth" in Petrified Forest National Park (PEFO) of Northeastern Arizona is not isolated to the well-known Ancestral Puebloan populations, but similarly includes Historic peoples. The westward expansion of the late 19th and early 20th centuries in Northern Arizona represents a time of clashing cultures and a period of uncertainty combined with untold risks and rewards. Along the Rio Puerco in and near PEFO are five homesteads from this period that display different and unique signatures that suggest varied occupants and functions. From "Cowboy Camps" occupied primarily by males working the range to significantly larger homesteads that display evidence of women with Chinese and other fine porcelain, which is not seen on other contemporary sites, demonstrates variability. The diverse signature of these sites represents a prime case study for the varied peoples who came to the area now occupied by PEFO. These sites demonstrate that even in seemingly homogeneous times diversity is present, describing more facets of the historic homestead populations than is previously thought. A contrast and comparison of these sites demonstrates the varied archaeological signature tied to the early historic ranching culture of the area; a ranching culture that continues today with the parks neighbors.

Dalton, Jordan and Paula Patricia Moreno Zapata

[100] *Exploring Local and Imperial Strategies in the Chincha Valley*

Inca archaeologists have regarded the Chincha Valley as a special case of imperial expansion due to the privileged position that the Chincha held within Tawantinsuyu. From the ethnohistoric documents we learn that the Chincha Kingdom was powerful, controlling long-distance maritime trade to Ecuador. The Chincha also relied on a highly specialized economy composed of fishermen, merchants, and agriculturalists. Previous studies of the Chincha Valley have emphasized coastal centers of fishermen and merchants, but in this poster session I present new research on how the large agricultural center of Las Huacas accommodated economic changes during the Late Horizon (A.D. 1470–1532). The archaeological site of Las Huacas covers 105-ha. and contains unique stratigraphy, a 2.5 m deposit that accumulated throughout the Late Horizon. This deposit is composed of various layers of fill and distinct floors, allowing us to establish a fine-grained chronology within the Late Horizon and explore changes that were brought about by the Inca occupation of the valley. By analyzing the cultural artifacts, plant material, faunal remains, and a series of architectural transformations associated with these distinct levels, this poster will present recent research on which activities at Las Huacas changed and which remained largely unchanged during Inca occupation.

Daltroy, Terence (Columbia University)

[170] *Discussant*

Damasceno Barbosa, Antônia [116] see Rebellato, Lilian

Damick, Alison (Columbia University)

[259] *Deep Ecology: An Introduction and an Inquiry*

Archaeology has engaged with ecology in various ways over the years. Recently, post-humanist thinking has gained popularity as an approach, urging us to think about human and non-humans relationally, as having contingent qualities that vary in relation to their interaction over time. Simultaneously, we see increasing attempts to think with indigenous philosophies and descendent communities about what the environment is and does. However, there remains a disconnect between approaches that seek to include indigenous philosophies and/or post-humanist approaches, and much work of the ecological sciences which are developing at a rapid pace, providing greater precision and clarity of information. This paper considers the history of archaeology's relationship to the idea and study of ecology, and proposes the concept of "Deep Ecologies" as an approach to human-nonhuman interactive pasts that offers the opportunity to bridge some of these perceived divides, while also being attentive to the politics of attempts to do so and the appropriative histories of archaeological work in this vein. It serves as an organizing thesis statement for the session, which presents attempts to grapple with the idea of "deep ecology" through ten years of archaeological fieldwork in northern New Mexico.

[259] *Chair*

Daneels, Annick J. E. (IIA-UNAM Mexico)

[128] *Making Sense of a Holy Trinity: The Dioses Narigudos of Classic Period Central Veracruz*

Dioses Narigudos are a series of ceramic figurines that are extremely frequent during the Classic period in a very restricted area of South Central Veracruz. They occur generally in ritual deposits under floors of major and minor buildings, combining female and male representations of different hierarchy. Current interpretations relate them to a solar deity or a water deity, none of which identifications apply to all three main figurine types. Their

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attributes and the contexts in which they are found would suggest they are used not only to sacralize the space but also the persons who inhabit the built spaces under which they are placed. This leads me to relate them to a deity similar to the later Postclassic Nahua Tlaltecuhli; to argue this I use the model of numbered ritual deposit proposed by Dehouve for the investiture of persons of authority, and the female/male elements related to the Classic Gulf Coast Water/Earth Mountain supreme being as analyzed by Koontz and Wyllie.

Daneels, Annick J. E. [285] see Pastrana, Alejandro

Dani, János [245] see Riebe, Danielle

Danis, Ann (University of California, Berkeley) and Ruth Tringham (University of California, Berkeley)

[309] *Doing Senses: Methods and Landscapes*

In this paper we discuss methods for what Yannis Hamilakis (2013) has called “sensorially reconstituted archaeologies.” Rather than being strictly focused on single mode sensory experience in the past, such archaeologies cannot be done without a self-reflexive awareness of multisensorial elements in every experience and event of modern archaeology and the imagined past. The theoretical goals of such a large-scale shift in thinking about archaeology and the senses have already been laid out, but they have yet to be borne out in practice. Our goal is to guide the “doing” towards an expanded toolkit of methods, some from within archaeology and some from other disciplines, that access, interpret, represent, and evoke sensorial attention. We pay particular attention to methods linked to landscape archaeology and our personal practices in the North American Southwest and Turkey.

Danis, Annie [239] see Peckham, Moira

Dardeniz Arıkan, Gonca (Koc University) and Tayfun Yildirim (Ankara University)

[71] *Metal and Vitreous Production Technologies at the Early Bronze Age Resuloğlu (Central Anatolia, Turkey)*

Modern day Çorum is the homeland of the Hatti people, the culture that later formed the Hittite Empire. Resuloğlu, dated to the Early Bronze Age (ca. 2500–2100 BC), is one of the few Hatti sites being systematically excavated. The site, located on a hilltop near the Delice River, consists of a cemetery area and settlement that spreads over two opposing–once connected–ridges with numerous extraordinary metal and vitreous artifacts. The settlement exemplifies well the self-sustaining pre-Hittite societies in the Halys basin.

This research focuses on the Early Bronze Age metal and vitreous artifacts at Resuloğlu to understand the production technologies by combining archaeometric methods with archaeological theories about integrated crafts. While comparing and contrasting the technology and raw material exploitation at Resuloğlu with the available local and regional data, we will also present the results of the new ongoing survey at the region. By using the archaeometric and survey results of Resuloğlu, we would like to bring a fresh look to theories of possible local production(s) region and trade relations of Hatti before the Hittite Kingdom emerges.

Darling, J. Andrew (Southwest Heritage Research, LLC), Barnaby V. Lewis (Tribal Historic Preservation Office, Gila River In) and M. Kyle Woodson (Cultural Resource Management Program, Gila River)

[72] *Nuh nuhy Himdag. The Role of Song in the Identification of O’Odham Traditional Cultural Properties*

The Gila River Indian Community Tribal Historic Preservation Office and Cultural Resource Management Program have been engaged in Traditional Cultural Property (TCP) inventory for more than two decades. This presentation considers the role of Nuh nuhy Himdag (song culture) in TCP identification with specific reference to a recent study of Vainom Do’ag (Iron Mountain), which, based on a ruling by the United States Board of Geographic Names in 2008, was named Piestewa Peak in honor of the first Native American woman to be killed in combat while on active duty in the United States military. New translations of the Vainom Do’ag song in the Ant and Oriole series reveal the significance of this TCP, while demonstrating the fundamental misunderstandings that can arise when the naming practices of two cultures confront one another. In spite of recent advances in the recognition of TCPs in cultural resource management, this study acknowledges that the O’Odham can never be free of the cultural appropriation that continues to be part of the national process and the accommodation that is required for Tribes to perpetuate their own culture within federally legislated frameworks.

Darras, Véronique (CNRS—University Paris 1 Pantheon-Sorbonne) and Brigitte Faugère (University Paris 1 Panthéon-Sorbonne)

[262] *Sociopolitical and Cultural Renewals during Late and Terminal Formative in the Lerma’s Valley: The Post-Chupicuaro Developments*

Chupicuaro reached its cultural and demographic peak between 400 and 100 BCE. This Formative culture was integrated into the western Mesoamerican sphere and was characterized by its homogeneity, with diversified but still poorly understood relationships with Central Mexico, particularly in the sites of Cuicuilco and Cerro de los Tepalcates, and Tlaxcala-Puebla area. The decades before our era underwent both socio-spatial reconfigurations, probably due to rapid environmental change in the principal cultural epicenter, the valley of Acambaro, which was massively depopulated. The synchronicity of these evolutions with the events that took place in the Basin of Mexico or the regions of Puebla Tlaxacala is particularly striking. The recent works carried out in two zones of the Lerma region, the valley of Acambaro itself, and the alluvial plain of Lerma some 100 km downstream, lead to revisit the current assumptions on the directions of population movements that signal the end of Chupicuaro and which mark the beginning of new processes embodied by Protohistoric societies in north-central Mexico. These societies are characterized by their diversity, at least through their material culture, and display more or less intense links with Teotihuacan.

D’Arrigo, Rosanne [213] see Buckley, Brendan

Darrington, Glenn, Kathryn McDonald (Confederated Salish and Kootenai Tribes), Mary Rogers (Confederated Salish and Kootenai Tribes) and Kevin Askan

[183] *Trails, Trees, and Transmission Lines—A Holistic Cultural Resource Study Involving the Jocko Wilderness Area*

The Jocko Wilderness Area is located in the southeast corner of the Flathead Indian Reservation in Montana. In 2015 a cultural resource study involving the Jocko Wilderness Area was initiated to assess the past, current, and future effects of an existing NorthWestern Energy electrical transmission line that was constructed in 1964. This study, undertaken by the Confederated Salish and Kootenai Tribes (CSKT) Preservation Office, integrated multiple avenues of research including historical records review, ethnographic interviews, and archaeological field surveys to identify a number of historic properties that are of immense importance to the CSKT. This holistic approach also helped in the development of effective management strategies to help protect and preserve a dynamic area with living cultural resources during the future operation and maintenance of the transmission line.

Darvill, Timothy [190] see Ruby, Bret

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Daugherty, Sean, Alexander Vermillion (Morehead State University/The Craft Academy), Garrett Jones (Morehead State University/The Craft Academy) and Timothy Hare (Morehead State University)

[190] *The Map Results of an Integrated UAV-Based Remote Sensing Platform in the Northern Yucatán*

We report the results of testing a UAV-borne LiDAR and multispectral mapping system for archaeological mapping and modeling at the city of Mayapán, Mexico, located 40km south of modern Mérida. Mayapán was the largest Postclassic political capital and was one of the most densely nucleated of all Maya cities. The initial test is in an area adjacent to the south side of Mayapán's monumental center. Previous research indicates the existence of a dense and complex system of residential and public architecture covered by low dense surface vegetation and a high forest canopy. Additional zones were randomly selected based on types of surface vegetation. The resulting data are processed in a variety of geographical information systems, photogrammetric software, and 3D modeling applications to generate final maps and models of the study areas. We compare these products with previous maps of the region, including those of the Carnegie Project from the late 1950's, total station and GPS-based maps, and a digital elevation model from the 2013 Mayapán LiDAR Mapping Project.

Daughora, Linas [43] see Harvey, Virginia

Davenport, Bruce [63] see Erlingsson, Christen

Davenport, James (University of New Mexico)

[265] *Three-Dimensional Photogrammetric Modeling of Ceramic Whole Vessels from Pachacamac, Peru: Challenges, Considerations, and Applications*

In recent years, photogrammetry has emerged as a low-cost solution for the digital preservation of archaeological sites and artifacts. Beyond preservation, the creation of three-dimensional models allows archaeologists and researchers to ask questions of objects or sites remotely and at more refined scales. It also allows sites or active excavations and objects not on display to be accessible to the public. Whole ceramic vessels from Max Uhle's 1897 excavations at Pachacamac, curated at the Penn Museum, were recorded using photogrammetry. The sample was excavated from several locations at the site of Pachacamac, including the Temple of the Sun and the Temple of Pachacamac, and includes ceramics in Inka, Ychsma, and earlier styles. These vessels included both closed and open forms, like plates, bowls, and cups. This poster examines the challenges in using this method to record ceramic vessels, as well as the potential applications for academic research and public outreach using the 3D models.

Davies, Gareth [139] see Knaf, Alice

Davies, Gavin (University of Kentucky)

[176] *Routes of Resilience and Dependency in the Lake Atitlan Basin of Highland Guatemala*

Combining archaeological, ethnohistoric and ethnographic data with an analysis of least cost routes, the current paper examines the network connections and craft industries that fueled Lake Atitlan's prehispanic economy and connected it to the wider Mesoamerican World. The documentary evidence, which I synthesize here, indicates that the lake's principle exports were perishable goods such as textiles, mats, rope products and foodstuffs. While insufficient to produce significant wealth, I argue that the diversity of products available in the lake area enabled its communities to weather broad scale political and economic fluctuations and to retain strong collective identities even during times of political integration. Correspondences between historically documented trade routes and ceramic imports indicate that the essential infrastructure for these industries was in existence by the Early Classic Period.

Davis, Allison (U.S. Department of State)

[322] *Discussant*

Davis, Christopher (University of Illinois at Chicago)

[73] *Conspicuous Knowledge Transmission through Amazonian Cave Art*

Among large-scale societies, esoteric knowledge is often exploited for power, prestige, or status. In such a social framework, it becomes important to guard the transmission of esoteric knowledge, restricting access by exclusive mechanisms of indoctrination or co-option. When discovered, evidence of guarded knowledge often flags the attention of the archaeologist because of its often meticulous preservation. However, if the same knowledge were conspicuous, unguarded, and socially mundane, evidence of it is less likely to preserve as well archaeologically, and archaeologists might be more inclined to underestimate its cognitive sophistication. Ancient rock art paintings conspicuously placed on the ceiling of a cave along the lower Amazon River conveys sophisticated astronomy knowledge that parallels knowledge chronicled during contact and historical periods from oral transmission. Archaeological excavations of the cave and region reveal low-density populations since the earliest period of human habitation over 13,000 years ago, during the same period that most of the red ochre pictographs were painted. Here, I argue that this small-scale society transmitted sophisticated knowledge through conspicuous rock art, which later transferred, or was re-imagined, through oral transmission. This example provides evidence for the importance and awareness of sophisticated knowledge maintained, and perhaps originated from (often overlooked) traditional cultures.

Davis, Dylan (Binghamton University)

[52] *Filling in the Map: Object-Based Image Analysis and Its Potential for Shell Ring Identification on Hilton Head Island, SC*

As a resource, the archaeological record is finite and remains largely incomplete. Within the context of Southeastern American archaeology, the incompleteness of the record can be seen in the study of shell rings. Many unidentified shell rings exist in the archaeological record, and their detection remains difficult—even with remote sensing techniques—due to the fact that many are located under heavily forested canopies. However, with the use of object-based image analysis (OBIA), such archaeological features can be rediscovered. Utilizing LiDAR data and a method known as "template matching," this study creates elevation and shape profiles to search for previously unknown shell mound sites throughout Hilton Head Island, South Carolina. This method has been successfully applied for similar purposes in other regions of the world, but has not been tested in the American Southeast. As such, this research offers a new means by which shell mounds and shell rings can be identified and further studied. Furthermore, this new method has the potential to be implemented worldwide for various archaeological purposes, including that of site and feature identification.

Davis, Jeffrey (Northern Arizona University), Julie Hoggarth (Baylor University), Jaime Awe (Northern Arizona University) and Chrissina C. Burke (Northern Arizona University)

[37] *Terminal Deposits and Terminal Classic Collapse: An Analysis of the Proportional Distribution of Artifacts from Terminal Deposition Events at the Site of Baking Pot, Belize*

Throughout the Maya Lowlands, archaeologists have identified Terminal Classic deposits associated with the final activities in ceremonial and domestic spaces. These features include concentrations of cultural material deposited in the corners of plazas and courtyards. At the site of Baking Pot, Belize, the Belize Valley Archaeological Reconnaissance (BVAR) project has identified several of these terminal deposits. This presentation will shed light on the types of artifacts that were deposited during these final events to answer questions related to the nature of abandonment activities. We also employ this data to identify the cultural significance of ritual deposition of cultural materials, to ascertain how distinct combinations of artifact classes can yield

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information on human behavior, and to demonstrate how the terminal deposits at Baking Pot offer additional information about abandonment activity in the Maya Lowlands.

Davis, Jennifer

[203] *The Walter Landgraf Soapstone Quarry State Archaeological Preserve: Honoring a Man and Preserving a Site*

Soapstone was a valuable raw material for the production of items used in food preparation, including cooking vessels, in eastern North America before the development and spread of ceramic technology. Durable, waterproof, fireproof, nearly impervious to thermal shock and, at the same time, soft and very easy to extract and then sculpt into a desired shape, the demand for this raw material was high but supply was geographically constrained. Designated a Connecticut State Archaeological Preserve in 2015, the Walter Landgraf Soapstone Quarry is an intact soapstone extraction site associated with a habitation, the Ragged Mountain Rockshelter. At least five unfinished and "unharvested" bowl forms are visible at Locus II, the primary soapstone source at the site. Excavation of the quarry, the discovery of numerous, primarily quartzite quarry picks, and a series of quartzite cobble workshops nearby the quarry provides an opportunity to investigate an important, multi-tiered industry in ancient Connecticut. The concept of "disruptive innovation" as initiated by the introduction of ceramic technology is offered to explain the abandonment of the Walter Landgraf quarry more than 2,800 years ago.

Davis, Kaitlyn E. (University of Colorado, Boulder)

[27] *Smoking Customs and Plains-Pueblo Interaction in the Southwest Border Pueblos*

This project centers on Plains-Pueblo interaction in the late-prehistoric and protohistoric periods. It analyzes how trade and inter-regional interactions were ritually mediated between these two culture groups, through the examination of pipes and smoking materials used in economic interactions at pueblos in the Northern Rio Grande area of New Mexico. Ethnographic and ethnohistoric literature indicates that pipe-smoking was part of rituals that cemented inter-tribal trade relationships. The data from this project support the idea that pipes were used in trade negotiations and ceremonial interactions and can be proxies for examining social interaction and regional mediation aspects of trade and decision making. The blending of Plains and Pueblo pipe forms and materials suggests that there may have been a certain level of integration, alliance, or partnership in these interactions. Three categories of data totaling 1,306 pipes were analyzed from known trade centers and comparative samples from interior sites not known to be trade centers in the Southwest and Great Plains. Methods used in this study included analyses and tabulations of particular physical attributes of pipes that provide information on pipe use and regional style, as well as spatial and temporal analyses of pipe concentrations and concentrations of particular pipe attributes.

Davis, Katharine (Ursinus College)

[17] *Libations and Meat: A View of the Construction of Social Capital in Tiwanaku Residential Spaces through Ceramics and Faunal Material*

In the latter part of the Middle Horizon (A.D. 800–1000) previously unoccupied areas around the megalithic ceremonial core of Tiwanaku came under settlement. A reorganization of space within the core coupled with the influx of new urban residents drawn to the site of Tiwanaku from the surrounding areas by the variety of social, economic, and ritual interactional opportunities meant that newly built households and neighborhoods further away from the monuments became the loci of quotidian activity. Experiencing population density never before achieved in this area of the Andes, families constructed their physical shelters as they built their interdependent social networks. This paper examines ceramic and faunal remains that suggests that feasting in one such household context, Muru Ut Pata, was perhaps more intense and integral an activity to building and maintaining social capital than in elite contexts.

Davis, Loren (Oregon State University), Alexander Nyers (Northwest Archaeometrics), Jillian Maloney (San Diego State University), Neal Driscoll (University of California, San Diego) and Shannon Klotsko (San Diego State University)

[79] *Searching Oregon's Outer Continental Shelf for Submerged First Americans Sites: Theory, Methods, and Recent Discoveries*

If the First Americans initially migrated into the New World from northeastern Asia along a coastal route, we should expect to find the earliest evidence of human occupation in the Americas in submerged sites along the northeastern Pacific Rim. Late Pleistocene-aged human coastal migrants would undoubtedly exploit high ecological productivity zones of ancient estuaries and bays that once existed along paleocoastal landscapes. A systematic approach to the discovery of First Americans coastal sites requires detailed knowledge of these paleocoastal landscapes and how they evolved since the last glacial maximum. To this end, we constructed a digital model of central Oregon's paleocoastal landscape, which guides offshore exploration efforts. We present the results of recent geophysical cruises that reveal physical traces of modeled terrestrial stream networks and discuss potential archaeological targets that will be further explored through marine coring in 2018.

Davis, Loren [101] see Nyers, Alexander

Davis, Mary A. (UW-Madison)

[304] *Domestic Craft Specialization and Social Spatial Organization of Harappa*

The site of Harappa, Pakistan, was a major urban center of the Indus Civilization with over two thousand years of occupation (3700–1700 BCE). The site did not have an obvious civic ceremonial center but was instead multi-nodal with walled sub-divisions. As an aspect of stone tool assemblage analysis at the site, the most functionally relevant attributes of the blade tools were differentially weighted to produce a soft hierarchical clustering classification scheme. These classes are considered temporally and contextually, across spatially distinct walled administrative districts and proposed social neighborhoods within these walled mounds. The relationships of the tool classes between and within the mounds were evaluated via correspondence analysis. Each of the districts is found to have a limited repetition of crafts, suggesting that some level of economic integration was a factor that contributed to the cohesion of this decentralized urban center. Analysis of chipped stone tools at the neighborhood level identified previously unknown centers of craft specialization of perishable products and craft specialist activities taking place in domestic contexts. Possibly two different textile traditions were important both for occupational specialization and neighborhood and community membership.

Dawson, Emily (University of Texas at Austin)

[259] *Plant Use and Deep Ecology in Colonial New Mexico*

Understanding the interactions between people and the landscape has long been a concern of archaeologists working in the American Southwest. A particular emphasis of this research has focused on understanding the way pre-colonial Pueblos altered the landscape for agricultural production. More recent studies have worked to incorporate indigenous voices into scholarly understandings of the landscape. So far, less attention has been paid to the way Hispano communities in New Mexico experienced and interacted with the landscape during the colonial period. Early accounts by Spanish colonists indicate that they brought wheat, lentils, melons, garlic, and other Old World cultivars with them. While these accounts indicate the colonists were growing the cultivars, previous archaeological work has produced limited evidence for the growth and use of these plants. This paper considers how the desire for specific plants impacted colonial views of the landscape and ecology of northern New Mexico through preliminary phytolith analysis. We use the evidence of everyday plant use over time to work towards a better understanding of the deep ecology of colonial life in the region.

[259] *Chair*

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De Anda Alaniz, Guillermo (Instituto Nacional de Antropología e Historia (INAH))**[134]** *Reconceptualizing Chichen Itza: The Gran Acuífero Maya Project*

During the summer of 2017, the Gran Acuífero Maya (GAM) project initiated an investigation at Chichen Itza designed to define the site around its aquatic resources. The project is based on my previous work at Cenote Holtun, located 1.6 miles west of Chichen Itza, which found that a line drawn between Holtun and Cenote Kanjuyum on the east passed through the center of El Castillo. It has long been known that El Castillo is bisected by a line drawn between the Sacred Cenote on the north and the Cenote Xtoloc on the south so Chichen Itza defined itself around a cosmogram formed by its water features. Additional, Balankanche and other caves with water are being restudied as cenotes. GAM is employing high tech equipment to Chichen Itz's aquifer including sonar to search for underwater passages in the cenote Xtoloc and the Sacred Cenote; low level Lidar that has located four caves that may lead to the water table, and ground penetrating radar to detect subterranean passages. Our preliminary assessment is that Chichen is far richer in water resources than previously recognized.

De Anda Alaniz, Guillermo [134] see Verdugo, Cristina

De Carteret, Alyce (Brown University)**[36]** *Building an Empire: Spanish Colonial Encounters with Maya Houses and Housebuilding*

In the late sixteenth century, King Philip II of Spain sent out a request to the local administrators of his overseas colonies, asking that they complete a questionnaire designed to collect information about the lands he had conquered. The responses to this questionnaire, completed primarily between 1578–1586, form a set of documents now known as the Relaciones Geográficas. Question 31 asked respondents to describe the form and construction of the local houses and the materials used to build them. In this paper, I consider Question 31 of the Relaciones Geográficas and its responses, in conjunction with a survey of archaeological research, to assess the nature of Maya housebuilding in the Colonial period (particularly the sixteenth century). These data indicate an interest on the part of the Spanish Crown to understand indigenous building practices and labor in order to better control it. I argue that construction was targeted by Colonial reducción policies (i.e., the policies intended to mold indigenous communities into proper Spanish subjects); in the Colonial Maya world, Spain aimed to build its empire literally, through reformed building practices of reformed Maya communities.

De Juan Ares, Jorge (IRAMAT-CEB, UMR 5060, CNRS, Orléans) and Yasmina Cáceres Gutierrez (Universidad Complutense de Madrid)**[275]** *Archaeology, People and Identity in Cape Verde Islands*

The geographical location of Cape Verde islands made them one of most important places in early Portuguese exploration of African coast. The first European settlers were favoured by the Portuguese monarchy in the relations with African coast. Since 1472, they were forced to carry out exchange with local goods. This encouraged the development of cotton and sugarcane crops with slaves from the "Guinea Rivers", as was common in other Atlantic islands and the American colonies. The excavations reported here were carried out in Cidade Velha, the first capital of the islands. Archaeological materials from the Iberian Peninsula and other places of Europe, Africa and China have been recovered. Material evidence is useful to explore early Atlantic commercial networks. Over the fifteenth and eighteenth centuries, this commercial activity was accompanied by the circulation of people, languages and ideas. The loss of the slave trade led to a gradual economic decline which, coupled with environmental constraints, resulted in the shortage of European settlers and the absence of indigenous population from the islands, and encouraged an early fusion of people and culture, giving rise to the present Creole Cape Verdean national identity.

De La Garza, Mary**[231]** *10 Years, 3 Supervisors, 7 Assistants and 30 Students. How the Iowa Office of the State Archaeologist Managed, Manages and Plans for the Future of Archaeological Data*

Sustainable accessible data storage is as important to archaeologists as tractors are to farmers. In 2001 the Iowa Office of the State Archaeologist, (OSA), was archiving 20GB of data on a 100GB server. Sixteen years later the office is serving 32TB on several server systems and plans are in place to archive 60TB over the next 4 years. In addition to space needs the office must also make this data in its many forms accessible to outside entities. In the not so distant past archaeologists secured and stored paper, photos and film in Hollinger boxes stacked to the ceilings in many places. These days many archaeological agencies have scanned and archived massive amounts of data to server systems which takes up less space and can contain many times more data. The OSA has taken advantage of many grants to scan and archive over 400,000 sheets of paper and 58,853 photos and slides. The advantage of this undertaking; accessibility and scalability.

Moving into the future the OSA must develop and plan for the security storage and accessibility in ways that protect sensitive data. Security is paramount in any organization but especially so when culturally sensitive data is in place.

De La Peña Paredes, Juan (Juan D. D. Paredes) and Yamile Lira-Lopez (Universidad Veracruzana)**[93]** *La sociedad prehispánica del valle intermontano de Maltrata, Veracruz: Desarrollo poblacional, aprovechamiento y cosmovisión*

El valle de Maltrata, al oeste del estado de Veracruz, presenta un desarrollo poblacional que inicia desde el periodo Preclásico, continúa en el Clásico, Posclásico y Colonia, durante esos periodos de tiempo la población se fue asentando en distintas partes del valle, aprovechando los espacios naturales que se disponían. Desde el inicio de la ocupación se utilizó la posición estratégica del valle como una ruta de comunicación, comercio e intercambio, que fue usada por diversas culturas para la obtención de materiales diferentes, unos instalaron enclaves, otros intentaron conquistar el lugar para extender su dominio hacia otras regiones. Durante esos periodos de tiempo la cosmovisión de los habitantes está plasmada en distintos materiales culturales como el Monolito de Maltrata, así como en los lugares de culto.

De Lucia, Kristin (Colgate University) and Enrique Rodríguez-Alegría (University of Texas-Austin)**[63]** *Digging in Churches: Community Archaeology in Xaltocan, Mexico*

Xaltocan has a thriving community and its people have a strong connection to their long history, although this was not always the case. Elizabeth Brumfiel pioneered community archaeology at Xaltocan almost 30 years ago and initiated a long process of collaborative archaeology that continues until this day. As a consequence of the close interaction between archaeologists and the community, the past has become a vehicle for the construction of local and national identity in Xaltocan. We will discuss recent efforts and new understandings that have emerged from our recent archaeological project focused on the town's 16th-century church, which is in disrepair and at risk of collapse, and look ahead to new possibilities for future community collaboration.

[63] *Chair***De Marigny, Elizabeth (Department of Anthropology, The University of Texas at Austin)****[229]** *The Economics behind Pottery: The Impact of Romanization on Castro Culture Ceramics in the Littoral Northwest*

Through a comparative analysis of ceramic materials from several archaeological sites including the Cividade de Bagunte, this paper explores the effects of Romanization on the fields of production and consumption belonging to the Castro Culture of northwest Iberia. These sites were chosen because the archaeological materials uncovered reflect differences in social, political, and economic organization from the Iron Age to the Roman period. Further, the proximity of these sites to one another would have been ideal for trade and communication. By analyzing ceramic assemblages, it

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is possible to determine the types of activities that dominated a settlement's economy, such as vessels used for storing or transporting agricultural products, or ceramic objects used in craft production such as loom weights and spindle whorls. Drawing from behavioral economics, this research will investigate how colonial interactions and economic restructuring brought on by Roman conquest led to the adaptation, adoption, or abandonment of certain ceramic forms. This presentation focuses on how the implementation of Roman standards of trade and commerce influenced the production and use of certain ceramic forms and led to separate but connected economies.

De Pena, Felicia

[304] *Lithics and Learning: Communities of Practice at Kharaneh IV*

Flintknappers during the Levantine Epipaleolithic were proficient at microlith production, these skills were learned and passed down from one flintknapping generation to another as no one is born with the innate ability to flintknap. By utilizing practice theory and a chaîne opératoire approach to the Epipaleolithic chipped stone tool reduction sequences of narrow-nosed cores at Kharaneh IV, I strive to identify how individuals learned to flintknap, from raw material acquisition to the production of the final tool. I view the knowledge transmission process as a proxy for culture: as apprentices took on new ideas and identities to fit within a community of practice, the apprentice may have lost (or maintained) kinship ties yet subscribed to a more meaningful relationship within their community of practice. Kharaneh IV is an Early and Middle Epipaleolithic aggregation site well-situated for this research due to its well-preserved stratigraphy, numerous caches, and hut structures, which allows for observation of repetitive practices and identification of changes in technique. Research is currently in the nascent stages of core refitting: future experimental work is planned to establish baseline knowledge regarding the relationship between skill level and social structures that influence the production process.

De Pol-Holz, Ricardo [86] see Mcrostitie, Virginia

de Smet, Timothy and Sean Field

[27] *Remote Sensing to Identify Chaco Roads: A Case Study of the North Road*

The focus of this research is to demonstrate the efficacy of data processing methodologies of remotely sensed data to detect the Chacoan Great North Road between Pueblo Alto and Pierre's group. This research highlights a scaled approach to the analysis and processing of remotely sensed data to efficiently identify prehispanic roads. The data analyzed in this project includes: thermal infrared multispectral scanner (TIMS), light detection and ranging (LIDAR), orthoimagery from Google Earth and Worldview 3, and legacy historic aerial imagery. We also discuss the efficacy of additional remote sensing data types which have not been applied to this study area, including advanced spaceborne thermal emission reflectance radiometer (ASTER) and hyperspectral thermal emission spectrometer (HyTES). The use of novel processing techniques via proprietary and open access processing methods, improved road identification as opposed to traditional aerial image analysis. The use of a multi-scalar integrative approach to the identification of roads allowed us to avoid false positives (modern roads), understand modern impacts, and predict the long term future of these roads.

de Smet, Timothy [156] see Frazer, William

De Vore, Steven [268] see Dempsey, Erin

Deal, Michael (Memorial University of Newfoundland)

[199] *Early Seventeenth Century French Feasting in Acadia and Its Relation to Pre-contact Mi'kmaq Practices*

The early French settlers at the Port Royal Habitation relied heavily on the local Mi'kmaq to survive the cold Nova Scotia winters. In the winter of 1606–07 Samuel de Champlain initiated a social club, commonly referred to as "The Order of Good Cheer", primarily to battle against scurvy, but also to create camaraderie among the colonists and to strengthen their relationship with the local Mi'kmaq. The French developed elaborate rituals for the feasts, partly based on those of their homeland. Food for the feasts came from their own gardens, ship's provisions brought from France, locally available plants and animals, as well as generous gifts of meat, fish and fruit from the Mi'kmaq who were invited to dinner. The Mi'kmaq had their own elaborate feasting traditions which also influenced the French celebrations. French writings of this period allow us to explore these two rich traditions, and along with available archaeological evidence, shed some light on the nature of Pre-contact Mi'kmaq feasting.

Dean, Emily (Southern Utah University)

[70] *The Mystical Past and the Lucrative Present: New Age Archaeological Tourism in the Andes*

The last two decades in the south central Andes have witnessed the rapid growth of "Turismo Místico" or New Age Tourism to archaeological sites and monuments in the south central Andes. Using the Cusco Valley of Peru as a case study, this paper analyzes textual, visual, experiential, and ethnographic data in order to assess the economic and socio-political impact this industry has on the communities in which it thrives. In particular, I explore the implications New Age Tourism has on local and visitor perceptions of Andean prehistory and heritage management. What are the positive and the negative aspects of New Age Tourism. I conclude by discussing the ambivalence many professional archaeologists feel when confronted with these 'un-scientific' understandings of the past. How do we, as archaeologists, respond (or not respond) to perceived challenges to our professional authority? How do we share the past with people we may disagree with? While many of us are keenly interested in indigenous religious practices, we may be highly skeptical or even contemptuous of New Age spiritual beliefs. How do we negotiate the limits of our own professional cultural relativism?

Dean, Rebecca

[187] *Fauna from the Marana Platform Mound Site, Arizona, in Context*

The Marana Platform Mound Site is an Early Classic period (1150–1350AD) Hohokam site in the northern Tucson basin, Arizona. It was one of many sites in the basin, part of an entire landscape that was shaped by the Hohokam people, reflecting their activities and values as a community. Faunal remains from Marana and surrounding Early Classic period communities are an excellent source of information on labor constraints, social organization, diet, microenvironments, and the cultural meaning of prey species. Comparing the faunal assemblage from Marana to those of its neighbors provides a baseline comparison for understanding the ecological and dietary context of Hohokam fauna, while highlighting the unique ways in which the Marana community interacted with prey species, particularly in the greater diversity of their faunal remains.

DeBoer, Warren (Queens College CUNY)

[178] *Discussant*

Debono Spiteri, Cynthia [126] see Schumacher, Mara

Decker, Michael (University of South Florida)

[130] *Discussant*

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DeCorse, Christopher (Syracuse University)**[275]** *Contact, Colonialism, and the Intricacies of Ethnogenesis: Portugal, Spain and the Iberian Moment*

This paper examines Portugal's and Spain's varied contacts, intersections and colonial aspirations in West and western Central Africa. Portugal and Spain share centuries of culture history, religion, and governance, and were united under the Iberian Union between 1580 and 1640. Yet within the context of European expansion into the non-Western world, they have often been considered distinct with regard to their histories and as foci of study. Pushing beyond national pasts, this paper contextualizes Portuguese and Spanish intersections with varied African people and polities in terms of both the wider socioeconomic landscapes of which they were part and the local conditions and contingencies that mitigated policy, and structured locally articulated social, cultural, and economic interactions. While inescapably nested in European nationalist agendas and global economy, the cultural exchanges of Portugal and Spain in Africa were characterized more by variability than by unitary templates, more by persistence than hegemonic change. Often they were expressly non-colonial in aspiration or affect. Drawing on archaeological and historical data from West and Central Africa, this paper considers the varied African-European interactions that unfolded, the diversity of ethnogenesis that evolved, and their materialities.

Dedrick, Maia (University of North Carolina at Chapel Hill)**[254]** *Ritual Use of the Rejolladas of Tahcabo, Yucatán*

In Tahcabo, Yucatán, 5% of the town's municipal land is contained within rejolladas. Rejolladas, like cenotes, are sinkholes formed in the karstic bedrock of Yucatán, although they do not reach to the level of the water table. They make for ideal gardens when located within settlements, as their low elevation allows for the collection of deep and moisture-rich soil that provides an advantage for the cultivation of almost any plant. At the nearby site of Kulubá it has also been shown that rejolladas share some of the same significance within Maya cosmology as cenotes and caves. Their locations, deeper into the earth, may have been seen as places with additional potential for communication with the underworld. Ceramic, botanical and faunal data from units excavated within five rejolladas in central Tahcabo demonstrate garden cultivation within the features over the community's long history. One rejollada demonstrated consistent ritual use through time. Today it is a place in which the Ch'a' Cháak ceremony is practiced, and in the deep past it was a place in which at least one human burial was interred. This paper will provide new evidence about the role of rejolladas and gardens more broadly in Maya worldview.

[254] *Chair*

DeFanti, Thomas [172] see Schulze, Jurgen

DeFelice, Matthew (CAHR, Inc.), Chris Davenport (Palm Beach County), Mallory Fenn (Florida Public Archaeology Network), Jeff Ransom (Miami-Dade County) and Sara Ayers-Rigsby (Florida Public Archaeology Network)**[195]** *On the Front Lines-Addressing Climate Change at the Local Level in South Florida*

How do you place a value on heritage at risk, and who gets to make these decisions? In South Florida, sea level rise is an issue of paramount importance, yet preservation of archaeological and historical sites are rarely the focus of resiliency planning efforts. This paper summarizes the efforts of various groups to combat this, though engaging with local governments and city planners to raise awareness of how archaeological sites will be impacted by sea level rise and insert it into policy at the local level, as well how archaeologists can work collaboratively with marginalized communities, activists, and local tribes to draw attention to these issues. Examples will include discussion of the South Florida Regional Climate Action Plan version 2.0, which includes a new section on archaeological resources, and the Tidally United Conference, which was co-hosted by the Florida Public Archaeology Network and the Seminole Tribe of Florida. Ultimately, not all sites can be saved or excavated and the process of identifying and evaluating sites at risk must be a shared responsibility.

deFrance, Susan (University of Florida), Edana Lord (Department of Anatomy, University of Otago, Dunedin), Michelle LeFebvre (University of Florida), Catherine Collins (Department of Anatomy, University of Otago, Dunedin) and Elizabeth Matisoo-Smith (Department of Anatomy, University of Otago, Dunedin)**[51]** *To the Caribbean and Beyond: Complete Mitogenomes of Ancient Guinea Pigs (Cavia porcellus) as a Proxy for Human Interaction in the Late Ceramic Age*

The Caribbean Ceramic Age (AD500–1500) was associated with increased interaction between the islands and mainland South America. The domestic guinea pig (*Cavia porcellus*) was introduced to the Caribbean post-AD500 through human transportation. Archaeological remains of guinea pigs are present on several Caribbean islands. This study used complete mitogenomes from ancient guinea pigs as a commensal model to identify likely human migration routes and interaction spheres within the Caribbean region. Possible origins of early historic European and North American guinea pigs were also determined. Complete mitogenomes of 23 ancient and two modern guinea pigs were obtained. The identified haplogroups indicate that two introductions of guinea pigs to the Caribbean likely occurred, both from Peru, to Puerto Rico (AD500) and the Lesser Antilles (AD1000). A potential origin for historic European domestic guinea pigs was identified as the Andean region encompassing Peru and Bolivia. A historic period North American guinea pig was found to have likely come from Peru. This study is the first to use next-generation sequencing to obtain complete mitogenomes of a commensal animal to investigate prehistoric interaction in the pan-Caribbean region, and results are in agreement with current archaeological evidence for human mobility and interaction in the Caribbean.

DeFrancisco, Nicole [157] see O'Brien, Colleen

DeGraffenried, Jennifer [154] see Martindale Johnson, Lucas

Dekel, Yaron [125] see Weissbrod, Lior

DeLance, Lisa (University of La Verne) and Jaime Awe (Northern Arizona University)**[147]** *Ancestor Veneration, Termination and Renewal: New Considerations of Construction Fill*

Archaeologists working in Mesoamerica frequently encounter construction fill within architecture. Construction fill has been variously used as a tool for determining architectural construction sequences, as a resource for seriation dating, and occasionally as a context for radiocarbon deposits. Although much information can be gleaned from examining construction fill, material culture found within such fill is frequently mentioned in passing as little more than refuse, if it is mentioned at all. This paper examines the phenomenon of material culture used in Formative Period construction fill at the site of Cahal Pech, Cayo, Belize and posits that the specific articles of material culture found within construction fill at Cahal Pech may not have been simply refuse but rather a special and highly significant form of ancestor veneration combining termination and renewal rituals to aid in the construction of new buildings.

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Delaney, Colleen (Cal State Channel Islands) and James T. Brewer**[305]** *Stories from the Guadaluca: Changes in Land Use along the California Coast*

California State University Channel Islands is known as the location of the former Camarillo State Mental Hospital. The campus also serves as a case study for examining changes in communities and land use in California throughout time. Archaeological surveys on campus, artifact analyses, and historic records together document shifts in human activities at this location. This presentation outlines the long term use of this area by a noteworthy variety of people: the Chumash and their ancestors, Mexican rancheros and vaqueros, Euro-American farmers, WPA workers, mental health professionals, mental hospital patients, laborers at the hospital dairy/farm, and homeless members of the public. In particular, our discussion focuses on a probable Depression-era structure of unknown function.

DeLeonardis, Lisa (Johns Hopkins University)**[69]** *The Hidden Faces of Santa Cruz de Lancha: Ceramics and Structure in Eighteenth-Century Architecture*

The global exchange of ideas and practices in Latin American architecture during the viceregal period (ca. 1520–1825) remains one of the issues at the forefront of scholarly interest. Remarkable insights are gained about how ancient building materials were sustained and translated as architects and novices alike sought to align European design canons with local techniques and materials. Equally informative is how imported materials were incorporated into building practices.

In this paper, I analyze one of several construction techniques identified at Santa Cruz de Lancha, a Jesuit-managed hacienda in Pisco, Peru. The practice employed earthenware bottle fragments (botija) to create wall encasements or internal facing. Initially, the technique was thought to be a response to earthquake damage late in the site's history. Recent discovery demonstrates an earlier precedent, and one with consistent application throughout the site. Analysis of the site's ceramic assemblage informs questions about the choice of construction materials and draws attention to the range of imported and locally-produced earthenwares.

These findings widen the scope of building methods and materials utilized in viceregal building construction. They provide material evidence for ancient practices that were translated by Andean builders, and speak to their innovation.

Delgado, James (SEARCH Inc.)**[78]** *Telepresence Enabled Maritime Archaeology*

Advances in robotic and satellite technology have shifted ocean exploration into an interactive forum that links scientists and the public via "telepresence." Working with this paradigm, archaeologists have joined the ranks of ocean explorers on a variety of projects ranging from surveys to excavation in depths ranging from a few hundred to thousands of meters deep. The process has encouraged wider scientific integration, provided access to sites at depths previously not considered "workable," and also provided a powerful educational and outreach tool to share archaeological practice, methods, theory and ethics to a global, Internet-savvy audience.

[193] *Discussant***Delgado Espinoza, Florencio****[132]** *Interaction and Resistance against the Inka on the Land of the Cañaris, Southern Ecuador*

According to the early Spanish chronicles, the Cañaris were a constellation of chiefdoms which fiercely challenged the Inka expansion to the north. Early Texts show that war and conflict was the way they interacted in the region. As a conquest strategy during Wayna Qhpac's rule, the Inkas built important infrastructure in their heartland, such as Tomebamba in Cuenca and Ingapirka in Hatún Cañar, in addition to other smaller sites along the Qhpac Ñan. However, the archaeological evidence for the conflictive nature of their relationship is not clear. Research around Ingapirka shows that while the Inka built extensive and prominent infrastructure, and apparently incorporated the locals into their political and belief system, the Cañaris' households did not incorporate any Inka cultural effects in their domestic behavior, indicating instead that resistance was held steadfast at the domestic sphere.

Delgado Espinoza, Florencio [177] see Oyuela-Caycedo, Augusto

Delle, James**[208]** *"A Glittering Speculation": Archaeology of Jamaica's First Coffee Boom, 1790–1806*

In the late 18th century, the British colony of Jamaica entered the first of its several boom periods in coffee production. A highly addictive product that was at the time primarily a luxury good for a small domestic market, overproduction on the island resulted in attempts by the coffee industry to expand their markets in Great Britain and the European continent to the middle and working classes. Meanwhile, the rush to get coffee to the market resulted in a rapid expansion in the number and scope of slave-based plantations, owned by both wealthy speculators and local middling planters without the means to become established in sugar production. This paper will examine the material evidence of this first coffee boom, which one planter characterized in his correspondence as "a glittering speculation." Evidence presented will include excavation results from Marshall's Pen Plantation in the central Jamaica parish of Manchester, as well as survey data from the former Blue Mountain parish of St. Davids.

DeLong, Kristine [68] see Caporaso, Alicia

Delque-Kolic, Emmanuelle [175] see Leroy, Stéphanie

DeLuca, Anthony (University of Colorado Denver)**[30]** *From Cooperation to Competition: An Architectural Energetics Analysis of Labor Organization for the Construction of Circle 2 at Los Guachimontones, Jalisco, Mexico*

The Teuchitlán culture is one of many cultures in West Mexico during the Late Formative to Classic periods (300 B.C.—450/500 AD) that share in the tradition of burying some of their dead in shaft and chamber tombs. The Teuchitlán culture is noteworthy among their contemporaries for the large number of circular ceremonial buildings concentrated around the Tequila volcano and surrounding valleys. Los Guachimontones, located on the southern side of the volcano, is the largest site in the region with the largest number of public architecture and highest concentration of people. One such building, Circle 2, is among the largest documented guachimontones in the region. Using an architectural energetics analysis of Circle 2, I modeled how lineage based elites within a corporate system at Los Guachimontones may have organized labor for construction. The variable construction represented within Circle 2 suggests multiple labor recruitment strategies were employed. A labor collective was used to construct the foundational patio of Circle 2 followed by elites employing corvée labor to finish the remaining architectural features. The switch from cooperation to competition suggests alliances were temporary and geared towards aiding the community through the construction of public architecture.

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Demarest, Arthur (Vanderbilt University)

[258] *Political and Economic Change on the Eve of the Classic Maya Collapse: Building on a "Ceramic Foundation"*

Joe Ball's research, his ceramic studies, his insistence on material culture as basis for work, and his honesty in critique of poorly grounded interpretation together provide a standard of building culture-history on solid ceramic studies, chronology, and material culture analyses. Many recent interpretations of Classic Maya society have not met that standard. Here we aspire to his bottom-up, material culture approach to interpretation in recent collaborative research in the western Peten and the southern "frontier" of the Classic Maya states. His emphasis on lab-driven research, detailed ceramic analyses and fine-grained chronologies and a "direct" style is shamelessly mimicked here, first to briefly criticize serious flaws in recent studies of economy, dynastic collapse, and other aspects of Classic Maya societies and social change. However, then we build positively on detailed ceramic classification, statistical study, chronology, and compositional analyses to reconstruct economic systems on a more solid, controlled data base. Those "ceramically-grounded" studies have revealed strengths and weaknesses in southern lowland political economies, ingenious attempts to adapt them to a changing Mesoamerican world, and reasons for the failure of those brilliant innovations. The field of ceramic studies remains central to any credible effort at culture-historical reconstruction and theoretical interpretation.

[176] *Discussant*

Demarest, Arthur [121] see Victor, Bart

Demarte, Pete (Trent University), Scott Macrae (University of Florida) and Gyles Iannone (Trent University)

[142] *The Ancient Maya Settlement of Waybil, Belize: Middle-Level and Hinterland Settlement Investigations*

The Classic Maya, with their towering jungle temples and sprawling cities have been the focus of archaeological studies since the mid-1800s. Although numerous investigations have fostered considerable insights, important questions remain regarding the circumstances in which these settlements originated, interacted, developed, and were ultimately abandoned. The organization of Maya settlements is best conceptualized as a continuum consisting of three basic, but variable types, including: upper-level, middle-level, and lower-level settlements. This discussion reviews the primary research results for the full-coverage survey and test-excavation program conducted at the middle-level hinterland settlement of Waybil, Belize, Central America. The overall result was the collection of valuable information concerning the development of the central courtyard, peripheral settlement groups, and relic agricultural terraces found within the site. Middle-level settlements such as Waybil are unique units within the continuum as they are smaller and more specialized than upper-level settlements, but larger and more diverse than lower-level settlements. Thus, they are thought to have performed distinct roles and functions within the greater settlement matrix. Exploring the configuration of individual middle-level settlements is essential to improving our knowledge of ancient Maya socio-political and socio-economic interactions, hinterland archaeology, human-environment adaptive strategies, and the circumstances surrounding the Classic period "collapse".

Demchak, Benjamin [303] see Reed, Karen

Dempsey, Anna [268] see Dempsey, Erin

Dempsey, Erin (National Park Service, Midwest Archeological Center), Steven De Vore (National Park Service, Midwest Archeological Center), Ashley Barnett (National Park Service, Midwest Archeological Center), Nora Greiman (National Park Service, Midwest Archeological Center) and Anna Dempsey (National Park Service, Midwest Archeological Center)

[268] *Looking Closer at Those Dots on the Map: Documenting Mound Sites at St. Croix National Scenic Riverway*

Over the last four years, the Midwest Archeological Center has been conducting a project designed to gather information on mound and earthwork preservation across the Midwest Region of the National Park Service. St. Croix National Scenic Riverway in eastern Minnesota and western Wisconsin, is one of several parks included in the study. The St. Croix and Namekagon river valleys are home to mounds and earthworks of a variety of shapes and sizes. Some have been dated to the Late Woodland period and others are of unknown age. Part of our work at the park has involved revisiting recorded mound sites to determine their locational accuracy, in addition to simply clarifying which sites are on federal versus private land. A more significant portion of our work at the park has been devoted to conducting magnetometer surveys at three sites where mounds are extant. The magnetic data clearly indicate that subsurface portions of mounds and other types of earthworks are present at each site. While ground disturbing efforts at exploring these features is not recommended or planned, these data form a critical component of properly preserving, protecting, and interpreting these valuable archeological and ethnographic resources.

DeMuth, Robert (Indiana University Bloomington), Joshua J. Wells (Indiana University South Bend), Kelsey Noack Myers (LG2 Environmental Solutions, Inc.), David Anderson (University of Tennessee) and Eric Kansa (Open Context)

[130] *Archaeological Geographies—A Reflexive Consideration of the Impact of Archaeology across Racial and Socioeconomic Regions Using DINAA*

This paper uses "big data" about archaeological sites from the Digital Index of North American Archaeology (DINAA) to reflexively assess and interpret how archaeology has affected minority communities. DINAA's data set represents an almost complete record of the current extent of archaeological site definitions, within the project's area of effect. Therefore, collectively, these data can reveal information about archaeologists and archaeology as a discipline, as well as the past. As public spending, whether via heritage management or university research, is the impetus for most archaeological work in the United States, archaeological sites can be seen as a metric of sorts to gauge public spending, and develop a better understanding of where, and how monies have been invested around American communities over the past half century. This paper will use the free, open source, and publicly accessible DINAA database to examine the correlation of archaeological site density across the eastern US with US Census data on socioeconomic and demographic trends, with specific interest in parts of Appalachia, and historically African American communities, in order to begin to assess the impact of archaeological work on modern residents.

Dengel, Craig (CEMML @ Fort Polk, LA)

[332] *New Beginnings at Fort Polk, Louisiana: CRM Strategies for the Expansion of Training Lands*

Located in western Louisiana, Fort Polk has an extensive record of cultural resource management with more than 150,000 acres of land surveyed between 1972 and 2002. Over 3,500 sites have previously been identified and 600 of these evaluated for eligibility. Recently, the Army expanded the installation by 42,000 acres of new training lands in less than four years. So a new round of Phase I surveys for cultural resources were necessary. The completion of these surveys will allow natural resources management activities to begin, which in turn will protect training areas against wildfires, encourage reforestation, and integrate endangered species and game management. In coordination with the Louisiana SHPO and consulting Native American tribes, the work of evaluating and protecting significant historic and prehistoric sites is an on-going joint effort between the Army, the National Park Service, private CRM firms, and The Center for Environmental Management of Military Lands (CEMML) at Colorado State University. In this paper we discuss the coordination and cooperation necessary to survey such a large area in a relatively short time frame.

[232] *Discussant*

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Dennehy, Timothy, Christopher Merriman (University of New Mexico) and Keith M. Prufer (University of New Mexico)**[77]** *Lithic Technological Changes from the Paleoindian to the Late Archaic: A Pilot Study*

How do subsistence-related changes impact lithic technology over the course of thousands of years? Three stratified rockshelters in Belize contain evidence of Paleoindian through Classic Maya period occupations. This span of time witnessed the initial hunting and gathering subsistence economy of the Paleoindian period, the introduction of horticulture and increasing reliance on cultivars in the Early Archaic, and the emergence of full-scale agriculture in the Late Archaic. Explaining variations in lithic technology during these millennia can shed light on the processes underlying the slow but steady increase in plant resources that preceded the adoption of agriculture. This study analyzes several chipped stone attributes—including cortex ratio, retouch intensity and frequency, and flaking type—of lithic assemblages from one such rockshelter known as Tzib'te Yux. By examining these traits in a subsample of artifacts, the authors will establish the ability of these methods to detect technological changes over time, and create a timeline of lithic technology using absolute dating methods. This study thus serves as a pilot study for a future project that will compare changes in mobility, subsistence economy, and lithic technology at all three rockshelters using the full assemblages available at each.

Dennett, Carrie (National Museum of Natural History, Smithsonian Institution, Washington, DC)**[263]** *It's Complicated: Making Sense of Material Monoculture in Multicultural Societies*

Ethnohistoric and colonial documents typically focus on detailing a socioeconomic and political landscape dominated by Chorotega and Nicaraog groups for contact-period Pacific Nicaragua. Yet these texts simultaneously indicate that other groups living in isolated communities or urban barrios were also commonplace and included Maribios, Mazatec, Chondal, Matagalpans, Sumo-Ulwa, and possibly Lenca and/or Maya-speaking peoples, among others. As archaeologists, we are aware—many of us dutifully placing the convoluted language distribution map in our culture history write-ups. Despite this, most of these groups are not factored into theoretical discussions and are rarely, if ever, seriously discussed as part of the region's archaeological past. Instead, a three-phase linear trajectory (Chibchan-Chorotega-Nicaraog) premised on 'great' migration events ending in regional domination by foreigners and their intrusive material monoculture has been the interpretive norm. This inconsistency begs the questions: Do we really believe complex multicultural lifeways magically appeared with or immediately before the Spaniards? And if multicultural lifeways were a pre-Columbian norm in this area, as complex social organization at contact suggests, why can't we see those other groups in the record? Using Sapoá-period (AD 800–1250) ceramics as a case study, this paper explores whether the assemblage represents 'Chorotega monoculture' or a complex multicultural aggregate.

[263] *Chair***Dennison, Meagan (University of Tennessee, Knoxville)****[90]** *Chair*

Dennison, Meagan [35] see Randall, Connie

Dent, Joe [239] see Cagney, Erin

Derevianko, Anatoly [41] see Douka, Katerina

Derose, R. Justin [105] see Finley, Judson

Des Lauriers, Matthew [19] see Hinojosa, Marlen

Desloges, Joseph R. [284] see Soleski, Anna Marie

Desrosiers, Pierre [16] see Forsythe, Kyle

Deter-Wolf, Aaron (Tennessee Division of Archaeology) and Tanya Peres (Florida State University)**[217]** *Archaic Tattooing and Bundle Keeping in Tennessee, ca. 1600 BC*

The Fernvale archaeological site in Williamson County, Tennessee, is a multi-component site that includes a significant Late Archaic cemetery and occupation dated ca. 1600 BC. Although the site was excavated in 1985, it was not fully analyzed or published for nearly three decades. Formal analysis of zooarchaeological materials from Fernvale took place from 2007–2012 as part of an overall effort to reassess the site assemblage. In this paper we describe findings generated by combining traditional zooarchaeological analysis with ethnohistorical research, ethnographic analogy, experimental archaeology, and use-wear analysis. By incorporating these various lines of evidence we are able not only to correct previous errors in species identification, but also to produce a contextual framework that informs our understanding of both emerging and entirely new aspects of Late Archaic lifeways. Through this interdisciplinary effort we are able to provide archaeological evidence of the oldest directly-identified bone tattoo implements in the world and to demonstrate the persistence of Native American bundle-keeping and tattooing traditions over more than three millennia.

Deter-Wolf, Aaron [217] see Peres, Tanya

Devièse, Thibaut [41] see Higham, Tom

Devièse, Thibaut (University of Oxford), Thomas W. Stafford Jr. (Stafford Research, LLC), Michael Waters (Texas A&M University) and Tom Higham (University of Oxford)**[74]** *Advanced AMS 14C Dating of Contaminated Bones Associated with North American Clovis and Pre-Clovis Butchering Sites*

When humans first colonized the Americas is becoming better understood by the addition of aDNA studies; however, the absolute dating of these late Pleistocene sites is crucial and depends upon accurate 14C dating of the fossils (i.e. bones, teeth and ivory). We re-dated vertebrate fossils associated with the North American butchering sites Wally's Beach (Canada), La Prele, also known as Fetterman (Wyoming), Lindsay (Montana) and Dent (Colorado). Our work demonstrates the crucial importance of sample preparation to completely remove contaminants derived from sediments or post-excavation museum curation. Specifically, our work illustrates that chromatographic methods, e.g. preparative High Performance Liquid Chromatography or column chromatography using XAD resins are the only efficient methods for removing geological and museum-derived contaminants. These advanced methods yield unquestionably accurate AMS 14C measurements that refine the ages of these sites and thereby advance our understanding of human population dispersals across North America during the late Pleistocene. We will present the new dating evidence and compare the results with previous determinations made using less refined techniques.

Devio, Jessica (Washington State University)**[76]** *Assessing Botanical Diversity of Late-to-Terminal Classic Households at Xunantunich, Belize*

Understanding household plant use can provide a wealth of data about subsistence practices, past agricultural systems, and strategies used to mitigate climatic stress. Plant use may also vary between households. By examining this variation, botanical data may yield further information on personal

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preference and cuisine differences between households. Aside from consumption for subsistence, plants were used for a wide range of activities conducted by individual households. Botanical datasets may reveal other activities such as fertilization of garden plots or ritual activities. This paper examines the botanical diversity found in Late-to-Terminal Classic households near the site of Xunantunich in Belize. The paper discusses on-going research at the site and focuses on macrobotanical analysis of activity areas. The results are part of a larger research design combining both macrobotanical and microbotanical data which seeks to overcome some of the biases that are inherent in single methods of analysis. By incorporating macrobotanical and microbotanical remains, a wide range of plant remains will be represented that may be absent from carbonized assemblages alone. The paper further discusses a comparison of machine-assisted flotation versus the washover method for processing flotation samples.

[76] *Chair*

Devlin, Joanne (University of Tennessee), Lee Jantz (University of Tennessee) and Michelle Hamilton (Texas State, San Marcos)

[90] *Beyond the Farm: Forensic Taphonomy in East Tennessee*

The impact of Walter Klippel's teaching has provided his students the tools necessary to answer several critical questions faced by forensic anthropologists. Through his classroom tutelage countless numbers of graduates have the skills to recognize and categorize non-human bones. Beyond this zooarchaeological training, his research influence and guidance has also afforded both students and practitioners alike with knowledge to identify and document particular signatures of postmortem damage and taphonomy on human remains. His long term research leadership at the outdoor research facility at the Forensic Anthropology Center at the University of Tennessee has centered on establishing techniques to best assess postmortem animal modification. This research has led to improved means for identifying and understanding the postmortem signatures of animal activity, significantly contributing to forensic investigations. Additionally, he has contributed to the knowledge of estimation of the postmortem interval via his student-centered approaches to research in animal scavenging. As a result, the success of our forensic work is directly attributable to the contributions of Walter Klippel and his dedication to students and anthropological science.

DeVore, Steven [301] see Green, William

Dewan, Eve (Brown University), Ian Kretzler (University of Washington) and Briece Edwards (Confederated Tribes of Grand Ronde, Historic Prese)

[114] *A Community of Heritage Practitioners: Keeping the Past in the Present at Grand Ronde*

For the Confederated Tribes of the Grand Ronde Community of Oregon, care of tribal heritage is an expression of sovereignty, cultural creativity, and connection to place. We discuss three arenas in which the Tribe draws on information about the past to reaffirm connections in the present. First, exhibits at the Chachalu Tribal Museum & Cultural Center, language immersion programs, and artistic pieces showcase how the diverse Native peoples of western Oregon overcame dispossession and removal to form the contemporary Grand Ronde nation. These Native-centered histories counter colonial narratives that relegate Native communities to a distant past and tragic present. Second, the Tribal Historic Preservation Office utilizes broad conceptions of heritage—placing tribal knowledge systems at the center—to protect archaeological sites and cultural properties threatened by development in the Tribe's homelands. A collaborative field school has contributed to these efforts by implementing a Grand Ronde-specific form of archaeological practice to investigate historic sites on the reservation. Third, tribal heritage infuses contemporary cultural practice, from song and dance at the tribal plankhouse to loans of historic objects to tribal members for ceremonial use. Within the Grand Ronde community, the past is present in ways that include and transcend conventional archaeological practice.

[151] *Discussant*

Dhody, Anna (Mütter Museum of The College of Physicians of Philadelphia) and Kimberlee Moran (Department of Chemistry, Rutgers University)

[107] *No Good Deed: The Recovery of Philadelphia's First Baptist Church Cemetery*

What to do when one box of bones becomes a whole cemetery? In late 2016, the Philadelphia Inquirer reported that human remains were uncovered at a local construction site, 218 Arch Street, formerly a cemetery that closed in 1859, its dead supposedly having been interred elsewhere. Because the site is privately owned and the construction privately funded, no clear legal guidelines exist governing authority over human remains. Seeing a potential research project, the authors contacted the developers and offered to take the small banker's box of human remains for analysis and reburial. Months later, the construction firm contacted the authors with a developing problem. Dozens of whole coffins were being unearthed daily, and no state or local government agency was willing to step in and take charge. In the absence of authority, with a construction deadline looming, the authors conducted a salvage archaeological operation to save the remains. This presentation will discuss the legal and ethical issues surrounding the Arch Street Project, which continues to evolve in magnitude and complexity.

Dhody, Anna [204] see Moran, Kimberlee

Di Paolo, Marianna [36] see Parker, Ashley

Diaz, Alice

[49] *Zooanthropomorph Iconography in the Gran Coclé, Gran Chiriqui and Tairona Areas*

The zooanthropomorphic beings present on some artifacts of the cultural areas Tairona (Colombia), Gran Coclé (Panama) and Gran Chiriqui (Costa Rica) dating back to pre-Columbian times have often been identified as shamans. But what are the iconographic elements that are in favor of such a precise interpretation?

To begin with, we did a thorough iconographical analysis aiming to determine taxonomically the animal component, the ratio between human and animal, and the precise anatomical elements that could be attributed to one or the other. In the second phase of this work the iconographic analysis has been cross referenced against the abundant anthropologic literature available on the subject of shamanism.

This process allows us to perceive better the diversity of possible interpretations for Zooanthropomorphic beings, which are not necessarily confined to a shamanic metamorphosis.

We can therefore reflect upon the spiritual and political context with more latitude, which is necessary for the information we have about either in the three concerned cultural areas is scarce.

Díaz, Mauricio [142] see Barrios, Edy

Diaz Arriola, Luisa Esther

[132] *Ychsma Cultural Identity in Armatambo during Inca's Occupation, Peruvian Central Coast*

This paper presents the results of a typology and iconographic analysis made on ceramic and textiles artifacts recovered at the Ychsma settlement of Armatambo. The Ychsma cultural affiliation of this archaeological site, which is located on a dense urban area south of Lima, is recognized in the literature (especially with the aerial photographs published by Kosok in 1965) but little detail has been published on the evidence of its affiliation and

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character of occupation. We can confirm that Armatambo was densely occupied during the Late Horizon (1450–1532 AD) on the Peruvian Central Coast and was the local Ychsma harbour to gain access to the ritual site of Pachacamac, the Ychsma capital. We propose that archaeological evidence that we have recorded resulted from the political interaction between Incas and local Ychsma population, which reflect a scenario of tolerance toward the local elites and the cultural expressions in the lower valley of the fertile Rimac drainage.

[132] *Chair*

Diaz-Andreu, Margarita and Tommaso Mattioli (Universitat de Barcelona)

[136] *Acoustic Effects at Las Cuevas Cave (Western Belize): An Archaeoacoustic Analysis of a Maya Cave*

The site of Las Cuevas (western Belize) has been identified as a mid-sized, Late Classic ceremonial and administrative center. Interestingly, given the importance of caves in Maya religion, the underneath part of the site has a large cave system. Research so far on this cave has focused on aspects that are common in cave archaeology: 1/ structures—in this case on the one hand the series of platforms built around a central, sunk cenote and on the other the walls subdividing the narrow part of cave into several distinct areas; 2/ pottery distribution in the different areas and platforms within the cave. Yet, in addition to the material remains within the cave, there are other aspects that are worth analysing. A decade ago Margaret Bruchez alluded in an excellent article that “subject to the precepts of science, archaeologists could collect the aural data as material artifacts, despite a previous regard of sounds as ‘immaterial’” (Bruchez 2007: 48). The aim of this paper is to show the results of our archaeoacoustic analysis in the cave of Las Cuevas highlighting the acoustic effects that have been detected as the most relevant and their relationship to particular parts of the cave.

Diaz-Guardamino, Marta (Cardiff University, United Kingdom)

[214] *Digital Imaging and Rock Art (Relational) Biographies: Reassessing Iberian Late Bronze Age “Warrior” Stelae*

Formal approaches to rock art traditionally focused on meaning and representation. Rock art images and panels were treated as static representations of symbolic frameworks while their materiality and active role in cultural production were overlooked. Rock art is the product of the dynamic interplay between people, tools and the rock surface. The properties of the rock panel have the capacity to shape rock art production as much as the skill and knowledge held by the engraver/painter and the social context in which these engagements take place. Furthermore, rock art panels may accrue complex biographies via multiple engagements.

I combine a relational-biographical approach with digital imaging technologies (e.g. RTI) to the study of rock art carvings as a way forward to address these questions. By focusing on the biographies of Iberian warrior stelae (how they were made, reworked, etc.), relevant details emerge: despite iconographic standardisation there is variability in the techniques and procedures deployed which are linked to the interplay between the stone, the skill of the carver and her/his knowledge of local rock art traditions; stelae can be reworked at later stages and reused in a variety of ways, opening up a debate about the temporality of rock art traditions.

Dibble, Harold [304] see Abdolazadeh, Aylar

Dibble, W. Flint [298] see Scarry, C. Margaret

Dice, Michael, David Barrackman (POWER Engineers, Inc.), Rebekka Knierim (POWER Engineers, Inc.) and Darren Schubert (POWER Engineers, Inc.)

[183] *Prehistoric Lake Cahuilla Shorelines Identified Using a Systematic Satellite Photograph and Ground Truth Methodology, Salton Sea Region, Imperial County, California*

Lake Cahuilla is the archaeological representation of the modern Salton Sea and represents one of the largest rift lakes in the Western Hemisphere. Formed in the Salton Basin by western-trending Colorado River runoff, in-fillings and outflows from the Colorado to the Lake and thence into the Gulf of California were episodic yet constrained by the vast Colorado River Delta. Because modern agricultural development has buried many of the ancient shorelines, the Lake’s Holocene oscillation history is difficult to identify and interpret. Recent improvements in satellite-based photographic quality have made it possible to use the desktop to hunt for prehistoric resources located on the margins of Lake Cahuilla. In this paper, we describe the discovery of a prehistoric cultural landscape made up of thousands of distinctive stone features known to local archaeologists as “fish-traps” using a systematic desk-top analysis and ground-truth process. Our research shows that at some period in the recent prehistoric past, the western shore of Lake Cahuilla can be identified in at least three stable strandlines between 40 and 90 feet below sea level and that these episodes may be datable.

Dickson, Antony [133] see Donahue, Randolph

Diederichs, Shanna R. [226] see Simon, Rebecca

Dieguez, Sergio [9] see Salgán, Laura

Dillehay, Tom

[79] *Dennis Stanford’s Legacy in Latin America*

The influence that Dennis Stanford has had on archaeologists (and others) working in Latin America on the topic of early peopling is discussed, with specific reference to lithic technology, migratory models, and logistical/academic support.

[257] *Discussant*

Dillehay, Tom [6] see Benson, Kristin

Dillian, Carolyn (Coastal Carolina University) and Charles Bello (FEMA)

[42] *Historic Preservation and the Indian Division of the Civilian Conservation Corps*

The Civilian Conservation Corps (CCC), and other federally sponsored work programs, provided much needed employment during the Great Depression and have been examined extensively by scholars in a range of fields. However, few are aware that a parallel program, Indian Emergency Conservation Work, later subsumed into the CCC as the Indian Division (CCC-ID), offered similar programs for Native American young men and performed extensive conservation work on reservations. These men built roads, bridges, fences, and public buildings; fought fires; constructed dams and irrigation systems; and improved rangeland. These landscape features are now eligible for the National Register of Historic Places, and this project outlines preliminary efforts to work with Tribal governments to recognize and document CCC-ID sites and structures.

Dillingham, Frederic, Bryan Hockett (Bureau of Land Management, Nevada State Office), Evan Pellegrini (Nevada Department of Transportation, Carson City) and Jeffrey Weise (Bridgeport Ranger District, Humboldt-Toiyabe Nation)

[106] *Communal Trapping and Pinyon Exploitation in the Wovoka Wilderness*

Heritage resources are recognized as a characteristic of the relatively new Wovoka Wilderness, created in 2014. Located in western Nevada’s Pine Grove Hills and in the Sierra Nevada’s rain shadow, resources relate to pine nut exploitation and communal artiodactyl hunting. The Wichman deer

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game trap still has standing corral posts, providing insights about the structure and function of Great Basin traps. Other game traps, blinds, rock rings, brush huts and bow stave trees are among the resources in this western Great Basin wilderness.

Dillmann, Philippe (LAPA-IRAMAT CNRS FRANCE), Stéphanie Leroy (LAPA-IRAMAT CRNS FRANCE), Sylvain Bauvais (LAPA-IRAMAT CRNS FRANCE), Maxime L'Heritier (HSPS, Université de Paris 8, France) and Alexandre Disser (LAPA-IRAMAT CRNS FRANCE)

[137] *New Insights for Provenance Studies of Iron Artifacts*

The study of the production and trade of metals is one of the means to highlight the technical and social organization of societies. Among several issues, the question of the provenance of the metal is of primary importance and can lead to enlighten the organization of the production (spatial and temporal structures of the chaîne opératoire) and of the supply networks. Concerning iron and its alloys, these last years have seen important developments in archaeological sciences to address the question of provenance. These approaches are based on both trace elements and isotopic approaches.

The aim of this paper is to discuss the principle, potentiality, advantages and limits of the archaeological science approach through the example of two provenance studies applied to different socio-economical contexts. The first one deals with the circulation of iron products in the North-Alpine area during the end of the First Iron Age (6th-5th c. BC). The second one concerns the use of iron reinforcements in the gothic monuments and cathedrals of the Middle Age in France. Finally, several prospects will be proposed for developing integrated and interdisciplinary provenance studies in the future.

Dillmann, Philippe [175] see Leroy, Stéphanie

Dillon, R. Scott [294] see Robinson, Francis "Jess"

Dimitroff, Braeden (New Mexico State University) and Candice Disque (Statistical Research, Inc.)

[269] *The Ancestral Puebloan Community of Alkali Ridge: Investigating The "Prudden Unit" Paradigm*

The 2017 Alkali Ridge Data Modernization Project completed an intensive survey of 10 Ancestral Pueblo habitation sites within the Alkali Ridge National Historic Landmark as part of the ongoing collaboration between NMSU and the National Park Service to modernize data and conduct research. The 2017 fieldwork season focused on recording small residential sites in close proximity to community centers to examine the role small satellite habitations played in the Pueblo II-III period landscape of Alkali Ridge. We speculate that there may have been a regional shift in architectural patterns of the Alkali Ridge community that differ from those seen in the Mesa Verde core region. By analyzing the "Prudden Unit" archetype at Alkali Ridge, there is potential to demonstrate variation that occurred amongst small residential sites of the same unit type. This would permit a better understanding of the differential placement and function of these sites within the local community landscape. This poster will summarize the 2017 project data collected, as well as provide the basis to future research in examining potential functional variability of "Prudden Unit" sites in relationship to the Alkali Ridge community landscape.

DiNapoli, Robert J. (University of Oregon), Terry L. Hunt (Department of Anthropology and Honors College, Uni) and Carl P. Lipo (Department of Anthropology and Environmental Studi)

[238] *Quantifying Energy Investment in Monuments (Ahu) on Rapa Nui (Easter Island) Using Structure from Motion Mapping*

Pre-European contact Rapa Nui (Easter Island) society is well-known for its substantial investment in monumental architecture, including over 300 platforms (ahu) and almost 1000 statues (moai). Recent theoretical and empirical research on the island suggests that ahu and moai were focal points for competitive and cooperative signaling by relatively small-scale communities dispersed across on the island. Evaluation of this hypothesis, however, requires the measurement of the amount of energy invested in the construction of these monuments and comparing these values to the relative quality of resources supporting local communities. Despite the significant amount of research directed towards Rapa Nui's monuments, we currently lack accurate, precise, and comprehensive estimates of monument size. To fill this gap, we used UAV-based photography and structure-from-motion photogrammetric tools to create scaled high-resolution, 3D representations of ahu. With these 3D models, we calculate volume estimates and use these values to derive energy investment estimates for each ahu. Using these data, we explore spatial patterns in energetic investment within and between local communities.

DiNapoli, Robert J. [13] see Napolitano, Matthew

Dine, Harper, Traci Ardren (Department of Anthropology, University of Miami) and Chelsea Fisher (University of Michigan)

[171] *Vegetative Agency and Social Memory in Houselots of Ancient Cobá*

It is difficult to pin down the objective definition of a weed; rather, the idea of a weed is constructed through a set of characteristics that are, for the most part, dependent on context and relative interactions. Doody et al (2014) use Judith Butler's (1990) concept of performativity to describe this dynamic, ongoing construction as a product of the agency of both people and plants. Here we interpret studies on ancient Maya agricultural techniques through the lens of plant agency and human-plant relations. We aim to investigate the place-making of agricultural landscapes through an analysis of both helpful and destructive 'weed' agencies in traditional planting, weeding, and medicinal practices. Using new LiDAR data from Cobá, we examine the liminal spaces around houselots, sometimes called 'toft zones,' to look at time management and place-making at different temporal scales. This shifting social practice and place-making factor into the performativity of weeds, and vice versa. A result of this exercise is the problematization of what it means for a plant to be 'out of place' in the ancient Maya agricultural landscape (Head et al 2014) as well as a new appreciation of how certain plants impacted daily time management schemas.

Diserens Morgan, Kasey (University of Pennsylvania)

[42] *Navigating Narratives of the Past in the Present: Archaeology and Heritage Preservation in Tihosuco, Quintana Roo, Mexico*

A national narrative glorifying the deep past of Mexico was formed using archaeological sites. The government has gone to great lengths to rebuild and preserve many ancient indigenous sites and objects for use as national symbols and as a draw for tourism. However, this practice has contributed to the 'othering' of indigenous groups by placing the 'mysterious Indians' firmly in the past, and restricting the access of descendant communities.

Working within a modern Maya community, the members of the Tihosuco Heritage Preservation and Development project seek to add to the national discourse on patrimony by using a tool recognized by the nation state: archaeology. The project investigates the legacy of the Caste War of Yucatan (1847–1901), one of the most successful indigenous rebellions in the New World.

This paper explores the ways in which archaeologists can navigate between the constructed national narrative and producing knowledge that may subvert or run counter to it. How do we negotiate the tensions that occur between the communities and government agencies that both provide approval for our work? How do government control and conceptions of ownership impact archaeological work? What impact do national laws protecting patrimony have on those living within historic sites?

Disque, Candice [269] see Dimitroff, Braeden

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Disser, Alexandre [137] see Dillmann, Philippe

Dixon, Christine C. (Green River College) and Payson Sheets (University of Colorado, Boulder)

[142] *The Complex Community of Cerén, El Salvador: a Classic Maya Example of Heterogeneity*

The Loma Caldera eruption of c. AD 660 dramatically buried a sophisticated community built by craftspeople, architects, religious specialists, political leaders, and agriculturalists. As people fled for their lives, they left behind belongings and buildings. Results from decades of archaeological research at Cerén, El Salvador and in the surrounding Zapotitán Valley challenges an ethnocentric, over-simplified reconstruction of ancient socio-political organization. Cerén was not in the middle of a city, but neither was it isolated. The large regional center of San Andres was only 5 km away, yet Cerenians distinguished themselves with their own governance, religious ceremonies, feasts, the wide array of species they grew, and their earthen architecture (road, domiciles, and public buildings), that was unlike the stone construction of surrounding settlements. The Cerén community expressed and maintained their ideological, social, political, and economic autonomy, while remaining connected to the variety of other settlements throughout the valley. Engaged in larger Maya practices and trade networks of southern Mesoamerica, Cerenians crafted a lifestyle for themselves that enabled them to successfully subsist off the land on their own terms. Remains of such communities enhance our understanding of the socio-political spectrum and provide a graphic reminder of the liabilities of using simple dichotomies.

Dixon, E. James (Maxwell Museum)

[79] *Dennis Stanford: The Alaska Years and Beyond*

Dennis Stanford was first introduced to Alaskan archaeology in 1966 as a field assistant to Robert L. Humphrey during an archaeological survey in the Utukok River valley in the western Brooks Range. At the urging of John M. ("Jack") Campbell he began work near Point Barrow in 1968 to investigate controversial questions about the origins of Thule culture. Following brief investigations at the Utkiavik site, he focused his excavations south of Barrow at Walakpa, where he discovered more than 20 stratigraphic levels documenting the transition from Birnirk to Thule cultures. His analysis led him to conclude that the transition from Birnirk to Thule was correlated to climate change and possibly an over-reliance on seal hunting. His subsequent research interest in Alaska have focused the relationships between eastern Beringia and the first colonization of the Americas. In 1989–90 he served as Visiting Distinguished Professor, at the Alaskan Quaternary Center, University of Alaska Fairbanks where he taught Paleoindian archaeology and mentored students. His long engagement in Alaskan research has significantly influenced his contributions to the study of bone taphonomy, late Pleistocene paleoecology, and the first colonization of the Americas.

[79] *Chair*

Dixon, E. James [79] see Graham, Russell

Dobney, Keith (University of Liverpool, UK), Ardern Hulme-Beaman (University of Liverpool), Carly Ameen (University of Liverpool), Allowen Evin (CNRS University of Montpellier) and Thomas Cucchi (CNRS Natural History Museum, Paris)

[212] *Divergence of Domestic Dog Morphology through Deep Time*

The modern domestic dog is behaviourally and morphologically far removed from its ancient counterpart. Increasingly, research has demonstrated that using modern comparative collections for identifying domestic animals in archaeological contexts is problematic. This is likely the result of the intensive breeding that modern animals have undergone in at least the last two centuries. It is unclear how far back the current modern morphology of dogs goes, or how different ancient dogs were from their modern descendants. Here we present the results of analyses examining the differences between archaeologically identified dogs with modern domestic dogs, modern wolves and Pleistocene wolves to see how these groups have morphologically diverged. To do this we will examine the morphologies of both the mandible and the first mandibular molar and compare the through-time shape change of archaeological dogs to the baseline of shape variation of each of the reference groups. The results of these analyses will go far beyond the simple identification of wild and domestic animals, as they will shed light on the changes brought about to one of the most important human-animal relationships across deep time.

Dobney, Keith [125] see Hulme-Beaman, Ardern

Dobrov, Amanda (UC Berkeley)

[242] *Roman Amphorae of North Africa: Markers of a Pan-Mediterranean Economy*

This project is centered around the Roman amphorae excavated from the Palatine East Archaeological Project. The site is located on the northeast slope of the Palatine Hill in Rome. The ceramic deposits date from the first century to about the fifth of sixth century CE. I focus on the amphorae produced in North African, specifically those of Tunisian origin. My work is hoping to better understand the geographical location of production sites of these trade vessels.

The results of this project intend to highlight the role played by specific regions with Roman North Africa in the supply of foodstuffs to the urban centers, including northern Tunisia, the Sahel, Tripolitania, and the Kabylie of Algeria, from the early to the late empire.

The project involves the classification of the rim fragments by amphora class, the characterization of their fabric by means of the evaluation of photomicrographs taken with a digital microscope with a view to determining their likely provenience, and their quantification by the estimated vessel equivalents (EVE) technique.

All of this work has been done in close consultation with Michel Bonifay's 2004 publication, *Études Sur la Céramique Tardive d'Afrique*, and Simon Keay's 1984 amphorae handbook.

Dockrill, Stephen (Stephen Dockrill, University of Bradford) and Julie Bond (Archaeological Sciences, University of Bradford)

[135] *Swandro, Rousay, Orkney: Between Sea and Land*

The site of Swandro is on the eroding coastal fringe of the island of Rousay, Orkney and has been the focus of field training for the next archaeological generation between the University of Bradford, Archaeological Institute UHI and Hunter College, CUNY since 2010. Such sites are a finite resource, endangered by coastal erosion exacerbated by the effects of climate change. The site straddles both the shore and the land and consists of a Neolithic Chambered Cairn and a later settlement dating from the Early Iron Age to the Norse period. Archaeological investigation of the beach, where the sea has cut into the complex depositional sequence to form a series of terraces required an adapted response. Excavation over multiple seasons has enabled an understanding of the stratigraphic sequence and the process of erosion and also the development of new methodologies to facilitate its recording before the sea destroys the surviving evidence. The evaluation and excavation of the beach has provided an understanding of past environments, structural succession, economic and industrial activities. A key element of the work is creating public awareness of this fragile but valuable resource.

Dodd, Lynn (USC)

[321] *Moderator*

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Dodge, Robyn (The University of Texas at Austin)[28] *Ongoing Household Research at Hun Tun: An Ancient Maya Hinterland Settlement in Northwestern Belize*

The ancient Maya site, Hun Tun is a Late-Terminal Classic commoner settlement located in northwestern Belize. Research at Hun Tun operates under the Programme for Belize Archaeological Project (PfbAP). Social complexity at the household level serves as a research theme for Hun Tun investigations. This paper addresses the ancient Maya commoners who lived in household contexts at Hun Tun while discussing how their role as a hinterland community contributed to ideas of household identity, social formation, and production within the larger La Milpa political capital. Ancient Maya commoners are great adapters to their environment responding to external cultural and natural pressures. Analysis of everyday material culture, monuments, and major architecture features from domestic contexts contribute to understanding the role of Hun Tun within the La Milpa hinterland. Interpreting the function and use of household spaces are crucial to understand the activities which took place. Knowledge about commoner rituals also serves to incorporate and legitimize Hun Tun within ancient Maya society. Specifically, ceramics, various lithic material assemblages, and small find material culture, are among the artifacts recovered from prominent features that will be discussed.

Doelle, William (Archaeology Southwest)[96] *Moderator***Doering, Briana (University of Michigan)**[283] *Exploring the Cause of the Athabaskan Migration through Isotopic and Geospatial Evidence*

Linguistic and archaeological evidence suggests that Athabaskan-speaking peoples rapidly spread south from present-day Central Alaska and Northwest Canada into the Great Plains region around 1000 years ago. Historically, explanations of this important event have centered on relatively small geographic regions and traditional methodologies. This paper offers an alternative view at both a much larger scale and using distinct methods. I argue that this significant migration event was driven by the increased importance of salmon and other fish in the Athabaskan diet, a hypothesis based on my on-going central Alaskan research, which employs a compound-specific isotopic analysis of soils, landscape modeling, and predictions from human behavioral ecology. The results of this research provide not only a more nuanced understanding of late prehistoric Athabaskan subsistence and culture, but also a novel perspective on human biogeography in the Americas prior to European colonization.

[250] *Chair***Doershuk, John (University of Iowa)**[166] *The University of Iowa American Indian Concerns Archaeological Field School—Putting the Zimmerman Vision to Work*

As an established scholar, Larry Zimmerman spent several years around the turn of the millennium at the University of Iowa where he served as a faculty member in the Department of Anthropology and Director of the American Indian and Native Studies Program. With the encouragement and support of then State Archaeologist of Iowa William Green, Larry and I initiated a program of study in 1999 emphasizing the teaching of high quality archaeological field techniques coupled with active exploration of American Indian concerns about how archaeology is often conducted. This field school represented a unique partnership of a wide variety of agencies, institutions, and individuals. With UI staff and faculty members as key personnel, the inaugural project also involved close collaboration with Plymouth County, Iowa officials; a Sioux City, Iowa archaeological consultant; Briar Cliff College as host institution and provider of food, lodging, and classroom/lab space; and several individuals associated with regional Indian tribes (Omaha, Sioux, Winnebago, and Meskwaki). We replicated our 1999 success in northwest Iowa with two additional editions of this Zimmerman-inspired field school configuration in 2000 and 2001.

Dogandzic, Tamara [304] see Abdolazadeh, Aylar

Dolan, Sean (Los Alamos National Laboratory)[42] *Thinking outside the Excavation Unit: Lessons Learned from an Alternative Mitigation Project on the Pajarito Plateau, New Mexico*

Excavation is often the way to mitigate for the loss of cultural resources to comply with Section 106 of the National Historic Preservation Act. However, excavation is not always the most practical solution. A case study is presented to demonstrate how alternative mitigations advance the research value of cultural resources, and increase flexibility in land-use decisions by agencies while satisfying the mutual interests of stakeholders. In 2012, four prehispanic Ancestral Puebloan fieldhouses were impacted at Los Alamos National Laboratory due to tree thinning activities. The State Historic Preservation Officer (SHPO), Advisory Council of Historic Preservation, and Pueblo de San Ildefonso were notified, and a damage assessment report was written. A Memorandum of Agreement between Department of Energy and the SHPO was signed in 2016, and it stipulated that a fieldhouse context document be written in lieu of excavation. The document resulted in the acquisition of new research that advances northern New Mexico archaeology. Also, funds went towards the creation of a free public book to achieve wider public awareness about the local archaeology and cultural preservation. I identify lessons learned during this project and offer recommendations for future application of alternative mitigations.

Dollarhide, Eli (New York University)[121] *Revealing the Local: A Look Inwards at the Archaeology of Southeastern Arabia*

Rita Wright's valuable contributions to the archaeology of urbanism and holistic, multi-scalar approaches to settlement patterns is well-attested in her survey work along the Beas River Valley. This paper picks up these themes in a different region of the interconnected Bronze Age world that has been the focus of her research—ancient Oman.

Known as Magan in Mesopotamian texts, a considerable amount of research has been conducted on Bronze Age Oman by focusing on its external connections to other polities. In this paper, I present an alternative, hyper-local perspective on the archaeology of this area. Utilizing ceramic and survey data collected in the spring of 2017 from the region surrounding the UNESCO World Heritage Site of Bat and nearby remains at 'Amlah, this paper works to shift the focus of research on ancient Oman inwards by examining connections between settlements in the Bat region. An analysis of the ceramics collected in this area suggests a temporally dynamic landscape, with shifting centers of activity. Taking a localized, historically-particular approach to the archaeology of interactions in this small area ultimately reveals the significance of even the smallest known settlements in ancient Oman.

[196] *Chair***Domeischel, Jenna (Eastern New Mexico University), Jesse Tune (Fort Lewis College), Christine Gilbertson (Eastern New Mexico University) and Heather Smith (Eastern New Mexico University)**[222] *UAV-Based Mapping and Public Outreach at Blackwater Draw*

Remote sensing has dramatically changed the way we collect data at archaeological sites, and has added new and innovative methodologies to our fieldwork. It has also facilitated greater public engagement by making archaeology more accessible—this is especially true of sites that are considered remote or difficult to access because of challenging terrain. As part of the public outreach initiative of the new Blackwater Draw Museum and its associated website, an unmanned aerial vehicle (UAV) mapping project was undertaken to provide a layered interpretive experience for visitors. Visitors are only able to physically access limited areas of the archaeological site due to a variety of factors, most importantly their own safety and the

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safety of our archaeological resources. As a result of the UAV mapping project, the public, students, and researchers alike will be able to digitally access and explore the terrain outside of the marked roads. In this manner they will have the unique experience of seeing archaeology through an archaeologist's eyes, and be better equipped to understand the data collected throughout the site's history.

Domeischel, Jenna [222] see Waggle, Tawnya

Domenici, Davide (University of Bologna (Italy))

[139] *An Underground Home for Earthly Beings. Reconstructing the Archaeological Context of a Lot of Mesoamerican Mosaic Encrusted Artifacts in the National Museum of the American Indian Collections*

The National Museum of the American Indian holds a lot of Mesoamerican mosaic encrusted wooden masks and shields bought in 1921 from Carl A. Purpus, who stated they were found in a cave near Acatlán, Puebla (Mexico).

The presentation, besides including a brief description of the artifacts, is aimed at reconstructing the objects' unknown contextual information through a comparison with similar objects held in American, Mexican and European museums, some of them proceeding from scientifically excavated caves. The comparative analysis, integrated by information deriving from Mixtec codices and early colonial Spanish historical sources, suggests that a group of caves in Puebla and Oaxaca contained similar sets of sacred bundles representing earthly beings known as ñuhu in Mixtec language. The bundles must have been used in ritual performances related with the reciprocal exchange of gifts between humans and extra human beings. The aim of the paper is thus to provide the artifacts in the NMAI collection with some of the contextual information that was lost when they were looted from the cave. In this way, the artifacts reacquire their status of powerful instantiations of earthly fertility, thus becoming much more meaningful both for Mesoamericanist scholars and contemporary indigenous communities.

[206] *Discussant*

Domic, Alejandra [59] see Hirth, Kenneth

Dominguez, Miriam (University of Florida)

[141] *Renderings of Knowledge and History in the Jubones River Basin: Neutron Activation Analyses and Petrography in the Ceramics of Potrero Mendieta (ca. 1,000 BCE)*

Inter-regional interaction cannot be defined simply by the unambiguous material evidence of exotic materials but also by the knowledge associated with the manufacture and movement of those materials. And thus, the physical properties of these materialized practices, which include human and non-human agents, are not unmovable facts or culturally specific interpretations but part of the histories of social interaction. This case-study examines the results from the compositional analysis of the ceramic wares from the site of Potrero Mendieta, in southwestern Ecuador, and the historical processes of social interaction and movement of peoples associated with this context through different regions by way of the inter-Andean Jubones River Valley at around the first millennium BCE. This archaeological analysis departs from the notion that the "physical world" and the "social world" are mutually constituted. The application of archaeological sciences to analyze materials at the compositional level generates data suitable for the description and interpretation of the historical processes of human mobility and social interaction which in turn presents how materials and their physical qualities have functioned as participants and mediators of history and not only as a background to history.

Dominguez, Silvia [285] see Pastrana, Alejandro

Dominguez Vazquez, Gabriela [59] see Gonzalez, Silvia

Donahue, Caitlin [241] see Hermit, Elijah J.

Donahue, Randolph (University of Bradford)

[133] *Further Understanding of Subsistence and Settlement in the Later Mesolithic of Northern England*

We present the results of an integrated study of lithic microwear analysis and lithic sourcing at the large Mesolithic site of Stainton West. Microwear analysis helped to understand why the site was so large and how the occupants supported themselves while at the site. Microwear analysis of 700 artifacts led to 49% identification of use. There is much diversity in tool use: hide working, butchery (meat/fish), impact, antler/bone working, wood working, and plant working. Various patterns were detected between tool use and tool technology. Many of the numerous microliths showed impact damage, but are attributed to fishing rather than hunting. This conforms to the riverside location of the site on the River Eden. Hide working was primarily limited to dry hide, which supports the hypothesis that hunting was not the primary procurement activity and is also suggestive of a residential site, which is further supported by the diverse set of tools and wide range of activities represented. The sourcing study shows that raw material was procured from long distances in all directions. We conclude that the site was likely an aggregation site where many bands came together to exploit an abundant but temporary fish resource.

[133] *Chair*

Donaruma, William (University of Notre Dame) and Ian Kuijt (University of Notre Dame)

[296] *I Could Read the Sky and Make Nets: 19th Century Irish Taskscapes of Remembrance and Belonging*

19th century Irish emigrants from coastal settings, including the islands of western Ireland, traveled to America to establish better lives for themselves, their relatives, and their future offspring, often in new and very challenging urban settings. These islanders left their homes, the seascapes that framed their lives, and entered into a new placelessness. To Irish islanders living and working in America, crafts such as making fishing nets, provided a point of entry into the emotional landscape of memory and belonging. Nets were not just economic tools or objects; rather these practice helped islanders make their past meaningful through the repeated reenacting of crafts, and negotiate their place in the New World. Migration is, above all else, a dissociative event, one that fundamentally challenges an individual's sense of place, of home, and identity, and creates moments in which individuals reside in one place, but "belong" in another place. Combining oral history, folklore and documentary records, we discuss how the film *Nets of Memory* (Lionta na Cuimhne) explores how a 19th century Islander from Inishark, County Galway, Ireland, continued to make fishing nets for 40 years after emigrating to Clinton, MA.

Dongoske, Kurt E. (Zuni Cultural Resource Enterprise) and Giorgio Hadi Curti (, Cultural Geographics Consulting (CGC) and San Di)

[72] *Re-indigenizing Mitigation Processes and the Productive Challenge to CRM*

What is mitigation? By definition, it is reducing the severity, seriousness, or painfulness of an event, development, procedure, or situation. As part of CRM mitigation processes, direct, indirect, and cumulative effects must all be identified in order to address any competent approach to and for mitigation. A key question must then also arise within any mitigation process—by whom is mitigation developed and implemented and for what and whose interests, concerns, benefits, and well-being? The bureaucratic recognition of TCPs in Bulletin 38 and in 1992 amendments to the National Historic Preservation Act have provided productive directives to identify and consider properties vital to different cultural groups. These directives have concomitantly presented a challenge to consider what sound mitigation may—or may not—be, as the significance of such places are defined far more

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by their integrity of associative relations. Avoidance is the mutually acceptable form of mitigation by tribes, agencies, industry and the CRM community; however, when it is agreed by all parties that avoidance is not feasible, we present examples from our experiences working with the Zuni of how cumulative effects and the Zuni worldview and associated cultural practices, must be considered and applied in the design of successful mitigation.

[166] *Discussant*

Donnelly, Chad [135] see Ollendorf, Amy

Donner, Kristin (Seyitömer Höyük Rescue Excavation Project) and Laura Harrison (University of South Florida)

[265] *Mix, Mold, Fire! An Exploration of the Chaine Operatoire through the Eyes of an Apprentice Potter*

Pottery manufacturing in Early Bronze Age (EBA) Anatolia witnessed a host of technical innovations that transformed what had been a small-scale domestic activity into a specialist craft. At the proto-urban village of Seyitömer Höyük, dedicated pottery workshops appeared in the EBIII period (ca. 2250–2200 BCE), along with a suite of technical innovations, such as pottery molds, clay mixing pits, and clusters of pottery kilns. These advances allowed potters to manufacture more vessels with less effort, and represent a fundamental shift in the chaine operatoire, which is indicative of broader social and economic changes in the EBA. This poster presents the archaeological evidence for various stages of standardized pottery production, in comic book style. Sequential illustrations tell the story of an apprentice potter learning her craft under the tutelage of a seasoned corporate group of specialists. These fictional characters perform activities that are empirically attested at Seyitömer Höyük, and offer an approachable way for general audiences to engage with real archaeological data.

Donner, Natalia (Leiden University), Andrew Ciofalo (Leiden University), Samuel Castillo (Universitat de Barcelona) and Alexander Geurds (Leiden University, University of Oxford)

[323] *Pre-colonial Griddles in Central Nicaragua: An Archaeometric and Archaeobotanical Approach to Foodways at the Barillas Site, Chontales*
Since 2007, the Proyecto Arqueológico Centro de Nicaragua, directed by Alexander Geurds, has excavated several archaeological sites in Chontales, Nicaragua, northeast of Lake Cocibolca. This paper reports on fragments of ceramic griddles recovered in layers dated to cal AD 1275 and 1290 at the Barillas site—unprecedented find challenging our views on ancient foodways in the region. The paucity of these comales has hitherto co-determined narratives on human mobility from Mesoamerica, due to the debatable assumption that this type of artifact necessarily entangles consumption of maize tortillas.

In this paper, we present results on paleoethnobotanical and archaeometric analyses, discussing technological and provenance aspects related to the ceramic fragments and interpretations of the ancient starch remains attached to the earthenware retrieved during the excavations. Also, we will review techno-functional and use-wear aspects related to chipped stone artifacts found in the same context. The interdisciplinary approach to this dataset will shed light onto the ways people prepared and consumed food in Central America. Studying foodways is vital to understanding socially learned practices. This research on cooking dynamics will help expose the unique Central Nicaraguan perspective of food practices.

Donop, Mark (University of Florida)

[301] *Pot Souls and Kill Holes: Weeden Island Ceramics from Palmetto Mound, Florida*

Most of the ceramic vessels interred in Palmetto Mound (8LV2), were “killed” for reasons that are not adequately explained. These include biomorphic ceramic effigy vessels that depict or embody living things, or their characteristics. Using ethnohistorical and archaeological data, I suggest that the ceramics vessels in Palmetto Mound were considered to be animate, non-human persons with souls that were ritually killed, dismembered, and interred in the mound.

Donovan, Erin (Indiana University Purdue University Indianapolis) and Jeremy Wilson (Indiana University Purdue University Indianapolis)

[266] *Who Was Where: Georectification and Radiometric Dating of a Mississippian Mortuary Complex*

The Orendorf site is a Mississippian village and mortuary complex located in west-central Illinois. Salvage excavations between 1970 to 1990 have yielded one of the largest and best-preserved skeletal assemblages in the central Illinois River valley. The human skeletal assemblage from the Orendorf site has been ideal for a wide variety of bioarchaeological research, both invasive and non-invasive. Despite the attention given to the individuals, research focusing on the burial contexts and radiometric dating of the burials are lacking. Through georectification of spatial data from the original excavation paperwork, I have identified seven individual burials from distinct stratigraphic episodes within the burial mound excavated between 1986 and 1990 for radiocarbon dating. Establishing a chronology for the Orendorf mortuary complex allows for greater inter- and intrasite comparisons within the central Illinois River valley, as well as, a more nuanced understanding of previous bioarchaeological research conducted with the Orendorf skeletal collection within a temporal context.

[337c] *Discussant*

Doonan, Roger

[318] *Moderator*

[318] *Discussant*

Doonan, Roger [77] see Mlyniec, Michael

Dore, Christopher [63] see Greaves, Russell

Dores, Tiago [68] see Fraga, Tiago Miguel

Dorison, Antoine (University Paris 1—ArchAm (CNRS)), Gregory Pereira (ArchAm (CNRS, Paris)) and Marion Forest (Arizona State University)

[169] *Thirty Years Later. Revisiting the Tarascan City of Las Milpillás and Its Environment, Malpaís de Zacapu, Michoacán*

Thirty years ago, investigations in the city of Las Milpillás in the Malpaís de Zacapu, provided unprecedented insights on the origins of Late Postclassic Tarascan social organization. One was the highlighting of a unique kind of urban organization upon lava flows ; as in all four Tarascan cities of the Malpaís. Yet, unlike its counterparts, Las Milpillás specificity resides in the fact that a site portion lies upon older volcanics, providing arable lands at hand for the city dwellers to use. Today, newly acquired LiDAR imagery covering the entire city and its environment brought the research to a new scale and raises several important questions regarding the management of agrarian resources and their appeal for human settlers through time. In this work, we revisit Las Milpillás integration in its volcanic environment in light of the LiDAR imagery. We first present the methods implemented to extract data from the LiDAR derived DEM, and compare the results with the 1980's alidade field mapping. We then assess the human effort undertaken to take advantage of the environment in view of the numerous agrarian features brought to light. We finally discuss the potentiality of dating areas on the basis of human-modified landscape features.

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Dorland, Steven (University of Toronto)

[87] *Learning through the Children: An Experimental Analysis to Investigate the Relation between Childhood Pottery Making Techniques and Social Learning Strategies*

In Güner Coşkunsu's *The Archaeology of Childhood: Interdisciplinary Perspectives on an Archaeological Enigma*, Kathryn Kamp has discussed the potential to conduct experimental archaeology to assess childhood practice. In this paper, we follow Kamp and propose the use of experimental studies to explore the relation between different social learning strategies and material interactions. We investigated the performances of youth participants making pottery. Three forms of social learning were observed: 1. Participants who made a bowl by copying a pre-made bowl made by the authors, 2. Participants who made a bowl while watching the authors make a bowl, and 3. Participants who made a bowl while the authors made a bowl and described the actions. The results demonstrate patterns of different mental processes, of which caused participants to apply different methods of bowl making. Rather than basing inferences of the past on assumptions of child performance, experimental studies provide a greater opportunity to develop a more concrete understanding of the material indicators that archaeologists identify to assess child performance. These questions help enhance our understanding of childcare practices and the roles of childhood agents in broader social milieus. As a result, we produce a refined understanding of the archaeological past.

[87] *Chair*

Dorshow, Wetherbee (University of New Mexico) and Michael Heckenberger (University of Florida)

[116] *Recent Investigations in the Upper Xingu Basin*

In the southern Amazon, two decades of rapid agro-pastoral development, extreme drought, and forest fires in the "arc of deforestation" threaten to precipitate an ecological oscillation of southern transitional forests from an eco-region dominated by closed tropical forest to one of open savanna and woodlands. Collaborative research conducted with the Kuikuro indigenous community in the Xingu River headwaters, involving archaeology, soil science, paleoecology, remote sensing, geospatial analysis, as well as, oral history and ethnographic investigation, documents human interventions into landscape of unprecedented scale, precision and planning in indigenous Amazonia. In the Xingu, indigenous knowledge and land management strategies, such as soil enrichment, wetland and fisheries management, and agroforestry, provide alternative pathways to ecological resilience and sustainable land use in the face of dramatic climate change during the Current Warming Period. This paper summarizes these findings, with an emphasis on a geospatial time-series analysis of Landsat imagery designed to identify the distribution, spectral signature, and potential functions of anthropogenic "Banded Forests" in the region.

Dorshow, Wetherbee [161] see Heckenberger, Michael

Dotzel, Krista (University of Connecticut)

[294] *Phytolith Analysis of Woodland Period Carbonized Food Residues from Block Island, RI*

Due to poor preservation, Woodland-era plant resources in New England, both wild and cultivated, have long been poorly understood. Previous macrobotanical analyses have suggested that Woodland subsistence strategies for plant resources in New England are unique to the region, with further intra-regional variation between coastal and interior contexts. This paper presents a preliminary analysis of phytoliths extracted from carbonized food residues found on ceramic sherds from the Early Woodland site 1428 on Block Island, RI and other Woodland sites in New England in order to gain new insight into the subsistence strategies of the era.

Doucette, Dianna (The Public Archaeology Laboratory (PAL)), Elizabeth Chilton (Binghamton University), David Foster (Harvard University), Deena Duranleau (UMASS Amherst) and Evan Taylor (UMASS Amherst)

[294] *Fire and Vegetation Dynamics: Blazing the Trail in Pre-contact Southern New England*

The concept that Native Americans were using fire for wide spread vegetation control and subsistence procurement during the pre-contact period in Southern New England has long been excepted as common practice, leading to changes in the landscape and then settlement patterns. However, save for the accounts of early explorers and colonists, whose goal was to solicit the "new land" as a familiar landscape and not an unknown wilderness, there is little supporting scientific evidence. This paper presents a component of a larger NSF-funded research project aimed to better understand the dialectical relationship among human activity (fire, land clearance, horticulture), vegetational dynamics, and climate by combining archaeological, paleoecological, and paleoenvironmental data. Overall, results of the multidisciplinary data analyses conducted thus far from state of Massachusetts and, further, from three distinct ecological zones within the state: Martha's Vineyard, the Taunton River Drainage Basin, and the Deerfield Valley, does not show clear influence of human agency on the environment during the pre-contact period.

Doucette, Dianna [294] see Jeremiah, Kristen

Douglas, Diane (Applied EarthWorks)

[292] *Climate Change Adaptation: Implementing Indigenous and Local Knowledge to Increase Community Resilience*

Community resilience can be enhanced by engaging local and indigenous groups in the management of their cultural resources, both intangible and tangible. Many communities in developing nations were formally subjected to colonial governance, which imposed foreign architectural designs, irrigation agriculture and economic crops—and these systems vastly changed the social-cultural dynamics of these communities, often destabilizing systems that had been in place for generations. After colonial powers left, indigenous and local groups were left with trying to manage their countries/regions with systems poorly adapted to their geographic landscape. In many regions, climate change is stressing communities to the brink of failure. Millions of people are subject to starvation, social/political collapse, forced migration due to degradation of the environment, and loss of their cultural heritage and social-cultural identity. This paper presents an upper level course that helps graduate students identify ways that public/private partnerships can be implemented to help communities recall and implement indigenous and local knowledge (ILK), and in so doing make them more resilient to climate change. The course encourages graduate students to "adopt" a particular community and make it their dissertation or master's thesis and to design a "resilience through ILK" program in collaboration with local persons.

Douglas, Michele Toomay [20] see Ikehara-Quebral, Rona

Douglass, John (Statistical Research, Inc.)

[275] *Chair*

Douglass, Kristina (The Pennsylvania State University), George Manahira (Morombe Archaeological Project), Roger Samba (Morombe Archaeological Project), Voahirana Vavisoa (Morombe Archaeological Project) and Felicia Fenomanana (Morombe Archaeological Project)

[114] *Integrated People, Practices and Knowledge in the Archaeology of Southwest Madagascar*

Since 2011 the Morombe Archaeological Project has undertaken archaeological survey, excavation and oral history recording in the Velondriake Marine Protected Area of southwest Madagascar. The project's aims are to investigate diachronic human-environment dynamics and refine our understanding of the region's settlement history by leveraging multiple scientific techniques and the collective historical and socio-ecological knowledge

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base of Velondriake's living communities. The project is run by a diverse team of ancestors, elders, men, women and youth from different communities in Velondriake, representing five ancestral clans. In this paper we describe the outcomes of the project's approach to integrate diverse community members and collective knowledge in all aspects of the research and promote this approach as necessary in generating new and humanized narratives of human-environment interaction on the island of Madagascar.

Douglass, Matthew (University of Nebraska), Simon Holdaway (University of Auckland) and Sam Lin (University of Wollongong)
[200] *Investigating Prehistoric Land Use History and Place Use Variability with Low Density Surface Scatters of Stone Artifacts in the Oglala National Grassland, Northwestern Nebraska*

The USDA Forest Service National Grassland System consists of 20 individual native and restored prairie grasslands. While the scale of these areas allows landscape survey, this 'sea of grass' is a challenge for artifact and feature discovery due to vegetation cover, meaning archaeologists must use surface visibility created by erosion, deflation, and other natural and anthropogenic processes. Here we report on a collaborative student-training project between the Forest Service and the University of Nebraska on the Oglala National Grassland in far northwestern Nebraska. A record of low-density lithic scatters permits assessment of movement and land use history in different locations throughout the grassland. Using raw material variability, measures of reduction intensity, and cortex proportions, we assess in-flow of non-local and out-flow of local materials, and discuss the implication of this pattern for understanding the organization of lithic technology in this environment, and how spatial variation in this process relates to a deep history of landscape structure and land use.

Douglass, Matthew [99] see Phillips, Emily

Douka, Katerina (Max Planck Institute & University of Oxford), Samantha Brown (Max Planck Institute for the Science of Human Hist), Mikhael Shunkov (Institute of Archaeology and Ethnography, Siberian), Anatoly Derevianko (Institute of Archaeology and Ethnography, Siberian) and Tom Higham (Research Laboratory for Archaeology, University of)
[41] *Searching for the Denisovans*

In 2010, a finger bone discovered in Siberia was assigned using DNA to a previously unknown human group, the Denisovans. The Denisovans interbred with both Asian Neanderthals and modern humans over the past 100,000 years; their geographic distribution is now thought to have stretched from the Siberian steppes to the tropical forests of SE Asia and Oceania. Despite their broad spatio-temporal range, the Denisovans are only known from 4 bones, all from a single cave. This patchy knowledge of an entire human population significantly limits our ability to test hypotheses regarding routes and timing of people movements across Asia, the nature and frequency of interaction between archaic indigenous groups and migratory modern humans, and the mechanisms leading to sole dominance of our species.

In 2017, a new 5-year research project "FINDER", funded by the European Research Council, was inaugurated, its main purpose being the discovery of new Denisovans. We apply a novel combination of analytical methods, namely collagen fingerprinting, also known as ZooMS, radiocarbon dating and ancient DNA analysis, designed to identify, date and genetically characterize human fossils amongst thousand animal fragments excavated from Denisova and elsewhere in Siberia. The first results from this work are reviewed in this presentation.

Douka, Katerina [41] see Higham, Tom

Dowd, Anne S. (National Park Service)
[140] *Sacred Stone, Sacred Land: A Traditional Native American Quarry Cultural Landscape*

The Pipestone National Monument, created August 25, 1937, attracts people to mine its catlinite rock containing traces of iron-rich hematite giving it a red hue. The living cultural landscape preserved as a National Monument in southwestern Minnesota is 301 acres, but its modern constituency extends far beyond these borders. In ancient times, raw material from the Sioux Quartzite Formation traveled long distances as well. Archaeological research in combination with ethnography and descendent community participation provides an important perspective on the interrelationship of natural bedrock and Native American groups, who extracted raw material for trade, pipe making, and other craft or ritual products.

Dowell, Mike [190] see Jones, Garrett

Downes, Jane [135] see Maher, Ruth

Downey, Jordan
[303] *No-Budget Archaeology: Landscape Archaeology Using Free Data and Software*

Geographical Information Systems (GIS) and remotely-sensed data are now used ubiquitously in archaeology. While these tools offer incredible possibilities for landscape archaeology and can be extremely cost-effective compared to traditional survey methods, they are nevertheless costs that must be borne by research budgets and home institutions. Data acquisition can easily reach thousands of dollars, and industry-leading GIS software platforms require expensive annual licenses. But all hope is not lost for those of us with no budget: many governmental or academic agencies offer free data with fair-use licensing for academic research, and open-source or free-to-use software can perform powerful computations and create publication-quality maps. This poster presents several examples to highlight how no-cost data sources and software can be used to explore the archaeological landscape of the north coast of Peru from 500 B.C. to A.D. 500. Of course, such data cannot address all research questions and fieldwork is always necessary to ground-truth findings, but this poster will give hope to junior academics and professors emeriti alike by showing how you can continue to produce and disseminate new research with nothing more than a computer and an internet connection.

Downs, Lauren (AECOM) and Kyle Waller (University of Missouri)
[306] *Problematic at Best: Assigning Sex to Prehistoric Remains with Consistency*

Historically, the sex of prehistoric human skeletal remains has been visually assessed by researchers who are (hopefully) knowledgeable about the population being examined. However, methods of assigning sex can be largely subjective and often lead to inconsistent results. In this study, we consider human skeletal remains from the Medio period (A.D. 1200–1475) from Paquimé, a site in northern Chihuahua, Mexico, that was the economic and political center of the Casas Grandes region. The sexes of the human skeletal remains from this site have been assessed on three separate occasions (Benfer 1968; Butler 1971; Waller 2017) using a variety of methodologies, and have yielded significantly different results. We examine how these inconsistent analytical methods can influence more general interpretations of Paquiméan society, and consider how these results might be applied to broader studies of gender roles and status within prehistoric societies.

Downum, Chris [70] see Smith, Jaye

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Doyle, James (The Metropolitan Museum of Art), Griselda Pérez Robles (Proyecto Paisaje Piedras Negras-Yaxchilan) and Edwin Pérez Robles (Proyecto Paisaje Piedras Negras-Yaxchilan)**[163]** *New Advances in the Conservation of Monuments at Piedras Negras, Guatemala*

In 2016, a pilot project began for the conservation of sculpted monuments including stelae, altars, and panels at the site of Piedras Negras, Guatemala. Since then, a team in conjunction with the international Proyecto Paisaje Piedras Negras-Yaxchilan has constructed new platforms with roofs to house the monuments, protecting them from further weathering, moisture, and biological agents. The results of the implementation of the innovative system—platforms of powdered lime and local stones, wooden supports made from local pucte trees, and semi-translucent polycarbonate roofs—are currently being monitored with respect to relative humidity and temperature. In 2017, notable reductions in microorganism and plant growth were observed.

Excavations and three-dimensional photogrammetric modeling are augmenting the data available for some well-known monuments, which will contribute to a new database of in situ and removed monuments and fragments in Guatemalan and international museum collections. Furthermore, archival research on Piedras Negras Stela 5, on loan from Guatemala to the Metropolitan Museum of Art, has revealed new information about the illicit removal of monuments from the site and their subsequent appearance on the art market in the United States and Europe.

Doyon, Luc (Université de Montréal & Université de Bordeaux)**[219]** *Aurignacian Projectile Points Do Not Represent a Proxy for the Initial Dispersal of Homo sapiens into Europe: Insights from Geometric Morphometrics*

It has been argued that Aurignacian projectile points made of antler, bone, or ivory represent a proxy for the initial dispersal of *Homo sapiens* into Europe. Our research reassesses this claim by using geometric morphometric analysis to study 547 Aurignacian osseous implements recovered from 49 European sites. This approach allowed the identification of eight volumetric templates reproduced by Aurignacian artisans during the manufacture of split-based points. Two templates were identified for massive-based points, one of which includes a number of variants. Spatial and chronological distribution of these templates suggests the dominant hypothesis must be reconsidered. We argue that Aurignacian armatures signal the development of innovative socioeconomic strategies by groups already present on the continent and linked to one another. In this case, the osseous armatures would have conferred an adaptive technological solution to prehistoric groups engaged in increased mobility. The subsequent adoption of the innovation at a continental scale must be linked with the dispersal of the Campanian Ignimbrite tephra. Finally, the replacement of split-based points by massive-based points suggests that an important transformation occurred in the technological strategies (i.e., curation versus expediency) implemented by earlier and later Aurignacians even though they favoured a similar mobility pattern.

Dozier, Crystal (Texas A&M University)**[36]** *Toyah Mitotes: Feasting in the Terminal Late Pre-Hispanic Southern Plains*

The proto-historic period within North America provides a framework for assessing the transformations brought on by contact and conflict between indigenous peoples and European colonizers. In central and south Texas, a distinct archaeological culture, Toyah, spans some 400 years, 1250–1650 CE. The hallmark projectile point and first systemic, locally-produced ceramic tradition in the area have intrigued archaeologists for over a hundred years; interpretations of the phenomena have been unsatisfactory as to the factors responsible for such a distinctive change in material culture within a foraging society. This paper argues that feasting theory provides an interpretative and explanatory lens for Toyah. With increasing population pressure on the landscape, interactions between foraging and farming groups across southern North America increased during the late Pre-Hispanic period. Large feasts, which the Spanish called mitotes, became important social mechanisms for crucial intergroup meetings for trade as well as political, marriage, and spiritual negotiations. Ethnohistorical accounts of mitotes complement the archaeological assessment of a feasting society.

Dozier, Danielle (Florida State University)**[102]** *Fire on the Waterfront: The Archaeology of an 1800s Storefront in Apalachicola, Florida*

In the 1840s, Florida was a large part of the trade and shipping networks of the Southeast United States. The Gulf coastal town of Apalachicola became the third largest port in Florida. This poster presents the archaeological evidence of a storefront located along Water Street in Apalachicola, Florida, built in 1837 and burned in 1844. The entire market place comprised of stores, clerk offices, and cotton warehouses, with this particular property (8FR1318) being B.S. Hawley's store. Nineteenth-century newspaper articles announcing the shipment of goods are compared to the archaeological evidence to show what was shipped, sold, and eventually burned in the store.

Drake, Lee (University of New Mexico)**[77]** *An Open-Source Calibration Framework for XRF*

The Lukas-Tooth and Price algorithm for empirical calibration of x-ray fluorescence systems has become the standard for archaeometry, particularly in obsidian sourcing. Here, a new way of using the computer language R and HTML5 websites is introduced to calibrate these systems.

Drake, Stacy (The Field Museum), Marla MacKinnon (The University of Victoria) and America Guerra**[15]** *Exploring Collaborative Curation of North American Human Remains*

In 2016, The Field Museum was awarded a National Leadership Grant from the Institute of Museum and Library Services (IMLS). The overall mission of this project is to “research, explore, develop, and implement thoughtful, practical, and forward-thinking practices for the ethical care of human remains.” The project is working to bring together stakeholders from collections-holding institutions, scientific research institutions, and Native American and First Nations communities to move beyond conversations of challenges imbedded within institutional collections of human remains by working together to establish shared protocols and principles involving these remains. This poster introduces the IMLS-funded collaborative project currently underway at The Field Museum and particularly focuses on the bioarchaeological and osteological work that is being conducted by the museum's newly hired bioarchaeologist and 2017 interns. The poster highlights a brief history of the project, and reviews the successes and difficulties of the developing osteological inventory process for these Native North American human remains, including ethical digital curation of human remains data, individuation of remains within commingled collections, rehousing individuals in conservation-approved materials, and accomplishing accurate osteological inventories of mummified individuals.

Drane, Leslie (Indiana University)**[301]** *Constructing Communities: A New Magnetometry Survey at the John Chapman Site*

The John Chapman site is a mounded village that lies along the Apple River in northwestern Illinois. At approximately A.D. 1050, it appears that Mississippian migrants traveled to the area and interacted with the Late Woodland people already occupying the land. Previous excavations in the northern portion of the site revealed John Chapman people changing their ceramics to emulate Mississippian styles, while keeping their houses Late Woodland-like. Recent magnetometry surveys targeted central and southern portions of the site that revealed high concentrations of materials during walk-over surveys with the goal of comparing potential habitation sites to the ones excavated in the north. This poster will display the subsurface anomalies picked up during the survey and discuss what this can inform us about landscape usage and communities.

[337c] *Discussant*

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Drapeau, Michelle (Anthropology, Université de Montréal) and Jesseca Paquette (Anthropology, Université de Montréal)**[219]** *Habitat Preferences in Early Hominins and the Origin of the Human Lineage*

Early hominins, such as australopithecines, are characterized by bipedality and enlarged posterior teeth. Originally, these traits were thought to be adaptations to an open environment. However, discoveries of older hominins, such as *Ardipithecus* that were possibly only occasionally bipedal and did not have enlarged teeth, have refocused the origins of early hominins within a much more closed, wooded setting. Even the later australopithecines are currently cast as inhabitants of mosaic environments encompassing some closed habitats. However, research in some localities that clearly sample closed habitats do not yield hominins. The four million-year-old Mursi Formation of southern Ethiopia is a good example: its fauna, and stable isotopes values from mammalian teeth and paleosol carbonates suggest a fairly closed woody cover, more so than in pencontemporaneous localities of the region. Yet, the Mursi Formation has no hominins while the other localities with dryer and more open habitats do, suggesting that early hominins could not occupy exclusively closed habitat and were reliant on resources found in more open settings. This type of habitat was novel and different from those exploited by our closest relatives, the great apes, and might be a defining characteristic at the origins of the human lineage.

Drass, Richard R. [268] see Trabert, Sarah

Draznin-Nagy, Sophia and Jeffery Clark (Archaeology Southwest)**[91]** *Pigment and Clay Variation in Polychrome Ceramics*

This poster presents the results of a project that attempted to replicate viable paint and clay combinations employed to make Salado and Maverick Mountain polychrome ceramics. We know from NAA and petrographic studies that both of these painted ceramics were locally produced and widely exchanged in the Upper Gila region. Local clays and pigments, from the Gila River Valley, were used to show how effectively different pigments adhere to clay. The study also provided an opportunity to explore the processing of organic and mineral materials potentially used as pigments. The study showed that several variables affect how pigments and clays interacted during the firing process including: the type of clay, type of pigment, time at which pigment was applied, firing temperature, and firing time. Using experimental techniques allowed for nuanced understandings of the results based on observations during various stages of production. The results of this project further show the complexity in manufacturing a polychrome vessel, from the clay type and paint recipe used to the firing technique.

Dresser-Kluchman, Elizabeth (Barnard College)**[259]** *Scarred Traces: Trees as Artifacts on the Northern Rio Grande*

In the Rio Grande del Norte National Monument, at the confluence of the Rio Grande and the Red River, groups of ponderosa pine trees are dotted with peeled trees, scarred by surrounding animals and weather as well as by human consumption of the trees' cambium. In most considerations of inner bark utilization, the threat of starvation is posited as the key motivation for bark-peeling. This landscape, however, lends itself to narratives that use trees as artifacts, among the full breadth of survey data, to consider its histories. Performing a landscape archaeology that takes these living artifacts of a visible food practice seriously raises questions for the process of looking at the landscape, by which trees become a powerful, if transient, player in a trajectory of landscape-based practices surrounding sustenance and sweetness on the northern Rio Grande.

Drew, Brooke [215] see Freire, Shannon

Drine, Ali [210] see Fenn, Thomas

Driscoll, Neal [79] see Davis, Loren

Druckenbrod, Daniel [39] see Proebsting, Eric

Drucker, Dorothee [2] see Haller Von Hallerstein, Sophia

Dublin, Susan-Alette (Hunter College)**[23]** *(Re)Building the Present, (Re)Claiming the Past: Architecture and Social Memory at the Medieval Monastery of Psalmodi, Gard, France*

This study employs archaeological and documentary evidence to examine adaptive reuse and social memory at the site of the medieval monastery of Psalmodi in Gard, France. During the late twelfth century, the abbey church was partially rebuilt, enclosing the footprint of an earlier church and maintaining early public space while transforming and enlarging monastic space. The reconstruction occurred shortly after a century of turmoil that saw the takeover of the monastery by a rival and the ultimate retention of Psalmodi's independence and sovereignty based on a forged foundation legend. I argue that the meshing of early and later architectural elements was an expression of social memory in the aftermath of a period when the independence and the very existence of the monastery and its community had been threatened.

Dubois, Jonathan (University of California, Riverside)**[264]** *We Are Kin with the Land: The Role of Rock Art Sites in the Negotiation of Social Relations in the North Central Andes of Peru*

Research in the highlands of Huánuco, Peru, has revealed rock art sites were used to establish, negotiate, and legitimize changing social relations for more than three millennia. Implementation of stylistic seriation bolstered by art from more securely dated archaeological deposits allowed for the development of a chronological sequence of rock art styles in Huánuco. The research revealed rock art played a prominent role in expressing changing social relations in the region. This paper focuses on the rockshelter, Gonga, and its rock art panel that was created and repainted multiple times over the millennia. An early painting depicts a human couple, while later repaintings emphasized the female character and the male figure was smeared with paint. I propose that the initial painting served to instantiate the people represented by the figures as founding ancestors of an ayllu (kinship group) based on the timing of the painting in conjunction with the appearance of public burial structures called chullpas. The highlighting of the female character at the expense of the male indicates a negotiation or contestation of prevailing social relations. Finally, I argue that rock art was a medium for negotiation because the mountains where they were painted were considered active, sacred agents.

[264] *Chair*

Dudar, Chris (Smithsonian Institution)**[337a]** *Contributions of Osteological Evidence to Repatriation Assessments*

Since the inception of the Repatriation Office at the Smithsonian's National Museum of Natural History in 1991, the documentation of Native American skeletal remains has been accomplished by the Repatriation Osteology Lab. The need for a computerized data entry system was recognized as a critical component to the success of this process along with a structured database for data access and management. The resulting software interface and SQL relational database, called Osteoware, is available to the public for free. The osteological data collected has contributed biological information that has assisted in the resolution of cultural affiliation in many difficult cases.

Dudgeon, John [8] see Riordan, Kyle

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Dudley, Meghan (University of Oklahoma)**[44]** *Identifying Hunter-Gatherer Socialized Landscapes in the Bridger Mountains, Montana*

Archaeologists working in the Rocky Mountains and throughout the world have long recognized that people invest social meanings into the landscape around them. Based on de Certeau's (1984) "Spatial Stories," these "socialized landscapes" consist of two archaeologically identifiable components: espaces (practiced spaces) and tours (practiced paths). I operationalize these ideas by creating archaeological expectations for six socialized landscape types and ask what types of socialized landscapes can we identify from a largely lithic archaeological record. I test my expectations with a pilot study in the Bridger Mountains, Montana. By controlling for time using projectile point types found at sites throughout the mountains, I conduct a series of four analyses by time period to determine what types of espaces and tours past peoples created. I then compare those results against my archaeological expectations and landscape types. Although this study reveals areas of the methodology and analyses that can be improved in future studies, my research suggests that we can use this approach to understand past hunter-gatherer socialized landscapes both in the Rocky Mountains and worldwide.

Dudley, Meghan [222] see Stackelbeck, Kary

Duenas Garcia, Manuel [172] see Lingle, Ashley

Duff, Andrew (Washington State University), Wesley Bernardini (University of Redlands) and Gregson Schachner (UCLA)**[218]** *The Homol'ovi Research Project—The View from ASU*

It is unlikely that we will see a research effort of the scope and duration of the Homol'ovi Research Program project replicated in the Southwest. It is the successful execution of this work by Chuck Adams and Rich Lange, unfolding over more than three decades, that we will attempt to contextualize from the vantage point of that other university in Arizona, ASU. We begin by reviewing the intellectual context of Southwestern research preceding the Homol'ovi project, in particular how the aftermath of the "complexity debates" shaped academic research going into the 1990s. A more productive environment for regional scholarship emerged, and a number of research products and approaches emanating from the Homol'ovi work informed research by ASU-associated scholars studying other Pueblo IV-era settlements and settlement clusters. The Homol'ovi program was a key hub in collaborative partnerships among scholars across multiple institutions and contexts (e.g., academic, tribal, governmental) that have enhanced our collective understandings of ancestral Puebloan settlements and the connections these have to contemporary Pueblo peoples.

Duffy, Paul R. (University of Toronto) and Péter Czukor (Eötvös Loránd University)**[295]** *Using Multiple Time Scales to Understand the Divergence of Prehistoric Social Trajectories in the Carpathian Basin*

A variety of new groups emerged during the Bronze Age in the Carpathian Basin—some had powerful rulers holding feasts and controlling the trade in commodities, and some were egalitarian peoples leaving little evidence for social differentiation outside of age and gender. This paper uses a comparative and multi-scalar perspective to study two different social trajectories in the Carpathian Basin during the second millennium BC: the Lower Körös Basin in Eastern Hungary, and the Danube and its tributaries in Central Hungary. We begin with coarse-grained chronological settlement data and consider the importance of foundational differences in population in both regions. We then look at the productive catchment and yearly agricultural needs of settlements, and weigh their likely importance in decision-making at the household level. Finally, we address how geographic location and compounding trade interests over successive generations potentially influenced the changing relationships between people and communities in the Körös and Central Danube regions in the second millennium BC.

Duffy, Paul R. [245] see Parditka, Györgyi

Duggan, J. S. [35] see Adovasio, J. M.

Duke, C. Trevor (Florida Museum of Natural History), Neill Wallis (Florida Museum of Natural History) and Ann Cordell (Florida Museum of Natural History)**[95]** *Mortuary Spaces as Social Power: Ceramic Exchange and Burial Practice at Safford Mound (8PI3)*

Mortuary spaces often served as gathering points for disparate communities in the pre-Columbian past. The deep temporal associations of many burial mounds across the southeastern United States linked living societies to the ancestral landscape, thus creating a sense of social memory that penetrated both quotidian and ritualized social practice. Safford Mound (8PI3), a burial mound located near modern Tarpon Springs, Florida, embodies some of these characteristics. In this study, we qualitatively describe thin sections, and also present a gross paste characterization and technological analysis of ceramic vessels from the Safford assemblage. Although the excavations were poorly recorded, the sheer size and completeness of this assemblage provides us types of information usually unattainable through standard recovery methods. We use these data to investigate the ways in which vessel exchange and provenance at Safford represents both change and continuity in mortuary practice during the Woodland (1000 BC-AD 1000) and Mississippian Periods (AD 1000–1500). The results of these analyses ultimately suggest that Safford Mound maintained its social power during a period of immense sociopolitical realignment and reorganization. We view this pattern as indicative of the embeddedness of mortuary ritual within social life in the Gulf Coastal Plain.

Duke, C. Trevor [84] see Pluckhahn, Thomas

Duke, Daron (Far Western Anthropological Research Group) and D. Craig Young (Far Western Anthropological Research Group)**[92]** *The Dated Paleoindian Archaeology of the Old River Bed Delta*

The Old River Bed delta is a premier open-air Paleoindian locality in the eastern Great Basin. Its chief distinction is scale—some 2,000 square kilometers-plus of nearly continuous and single-component archaeological material on what would have been the largest basin wetland in the region. But the record is largely surficial. In this poster, we detail a series of sites that have yielded temporal data from buried cultural contexts. The sites help clarify the broader associations of artifact types and shifting hydrology that have thus far defined the limits for examining change through time on the delta. These refinements have implications for our understanding of Paleoindian land use and technology throughout the region, and what life was like in Great Basin wetlands.

Duke, Guy (The University of Texas Rio Grande Valley), Sarah Rowe (The University of Texas Rio Grande Valley) and Brandi Reger (The University of Texas Rio Grande Valley)**[101]** *Figuring Things Out: 3D Models of Valdivia Figurines for Research and Outreach*

During excavations at the Valdivia site of Buen Suceso, Ecuador, in 2017 we recovered a number of figurines. Using in-field photogrammetry and post-field processing, we have created digital 3D models of these figurines. For us, the purpose of photogrammetric models is: 1) to facilitate comparisons across assemblages by a variety of scholars, and 2) for use in public education and outreach. While the creation of 3D images via photogrammetry is becoming more common in archaeological practice, the results of applying these methods are still only rarely publicly available. In fact, even at academic conferences, they are often employed within standard PowerPoint presentations with little opportunity for audience interaction. For this

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reason, it is crucial to utilize various platforms in order to make these models more accessible to the public at large, including other academics. This allows for remote comparison of other figurine databases by archaeologists without needing to rely on two-dimensional photographs or drawings, as well as a fantastic educational opportunity for the public to see entire figurines and virtually turn them over in their hands in order to gain a greater appreciation for their craftsmanship and artistry as well as a deeper understanding of their cultural meaning and context.

Duke, Hilary (IDPAS, Stony Brook University, New York) and Sonia Harmand (Department of Anthropology, Turkana Basin Institute)

[329] *Hilary Duke and Sonia Harmand—A New Approach to the Evolution of Early Pleistocene Hominin Cognition and Technological Change: Examining the Technological Context of LCT Emergence 1.8–1.76 Ma at Kokiselei, West Turkana, Kenya*

The eastern African Early Pleistocene witnessed critical shifts in climate, environment, hominin anatomy and behavior. The lithic record shows change within this broader context. After 1.8 Ma, Large Cutting Tools (LCTs), such as bifaces, entered the hominin lithic repertoire. These artifacts are widely viewed as the first evidence of lithic shaping. Many archaeologists theorize both cognitive and practical differences between “flaking” and “shaping” among knapping strategies. Most of these cognitive models are based on our current understanding of living human cognition, not that of Early Pleistocene hominins. Little empirical evidence supports these concepts’ usefulness for Early Pleistocene archaeology and the study of hominin cognitive evolution. Further, we often lack holistic information about non-LCT components of Early Acheulean lithic assemblages. Early LCTs, and associated non-LCT lithics, occur in the Kokiselei Site Complex in West Turkana, Kenya (1.8–1.76 Ma). This project fills a gap in the empirical research necessary for testing hypotheses about “shaping” and LCT emergence through holistic technological analyses of both LCT and non-LCT lithics at Kokiselei and an experimental program that investigates the knapping strategies employed by hominins at Kokiselei. Here, non-LCT lithic components from Kokiselei are compared to data collected from an experimental lithic assemblage.

Dumitru, Ioana, Joseph Lehner (Department of Anthropology, University of Central) and Michael Harrower (Department of Near Eastern Studies, Johns Hopkins)

[177] *Modelling the Connectivity of Socioeconomic Networks of Copper Production in Ancient Northern Oman*

With over 5000 years of production history, Oman was a major ancient source of copper, participating in a trade network that supplied a large part of the ancient world, the extent of which has yet to be fully mapped. As part of the Archaeological Water Histories of Oman (ArWHO) Project, we have been working since 2012 in the Ad-Dhahirah Governorate of Oman to clarify the structure of ancient copper production networks. Methodologically, our investigations employ satellite imagery analysis to map copper resources, ground-truthing of resulting prospectivity maps, systematic and targeted archaeological survey, and x-ray fluorescence of slags and ores. While we are broadly concerned with understanding raw material exploitation, production, and circulation, this paper focuses on modelling Iron Age and Islamic Period networks of production. Sites which demonstrate shared production technologies are used as proxies for social network connectivity. We combine pXRF-derived geochemical analyses of copper slag with formal social network analytical methods (SNA). We use pXRF data to determine technological strategies employed by metal producing communities. We then compare geochemical data between sites to elucidate dynamics of inter-site relations. Combining site-centered data with regional survey data enables multi-scalar analysis that provides a novel view of ancient metal producing societies.

Duncan, Lindsay [224] see Graham, Elizabeth

Duncan, Neil (University of Central Florida) and John Walker (University of Central Florida)

[333] *Donald Lathrap, the Tropical Forest, and Hemispheric Archaeology*

Donald Lathrap was a visionary anthropologist and archaeologist. His contributions always reflected the “big picture”: an understanding that all pre-Columbian culture history was intertwined, and that these connections went back through time to origins in the lowland tropics, or the Tropical Forest. He practiced an archaeology that gave equal weight to iconography and religious thought, and rim sherds and energetics. The most significant issues for Lathrap’s version of American Archaeology, is not an argument over the significance of the Amazon Basin in comparison to the Andes, or as a center for cultural innovation. The legacy of Lathrap is Hemispheric Archaeology, that there are deep cultural-historical connections across the Americas, particularly between the Andes and the Amazon that have explanatory value. The big picture is relevant both for maize farmers in the Mississippi Valley, tuber gardeners in the Pacific Northwest, and raised field builders in the Southwest Amazon. Such hemispheric explanations could be just-so-stories, but correcting for this danger is worth the effort, because as the evidence for earlier developments continues to accumulate, the big picture is getting bigger.

Dungan, Katherine (Center for Archaeology and Society, Arizona State University)

[287] *Secret Identities and X-Ray Vision: Applying CT-Scanning to Roosevelt Red Ware Formation Techniques in the Tonto Basin*

The techniques used to form ceramic vessels—in this case, coiling and scraping as opposed to the use of a paddle and anvil—have long been treated as key elements differentiating among archaeological “cultures” in the US Southwest. At the same time, finished vessels often retain little or no obvious visual evidence of the technique used in their formation, and this low visibility has implications for both ancient practice and modern archaeological analysis. We utilize computed tomography (CT scanning) to examine the formation techniques used in producing Roosevelt Red Ware in the Tonto Basin, an area with a deep history as a geographic and cultural frontier between archaeological traditions. While this pottery is ubiquitous in the 14th- to 15th-century Tonto Basin, contemporaneous sites otherwise show substantial differences in material culture and were likely home to diverse populations. Along with a broader examination of variation in Roosevelt Red Ware vessel forms and use among sites, exploring the techniques used to make these vessels in relationship to deep histories of ceramic production can shed new light on the place of this pottery in social diversity in the Tonto Basin and the greater Southwest.

[287] *Chair*

Dunham, Sean (Chippewa National Forest)

[133] *Feeling the Juju: Archaeological Survey as Traditional Knowledge*

The practice of archaeological site reconnaissance falls within the western scientific tradition and relies on consistent methodology, precise measurement, and sampling strategies. However, there is also an experiential element to archaeological survey in which practitioners consciously and unconsciously observe patterns in the field that lead them to hunches or gut feelings that drift beyond quantifiable, empirical observation. While such hunches are occasionally crafted into hypotheses, they are more commonly shared and discussed among practitioners without finding their way into the official project record. The experiential knowledge obtained through archaeological survey is the result of accumulated observations of archaeological and geographic phenomena as well as interactions with the environment. From this perspective there is a common theme with forms of traditional knowledge especially those related to experiential knowledge acquisition and reading landscapes. This paper explores the premise of archaeological survey as a form of traditional knowledge.

Dunne, Jennifer (Santa Fe Institute)

[83] *Discussant*

Dunne, Julie [87] see Salisbury, Roderick B.

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Dunning, Nicholas [76] see Lentz, David L.

Dunning Thierstein, Cynthia (Dr.), Sabah Jasim (Dr), Eisa Yousif and Ellinor Dunning

[145] *Mleiha Archaeological Park: Management of a Future UNESCO World Heritage Site within Nature and Culture*

Mleiha in the center of the Emirate of Sharjah (UAE) presents a long archaeological history in which the natural environment plays an important role. The management of this site is complex and serves as a good practice example for the Salalah Doctrine. Our presentation will develop the challenges of management of archaeological sites in their special natural context involving the management of water resources, game and agriculture in an environment situated between the desert and the high mountain regions of the Hajar range. The particular societal structures of Sharjah and the importance of foreign researchers in the development of knowledge may also be subject to discussion. Another challenge is tourism, since this desertic region draws more and more visitors that could disturb the cultural and natural balance of this fragile zone.

Dupont-Hébert, Céline [16] see Frasier, Brenna

Dupont-Hébert, Céline [167] see Woollett, James

Dupras, Tosha [87] see Wheeler, Sandra

Dupre, Jacob [39] see Mann, Rob

Dupuy, Paula (Nazarbayev University)

[336] *The Role of Pastoralists and 'Operational Complexity' in Shaping the Materiality of Trans-Eurasian Exchange*

For decades, descriptions of prehistoric Eurasian pastoral societies would present ceramic typologies as material evidence for macro scale economic, social, and ideological cohesion—and trans-Eurasian interaction. However, recent investigations that focus more on human-environment interactions and domestic economies reveal a more dynamic and varied past in micro-regions of Eurasia. Pastoral strategies dating to the 3rd-2nd millennium BCE were regionally diverse, and societies were engaged in contacts that extended beyond the steppe world confines. These new discoveries bring material assemblages back into focus with the fresh purpose of scientifically examining the spectrum of technologies and social dynamics that generated the materiality of Eurasian pastoralism. Through a focus on mountain campsites in Kazakhstan, this paper proposes that 'operational complexity', a new theoretical term to describe the varied technological behaviors and learning contexts behind the production of household and ritual items, was a central factor in shaping the materiality of Eurasian pastoralism and trans-Eurasian exchange.

Duranleau, Deena [294] see Doucette, Dianna

Dussol, Lydie (University Paris 1 Panthéon-Sorbonne), Louise Purdue (University Nice Sophia Antipolis), Eva Lemonnier (University Paris 1 Panthéon-Sorbonne), Dominique Michelet (University Paris 1 Panthéon-Sorbonne) and Philippe Nondédéo (University Paris 1 Panthéon-Sorbonne)

[254] *Domesticated Forests? Interpreting Agroforestry Practices from Diachronic Trends in Firewood Collection at the Classic Maya City of Naachtun*

What can be drawn from anthracological data to infer long-term socio-environmental dynamics among ancient Mayas is a question that has received little attention. At Naachtun (Northern Peten, Guatemala), we studied charcoal remains from archaeological contexts in relation with pedological data to reconstruct forest resources and land management through time. Since the beginning of Naachtun's occupation at the end of the Preclassic period (\approx AD 150), domestic firewood economy seems to have been closely linked to the local agrarian system. Wood was collected in semi-opened woodlands, suggesting a reliance on both fallow lands and preserved forests probably close to human settlements. In that context, the observation of an important shift in firewood collection strategies during the second half of the Late Classic period (AD 750–830), from opportunistic gathering of a wide range of forest species to a heavier reliance on fruit tree species, allows us to draw hypotheses on the intensification of arboriculture practices and the progressive transformation of woodlands around the site. As this shift occurred rapidly while the city experienced its demographic peak, it could express an adaptation strategy throughout Naachtun society, utilizing forest garden plots for its firewood supply as a result of higher pressure on local resources.

Dussubieux, Laure (Field Museum of Natural History), Thomas Fenn (California State Polytechnic University, Pomona), Shinu Abraham (St Lawrence University) and Alok Kanungo (IIT Gandhinagar)

[137] *Pushing Boundaries in the Scientific Investigation of Glass: A New Project to Source Ancient Indian Glass*

Scientific investigation of archaeological glass has advanced, beginning in the early 2000's, with studies relying more heavily on determination of trace element concentrations to differentiate production recipes depending on distinct ingredient sources and the use of larger corpuses of artifacts to more easily and reliably reveal production patterns. At the same time, isotope analyses (e.g., Pb, Sr and Nd) attempting to source raw materials used to manufacture glass in antiquity grew in importance, focusing mostly on glass produced around the Mediterranean basin.

In a new project, recently funded by the National Science Foundation (NSF), we will combine trace element and isotope analyses to study the ancient glass industry of South Asia which, despite its importance and impact within and beyond the Indian Ocean region, is still poorly understood. To this end, we will collect raw materials, test their suitability to obtain glass and compare the trace element and isotope signatures with those of different South Indian glass types. By connecting Indian glass types to potential production regions in South Asia, the results of this project will illuminate the spatial and temporal interconnections between cultures and regions of the Indian Ocean and beyond.

Dussubieux, Laure [141] see Klarich, Elizabeth

Duwe, Samuel (University of Oklahoma)

[131] *Not Abandoning the Middle Place: Rethinking the Historic Tewa Pueblo World*

In the 1500s the settlement patterns of the Tewa Pueblo world fundamentally shifted. The Rio Chama valley was a population center with 12 villages housing thousands of people at the beginning of the fifteenth century. By century's end it was nearly devoid of full-time habitation. The timing and causes of the protohistoric 'abandonment' of the Chama has sparked interest from archaeologists and historians. Was this movement out of the Chama the continuation of a centuries-long process of Pueblo coalescence, or rather a response to early Spanish contact and colonization? The latter idea is bolstered by the fact that the Chama is the ancestral homeland of Ohkay Owingeh where Governor Oñate established the first capitol of New Mexico in 1598.

I reframe this debate by assuming that the Chama was never abandoned. Based on archaeological, historic, and ethnographic documentation the Chama remains the heart of Ohkay Owingeh's cosmography, and was visited and occupied throughout the Historic period. Opposed to favoring a

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prehistoric or historic cause for sixteenth-century landscape change, I take a 'long-view' that incorporates these disparate sources of knowledge and blurs the lines between history/prehistory to understand how the Tewa cosmos evolved in the face of dramatic change.

Dvoracek, Douglas [188] see Van Hagen, Logan

Dwyer, Rachel (SUNY-University At Buffalo)

[86] *Passing the Paleo Drug Test: Testing for Medicinal Plant Use in the Paleoethnobotanical Record*

For decades, paleoethnobotanical research almost exclusively concentrated on reconstructing past subsistence economies. At 2011's SAA conference, I presented a paper entitled, *Toward A Paleoethnomedicine*. I suggested that paleoethnobotanical research should take inspiration from ethnomedicine (a subfield of ethnobotany) and concentrate on analyzing past people's healing practices and performances. This paper presents a method to operationalize this concept, a technique for analyzing paleoethnobotanical data to detect past medicinal plant usage. The general observations from ethnobotany/ethnomedicine about modern medicinal plant use gives researchers an idea of expected observations in the paleoethnobotanical/ paleoethnomedicine record. A common practice in macrofloral analyses is to calculate the ratio of a plant group (food, nut shell, charcoal etc.) in order to provide evidence of the certain activities at a site. This paper presents a new ratio extrapolated for plant observations from archaeological contexts and includes the results of a pilot study based on the paleoethnobotanical data from Birka and other Late Iron Age/Medieval sites in east central Sweden.

Dye, David [291] see Burnette, Dorian

Dyer, Monica

[154] *XRF Analysis of North Carolina Piedmont Ceramics to Locate Source of Production and Trade at Rural Plantation Sites*

Little documentation exists of the trade exchange occurring in the central Piedmont during the 18th and 19th century at wealthy plantation sites or at surrounding sites of lower economic status. In this historical archaeology research, I focus on understanding the socio-economic patterns of settlers in the more rural areas of the region at two plantation sites and wasters from a local kiln site from same time period. Using pXRF data of lead glazed earthenware I attempt to map ceramic regional origin using existing pXRF data of identical ceramic types. Non-local wares for comparison were chosen based on documented trading sites during the 18th and 19th centuries, including Britain, Philadelphia, the Chesapeake, South Carolina and the Northern Virginia Piedmont. I propose that the settlers' desire for independence and sustainability to form a nation independent from Britain would have been the primary factor in deciding where to obtain utilitarian vessels, rather than choosing non-local sources as an indicator of social status, i.e., local wares should be much more common than those from northern states or imports.

Dyke, Arthur [16] see Forsythe, Kyle

Dylla, Emily (Baer Engineering and Environmental Consulting, Inc.)

[220] *Hunters, Soldiers, and Holy Men: Exploring the Gendered Politics of Mission Landscapes in Alta California*

Space was paramount to Spanish missionary work in 18th and 19th century Alta California. This mission system was designed to irreparably reshape the Indigenous conceptual universe into that of a Christo-European worldview, to transform Native peoples into gente de razón. In addition, missions were the setting against which ecclesiastical and military colonists were in constant contact, and missionaries also used space as a moralizing tool, in an attempt to reform the lax morals of soldiers assigned to guard the missions. In this paper, I examine how the mission system reconfigured California's natural and cultural landscape, and the gendered politics underpinning these changes. I focus in particular on identifying disparate ideals of masculine gender among mission inhabitants, and suggest masculinity was a significant locus of both conflict and concord that helped to shape not only the missions themselves but Alta California as a whole.

Dzvonick, Laura [155] see Ripley, Kevin

Ea, Darith [175] see Heng, Piphah

Earle, Julia [100] see Payntar, Nicole

Earle, Timothy (Northwestern University), Magdolna Vicze (Százalombatta Museum), Kristian Kristiansen (Gothenburg University) and Marie Louise Sørensen (Cambridge University)

[245] *Százalombatta Archaeological Expedition (SAX). Hungary: A 20-Year History of Theories, Methods, and Results of an International Project in Central Hungary*

This paper documents the theories, methods, and results of SAX, an international, collaborative Bronze Age project in the Carpathian basin. Three topics are emphasized: First is the value added by international collaboration, which creates an intellectual openness to research objectives and theoretical discussion. Second are technological transfer and creative problem-solving approach to field and laboratory research. And third is an inherent comparative agenda, for which results are seen always within broader regional, transregional, and world contexts. The project has produced 20 years of sustained research with substantial results on Bronze Age society along the Danube, a major transport route for metal.

Earley, Caitlin (University of Nevada, Reno)

[128] *Becoming Divine: Stone Sculpture and Deity Impersonation in Classic Veracruz Visual Culture*

Recent study of an hacha from Classic-period Veracruz in the collection of the Metropolitan Museum of Art reveals that hachas and palmas may have been used as costume elements in ritual performances related to the ballgame. As costume elements, these sculptures would have allowed actors to assume the identity of captives, rulers, or deities. This accords well with iconographic evidence of ballgame-related ritual performances in Veracruz, and suggests comparisons with artworks from other Mesoamerican cultures, in which rulers impersonate deities in performances associated with the ballgame. In this paper, I suggest that deity impersonation and performance are productive lenses through which to interpret ballgame-related sculpture, including yokes, hachas, and palmas. I examine a corpus of stone sculpture from Classic-period Veracruz, considering how such sculpture may have been used to invoke the presence of specific deities, and what it can tell us about the role of those deities in Veracruz culture. Incorporating comparative evidence from Central Mexico and the Maya area, I demonstrate that deity impersonation in Classic Veracruz worked to affirm political power, solicit the sanction of the divine, and express fundamental ideas about gods, the cosmos, and the continuation of time.

Earley-Spadoni, Tiffany (University of Central Florida)

[75] *Fear Written Large: Systematic Warfare and the Ancient Empire of Urartu*

This paper presents a Landscapes of Warfare case study, combining textual documentation, archeological data and GIS analysis to elucidate the effects of pervasive warfare on the development of Urartu, a highland empire that existed in the ancient Near East in the 1st Millennium BCE. Specifically, I argue that forts, fortresses and fortified settlements were strategically placed for both defensive communication as well as the systematic

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surveillance of roads. The paper contributes to scholarly debates by showing that the evidence for systematic warfare conveyed by Neo-Assyrian texts and images stands in contrast to the primarily economic and ecological explanatory models offered to explain regional phenomena, indicating a need to integrate historical evidence with archaeological explanation. I conclude that signatures of warfare are discernible in landscape studies, and that GIS reconstructions provide powerful tools for evaluating them.

Eberl, Markus (Vanderbilt University), Sven Gronemeyer (Rheinische Friedrich-Wilhelms-Universität, Bonn) and Claudia Marie Vela González (Universidad del Valle de Guatemala)

[142] *A Non-elite Termination Ritual at the Classic Maya Capital of Tamarindito*

In Classic Maya society, termination rituals were conducted to 'kill' buildings and artifacts, predominantly in elite contexts. The resulting deposits were rapidly deposited in intentionally damaged buildings. They contain dense artifact assemblages with exotic objects and refittable ceramic sherds. After burning them, the artifacts were covered with white marl. Here, we report the extensive excavation of non-elite Structure 5PS-12 at the outskirts of the Classic Maya capital of Tamarindito. Its use and abandonment date to the eighth century AD and towards the end of the site's royal dynasty. The destruction of its wall foundations and the even distribution of wallfall suggest that the building was dismantled. Wallfall and floor contained many complete tools and rare artifacts, particularly in the north annex. Refitted ceramic sherds indicate that partial vessels were broken apart and systematically distributed across the building. The lack of a marl cover and limited evidence of burning set Structure 5PS-12 apart from elite termination rituals. The artifact assemblage largely mirrors non-elite contexts and customs. Tamarindito Structure 5PS-12 attests to termination rituals as a ritual practice shared throughout Classic Maya society. Its specific characteristics manifest a discourse of social differentiation.

Eberling, Bo [135] see Harmsen, Hans

Ebersole, Justin [202] see Kelly, Sophia

Ebert, Claire (University of Pittsburgh), Julie Hoggarth (Baylor University), Kirsten Green (University of Montana), Carolyn Freiwald (University of Mississippi) and Jaime Awe (Northern Arizona University)

[310] *The Stable Isotope Ecology of Agriculture in the Eastern Maya Lowlands from the Preclassic through Colonial Periods*

The reconstruction of subsistence strategies using stable isotope analyses is integral to understanding the role of maize agriculture in the development and decline of ancient Maya society. Here we present stable carbon, nitrogen, and sulphur isotope data from over 230 radiocarbon dated human skeletal remains from western Belize dating from the Preclassic through Colonial periods (~1000 BC-AD 1700). Stable isotope data are also compared to paleoclimate proxy records to interpret the climatic contexts for changing agricultural practices. Results indicate that the Preclassic (1000 BC-AD 300) Maya of western Belize had diverse diets incorporating both maize and wild foods, which may have promoted resilience in the face of social reorganization and changing ecological systems at the end of the Preclassic period. During the Classic period (AD 300-900/1000), inter-individual isotopic variations indicate that high-status individuals had a narrow and highly specialized maize-based diet, which may have created a more vulnerable socio-economic system that disintegrated due in part to drought conditions during the Terminal Classic period. While maize continued to be a dietary staple through the Postclassic and Colonial periods, agricultural systems were impacted by severe multi-year droughts that resulted in high levels of mortality and migration across the Yucatán Peninsula.

[317] *Discussant*

Ebert, Claire [101] see Huang, Jiawei

Eberwein, Ann (University of Wisconsin—Milwaukee)

[86] *An Examination of Circum-Alpine Lake Dwelling Botanicals at the Milwaukee Public Museum*

The lake dwelling sites of circum-Alpine Europe were discovered by the archaeological community in the mid-19th century and their artifacts were dispersed to museum collections in the United States and Europe. The Milwaukee Public Museum houses one such collection, which includes zoological material, textile fragments, tools, and carbonized botanicals and food. This paper focuses on the collection of plants and food, which come from Robenhausen, a lake-dwelling site south of Zurich. In studying this collection, there are a variety of factors that preclude traditional paleoethnobotanical methods. First, the protocol for handling carbonized botanicals from waterlogged sites is to maintain their moisture content, which is an impossibility in this context. In addition, since these excavations were carried out in the 1800s, artifacts were removed from the site without regard for stratigraphy and excavations were funded through the sale of Lake Dwelling objects, making quantification of these assemblages impossible. This paper examines the Milwaukee Public Museum's collection of botanical and food remains, given the limitations inherent in the study of waterlogged carbonized material excavated before modern paleoethnobotanical methods were developed. In addition, this paper/poster works toward the development of a methodology that can be applied to similar paleoethnobotanical museum collections.

Echavari, Mikhail (University of Washington) and Stephen Acabado (University of California Los Angeles)

[117] *Localizing the Narrative of Spanish Colonization in the Philippines*

The Spanish conquest of the Philippines consolidated the islands into a single political entity and subjected its diverse peoples to homogenizing colonial policies. However, indigenous responses to conquest were wide-ranging, which depended on the political and economic conditions of particular regions. To determine local patterns of responses to conquest, the Ifugao Archaeological Project (IAP) and the Bicol Archaeological Project (BAP) are working to produce localized archaeologies and histories to construct a Philippine-wide archaeology of colonialism. The IAP refutes dominant historical narratives surrounding the antiquity and nature of the highland Ifugao and their rice terraces. Rather than a people isolated from time and conquest, the IAP findings show that the Ifugao mobilized behind a concerted economic, political, and environmental restructuring as a pericolonial response to Spanish activities in the lowlands. In a similar vein, the BAP revisits historical narratives concerning the conquest of lowland Filipino groups. Informed by our work in the highlands, these archaeological investigations explore the under-documented indigenous experience surrounding Philippine-Hispanic churches and the early introduction of Spanish Catholicism.

Eche Vega, J. Eduardo (Universidad Nacional de Trujillo) and Jose Peña (University of South Florida)

[153] *La subsistencia en el sitio de El Campanario, Valle de Huarmey*

La obtención de alimentos es quizás la función de elemental prioridad que el poblador andino de la costa peruana haya tenido que afrontar desde sus inicios como sociedad pre-industrial. La subsistencia como mecanismo para el autoabastecimiento de alimentos ha llevado a las sociedades complejas a innovar ideas, tecnologías, redes de intercambio para asegurar una sobrevivencia compleja. No obstante, los diferentes aspectos tanto ambientales como sociales, políticos y económicos permitieron a estas sociedades de la costa peruana lograr cambios significativos en su dieta. Las excavaciones realizadas en el sitio El Campanario están ofreciendo nuevos datos en el comportamiento doméstico para la obtención de productos. Esta sociedad compleja, Casma (700-1400D.C), quizá haya logrado desarrollar a nivel familiar pequeñas "interrelaciones" para su subsistencia. En El Campanario, se ha logrado identificar restos de algodón, corontas de maíz, semillas diversas, restos óseos de acuñidos, restos óseos de peces, así como restos de redes de pescar. Qué tipos de actividades de subsistencia desarrollaron los pobladores de El Campanario. Qué tipo de estrategias de producción, de extracción o de intercambio realizaron.

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Eckersley, Jaclyn (Brigham Young University)**[69]** *The Pottery of Beef Basin and Its Cultural Implications*

I present my completed thesis research hypothesizing that the chronology and culture of the prehistoric occupation in Beef Basin is reflected in ceramics and architecture. Beef Basin is located west of Monticello, Utah and south of Canyonlands National Park. Archaeologically it is located within the fluid boundary space between the Ancestral Puebloan and Fremont archaeological cultures. Although there has been a surge of recent research in the north periphery of the Ancestral Puebloan area, recent research in Beef Basin remains sparse. My research provides the first in-depth analysis, including neutron activation analysis, of ceramics from this region. My data set includes ceramics analyzed in the field as well as from the archaeological collection at the Natural History Museum of Utah. I discuss the results of my ceramic and architectural analysis within the context of the late Pueblo II period Chaco proliferation.

Eckersley, Jaclyn [68] see Searcy, Michael

Eckert, Suzanne (Arizona State Museum, RPA) and Deborah Huntley (Tetra Tech)**[95]** *At a Crossroads: 300 years of Pottery Production and Exchange at Goat Spring Pueblo, NM*

The Goat Spring Archaeology Project explores late Pueblo period (A.D. 1300–1680) cultural continuity and transformation in south-central New Mexico. Goat Spring Pueblo was occupied periodically: initially during a period of demographic reorganization and expansion of regional networks in the 1300s, again during the early Spanish Colonial period, and possibly during the Pueblo Revolt of 1680. This highland village was strategically located along the trail connecting Western Pueblo and Rio Abajo villages. Petrographic analysis of decorated and undecorated sherds from Goat Spring Pueblo sheds light on local identities, ritual practices, and participation in regional networks.

Eckert, Suzanne [287] see Huntley, Deborah

Edgar, Heather [306] see Marquardt, William

Edinborough, Kevan [29] see Schauer, Peter

Edinborough, Marija (University College London) and Kevan Edinborough (University College London)**[88]** *Cranial and Dental Pathologies in Mesolithic-Neolithic Inhabitants of the Danube Gorges, Serbia*

We use anthropological data and a new statistical method to determine if there is a significant change to the health of people found in the Danube Gorges, Serbia (c. 9500–5500 BC), following the arrival of the Neolithic. A gross anatomical study of porotic hyperostosis and cribra orbitalia was undertaken on 113 individuals. The results show a high prevalence of porotic hyperostosis (89%) and a lower prevalence of cribra orbitalia (13%). 1308 teeth deriving from 89 individuals were examined for rate of tooth wear, caries, antemortem tooth loss and periapical lesions. Prevalence of caries increased after the Neolithic transition (6% vs. 10%). Whilst poor sanitation and various nutritional factors are probable causes of cranial pathologies, dietary practices and use of “teeth as tools” may have adversely affected dentitions of the observed individuals. Despite these new findings, rigorous statistical testing does not show a significant difference between adverse health indicators before or after the Mesolithic-Neolithic transition.

[88] *Chair*

Edwards, Alexandra (University of Georgia), Robert Speakman (University of Georgia), Alice Hunt (University of Georgia), David Thomas (American Museum of Natural History) and Anna Semon (American Museum of Natural History)**[154]** *Lead Isotope Analysis of Bronze Bells from Spanish Colonization Era*

This study focuses on using analytical techniques, such as Multi-collector inductively coupled plasma mass spectrometry (MC-ICP-MS) and X-ray Florescence (XRF), to determine lead isotope levels of bronze bells from the Spanish colonization era within South Carolina and New Mexico. These values are compared both against one another geographically and against ore isotopic data within regional and possible imported geographic regions. The goal is to both discern whether these bells are locally sourced and manufactured or imported from Spain, and to create a baseline for isotopic values within the area. Preliminary studies using XRF against ores have shown that the bells recovered have been both a mix of locally sourced and imports from Spain.

Edwards, Briece (Confederated Tribes of Grand Ronde)**[331]** *Privileged Knowledge and Perspectives: Tribal Archaeology of, by, and for a Community in Oregon*

Today, the increased involvement of Tribes in Cultural resources and historic preservation has resulted in culturally specific understanding and knowledge being integrated into the shared heritage of place. This emerging shift toward Tribal inclusion in policies and understanding is also reflective in Tribal inclusion of archaeological practice and methods for reconnecting with place and practice. For the past five years The Confederated Tribes of Grand Ronde, has utilized archaeological methods in conjunction of traditional knowledge to re-connect with places of significance and bring cultural practice back to the landscape from which it has been absent for 150 years. This presentation will discuss the general policies the Tribe operates within, the perspectives of archaeological practice held in community, and the on-the-ground results case examples.

[322] *Discussant*

Edwards, Briece [114] see Dewan, Eve

Edwards, Kyle (University of Virginia)**[104]** *Evaluating the Environmental Impacts of Colonial Settlement: A Palynological Study of La Cienega, New Mexico*

Using palynological data, this project attempts to contextualize the ecological impacts of Spanish settlement and land-use practices at LA 20,000 within a broader discussion of the long-term environmental history of La Cienega, New Mexico. This is essential because La Cienega has a deep and complicated settlement history that includes Puebloan, Spanish, and Anglo-American occupations. As a result, the ecological relationships created during initial colonial settlement must be considered in dialogue with pre-existing anthropogenic landscapes as well as subsequent environmental change. The data for this project come from a single sediment core that provides a 600-year history of La Cienega. Analyses were conducted by identifying zones within the pollen spectra and applying linear models, principal component analysis, and hierarchical clustering to verify trends within pollen assemblages. Ultimately, the results illustrate clear changes within local plant communities corresponding to Spanish settlement and long-term environmental trends not visible in site-specific samples. More pronounced environmental changes occurred in the 18th and 19th centuries, suggesting the impacts of colonial population growth and increased grazing. Moving forward, these results set the stage for further comparative palynological studies at LA 20,000 and show the efficacy of statistical analyses for identifying nuances in pollen data.

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Edwards, Matt (SWCA Environmental Consultants) and Weston McCool (University of California, Santa Barbara)

[335] *Corridors of Conquest: The Nasca Headwaters during the Middle Horizon*

Global studies of ancient imperialism are beginning to focus on the importance of communication corridors (roads, canals, waterways, etc.) in the origins, formation, and expansion of empires. As the number of such corridors increase and intertwine, a network is formed on the landscape that many past empires, including—we believe—the Wari, augmented with considerable imperial investment. By constricting the number of reasonable overland routes, mountainous terrain can concentrate such imperial infrastructure along those natural corridors that simultaneously advance imperial interests (e.g., connecting allied or conquered territories while isolating others) and are suitable to the type of travel (e.g., messengers, trade caravans, armies, etc.) required to meet particular administrative, political, or economic needs. This paper reports recent results from continued research on the Wari presence in the headwaters region of the Nasca drainage in southern Ayacucho and interrogates these data through the lens of network imperial interaction.

Edwards, Richard (UW-Milwaukee) and Robert Jeske (UW-Milwaukee)

[26] *Maize's Role in the Diets of Late Prehistoric People Living in the Prairie Peninsula*

Population aggregation and shifts in material culture of the Late Prehistoric Eastern Woodlands (AD900–1100) has often been linked to the increase in the importance of maize in the human diet. In the Midwest, the development of distinct contemporaneous archaeological cultures (e.g., Oneota, Langford and Middle Mississippian) has often been connected to assumed differences in maize consumption. A commonly used model is that increased complexity in social structures result from, and/or are required for, increased production and consumption of maize. However, most comparisons among Late Prehistoric groups in Illinois and Wisconsin have relied on incompatible or incomplete datasets, or were of limited geographic scope. This paper applies the Canine Surrogacy Approach to add isotopic data about dietary profiles from Late Prehistoric sites across northern Illinois and southern Wisconsin. Coupled previously published data, a more nuanced pattern of the relationships among maize agriculture, political complexity, economic structures and social institutions emerges.

Eerkens, Jelmer [44] see Morales, Jessica

Egan, Rachel (University of Colorado at Boulder)

[11] *Modeling Hazard Risk, Vulnerability, Recovery, and Adaptation in Tilarán-Arenal, Costa Rica: An Integrative Approach to Disaster Studies*

The Tilarán -Arenal region of Costa Rica is one of the most volcanically active regions in the world. Despite the inherent hazard, people have occupied this region since the Paleo-Indian period (7000 B.C.). Numerous studies have explored volcanic eruptions as forcing mechanism that lead to culture; however, starting with the advent of sedentary villages during the Tronadora phase (2000–500 B.C.) until the arrival of Spanish in the 16th century, people maintained relatively small-scale, semi-horticultural societies. To explore the adaptability of the pre-historic peoples of this region, this research aims to address innovative ways people respond, recover, and mitigate disaster by dynamically modeling risk using GIS. This is important for the Tilarán -Arenal region as this is an area with variable topographic terrain and microclimates. The repeated volcanic eruptions were not uniform events with clearly demarcated boundaries but rather would have had diverse impacts even within relatively small geographic areas. In applying this methodology to the Tilarán-Arenal region, this research aims to expand beyond the pervasive holistic effects scenario that pervades disaster research.

Eguez, Natalia (Kiel University, Germany) and Carolina Mallo (Archaeological Micromorphology and Biomarkers -AMB)

[126] *Fluorescence Applied to Modern Carnivore Excrements. A Reference Collection for Archaeological Deposits*

Traditionally, coprolite identification in archaeology has been limited to hyenids, the most well-preserved and recognizable fossilized faeces, although non-hyena carnivore coprolites are also present in some Pleistocene deposits displaying a wide range of morphological variation (e.g., elongate, spherical, globular, sub-cylindrical, oval, tubular). Common micromorphological characteristics of these different excrements are the appearance of an amorphous phosphatic, optically isotropic and, a highly autofluorescent matrix, all of them related with bone ingestion and its fossilization. Here we present preliminary results from an experimental application of fluorescence techniques to measure wavelength indexes in thin section samples from a variety of different modern carnivore family excrements—canis, felis, and ursids—. The aim of this experiment is to test discrimination of proper faecal features from phosphatic aggregates and, to a greater extent, to help for a better recognition and identification of archaeological carnivore coprolites, as identification of non-hyeniid carnivore coprolites in the fossil register is vital for improving palaeoenvironmental and landscape reconstruction.

Eisenlauer, Noble [155] see Ripley, Kevin

Ek, Jerald (Western Washington University), Ricardo Armijo Torres (Instituto Nacional de Antropología e Historia, Cen), William Folan (Centro de Investigaciones Históricas y Sociales, U) and Hubert Robichaux (University of Texas at San Antonio)

[30] *All Politics Isn't Local: The Role of Oxpemul in Classic Maya Geopolitics*

Oxpemul was one of several centers surrounding the city of Calakmul, within the region known as Uxte'tuun. Archaeological research at Oxpemul reflects occupation continuity from the Formative through Classic periods. However, hieroglyphic inscriptions indicate a late florescence in the mid to late eighth century. This paper explains this seeming contradiction from the perspective of broader geopolitical dynamics, particularly the rivalry between Calakmul and Tikal. Unlike other centers in Uxte'tuun, the dynastic history of Oxpemul is silent during the height of the Kaanul (Snake) Dynasty during the 'Three Kings Period' (AD 635–730), when Calakmul exerted direct rulership over subordinate kingdoms in Uxte'tuun. This could reflect either stagnation and decline, or a later rewriting of history following major political upheaval in the region. Following the decline of the Snake Dynasty, Oxpemul undertook a major campaign of monument construction, with kings holding both the local 'stone throne' and the enigmatic 'bat head' emblem glyph. These data indicate that Oxpemul benefitted from the decline of its more powerful neighbor and rose to regional preeminence under the aegis of Tikal. The history of Oxpemul provides an important window in the political strategies adopted by expansionist hegemonic states during the Classic Period.

Ek, Jerald [302] see Nolan, William

Elera, Carlos [65] see Shimada, Izumi

Elfström, Petra (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College), Colin Quinn (Hamilton College) and Emily Rubinstein (Cultural Resources Branch at Fort Drum)

[224] *Sediment Geochemistry and Household Spatial Analysis: Social Organization and Housepit Floors from Three Millennia of Occupation at the Slocan Narrows Site, Interior Pacific Northwest*

House floors in archaeological contexts often lack the density of artifacts and in situ placement to be able to fully reconstruct the spatial organization of activities. Geochemical analyses of sediments provide an alternative line of evidence for understanding household organization and potentially changing social systems. This study presents geochemical analyses of living floors from several pithouses at the Slocan Narrows site in the Upper Columbia river area of interior British Columbia. In order to understand the spatial organization of activities in these dwellings, we use pXRF and EA-

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IRMS analyses of sediment samples to measure element concentrations and determine carbon and nitrogen ratios respectively. Our sample strategy targeted multiple housepits of varying size that were occupied throughout the site's history, making Slocan Narrows an ideal site to study household organization change through time. This study expands the methodological toolkit for reconstructing household organization and contributes more broadly to understanding social organization in prehistoric villages.

Elgerud, Lucia (University of Tennessee), Hugh Tuller (University of Tennessee/DPAA) and Wilfred Komakech (University of Tennessee)
[282] *Displacement and Burials in Wartime Acholiland; Archaeological Surveying and Ethnographic Research in Northern Uganda*

A multi-subfield anthropological research team from the University of Tennessee Knoxville has been conducting fieldwork in Acholiland since 2014 in order to analyze how improper burials are affecting the cultural and geospatial reality of post-war Northern Uganda. The project has primarily involved ethnographic research; however, archaeological surveying was introduced in 2016 for the purpose of locating and documenting wartime burials. The concerned burials are related to the 1987 to 2006 war between the Ugandan Government and the Lord's Resistance Army (LRA) rebels in which the local tribal population, the Acholi people, were subject to attacks from both sides during the war. Many civilian wartime burials are located in Internally Displaced Person's (IDP) camps, mass graves, or as skeletal surface scatters throughout the landscape. These forms of burials constitute a violation of traditional Acholi practices, which require graves to be placed on ancestral land in individual grave plots. Fieldwork conducted links the burials to spiritual disturbances as well as subsistence impediments within Acholi communities. Archaeological surveying provides evidence of the displacements and the violence committed against the Acholi during the war and survey reports may assist in establishing the location of burials for future exhumation and repatriation to ancestral lands.

Elia, Ricardo [222] see Perez-Juez, Amalia

Ellenberger, Katharine (Binghamton University)

[168] *Teaching the Possibilities and Politics of Digital Artifact Representations using Virtual Reality and 3D Printing*

When teaching about preservation, it can be difficult to communicate the options and ethical dilemmas that inform principles of archaeological ethics. The message many members of the public get from brief exposure to digital records and virtual models often adds to the challenge, leaving them with impression that these are viable alternatives to physical site preservation. I propose employing evidence-based teaching practices to create public and university lessons which result in a properly contextualized understanding of technology as a preservation tool. In this paper I describe a hands-on guest lecture in an undergraduate course where I employ experiential learning pedagogy to cultivate students' observation skills and critical thinking about virtual models in archaeology.

[61] *Discussant*

Ellick, Carol (Archaeological and Cultural Education Consultants)

[233] *Moderator*

[289] *Discussant*

Elliott, Daniel (LAMAR Institute) and Michael Seibert (National Park Service)

[154] *Get the Lead Out! Establishing a Global Database for the Elemental Analysis of Roundball Ammunition*

Archaeologists with the LAMAR Institute and the National Park Service collaborated in an ambitious undertaking to characterize the elemental composition of round ball ammunition from early historic sites. Researchers used portable X-ray fluorescence (pXRF) technology to sample the elemental content of over 500 round balls from more than 17 different archaeological sites in eastern North America. These include samples from Native American and Euro-American settlements as well as French and Indian War, Revolutionary War, Indian Wars and War of 1812 sites. These preliminary data demonstrate that Antimony (Sb) and Tin (Sn) are very important elements for measuring differences in round balls. One goal is to elevate the diagnostic value of round ball ammunition so that we can determine where the lead came from, who was firing the bullets, and how access to lead varied over time. The pXRF information shows promise in identifying additives or contaminants introduced and military association. If combined with element data from lead ore sources, baseline information can be developed for comparison among battlefield assemblages and incorporated into a global dataset with the purpose of better understanding the geographic distribution of military supplies and military strategy at macro global and regional levels.

Elliott, Hannah (Binghamton University)

[300] *Camelid Exploitation at the Middle Horizon Site of Huari*

Excavations at Huari, the urban center of the Wari state in Peru's Ayacucho Basin, have uncovered well preserved faunal remains, with the majority belonging to native camelid species. While knowledge pertaining to camelid exploitation by the Wari people has been enhanced in recent years through excavations at sites such as Conchopata, little is known about camelid usage at the site of Huari. In this paper, I use osteometric analysis to identify specimens to the species level and to examine the distribution of camelid species using the faunal remains recovered during the 2017 excavations of Patipampa, the domestic sector located within the Huari capital and occupied during the Middle Horizon (AD 500–1000). The results of this preliminary analysis provide valuable insight regarding the usage and management of multiple native camelid species at Patipampa, shedding light on Wari economic and subsistence practices.

Elliott, Rita (The LAMAR Institute)

[281] *Discussant*

Elliott, Sarah [4] see Jenkins, Emma

Elliott Smith, Rosemary [172] see McFarland, Christopher

Ellis, Christopher [120] see Lothrop, Jonathan

Ellis, Erle (University of Maryland, Baltimore County)

[161] *Evolution of the Anthropocene*

Why did humans, unlike any other multicellular species in the history of the Earth, gain the capacity to shift Earth into a new epoch of geologic time, the Anthropocene? Here, a general causal theory, sociocultural niche construction, is presented to explain long-term changes in Earth's ecology driven by societal dynamics across human generational time through sociocultural evolution of subsistence regimes based on cooperative ecosystem engineering, social specialization, non-kin exchange and energy substitution. It is these unprecedented anthroecological change processes that have enabled both the long-term upscaling of human societies and their unprecedented transformation of Earth. Regime shifts in human sociocultural niche construction over thousands of years can explain the sustained transformative effects of human societies on the Earth system. A global archaeology of the Anthropocene, combining both empirical and modelling approaches to reconstruct and examine the mechanisms underlying long-term evolutionary

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regime shifts in sociocultural niche construction, are the key to gaining a deeper scientific understanding of both the past and future prospects for humanity and nonhuman nature.

Ellis, Grace, Anna Browne Ribeiro and Filippo Stampanoni

[240] *Ancient Landscapes of Amazonia: A Study of Pre-Colonial Processes and Contemporary Use at Macurany, Brazil*

We analyze settlement organization and landscape modification at Macurany, a pre-Colonial terra preta site on the Middle Amazon River in Parintins, Brazil, within local and regional contexts. Pre-colonial land modifications dot the contemporary landscapes of Amazonia. Many such landscape features, such as anthrosols, elevated platforms, mounds, ramps, and riverine ports, are used today by contemporary inhabitants of Amazonia. New data gathered at Macurany reveals that ancient Amerindians altered the local landscape, creating ports and anthrosols. Topographic data sheds light on pre-colonial human-environment interactions and settlement organization at Macurany. Similarities with sites in the Central Amazon and Lower Amazon regions include anthrosols and ports, and possibly ring middens; Macurany is unique in the frequency and size of ports. Preliminary results suggest site organization was decentralized due to the spatial distribution, frequency, and size of the ports and depth and distribution of terra preta. Today, these ancient landscape features are managed and used by rural smallholders; although they may not knowingly engage with the past through these actions, they constitute a way of interacting with the material remains of the past. This analysis contributes toward an understanding of pre-colonial land modification and contemporary use of ancient landscape features in Amazonia.

Ellison, Leigh Anne (The Center for Digital Antiquity) and Francis McManamon (The Center for Digital Antiquity)

[231] *Sharing Curation Expertise and Space for Digital Archaeological Data*

Archaeologists are busy all the time. Often stretching to meet a variety of professional obligations. CRM and government agency archaeologists are among the most stretched given the different directions that pull upon their professional lives. Scholarly pursuits; administrative, bureaucratic, regulatory, and public outreach responsibilities related to physical sites and collections, easily fill or over-fill their schedules. Now the care and curation of digital data adds to the piling up of responsibilities. Digital data and the technical tools that create and enable its use present many opportunities for research and resource management. Digital technology makes data easily and widely accessible, sharing information, and enabling the creation of new interpretations and increase in overall knowledge. But, digital data must be curated or it will be lost. Digital curation doesn't just happen, it requires attention, special expertise, and long-term commitment to the curation enterprise. The Digital Archaeological Record (tDAR) is a repository where individual archaeologists, agencies, and organizations deposit their data (e.g., documents, images, data sets, and more). Once deposited in tDAR the data are curated by digital archival specialists who focus on ensuring the data are protected, made available as the depositor determines, and kept available for use and re-use.

Ellison, Leigh Anne [172] see McManamon, Francis

Ellyson, Laura (Washington State University), Tim A. Kohler (Washington State University) and Catherine Cameron (University of Colorado, Boulder)

[27] *Quantifying Inequality among Ancestral Pueblo Households*

Recent studies of household inequality in the central Mesa Verde region (CMV) and Chaco Canyon indicate that the degree of wealth inequality among ancestral Pueblo households remained relatively low in the CMV even as it increased dramatically in Chaco from the mid-800s through the early 1000s, based on Gini coefficients calculated on household floor area as a proxy for wealth. Beginning in the late A.D. 1000s, however, Gini coefficients increased among CMV households as well, reaching values as high as those for Chaco Canyon, and above the median for a recently compiled worldwide sample of prehistoric agriculturalists. Here we expand this analysis by calculating Gini coefficients through time for households in the middle San Juan and add some comparative ethnographic data from the Hopi pueblo of Orayvi (late 19th/early 20th century).

Elquist, Ora (Public Archaeology Laboratory, Inc.)

[294] *A Woman's Retouch: Lithic Recycling at the Strow's Folly Site (Locus 3), Wareham, Massachusetts*

Locus 3 of the Strow's Folly Site (19-PL-1161) in Wareham, Massachusetts represents a small, temporary camp. Archaeological investigations at the site resulted in the recovery of an unusual artifact assemblage believed to be associated with a single component dating to the Middle Woodland Period. Evidence for hunting was notably absent, and the presence of processing tools and relatively dense deposits of ceramics indicate that women were present at the site. Domestic activities associated with women are typically more apparent at sites of a more residential nature. Previous studies indicate that lithic assemblages associated with women's activities are oriented towards use of processing tools and the production of expedient flake tools. The site assemblage does not contain expedient tool forms, but does contain a number of reworked older diagnostic tools suggestive of a strategy of expedient tool production. Such tool recycling may be an indicator of women's activities that are otherwise less archaeologically "visible" at smaller, more ephemeral temporary campsites.

[294] *Chair*

Elquist, Ora [294] see Ort, Jennifer

Elsbury-Orris, Britney

[188] *A Faunal Analysis of the Kirshner Site (36WM213)*

The Kirshner Site (36WM213) is a multi-component site in South Huntington township, Westmoreland county, Pennsylvania that contains two Middle Monongahela villages. Relatively little is known about Monongahela use of animals. Fortunately, good faunal preservation has made zooarchaeological analyses of materials from this site possible. Identifying and analyzing these faunal remains with respect to taxa and skeletal elements, as well as human and animal modifications, provides important new information. The distribution of faunal remains across the features of the site and its two components has been examined, as they have implications for relationships between the site's inhabitants and their environment. These data provide insights into the nature of this site and the activities of its occupants. Comparisons with other faunal studies, like those done on zooarchaeological materials from other Middle Monongahela sites, including the Johnston Site (36IN2) and the Hatfield Site (36WH678), further expands the understanding of the Kirshner Site and the Middle Monongahela tradition.

Elston, Robert (University of Nevada, Reno—Dept. of Anthropology), Gloria Brown (California State University, Sacramento), Ryan Bradshaw (California State University, Sacramento), Martijn Kuypers (California State University, Sacramento) and David Zeanah (California State University, Sacramento)

[92] *Evaluating a Stratified, Prearchaic, Open-Air Site in Grass Valley, Nevada*

Current views of the Prearchaic draw heavily from investigations of sites near pluvial lakes in the eastern and western Great Basin. The record from the Central Great Basin remains impoverished, largely due to the limited number of stratified archaeological sites containing well preserved material suitable for faunal analysis and radiocarbon dating. Recent investigations of an open-air site (26La4434) along the northern shore of Pleistocene Lake Gilbert in Grass Valley, revealed a buried deposit with preserved organic material, obsidian artifacts and Prearchaic time-markers. Here we report on ongoing investigations examining the stratigraphy, chronology, assemblage, and faunal remains recovered from the site. While faunal remains reflect

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procurement of a broad array of prey including waterfowl, large mammal hunting was clearly an important activity. The site appears to represent at least two spatially discrete, single component campsites positioned to facilitate an intercept hunting strategy, as well as access to wetland habitats.

Elston, Robert [92] see Zeanah, David

Elvir, Wilmer (Universidad Nacional Autónoma de Honduras), Ashley Sharpe (Smithsonian Tropical Research Institute) and Whitney A. Goodwin (Southern Methodist University)

[299] *Relaciones Sociales y Medioambientales en Selin Farm a través del Análisis de su Conjunto Arqueomalacológico*

El motivo al cual se llevó a cabo la presente tesis es para adquirir conocimientos sobre las interacciones humanas con su medioambiente de las sociedades prehispánicas que vivieron en el Noreste de Honduras, por medio de un análisis de conchas de moluscos excavadas en el año 2016. Estas investigaciones son parte del Proyecto Arqueológico Regional Islas de la Bahía (PARIB). El material arqueomalacológico proviene del sitio arqueológico Selin Farm, ubicado en el departamento de Colón en las cercanías de la ciudad de Trujillo. Este sitio consiste de aproximadamente 22 montículos levemente organizados alrededor de una plaza central y de acuerdo a estudios previos se determinó que el sitio fue ocupado continuamente desde el 300 al 1000 d.C. Los montículos están compuestos en su mayoría de cerámica y conchas de moluscos, con algunos restos óseos y líticos. Se recuperaron 73 especies de bivalvos y gasterópodos y su análisis sugiere que los habitantes del sitio tenían un alto conocimiento de diversos ambientes a través del tiempo. La mayor parte de las presentes especies fueron explotadas para su consumo y en algunos casos el material adquirió un valor social sobre sus desechos orgánicos.

Emerson, Patricia (Minnesota Historical Society) and Nancy Hoffman (Minnesota Historical Society)

[138] *Technical, Political and Social Issues in Archaeological Collections Data Management*

Managing collections means ensuring the data about them are useful, available, and accurate. In addition to the technical aspects of data management, there are layers of political and social structure that direct the construction and use of collections data.

The Minnesota Historical Society employs a set of data standards that allows us to gather electronic cataloging data from a wide community of archaeology researchers depositing collections at MNHS. Though met with initial resistance, these standards have facilitated publication in Open Context as linked open data. Furthermore, institutional discussions concerning Creative Commons licensing and the cultural sensitivity of collections data were precipitated by publication.

Similarly, as Minnesota has prepared to roll out an electronic sites database, much of the development has dealt with defining standards for terminology and classification, highlighting the role of social agreement in data management. Establishing the technical requirements was challenging. Finding a way to accurately represent existing data in a useful, searchable manner has been equally challenging.

Emerson, Patricia [74] see Scott Cummings, Linda

Emery, Kitty (FL Museum of Natural History, UF), Rob Guralnick (FL Museum of Natural History, UF), Michelle LeFebvre (FL Museum of Natural History, UF), Laura Brenskelle (FL Museum of Natural History, UF) and Sarah Whitcher Kansa (Alexandria Archive, Open Context)

[217] *ZooArchNet: Linking Zooarchaeology Data to Archaeological and Biodiversity Information for Big-Data Archaeological Research*

Re-use of large zooarchaeological datasets offers new ways of tackling the grand challenges of archaeological science. But big-data research requires integrating multiple zooarchaeological datasets while maintaining the biological and archaeological details needed to contextualize the faunal information. Accessing and combining these data remains difficult despite the increasing use of open-access archaeological data publishers and archiving services, and the open-access, interoperable biological data of the global biodiversity data network (GBIF and associated worldwide nodes). We do not yet have a means to effectively integrate data among zooarchaeological, biological, and archaeological databases.

Here, we present ZooArchNet—a bridge between zooarchaeological data and the biological and archaeological open-access networks that will allow us to contribute meaningfully to big-data archaeological research. ZooArchNet is a collaborative project that spans expertise in zooarchaeology, archaeoinformatics, and biodiversity informatics and that links zooarchaeological data to the biodiversity distributed data network and the many publishers and archives of the developing archaeoinformatics infrastructure. We discuss the benefits and challenges of such a system based on our current work combining several millennia of Florida zooarchaeological data with Florida biodiversity data from the biodiversity network (represented by VertNet) and site-based archaeological context through links with archaeoinformatics (represented by Open Context).

[316] *Discussant*

Emery, Kitty [217] see Sharpe, Ashley

Emmanuel, Ndiema [198] see Chritz, Kendra

Emmerich Kamper, Theresa (University of Exeter)

[89] *Hide Processing in Prehistory: An Experimental Approach to Prehistoric Tanning Technologies*

The importance of skin processing technologies, in the history and dispersal of humankind around the planet cannot be overstated. This presentation outlines a systematic analysis methodology targeted at this specific material type, with the goal of determining the tanning technologies in use during prehistory, from extant archaeologically recovered processed skin objects. The methodology is a product of macroscopic and microscopic observations of a sample reference collection containing over 200 samples. Which were used to produce a database of defining characteristics and tendencies for each of six tannage types; wet and dry scrape brain tan, bark tan, alum taw, urine tan and rawhide. The sample collection is made up of twenty-two economically important species from both Europe and North America, as well as a collection of well used clothing and utilitarian items, made from traditionally processed skins. This research has demonstrated that archaeologically preserved objects made from processed skin can provide information about the tannage technologies in use prehistorically, as well as more detailed information such as manufacturing sequences and the conditions of use to which the object was subjected.

Engel, Paul [221] see Whitley, Thomas

Engelbrecht, William (Buffalo State College)

[22] *Iroquoian Chunkey*

Iroquoians played the hoop and pole game in Historic times, but there are no descriptions of Iroquoians playing chunkey, a variant of hoop and pole that makes use of a rolled stone disk. This has led to a widespread belief that chunkey was not played by Iroquoians. However, a symmetrical stone disk was recovered from the Eaton site, a mid-sixteenth century Erie village. Other researchers report stone disks from the following groups: Neutral (Bill Fox), Erie (Joshua Kwoka), Seneca (Martha Sempowski), Cayuga (Kathleen Allen), Mohawk (Wayne Lenig), and Susquehannock (Jim Herbstritt).

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While none of these disks resemble the highly polished discoidals associated with Cahokia and related Mississippian centers, stone disks from Iroquoian villages could have been used in the game of chunky. The context in which chunky may have been played and its related symbolism is discussed.

Englehardt, Joshua (El Colegio de Michoacan) and Michael Carrasco (Florida State University)

[128] *Transformation of the Gods: Symmetry and the Construction of Mesoamerican Deity Systems in the Middle Formative*

This paper explores theoretical and methodological issues associated with the etic conceptualization of Mesoamerican deity systems and the identification of individual supernaturals in cross-cultural contexts. It critically focuses on previous classificatory systems of Olmec deities. Iconographers often identify individual deities on the basis of defining attributes or material accoutrements, frequently extending these identifications across contexts (as in Covarrubias' famous "evolution of the Mesoamerican rain god"). However, building in part on Eva Hunt's work, we find that the conflation or sharing of attributes among Formative period entities casts doubt on the validity of classificatory schemes that fail to adequately consider the fluidity of deities or their relationship to that which they personify. This "conceptual overlap" in Olmec art may lead to confusion, misidentification, or overly simplistic interpretations. It is argued that the construction of deity systems should consider such conceptual overlaps in representational art, in order to more fully unpack the multiple, non-hierarchical levels of significance imbricated in images of gods and supernaturals, as well as the dynamism of such representations within larger symbolic complexes. A range of data from various contexts are considered in an effort to evaluate the utility of cross-cultural analogies in comparative iconography.

[150] *Moderator*

[150] *Discussant*

Engleman, Jenny (Northern Arizona University)

[269] *An Examination of Food Storage Patterns in the Northern Southwest*

The purpose of this project is to identify patterns in Ancestral Puebloan food storage across the northern Southwest between AD 950 and 1300. Using legacy data from the Grand Canyon, I examine characteristics of food storage in canyon environments and then compare the results to southeastern Utah. To combat harsh environmental conditions and secure reliable resources, ancient people stored food in sealed masonry structures, or granaries, protected in alcoves high on canyon walls. These understudied archaeological features can be explored to learn vital characteristics of daily life and long-term subsistence practices. Although food storage is found within Ancestral Puebloan communities, many granaries are situated at great distances from habitation sites, in difficult to access-areas in canyon country. Using a foundation of Human Behavioral Ecology, I evaluate variability in both location and construction style of granaries. Variability of food storage practices adds to the conversation of complex human interaction within and among other human groups, with the environment, and mobility strategies across the northern Southwest.

Enloe, James (University of Iowa)

[124] *Spatial Analysis in the Woodland: Foraging Behavior in Sedentary Agricultural Societies*

Spatial analysis has the potential to yield substantial evidence about the organization of economic and social interactions of prehistoric archaeological sites. There is a growing body of ethnoarchaeological research that allows robust interpretations of spatial patterning in the open-air campsites of mobile peoples. The very fact that such sites may represent short-term, low density occupations means that the configuration of labor and activities may actually be clearer than in longer-term open-air or architectural sites, where accumulated activities create more ambiguous palimpsests. The content and configuration of occupied surfaces offer not only information about activities carried out there, but also the potential for interpreting the role of site usage within a larger settlement pattern. Even otherwise sedentary agricultural societies may have mobile components that fulfill other roles in their settlement and subsistence systems. An example from Woodpecker Cave, a Late Woodland rockshelter in Iowa, can be contrasted with the Paleolithic open-air sites of Pincevent and Verberie to give insight on the commonalities of behaviors and adaptive poses of site occupants identified through spatial analysis.

Ensor, Bradley (Eastern Michigan University)

[19] *The Western Chontalpa: What's in the Archaeological "Black Hole" of the Mesoamerican Gulf Coast?*

The Mesoamerican Gulf Coast figures prominently in grand schemes of interregional population interactions from Olmec to contact eras. However, most models of exchange, migrations, or identities rely on samples from Southern Veracruz, the Usumacinta, and the southern Isthmus without considering the vast Chontalpa in-between. This paper synthesizes new and old data on sites, intrasite spatial organization, and material culture from the Mezcalapa Delta for a synopsis on prehispanic settlement history, settlement patterns, and interpretations on intra- and interregional identities in the Western Chontalpa. These sources suggest low populations during Olmec times, growth in the Late Formative, a hiatus in the Early Classic, and significant growth in the Middle-Late Classic when the first states appeared. The greatest political centralization was in the coastal-levee transition zone, without significant incorporation in trade networks, suggesting a tributary economy focused on diverse local resources. The people of the region cannot be viewed as Olmec, Chicanel, Maya, Nahua or their subjects. Instead, changing local to interregional layers of cultural identities are interpreted for Formative to Late Classic times, which in the latter were variably negotiated by class. Implications on modeling broader patterns of exchange/interaction spheres in the Gulf Coast are discussed.

Eppich, Keith (Collin College)

[258] *The Function of Ceramic Analysis in the Maya Lowlands*

Why study ceramics at all? What is the point of analyzing hundreds and thousands of small, broken pieces of pottery? This paper explores these, and other questions, within the context of Classic Maya civilization. Too often, it seems, ceramic analysis is used as a loose chronological framework, used solely to construct broad frameworks of relative dating. These frameworks are then applied to archaeological assemblages, placing them within chronologically bounded "ceramic complexes" and geographically bounded "ceramic spheres." Then most ceramic analyses end. This paper argues that this is the point where real ceramic analysis should begin. Ceramic complexes should be broken down into distinct centuries and even individual decades, if possible. Ceramic analysis can be used to create absolute chronologies. Ceramic spheres can be subdivided, revealing the exchange of material culture between individual cities, communities, and households. Thus, ceramic analysis can shed significant light on cultural, social, economic, and political ties on such material exchanges. Such analysis can be shown by examining the recent work at El Perú-Waka', where internal social, political, and economic ties are shown, within the context of an absolute chronology.

Eppich, Keith [80] see Menéndez, Elsa

Erb-Satullo, Nathaniel (Harvard University)

[177] *Early Iron Metallurgy in the Caucasus: Filling in a Technological "Missing Link"*

In the study of technological transformations, there is often much discussion of how innovations are conditioned by earlier systems of technical knowledge. Identification of transitional features is often challenging, however, particularly for questions about the origins of iron smelting and its relationship with copper-base metallurgy. This paper discusses some unusual technological features in iron metallurgical debris (circa 8th-6th c. BC)

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from a fortified hilltop site in the Caucasus, shedding light on the early development of iron technology. Macroscopically and microscopically, the slags are in most respects classic iron smelting slags. Larger fragments show the classic planoconvex shape of smelting hearth bottoms, and the slag microstructures are dominated by wüstite (FeO) and small particles of metallic iron. However, analysis of metal inclusions trapped within these slags shows that they contain small amounts of copper and arsenic. These results suggest that the iron forged in this workshop was smelted from the oxidized upper zone (gossan) of a copper-bearing polymetallic deposit. If so, this would provide the first direct evidence of a much-discussed theory that iron smelting emerged from experimentation with copper ore deposits, linking the invention of iron with earlier copper-base metallurgical traditions.

Erek, Cevdet Merih [41] see Yaman, Irfan

Eren, Metin (Kent State University), Brian Andrews (Rogers State University), Michelle Bebber (Kent State University), Ashley Rutkoski (Kent State University) and David Meltzer (Southern Methodist University)

[44] *Year One of New Excavations at the Paleo Crossing (33ME274) Clovis Site, Ohio: The 2017 Field Season*

The Paleo Crossing (33ME274) Clovis site in Northeast Ohio was discovered in 1989, and excavated in the early 1990s. Analysis of the collections over the past 27 years has shed light on Clovis technology, mobility, raw material transport, and forager colonization behavior. Now, armed with several new questions involving the site's chronology, Clovis tool function, and the possible presence of a Clovis "structure", we re-opened excavations at the site during June 2017. While more excavations will take place during summer 2018, this presentation serves as an preliminary report on new discoveries at this unique and fascinating Clovis site.

[44] *Chair*

Erickson, Clark (University of Pennsylvania), Shimon Wdowinski (Florida International University), Jonathan Thayn (Illinois State University), Rex Rowley (Illinois State University) and Jedidiah Dale (University of Pennsylvania)

[116] *Flood Regimes, Earthworks, and Water Management in the Domesticated Landscapes of The Bolivian Amazon*

Exploitation and control of wetland resources was a major strategy of early sedentary peoples in many areas of the world. In some cases, indigenous knowledge about flood pluses and water dynamics and anthropogenic transformation of waterscapes increased to the point where some wetlands were transformed into domesticated landscapes. Analysis and interpretations of relevant radar (TerraSAR-X, ALOS SAR-X, Sentinel-1), multispectral (Landsat ETM and ETM+, ASTER), DEMs (SRTM, ASTER) satellite and aerial imagery is used map and understand the distribution, volume, and movement of water through anthropogenic landscapes in the Bolivian Amazon. Pre-Columbian peoples built numerous earthworks including raised fields, causeways, canals, fish weirs, and fish ponds within the seasonally inundated savannas and wetlands of the region. Our research attempts to show that these earthworks were created to capture, control, and manage large volumes of water, and as a result could produce, capture, and sequester carbon, aquatic/alluvial organic sediments, and aquatic food resources.

Ericksen, Connie, Haagen Klaus (George Mason University), John Clark (Brigham Young University) and Zachary Chase (Brigham Young University)

[66] *Burial Plots: Finding Theatre in the Thanatology of Colonial North Coast Peru.*

Spain's invasion of the Andes initiated a social drama unprecedented in the experience of the Andean natives. Spanish and Spanish-conscripted native chroniclers wrote extensively about Inca pageantry, spectacle, and ritual, and hastily attributed pagan belief to performances they witnessed or heard about. With equal haste, the Spanish appropriated performance as means of introducing and enforcing Christianity. In this paper, I treat performance as the central feature of Andean Colonial transition. Performance may be considered an ephemeral social feature but fortunately, in mortuary performances (dealing with death and treatment of the body); there are many theatrical elements that survive in mortuary contexts (e.g., staging, setting, costumes, make-up, props, and choreography). Archaeology, history, and ethnographic observation together illustrate that performance has alternately established, celebrated, or subverted Andean power relations during hundreds of years. Mortuary performances are especially excellent commentaries about the religious climate of Colonial Peru. I argue that the Colonial Spanish saw performance as evidence of belief and employed performance in the effort to transform pagan belief to Christian belief. Ultimately, communities, religion, and performance itself were transformed; integrated and reintegrated into dynamic personal and public expressions.

Eriksson, Gunilla [16] see Harris, Alison

Erlingsson, Christen (Linnaeus University, Kalmar, Sweden), Bruce Davenport (Newcastle University, Newcastle upon Tyne, United) and Susanne Bollerup Overgaard (Aarhus University, Aarhus, Denmark) (Newcastle University, Newcastle upon Tyne, United) (Newcastle University, Newcastle upon Tyne, United)

[63] *Cultural Heritage-Based Reminiscence Sessions in Open-Air Museum Settings to Enhance Well-Being of Persons with Dementia*

Background: The 3-year Active Ageing and Heritage in Adult Learning project (2014–17, EU Erasmus+ program) involved five open-air museums in Sweden, Denmark, Norway, UK, and Hungary. Sessions were conducted in venues matching the era of clearest memories for participating older persons with dementia (PwD), e.g., 1940-ties apartment. University researchers (Sweden, UK, & Denmark) evaluated the project. This presentation describes qualitative results.

The objective was to investigate if/how experiences of participating in reminiscence sessions held in open-air museum venues affected wellbeing in PwD.

Method: PwD (n 129) were interviewed individually or in groups. Third-person perspectives were gathered from carers accompanying PwD (n 75), and session facilitators (n 24) using questionnaires that included space for free-text responses. Interviews and free-text responses were analyzed with content analysis.

Results: Both museum venue and object handling stimulated PwD reminiscence.

Evidence strongly indicates that PwD wellbeing (denoted e.g., by showing pleasure, humour, creative self-expression, interest, sustained attention, and a sense of connection with others) was generally promoted through participation in museum-based reminiscence sessions.

Conclusion: Museum-based reminiscence sessions were successful for enhancing PwD well-being at the time of the session. Further research is needed to explore and compare long-range effects of sessions.

Ernenwein, Eileen (East Tennessee State University), Jay Franklin (East Tennessee State University) and Nathan Shreve (University of Mississippi)

[241] *Cherokee-Spanish Interactions in the Middle Nolichucky Valley, Tennessee, Revealed by Geophysics and Targeted Excavations*

The Middle Nolichucky River in northeast Tennessee has been largely overlooked in Mississippian prehistoric narratives, but recent geophysical surveys and archaeological excavations at the Cane Notch site document a mid- to late- 16th century Cherokee Town with evidence of Spanish contact. Our multimethod approach includes sitewide magnetometry and a large portion covered with ground penetrating radar (GPR). Excavation of a house floor unearthed a rich assemblage of glass trade beads and pottery, and was dated to the mid- to late- 16th century. The house had burned rapidly and several pots appear to have been dropped during a hasty abandonment. A probable Spanish arquebus lead shot ball in the roof fall and other contact-era artifacts suggest contact with the Spanish. The site was featured in a documentary film, *Secrets of the Nolichucky River*, in 2017. A

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host of other pre-contact and contact-era sites are known along this stretch of the Nolichucky, one of which is the focus of our current work. Magnetometry, GPR, and electromagnetic induction (EMI) survey at Runion reveal a large village with multiple housing clusters, a large public structure, and possible fortifications. Excavations will take place at Runion this summer.

Ernststein, Julie (National Park Service)

[280] *Discussant*

Erny, Grace

[201] *"Fair Greece, Sad Relic:" Greek Archaeology at the Intersections of Power*

In this paper, I address the challenges faced by Classical archaeologists who wish to practice engaged archaeology in Greece. Two aspects of Classical archaeology's disciplinary history are particularly important for understanding the relationship between Greek archaeology (as practiced by American archaeologists) and modern Greece: first, Greek archaeology's early and close relationship with the ideology of Hellenism and, second, the ways in which archaeological work in Greece has intersected (or not) with ethnographic studies of Greek communities. I then explore some of the current institutional factors (many of them legacies of the discipline's trajectory) that either inhibit or fail to actively encourage collaborative archaeological practice in Greece. For archaeological projects supported by U.S. academic institutions, these include the academic position of Greek archaeology within Classics departments and the dismissal of Modern Greek as a legitimate field of study for Classical archaeologists. Finally, I suggest potential future directions for engaged archaeologies of Greece that directly confront this disciplinary legacy. How can Classical archaeologists both avoid uncritically promoting narratives of Classical Greece as the "birthplace of Western civilization" and actively advocate for collaborative practices within an academic power structure that is often unsympathetic to these concerns?

Ervin, Kelly (Washington University St Louis)

[156] *Parsing out the Pace of Occupation at Poverty Point*

Built by hunter-gatherers, the Poverty Point UNESCO World Heritage site is a three-square-kilometer earthwork complex of two massive mounds, several conical and flat-topped mounds, and six elliptical ridges enclosing a 17.4-hectare plaza. The Late Archaic Poverty Point culture (ca. 3800–3000 cal. B.P.) exhibited an unprecedented form and scale of social organization indicated by non-local material measured by the metric ton and the construction of extraordinary monumental architecture at a scale that surpasses most monuments built by North American agriculturalists. Numerous sociocultural models have proposed explanations for Poverty Point social organization. Previous investigations led some researchers to suggest evidence for a large, socially stratified permanent population where the ridges served as platforms for residential structures. Others claim the data do not support the presence of social hierarchy, year-round occupation, or houses on the ridges. Recent excavations during 2017 were undertaken within the earthen ridge complex. Fundamental goals of the project were to apply modern geoarchaeological techniques to obtain high-resolution stratigraphic and chronologic data for assessing the pace and timing of ridge construction and occupation. This type of geoarchaeological analysis within large monumental earthworks provides necessary information to understand the history of political, social and economic organization at Poverty Point.

Ervin, Kelly [291] see Grooms, Seth

Eschbach, Krista (Arizona State University)

[271] *Casta, Class, or Race? Social Transformations at the Colonial Port of Veracruz*

The social structure of colonial New Spain underwent large-scale transformations following the Spanish conquest. Changes in social categories of identification evolved through an interplay between religious and civil administrators—who attempted to control colonial populations—and local social relationships of interpersonal interaction. I examine social relations and changing categories of identification at the colonial Port of Veracruz. Throughout the colonial period, Veracruz served as a central gateway for African slaves entering New Spain. Subsequent biological and cultural mixing with European colonists and native peoples led to a substantial population of people of mixed African descent. Archaeological and historical investigations of Afromestizo neighborhoods provide information on local social reproduction and transformation—such as through the production and consumption of material culture, the use of urban space, and the formal application of social categories. These data provide an opportunity to begin to evaluate the transformation of casta categories, the development of economic classes, and the role of race among pluralistic African descendant communities in an urban setting.

Esdale, Julie (Colorado State University, CEMML)

[332] *Interdisciplinary Studies at Delta River Overlook Site, a Late Pleistocene to Late Holocene Multicomponent Site in Central Alaska*

Recent large-scale excavations at Delta River Overlook in the middle Tanana River basin yielded 12 components dating from the onset of the Younger Dryas (~12,860 cal BP) to the later Holocene (2300 cal yr BP). Well preserved faunal assemblages, including bison, are present in multiple components, with economic transitions evident at ~6000 cal yr BP. Several features and activity areas were analyzed, including ochre-rich processing areas. Over 20,000 lithic items have been analyzed, primarily from the 11,500 and 10,900 cal BP components, indicating multiple lithic reduction behaviors from cobble testing to tool maintenance. We present interpretations of site function, geological context, radiocarbon dating, component delineation, lithic, faunal, and spatial analyses that track technological and subsistence.

[232] *Discussant*

[332] *Chair*

Esdale, Julie [177] see Henry, Aureade

Eshleman, Sara [173] see Guderjan, Thomas

Espejel, Claudia

[169] *Una síntesis de la historia prehispánica de Michoacán*

El avance de los estudios arqueológicos realizados hasta el momento permiten delinear ya un panorama general de la historia prehispánica en Michoacán desde aproximadamente 1500 aC hasta 1522 dC. En esta ponencia presentaré una síntesis de dicha historia, vinculando la información de Michoacán a la de otras regiones colindantes con el fin de distinguir los rasgos particulares de diversas zonas pero identificando también las tendencias generales de desarrollo que se dieron a través del tiempo.

Espinoza, Pedro (Ministerio de Cultura del Perú)

[42] *El Continuum cultural, una nueva estrategia de investigación y gestión del patrimonio arqueológico en Lima, Perú*

Los cientos de sitios arqueológicos en plena ciudad de Lima así como la usual inexistencia de una valoración positiva de estos por parte de la comunidad vecina, son un reto para la investigación y gestión del patrimonio arqueológico monumental.

Como una alternativa a ello, el proyecto encargado del complejo arqueológico Mateo Salado (en el distrito de Lima), ha venido aplicando desde el 2011 un plan de gestión en cuyo marco se creó la estrategia del Continuum Cultural. Esta es una perspectiva que considera que todas las etapas

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históricas que se manifiestan en el monumento tienen el mismo valor. Mateo Salado es así un sitio prehispánico, colonial, histórico y contemporáneo; superándose la focalización de la arqueología peruana en lo precolonial.

Para la investigación, esta perspectiva determina que los restos materiales modernos recientes sean recuperados como en cualquier excavación arqueológica estándar. En la gestión, hace que las actividades hacia la población (talleres educativos, por ejemplo) aborden también temáticas contemporáneas: el reciente conflicto armado interno, la violencia por origen étnico, la discriminación por género, etcétera.

La ponencia desarrollará la aplicación de la estrategia y sus alentadores resultados, obtenidos bajo principios éticos de responsabilidad, educación pública y extensión, y entornos educativos seguros.

Estis, Julie [94] see Carr, Philip

Estrada, Javier [163] see Roche Recinos, Alejandra

Estrada-Belli, Francisco (Tulane University)

[252] *Ritual and Political Landscapes of the Preclassic Maya: A View from the Cival Region*

The link between Lowland Maya ritual and power relations during the Preclassic period has been so far approached primarily through iconographic, burial and artifact data at the local scale. Very little evidence exists linking notions of political authority, ritual practices and landscapes at the regional level. Recent survey and excavation data from the Cival region of Northeastern Peten, reveals a vast and complex settlement pattern. The Preclassic Maya city of Cival was surrounded by a network of ceremonial centers with monumental architecture. Through an analysis of architectural forms and functions, relative sizes and orientations, links are being identified and a model is proposed for regional political integration during the Late Preclassic period.

[176] *Discussant*

Estudillo Colon, Felipe [222] see Thomas, Jayne-Leigh

Ethridge, Gary [226] see Hovezak, Tim

Etnier, Michael A. [10] see Bovy, Kristine

Evans, Amanda (Coastal Environments, Inc.) and Matthew Keith (Echo Offshore, LLC)

[78] *Submerged Landscapes and Shipwrecks: The Fractioning of Marine Archaeology(?)*

The study and management of submerged paleolandscapes is an extension of terrestrial prehistoric archaeology, but due to the location of the sites on now submerged lake margins and continental shelves, it is typically lumped into a general category of "underwater" or "marine" archaeology. Marine archaeology has been, and in many ways, still is, strongly associated with shipwrecks. In some ways, the lumping of shipwrecks and submerged landscapes into one category is beneficial, since many of the same tools, methods, and issues affect both submerged landscapes and historic resources. However, key differences are also present in both site distribution (shipwrecks are by nature portable sites) and theoretical approaches to identifying sites and investigating them. While there are clear differences between shipwrecks and submerged landscapes, is there a danger in further fractioning their practitioners? This paper will explore some of the benefits and highlight the pitfalls of treating all inundated sites as "marine archaeology".

Evans, Amanda [84] see Weinstein, Richard

Evans, Damian (French Institute of Asian Studies (EFEO))

[175] *The Past, Present and Future of Archaeological Lidar: A View from Southeast Asia*

In the last five years multiple campaigns of airborne laser scanning (or lidar) have been conducted by archaeologists over Angkor-period sites in Cambodia and neighbouring countries such as Thailand. Analysis of the lidar data is still underway and will continue for many years both in the lab and on the ground, but some key outcomes have now been published, and it is already clear that the advent of lidar represents an important milestone in the history of archaeological remote sensing. This presentation will locate lidar within the historical context of mapping and surveying the Angkorian world; summarise archaeological lidar projects in Cambodia and beyond that are completed or ongoing; present new tools and techniques that have been developed for analysis and interpretation; and discuss some key limitations and opportunities that arise as a result of the technology. The paper will canvas the potential for new acquisitions and comparative studies across the region in light of new developments in UAV technology, lidar miniaturisation, and the imminent deployment of high-resolution spaceborne lidar systems, and explore how research data might be integrated into global repositories of archaeological topography.

Everett, Genevieve (Indiana University of Pennsylvania, Department of Anthropology)

[334] *From Field School to Graduate School: How One Public Archaeology Program Has Made It All Possible*

The Paleoindian Period of New Hampshire has been studied extensively, particularly in the White Mountains. Volunteers and avocational archaeologists from the summer field school known as the State Conservation And Rescue Archaeology Program (SCRAP) have excavated several of the known Paleoindian sites in northern New Hampshire. Accessibility to the data recovered by SCRAP is an important aspect of this program, allowing many scholars to complete theses and dissertations using existing collections. This paper outlines how participation in the SCRAP field school has been beneficial to the author's academic career, including her current Master's thesis. The purpose of this thesis is to produce a spatial and statistical analysis of the artifact assemblage from excavation block K at the Potter Site (27-CO-60) located in Randolph, New Hampshire in comparison with the Jefferson VI (27-CO-74) salvage block in Jefferson, New Hampshire. This comparison not only examines the spatial relationships within one Paleoindian site (27-CO-60), but also helps the author make inferences about the similarities and differences between two Paleoindian sites in close proximity. Public archaeology programs such as SCRAP are a valuable part of North American Archaeology, without such programs this and other scholarly works would not be possible.

Everhart, Timothy (University of Michigan Museum of Anthropological Archaeology)

[190] *Approaching Monument Diversity in the Woodland Societies of the Central Scioto Valley*

The Woodland societies of the central Scioto Valley are renowned for various aspects of their ceremonial practices. Among the better known are craft production of ornate works from exotic materials and the erection of vast monumental landscapes. Those construction practices led to monuments with an incredible diversity of form, scale, and organization. This variability is yet difficult to explain, with the existing explanations differing widely and being inter-related with various other social and ideological factors. Additionally these explanations are based to some extent on limited and biased data sets. Alongside data collected from pre-existing museum collections, recent excavation of an earthen enclosure at the Steel Group offers new data to examine this question.

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Evin, Allowen [212] see Dobney, Keith

Ewing, Josh (Friends of Cedar Mesa)
[96] *Discussant*

Fajardo, Blanca [299] see Morales, Ridel

Fajardo, Carmen Julia (Universidad Nacional Autónoma de Honduras)

[299] *Los Recursos Culturales del Pasado en la Zona del Oriente: Represa Hidroeléctrica Patuca III*

En el marco de los estudios necesarios para obtener la licencia ambiental del Proyecto Hidroeléctrico Represa Patuca III se llevó a cabo el estudio arqueológico del área en donde se iban a realizar actividades de construcción de infraestructura. Se desarrolló el reconocimiento y prospección arqueológica sin pozos de prueba en 2007 y 2012 en la zona de embalse del proyecto hasta la cuota de 287 metros de altitud y el trayecto de la línea de transmisión. Éste se realizó por secciones en la primera y segunda terraza aluvial de los ríos Guayambre y Guayape hasta la confluencia de ambos con el Río Patuca, donde se construyó la cortina de retención. Los recursos culturales del pasado prehispánico que resultaron del reconocimiento y prospección arqueológica fueron una variedad de sitios y dispersiones de material lítico y cerámico de superficie. Se registraron cuatro sitios arqueológicos en la zona del embalse; Pueblo Viejo, La Sabana del Pueblo—con estructuras parcialmente visibles en la zona que va ser inundada—y los sitios Los Encuentros y Las Corrientes en la zona de influencia directa. Los sitios fueron mapeados y delimitados por recorrido de superficie, considerando la concentración y dispersión de material de material arqueológico.

Faniel, Ixchel [130] see Kansa, Sarah Whitcher

Farah, Kirby (University of Southern California)

[257] *The Nature of Leadership and Community Cohesion at Postclassic Xaltocan, Mexico*

Immediately after the consolidation of the Aztec Empire, Itzcoatl, the king of Tenochtitlan, ordered the destruction of the ancient codices from newly incorporated territories. By erasing these alternative histories, Itzcoatl paved the way for the construction of an official imperial history that bolstered the political aims of Aztec leaders. Nearly a century later, a second wave of erasures occurred when Spanish conquerors destroyed indigenous books and idols in an effort to eradicate blasphemous religious beliefs. Although indigenous accounts were eventually rewritten, largely at the hands of Spanish-educated indigenous elites, the diverse histories from Basin of Mexico polities that pre-dated the formation of the Aztec Empire remained lost. Only recently have archaeological investigations begun to demonstrate the diversity that characterized the Postclassic Basin of Mexico. Recent archaeological excavations at Xaltocan recovered the remains of successive structures that once housed Xaltocan's Postclassic political leaders. The structures and their associated artifacts reveal the distinctive political strategies utilized by Xaltocan's leaders. New revelations concerning the nature of leadership at Xaltocan, combined with other archaeological evidence from across the site, contradict or call into question certain long held historical assumptions about how Basin of Mexico polities functioned on the eve of the Aztec conquest.

Farahani, Alan (University of California, Los Angeles)

[4] *Change and Continuity in Agricultural Production in Iraqi Kurdistan, ca. 4000 BCE–1000 CE*

The archaeological site of Kani Shaie is a small (<3ha) tell site located in Iraqi Kurdistan not far from contemporary Sulaymaniyah. Archaeological evidence as well as radiocarbon dates procured from excavations at the site indicate in-habitation from at least 3500 BCE until the Middle Islamic period, ca. 1400 CE. Excavations in 2015 and especially 2016 included a substantial archaeobotanical sampling component, which entailed the sampling of every archaeological deposit and the subsequent spatial recording of those samples using electronic digital mapping methods. The paper presents the analysis of over 150 samples collected at the site, comprising about 800L of analyzed archaeological sediment. The paper identifies continuities and discontinuities in major food crops (emmer wheat, barley, fig, etc.) through time and the inferred relationships of Kani Shaie communities with the site in terms of agricultural production and food consumption, especially with respect to new foods that appeared in the later historic periods such as rice. The shifts in Kani Shaie's different modes of agricultural production, especially ca. 3500 BCE and later in 500 CE, reflect the interplay of new modes of social organization and local environmental realities.

Fargher, Lane (Centro de Investigación y de Estudios Avanzados del IPN) and Richard Blanton (Purdue University)

[257] *Multiethnic Landscapes, Inclusive Identities, and Collective State Building*

In small-scale societies, including territories of failed states and peripheries; regional landscapes are chaotic and rife with interpersonal violence, slaving, and social disorder, etc. Accordingly, organizing for collective defense and the management of common pool resources is vital for the survival of small communities occupying these zones. In such contexts, ethnic identities, constructed around concepts of blood, race, language, or locality, are important for achieving cooperation because they heighten trust that group members are willing to comply with the costs associated with collective action. Members "signal" their ethnicity and, thereby their commitment to costly moral values associated with cooperation by consuming ethnically appropriate material culture, speaking local dialects, and participating in community rituals. However, when such regions shift toward more centralized administration, multiethnic landscapes appear to pose impediments to achieving collective action at larger spatial scales. In such cases, larger more inclusive identities are hypothesized to be an important ingredient in overcoming inter-community distrust and the unwillingness of individuals with local identities to collectively bear the costs of regional public goods and/or collective defense. In this paper, I consider this supposition using cross-cultural data, as well as the case of the Late pre-Hispanic State of Tlaxcallan, in central Mexico.

Fargher, Lane [31] see Marino, Marc

Farmer, Alyssa [157] see Kilgore, Gertrude

Farmer, James

[73] *Recontexting, Decontexting, and Un-Contexting the Great Gallery: "Alternative" Iconography and Romantic Exploitations of the Archaic Barrier Canyon Style*

The Barrier Canyon Style (aka. Barrier Canyon Anthropomorphic Style) is widely regarded as one of the more prominent and significant pictographic rock art styles in North America, and the Great Gallery from Horseshoe Canyon in Utah has long been recognized as both the type-site and arguably most prominent and complex of all Barrier Canyon Style sites. It is also the most overly exploited and often visually abused site in popular visual culture. Beyond scholarly reproduction, images of the Great Gallery are routinely co-opted through modern cinema, major museum exhibitions, and commercial branding. Such borrowings and exploitations typically show little concern for stylistic or archaeological accuracy, and in fact often intentionally distort or invent alternative histories to perpetuate agenda driven interpretations of the ancient style. This presentation considers the impact such "recontextualizations" have on both popular and scholarly perceptions of the specific style, rock art in general as an ancient form of human expression, and the role of factually accurate translation of documentary evidence into the popular realm.

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Farnsworth, Paul (Temple University)**[67]** *The African-Caribbean Landscape of Wallblake Estate, Anguilla*

Historical archaeologists have explored the plantation landscapes of the Caribbean for more than 50 years, and there have been archaeological excavations at historical sites on every major island. However, there are still islands where there have not been any previous excavations at historic sites, including plantations. Anguilla was one such island until June 2017 when archaeological survey and excavations began at the Wallblake Estate to understand the plantation landscape and the major activity areas of the estate. The research project is focused on understanding the development of African-Anguillan culture from its origins in the boom and bust plantation economies of the seventeenth and eighteenth centuries, through the nineteenth and twentieth centuries. The research in the summer of 2017 has identified the site of the African village and excavated a sample of materials from it to compare to samples excavated at both the extant main house and kitchen. The results of the excavations and preliminary interpretations will be presented.

Farr, R. Helen**[54]** *Implications for Submerged Prehistoric Archaeology: Coastal Geomorphological Mechanisms on the Local Scale in the San Pasquale Valley, Bova Marina, Reggio Calabria*

Marine reconnaissance off the coast of San Pasquale, Calabria in southern Italy revealed a dense offshore terrestrial peat deposit dating to the mid Holocene. Subsequent radiocarbon dating of samples revealed a conflict with regional relative sea level curves and local patterns of terrestrial uplift. As such, initial analysis suggests that these deposits result from a local hyperpycnal flood event and are not subaerial drowned deposits resulting from Holocene coastal evolution and rapid marine transgression. This paper presents new palaeo-botanical analysis that provides insight into the local coastal environment. Additionally, with increasing recognition of the importance of studying submerged prehistoric landscapes, it documents a cautionary tale about the need to fully understand taphonomic processes and coastal dynamics on the local scale where systematic investigations are rare.

Farrell, Mary, Brian Bates (Longwood Institute of Archaeology), Craig Rose (Longwood Institute of Archaeology) and Walter Witschey (Longwood Institute of Archaeology)**[159]** *The Longwood Vulnerability, Potential, & Condition (VPC) Assessment Method: A Case Study from a Hurricane Sandy Project in Virginia*

Where cultural resources are increasingly threatened by the effects of a changing climate, the old model of preservation in place is no longer sustainable. For resource managers charged with the preservation of our cultural heritage, effective stewardship demands that managers are in a position to make data-driven decisions to prioritize the deployment of scarce financial resources to the most vulnerable cultural resources. Nowhere in Virginia are the effects of climate change more apparent than along the shoreline of the Chesapeake Bay, and nowhere else is scientifically derived data on those impacts more urgently needed. To generate this data, the Institute of Archaeology developed the Longwood Vulnerability, Potential, and Condition (VPC) Assessment method and applied it to the Hurricane Sandy Shoreline Survey in Lancaster, Northumberland, Middlesex and Mathews Counties. By triangulating the data from site vulnerability to quantify annual shoreline change rates, potential for undocumented resources through predictive modeling of the study area and the observed condition of known sites, the Longwood VPC Assessment method provides resource managers with a powerful tool for making informed, data-driven management decisions about archaeological sites and the level of threat to which each may be subjected.

Farrell, Sean (Texas State University)**[127]** *New Investigations of Bone Bed 1, Bonfire Shelter: A High-Resolution Analysis of Late Pleistocene Deposits*

This paper reports the results of new excavations of Late Pleistocene deposits at Bonfire Shelter, a stratified rockshelter in the Lower Pecos Canyonlands of Val Verde County, Texas. Previous excavations identified three bone deposits. Bone Bed 1, the oldest deposit, yielded a single uncalibrated radiocarbon date of 12,460 +/- 490 BP. Investigators in the 1960s and 1980s argued that the patterned distribution of megafaunal elements associated with large limestone cobbles in Bone Bed 1 suggests human subsistence activity. However, no formal artifacts were recovered. Mounting evidence for earlier than Clovis occupations elsewhere in Texas, combined with advances in dating technology and spatial analysis, catalyzed new research into Bonfire Shelter's deepest deposits. In the summer of 2017, Texas State University archaeologists excavated a 3x1m2 trench into intact Bone Bed 1 deposits. A three-tiered approach was implemented to identify evidence of human activity: targeted sampling for microdebitage in association with Pleistocene megafauna, a Structure from Motion (SfM) photogrammetry based spatial analysis of faunal remains, and a column sample addressing the depositional environment of the shelter over 12,000 radiocarbon years ago. If human activity is confirmed, these analyses have the potential to elucidate the subsistence strategies of southern Texas's earliest inhabitants.

Farrow, Clare (University of Alabama), Jessica Conway (Millersville University) and Haley Hoffman**[334]** *The Pennsylvania Precontact Predictive Model*

In 2015, the Pennsylvania Department of Transportation and the Federal Highway Administration sponsored the development of a predictive model for prehistoric site locations in Pennsylvania. Since the development and release of the model, numerous surveys have been performed across the state, and many new prehistoric archaeological sites have been identified and mapped. During the 2016 and 2017 summers, undergraduate and graduate archaeology students participating the Pennsylvania Department of Transportation's ESTI (Engineering, Scientific, and Technical Internship) program tested the efficacy and accuracy of the model. The 2016 interns mapped 132 phase 1 survey report results, locations and associated data into Pennsylvania's Cultural Resources Geographic Information System (CRGIS), and subsequently conducted analysis with this new data. In 2017, the interns concentrated on new phase 1 survey and Pennsylvania Archaeological Site Survey (PASS) site data from eight counties: Erie, Delaware, Lancaster, Berks, Bucks, Chester, Lehigh, and Cumberland. While the conclusions we have reached in this paper are preliminary and will require more years of analysis to fully understand, they reveal several interesting trends in cultural resource management (CRM) archaeological testing methods and model accuracy in different topographic regions of the state.

Farrow Ferman, Teara (Confederated Tribes of the Umatilla Indian Reservation)**[253]** *Partnerships Developed during the Ancient One History and Next Steps to Building Better Partnerships—A Tribal Perspective*

The Claimant Tribes worked whole-heartedly together for 20 years for the return of the Ancient One to his homelands. Throughout those twenty years, many partnerships were made with academia and federal agencies. However many challenges were encountered during the NAGPRA process. These challenges provided unexpected hurdles and trials for the Claimant Tribes in their fight for a cultural affiliation determination with the U.S. Army Corps of Engineers.

The range of challenges the Claimant Tribes faced and continue to struggle with encompass: demonstrating a continuous, documented history dating from 9000 years ago to present, absence of artifacts and analysis data from Columbia Plateau collections, maintaining collaborative and inclusive relationships between researchers and Tribes, conducting meaningful consultation, and ethical interpretations of NAGPRA. From a tribal perspective, the challenges can be overcome but will require outreach, training, research, ethical guidance, development of guidance documents, and possible legislative changes to NAGPRA's inadvertent discovery regulations.

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This presentation will provide an overview of the challenges and partnerships the Claimant Tribes made which resulted in examples and recommendations to remedy those challenges for the benefit of all our ancestors today and in the future.

Fash, Barbara [293] see Fash, William

Fash, William (Harvard University), Nawa Sugiyama (George Mason University), Barbara Fash (Peabody Museum, Harvard University), Mariela Pérez Antonio and Alexis Hartford (Harvard University)

[293] *Maya-Teotihuacan Relations Viewed from Front D at the Plaza of the Columns*

Two distinct excavation contexts from Front D in the Plaza of the Columns Complex yielded pictorial representations in different artistic media that strongly suggest the presence of Maya artists in Plaza 50, decades prior to the famous Teotihuacan "Entrada" of 378 C.E. in the Petén. Excavations at this civic-administrative structure at the heart of the ceremonial core of Teotihuacan have revealed a sequence of numerous plaster floors in Plaza 50 associated with Structure 44, whose form is reminiscent of Classic Maya "palace" structures. Hundreds of small mural fragments painted in Maya style were scattered beneath the deeper plaza floors, suggesting they were discarded there after the ritual destruction of at least one elaborately decorated earlier building. A contemporaneous termination ritual offering found nearby, adjacent to Structure 25C, contained incised ceramics that are also clearly executed in Early Classic Maya style, with seated human figures bearing elaborate adornments and plumed headdresses. Together these new data and their dating and contexts will allow scholars to address the problem of Maya-Teotihuacan relations in greater specificity and with more time depth than had previously been possible.

Faugère, Brigitte (University Paris 1)

[59] *Paleoindian and Archaic in North Centre and Western Mexico*

The Highlands of North Center and Western Mexico were occupied from the lithic period as testify paleo Indian vestiges (Clovis and Agate Basin points) found in several sectors. From the beginning of Holocene, only the excavations of some sites allow to recognize typological characteristics and to know how the archaeological material change through time. In this presentation, I will examine the available data, in particular the cases of the States of Querétaro and Michoacan, to show the specificity of lithic industry in the region during preceramic time.

Faugère, Brigitte [262] see Darras, Véronique

Faulkner, Charles [90] see Baumann, Timothy

Faulkner, Ivy (University of Minnesota)

[197] *The Ritual Performance of Gift Exchange in Archaic Greece*

Gift exchange is most often discussed as an economic transaction. Whether goods are exchanged for social, political or cultural capital, the model for examining the practice is based on a commodity framework. However, gift exchange is also a performance, often with prescribed behaviors based on the culture and the individuals participating in the exchange. This behavior clearly falls within the realm of ritual as much as that of trade or economics. In this paper, I discuss gift exchange as a performed ritual both within and across cultural groups. Furthermore, while gift exchange is a behavior between individuals, it often has larger ramifications for the communities these individuals inhabit. For example, gift exchange between political leaders may influence the lives of everyone within their society. This link between social organization and gift exchange is an important aspect of its power as a ritual behavior. In particular, I will discuss how ancient Greek elites used gift exchange as an important unifying ritual in order to connect disparate communities in order to maintain cooperative relationships.

Faulseit, Ronald [155] see Ripley, Kevin

Fauvelle, Mikael (University of California, San Diego)

[19] *A Tale of Two Peripheries: Recent Excavations at Fracción Mujular, Chiapas, Mexico*

Fracción Mujular is a modest residential site located on the Pacific Coast of Chiapas, Mexico. Long known for the Central Mexican iconography found on its carved stelae, investigations conducted during the winter of 2017 represent the first excavations of the site. This paper presents the results of these excavations, as well as subsequent laboratory analysis. We now know that Fracción Mujular has a history that covers over one thousand years of occupation, from the Early Classic to the Late Postclassic periods. Situated on top of the natural coastal choke-point of Cerro Bernal, Fracción Mujular would have had close access to important trading routes used throughout Mesoamerica's history; a detail that is evident in the material culture recovered in excavations. With a diverse ceramic assemblage and obsidian from at least 14 different sources, it is clear that Fracción Mujular was connected to trading partners from across Mesoamerica. I argue that despite its position on the periphery of several Mesoamerican exchange spheres, Fracción Mujular maintained preferential ties to Central Mexican centers—first Teotihuacan and then Cantona—throughout much of its history.

Favier Dubois, Cristian [2] see Politis, Gustavo

Fecher, Franziska (University of Zurich)

[299] *Cultural and Economic Interaction at Postclassic Guadalupe, Northeast Honduras*

The Postclassic settlement of Guadalupe is located on the northeastern coast of Honduras, near Trujillo. With its location inside the interaction sphere between Mesoamerica, Lower Central America and the Caribbean, it lies within a culturally dynamic region that has received influences from various areas during different times. With respect to the Postclassic period, it has been demonstrated that access and distribution patterns of resources and goods changed and new networks of interaction emerged. Communication routes along the coast gained importance. In Guadalupe, many objects were found that point to cultural and economic relations with Mesoamerica and Lower Central America, suggesting that the settlement might have functioned as a coastal trading center. The goals of the Proyecto Arqueológico Guadalupe, which has carried out archaeological investigations since 2016, are to find out what role Guadalupe played in these newly emerging networks and with what regions its inhabitants interacted.

[299] *Chair*

Fecher, Franziska [299] see Reindel, Markus

Feder, Kenneth

[203] *"An Ever Widening Circle": The Lighthouse Site State Archaeological Preserve*

When John Elwell died in the late nineteenth century, newspapers characterized him as the "last of the Lighthouse tribe." When Sol Webster died in 1900, newspapers said he was the "last of the Lighthouse tribe." Before Mary Matilda Elwell died in 1928, she called herself the "last of the Lighthouse tribe." In fact, however, hundreds of descendants of the founding couple, the Narragansett Indian James Chaugham and his white wife Molly Barber, survive and, as historian Lewis Mills phrased it, have spread across the U.S. "in an ever widening circle." As a result of archaeological and genealogical

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research, many people in that ever widening circle are now aware of the place where their ancestors sought sanctuary in northwestern Connecticut in the mid-eighteenth century. Their village has been the subject of an archaeological excavation and honored as a State Archaeological Preserve (SAP). That designation led to the publication of a booklet and the erection of signage. Inspired in part by the SAP program, more than sixty descendants of James and Molly made a pilgrimage in the summer of 2015, visiting the place that is much more than an archaeological site; it is their ancestral home.

[160] *Discussant*

[203] *Chair*

Fedick, Scott (Anthropology, University of California, Riverside), Gerald Islebe (Biodiversity Conservation, ECOSUR Chetumal, Quintana Roo) and Louis Santiago (Botany & Plant Sciences, University of California)

[76] *Exploring the Edible Forest: Food Values and Archaeological Visibility of Indigenous Food Plants of the Maya Lowlands*

A review of 28 ethnographic, ethnobotanical, and botanical studies published since the 1930s identified 497 species of indigenous food plants used by the Maya in the lowlands of southeastern Mexico and upper Central America. This consideration of the Maya cornucopia focuses on the relative food values of the plants and the visibility of the species in the archaeological record. The diversity of food plants has significant implications for the reconstruction of ancient foodways, agricultural ecology, and the resilience of subsistence systems under stresses of demographic flux and climate change during both ancient and modern times.

[254] *Discussant*

Feest, Christian (Herr) and Viviane Luiza da Silva (University of Manitoba)

[206] *Between Enlightenment and Structuralism: Bororo and Kadiwéu Collections outside Brazil, 1791–1938*

From the Philosophical Voyage to Brazil of Alexandre Rodrigues Ferreira in 1791 to the Brazilian fieldwork of the young philosopher Claude Lévi-Strauss from 1936 to 1938, nearly 4000 Bororo artifacts and more than 300 Kadiwéu pots were collected for museums in Europe and the United States by naturalists, anthropologists, missionaries, artists, and adventurers. What began as part of the project of the Enlightenment to catalog the world based on the principles of Linnaean taxonomy turned into a salvage operation to preserve vanishing traditional cultures. The objects filled the shelves of the storage rooms of museums, were more rarely seen in their exhibition halls, and almost never engaged the productive curiosity of scholars. This paper uses the Bororo and Kadiwéu cases to illustrate aspects in the history of ethnographic collecting and shows how the virtual gathering of this now widely scattered monumental corpus may at last be put to some beneficial use for new anthropological approaches and for the benefit of the source communities.

Fehren-Schmitz, Lars [337b] see Schaffer, William

Feibel, Craig [41] see Hlubik, Sarah

Feinman, Gary M. [43] see Lapham, Heather

Feinzig, Kristi (Harvard University)

[36] *Tracing Sixteenth-Century Beads in South America to Understand Their Impact on Indigenous Ritual Practices and Material Culture at the Time of the Spanish Conquest*

Studying beads and changes in use of beads in a given population provide insight into the impact of outside influences on people in a given population. This research identifies bead types that were valued by indigenous cultures in South America prior to the Spanish Conquest in the Sixteenth-Century, and compares their frequency in six geographic regions within Peru, Ecuador, Venezuela, and Colombia with the frequency of glass beads brought by the Spanish to the same regions. This study examines close to 4000 beads across 50 bead attributes from several museum collections, primarily from The Peabody Museum of Archaeology and Ethnology at Harvard University and The Field Museum in Chicago. The frequency of bead colors and materials is analyzed to help determine the value of glass beads in these regions. If there were no cultural preferences or significance by color or material, the analysis should provide a random distribution of Spanish introduced glass beads throughout each region. However, statistical analysis of bead distribution shows that indigenous people did not replace pre-existing shell and stone beads with glass beads. This reveals that people in different regions rejected European glass beads presumably because of existing value systems and preferences.

[36] *Chair*

Feit, Rachel [44] see Seikel, Katherine

Feltz, William

[238] *A Study of 3D Photogrammetry and Oneota Ceramics*

3D photogrammetry is the process of creating a manipulable 3D model using only photos from a high-resolution camera that are then processed through computer software to extract 3D data and create a wireframe and mesh. This process can be accurate enough to measure a hairline fracture along the surface of prehistoric pottery with .1mm accuracy. Analyze the benefits of such methods, a study was conducted using Oneota ceramic artifacts of the La Crosse, Wisconsin locality that have been curated at the Mississippi Valley Archaeology Center, with the data compiled into a virtual database. Using typology, archaeologists have recognized differences in Oneota culture. Distinctive characteristics of Oneota ceramics are the motifs created by trailing along the surface of the still moist clay. The pot shape and contours can be recorded by taking photographs at multiple angles to be processed on a computer to create a digital replica that can be studied by anyone with internet access, data no longer restricted to a site whose physical artifacts are exclusively stored within the curation facility. 3D models can also be printed to be used as aids for teaching and studying different methods of analysis, such as typology.

Feltz, William [332] see Herbert, Joseph

Fenn, Thomas (Cal Poly Pomona), Brett Kaufman (Institute of Historical Metallurgy and Materials,), Ali Drine (Institut National du Patrimoine), Hans Barnard (Cotsen Institute of Archaeology, UCLA) and Sami Ben Tahar (Institut National du Patrimoine)

[210] *Preliminary Results of Ground Penetrating Radar (GPR) Geophysical Prospection at the Neo-Punic/Roman Period Site of Zita, Tunisia*

During the summer of 2016, preliminary geophysical prospection survey using ground penetrating radar (GPR) was conducted at the Neo-Punic and Roman period site of Zita, Tunisia. Since the time available for the fieldwork was limited to two weeks, the survey focused on examining specific areas of the site to document certain architectural features, and in several locations where industrial activities were known to have occurred based on previous limited excavations. Additionally, a region identified as a "tophet", a sacred burial precinct for infants, was examined during the survey. Goals for the GPR survey were different in each area examined, and the results will aid in future excavations and paleoecological reconstructions.

Results from all survey areas will be briefly mentioned, but the paper will emphasize two main target areas. Two industrial sectors were surveyed, where iron metallurgy was practiced, and total slag volumes are estimated to assess the ecological legacy of the industry. A second area of emphasis

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was the “tophet” burial precinct, for which the GPR survey produced unexpectedly clear results that enable analysis of the mortuary landscape. Implications of all the results will be briefly discussed, and directions for future GPR survey and excavation will be presented.

Fenn, Thomas [137] see Dussubieux, Laure

Fennelly, Katherine (University of Lincoln)

[87] *Educating Children of the Labouring Poor: Neepsend School and the Industrial City of Sheffield at the End of the Nineteenth Century*
In the nineteenth century, the northern city of Sheffield in England developed significantly as the city's traditional manufacturing output—metal and metalworking—was industrialised on a mass scale. To support this rapidly growing industrial city, services like railways and gasworks were constructed around the city perimeter, along with housing, shops, and other services and institutions. Neighbourhoods like the industrial colony of Parkwood Springs were home to long term residents, and a growing population of families. The city authorities became concerned with the formal education of these children of the industrial city, children of the 'labouring poor'. Built initially for the children—boys, girls, and infants—of men employed in the metal trades, the Neepsend School near Parkwood Springs attracted subscribers from across the city, as well as from within Parkwood itself. The school's situation, amongst the works of Neepsend, firmly embedded the children's education within the industrial cityscape. As an institution for the care as well as education, the building was carefully spatially divided and managed, communicating social behaviour as well as industrial training. Employing standing building survey, GIS, and archival research, this paper will examine the site of Neepsend School.

Fenoglio, Fiorella [209] see Nielsen, Jesper

Fenomanana, Felicia [114] see Douglass, Kristina

Ferguson, Haylie (Brigham Young University)

[11] *A GIS Approach to Settlement Patterns and Predictive Modeling in Chihuahua, Mexico*
In this study I analyzed the pattern of settlement for known Medio period (A.D. 1200–1450) sites in the Casas Grandes region of Chihuahua, Mexico. Locational data acquired from survey projects in the Casas Grandes region were evaluated within a Geographic Information Systems (GIS) framework to reveal patterns in settlement and site distribution. Environmental and cultural variables such as elevation, topographic aspect, slope, soil, distance to nearest water, and distance to nearest known ballcourt were calculated for each site in this region. It was expected that the relationships of correspondence between known sites and these variables would provide a quantitative framework that could be used to model the locational probability of unknown sites in the region. Through the use of GIS and statistical analyses, the results of this study were used to produce an archaeological site sensitivity map for this region of northern Mexico.

Ferguson, Jeffrey R. (University of Missouri)

[246] *Discussant*

Ferguson, Jeffrey R. [51] see Neiman, Fraser

Ferguson, Leland (University of South Carolina)

[278] *Discussant*

Ferguson, T. J. (University of Arizona)

[72] *Chair*

Ferguson, Terry, Andrew Ivester (University of West Georgia) and Christopher Moore (Savannah River Archaeological Research Program / S)

[90] *A Geoarchaeological Investigation of Site Formation Processes and Late Pleistocene and Holocene Environmental Change at the Foxwood Farm Site (38PN35)*

The Foxwood Farm site (38PN35) is deeply stratified (4.8 m) sedimentary sequence located on the Oolenoy River, near the boundary between the Piedmont and Blue Ridge in Pickens County, South Carolina. The lower most sediments, (4.8 to 3.2 m), consisting of channel gravels, lateral accretion sands, and clays, were deposited during the late Pleistocene prior to 12.6 ka. These sediments exhibit a fining upward sequence from channel gravels and sands, through bar sands, to a cap of clays. The upper alluvium (3.2m to surface) exhibit a well-defined series of discrete fluvial strata separated by three buried A-horizons. These strata are composed, primarily of overbank sands and indicate episodic deposition and erosion throughout the Holocene. The upper 2/3 of the Holocene strata contain multiple cultural components spanning 11ka to present. Radiocarbon and OSL dating of upper alluvium produce several distinctly different chronological models. The presence of an apparent peak in Pt is consistent with similar anomalous peaks found recently at several sites across North America at the onset of the Younger Dryas. 38PN35 not only provides a record of Holocene cultural adaptations but provides insight into the history of a fluvial system in the non-glaciated southeastern US from the late Pleistocene.

Ferland, Laurence (Université Laval)

[29] *Substances in Transition: Tell Construction in Chalcolithic Bulgaria*

Tells are living places continuously constructed and transformed by their inhabitants through their actions on the matter and objects constituting these places. In effect, the accumulation of clay, rubble and refuse on which houses are built and lives lived reflects daily actions, cultural events happening on longer cycles as well as environmental considerations. Therefore, the blend of things and matter that transited from the riverbed to houses, pots, and aggregated rubble and rubbish requires a special consideration: in this blend, things are not things and clay is no natural matter either. However, the breaking down of aggregates needs to be a means to understand their formation as the aim is to consider the lump of clay and objects as a whole, a tell being more than the sum of its parts. In order to investigate the intricate and flowing matter of the Chalcolithic tell of Petko Karavelovo, this paper focuses on the input of micromorphology. This approach allows comparing matter and its accumulation inside and outside the village's limits along with the natural soils. Artefacts belonging to the houses are also considered since dirt alone cannot tell the story of the tell people and their interactions with things and matter.

Fernandez, Arabel (Fundación Augusto N. Wiese)

[216] *Entre símbolos de poder y género. Nuevas Interpretaciones sobre la Señora de Cao*

Excavaciones en el segundo templo de la Huaca Cao Viejo del Complejo Arqueológico El Brujo (valle de Chicama, costa norte centroandina), revelaron un hallazgo sin precedentes en la arqueología peruana. Este sector fue el lugar de enterramiento de tres personajes de alto estatus social, acompañados de otros dos individuos de menor jerarquía. En esta oportunidad presentaremos los resultados del proceso de apertura del fardo del personaje femenino conocido como la Señora de Cao. Diversos factores, tanto naturales como antrópicos, favorecieron la conservación excepcional del fardo, siendo posible realizar un registro detallado de su conformación. Se propone que el fardo presenta tres etapas de elaboración, siendo la

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diferencia de contenido indicador de las mismas. La lectura de esta conformación ha permitido realizar diversas interpretaciones sobre el rol social y simbólico que envuelve a este personaje femenino.

Fernandez, Rachel (Center for Digital Antiquity) and Leigh Anne Ellison (Center for Digital Antiquity)

[238] *Hidden Threat: Issues with Confidentiality and Protection of Digital Data*

With every trowel stroke, archaeologists expose layers of the past, allowing for the preservation of material while using destructive methods. Fortunately, with the formulation of research and documentation methods over the years, our destructive behavior has been offset with the increase of data and research possibilities. In more recent years, this data has taken on a digital format which has accumulated exponentially. As the amount of data produced from archaeological investigations increase every year, likewise has the threat of data loss and confidentiality issues. We have seen this in the last few years with cases of ransomware and the release of personal celebrity information. Although the archaeological record may not seem to match up to celebrity and corporate prestige, issues with sensitive cultural materials being exposed is of great concern. Without the proper standards in place to secure and safeguard data it will lead to a host of issues in the present and for future researchers. Using the Digital Archaeological Record (tDAR) as a case study, in this poster we hope to illustrate proper management and protection tools vital to ensuring archaeological data is safeguarded against security breaches and protected for the long-term preservation of data.

Fernandez Diaz, Juan (University of Houston / NCALM), Anna Cohen (Utah State University), Christopher T. Fisher (Colorado State University), Ramesh Shrestha (University of Houston / NCALM) and Alicia M. Gonzalez (Independent Scholar)

[299] *New Insights into Honduran Archaeology from the Recovery and Reanalysis of an Antique Lidar Dataset*

In response to the widespread destruction caused by Hurricane Mitch in 1998, the US Geological Survey conducted an extensive survey of 15 modern cities in Honduras. This 2000 survey was carried out by the Bureau of Economic Geology of the University of Texas, and the resultant data were used to generate flood risk maps. The survey also produced the first lidar data collection of a Maya site; however, in the early 2000s, lidar algorithms were not capable of performing the same tasks as today. The final elevation rasters that were archived by the USGS were low resolution and had very basic ground/non-ground classification which made archaeological interpretation difficult. Over the past two years semi-raw lidar data was recovered from old magnetic tapes. We have been able to reprocess these data using current algorithms at a level suitable for archaeological investigation. The newly processed data provides unique insight into Honduran archaeological sites as well as settlement patterns throughout a large part of the country. This paper discusses these lidar data from better-known locations such as Copan, the Sula and Comayagua Valleys, and from less-studied areas along the Atlantic Coast, the Aguan and Olancho Valleys, and the southern gulf of Fonseca region.

Fernandez Diaz, Juan [299] see Solinis-Casparius, Rodrigo

Fernandez Souza, Lilia [162] see Peniche May, Nancy

Fernandini, Francesca (Stanford University)

[295] *The Timespace of the Pre-Hispanic City of Cerro de Oro*

This work uses the concept of timespace (Schatzki 2010) to follow the construction and habitation of the prehispanic city of Cerro de Oro within the lower Cañete valley between ca. 500–900 AD. The concept of timespace assumes that the temporality and spatiality of the social are considered as intertwined elements that form the dynamic infrastructure where social phenomena such as power, social organization or coordinated action are constituted. These timespaces are embedded within a “deep time” approach that follows the entangled formation of a city through time and space, allowing to integrate the multiple dimensions and facets that characterize social processes. Moreover, this study proposes to reevaluate the concept of time, criticizing its use as an independent variable which is reduced, molded or extended to fit within “concise” or “logical” narratives of past events, in favor of a view that holds time as embedded within daily practices.

Fernandini, Francesca [211] see Varillas, Rosa Maria

Fernstrom, Katharine (Towson University)

[58] *Embodying Identities: The Human Figure in Pre-European Native American Art*

Two- and three-dimensional human figures, and disembodied parts of figures, are commonly found across North America, and are considered important dimensions of Native American art. Figures appear in diverse media and sizes including stone, copper, shell, earthen effigy mounds, and petroglyphs/petrographs. In the literature, they are most frequently addressed as examples of art for the regions in which they are found, but rarely as pan-North American phenomena. A solely regional perspective implies that they only had local audiences. Human figures and disembodied parts are rarely examined, or compared/contrasted with reference to wider geographic regions as potentially having had diverse and travelling audiences. This regionalism has developed despite Omaha self-identification as having relocated several times, and the patchwork distribution of linguistic groups across North America for example, speakers of Siouan languages are found in both the Great Plains and South East. This research looks at full figures, hands, and hand and arm postures as one example of such widespread imagery. Hand and arm postures are significant not only for their variation in visual imagery, and in disembodied formats, but also their use in historic American Indian gestural sign language.

Ferrante, Lindsay [231] see Blewitt, Rosemarie

Ferring, Reid [41] see Coil, Reed

Fetterman, Liv (USDA Forest Service)

[193] *Discussant*

Feuerborn, Tatiana [16] see Harris, Alison

Fiedel, Stuart (Louis Berger US)

[21] *Chasing Red Herrings Down the Kelp Highway: Paleoindian Migration via the Pacific Coast is Unproven and Improbable*

Over the past two decades, migration of Paleoindian ancestors along the Pacific coast has become the dominant origin hypothesis mainly because: 1) arrival at Monte Verde by 14,300 cal BP (or even 19,000 cal BP, as recently claimed) requires a still earlier emigration from Beringia and 2) the alternative “ice-free corridor” ostensibly was not habitable by large herbivores before 13,000 cal BP. However, the coastal hypothesis cannot account for many inconvenient facts. These include: absence of pre-13,000 cal BP sites on long expanses of habitable and archaeologically visible coast, from the Aleutian Islands to the Atacama Desert; genomic evidence of all Native Americans’ descent from interior-adapted South Siberian and Clovis populations; and absence from coastal East Asia of both any credible ancestral non-microlithic archaeological complexes and the expected ancestral haplotypes (e.g., the Q-L330 male lineage) in ancient and recent genomes.

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Field, Julie (Ohio State University), Christopher Roos (Southern Methodist University) and Rebecca Hazard (Idaho State University)

[224] *Evidence for Forest Clearance and Food Production in Lapita and Post-Lapita Fiji*

Investigations at the site of Qaraqara have sought to determine the antiquity of forest clearance and food production in Fiji. Located over 25 km inland from the coast, archaeological excavation has indicated that the site was used for habitation and cultivation, producing a ceramic-rich deposit that extends to a depth of 250 cm. Geoarchaeological analyses of sediment cores from Qaraqara reached 500 cmts, and document the formation of stable soils by 3000 BP, during the Lapita period. Plant microfossils identified through scanning electron microscopy analysis trace a synchronous decline in forest taxa, and a concurrent marked increase in grass taxa, providing a context for the sudden appearance of cultivated banana (*Musa* sp.) phytoliths. Radiocarbon dates obtained from identified charcoal and ceramic residues, as well as phytoliths and indicators for soil formation and stable carbon isotopes, further trace the history of habitation and food production at Qaraqara for the following millennium. Combined, these data provide critical evidence for the clearance of forest in the interior of Viti Levu, and the immediate commencement of food production in the late Lapita period.

Field, Julie [8] see Riordan, Kyle

Field, Sean (University of Notre Dame)

[226] *Chaco Connections to Mesa Verde: An Engagement with Interregional Landscape Relationships*

Ideas of spiritual landscapes and aligned site orientations are gaining traction within the Chacoan archaeological community, and stand as strong examples of intentionally constructed macro-landscapes in the prehispanic Southwest. In this poster, these landscape relationships are extended towards a better understanding of interregional relationships in the four-corners, particularly to investigate inferred and intended relationships between Chaco Canyon and Mesa Verde. This analysis focuses on northern Chacoan outliers like Aztec and Holmes Group as demonstrations of intermediary locations between larger, more distinct cultural regions. Site relationships are investigated through several avenues: 1) geospatial analyses, with a focus on viewsheds, road orientations, and linear alignments; 2) site specific and remotely sensed data; and 3) chronological habitation data. These data demonstrate fluctuations in the northern reaches of Chaco and southern extensions of Mesa Verde throughout the PII and PIII periods, to postulate a diachronic and landscape scale perspective of relationships in the Southwest.

Figueiredo, Camila

[116] *Tapajó Group Routes Networks, Santarém and Belterra Region, Lower Amazon, Brazil*

From the 10th until the 18th century, the Tapajó Indians inhabited the present city of Santarém and the surrounding region. The material culture associated with this group is distributed between the Trombetas and Xingu rivers—west/east—and Almeirim until the middle Tapajós Rivers—north/south. Archaeological and ethnographic data demonstrate that the Tapajó produced the elaborate Santarém pottery. This particular region is characterized by a rich and varied archaeological modified landscape consisting of inland wells, Amazonian Dark Earth (ADE), anthropogenic forest and trail networks. For this presentation, archaeological sites located on the Belterra Plateau and inside the National Forest of the Tapajó are considered. The presence of old indigenous paths connecting archaeological sites on ADE soils on the plateau to the riverine environment and between settlements on the plateau suggest that archaeological sites located on different landscape types were interconnected and complemented each other in the Tapajó domain. In addition, a model created using ArcGIS spatial analyst toolbox proposes how the settlements in these peripheral areas were integrated and connected through a network of pathways and river to the Porto site, the heartland of the Tapajó group, in Santarém.

[116] *Chair*

Figueroa, Alejandro (Southern Methodist University)

[299] *The Multiple Meanings of the Rock Art Landscape of Central and Southern Honduras*

The physical landscape of Honduras was and continues to be home to a diverse group of indigenous groups, each with distinct cultural traditions, artistic styles, and sociopolitical configurations. In prehistory, this landscape was imbued with cultural meaning in a variety of ways, from the monumental to the perishable. This paper presents and discusses what we know about the rock art of central and southern Honduras, which contains a variety of iconographic rock art styles within a very limited spatial scale. The location and content of these sites suggest the inhabitants of this part of Honduras assigned multiple, often overlapping meanings to major features of the landscape, particularly caves and waterways. While preliminary, the results of the work done so far in this region indicate strong symbolic connections with Mesoamerican groups to the north and Lower Central American groups to the south.

Figueroa, Alejandro [59] see Hirth, Kenneth

Figuti, Levy [2] see Bachelet, Caroline

Filyk, Megan [323] see Chinique De Armas, Yadira

Fine-Dare, Kathleen (Fort Lewis College)

[60] *Discussant*

Finley, Judson (Utah State University), Erick Robinson (University of Wyoming), R. Justin Derose (Utah State University) and Elizabeth Hora-Cook (Utah Division of State History)

[105] *Fremont Maize Cultivation and Latest Holocene Climate Variability in the Cub Creek Archaeological District, Dinosaur National Monument*

The Cub Creek Archaeological District in northern Utah's Dinosaur National Monument was an early center of Fremont maize cultivation and village settlement AD 450–850. Cub Creek lies near the northern limit of maize cultivation in western North America in the foothills of the Uinta Mountain Range. We couple a Bayesian analysis of radiocarbon-dated pithouses and roasting features with a 2,115-year tree-ring reconstruction of August-July precipitation to explore relationships between Fremont subsistence and settlement strategies and climate variability. We propose a multi-stage model where the adoption of maize cultivation and development of pithouse hamlets was a response to regional drought ca. AD 500. Fremont subsistence and settlement reorganized during nearly a century of climate stability moving away from a focus on intensive maize cultivation and pithouse hamlets. During the Medieval Climate Anomaly, we suggest Cub Creek residents shifted strategies to a more foraging-dominated subsistence focus that still incorporated small-scale maize cultivation, but intensified collection of wild plant foods evident by numerous roasting features in the Cub Creek uplands. Our results challenge notions of regional abandonment and narratives of collapse and suggest that flexibility in subsistence options that strategically incorporated maize cultivation was a successful adaptation to climate variability.

Finley, Judson [105] see Byers, David

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Fischer, Lisa (Jamestown Rediscovery Foundation)**[286]** *The Search for Jamestown's 1617 Church: How Digital Technologies are Providing New Insights into an Old Site*

Digital technologies are changing fundamental approaches to archaeological excavation and analysis. The Jamestown Rediscovery project to examine James Fort, the first successful English settlement in North America, has been ongoing for more than 20 years. Recently the team has been working on re-excavating the site of three of Jamestown's 17th-century churches, the earliest of which is significant for having been the site of the first representative assembly meeting in English America in 1619. The church remains were first examined over a century ago by preservationists from the Association for the Preservation of Virginia Antiquities. Today the site is incredibly complicated because the fragmentary remains of the three buildings have been "cut" into small pieces by the numerous grave shafts dug into the church floors over time as well as the 20th-century archaeological test units. Digital technologies, from drone imaging to 3D modeling, are changing how the site is being recorded, assessed, and visualized, in ways simply not possible a century ago. The one thing that cannot be replaced by technology, however, is the examination of the features and subtle stratigraphic relationships by the archaeologists as they work to define and tease apart the three structures.

[286] *Chair*

Fish, Paul (Arizona State Museum) and Suzanne Fish (University of Arizona)**[131]** *Dimensions of Multi-ethnicity in Hohokam Society*

We examine multi-ethnicity as a persistent and integral dimension within an overarching concept of Hohokam as a holistic archaeological tradition centered on O'odham peoples in central and southern Arizona. Internal and external multi-ethnic relationships of many sorts abound in the ethnography, oral history, and ethnohistory of descendant O'odham peoples in former Hohokam territory. Post-contact O'odham sources document the expansive geographic range and the multi-faceted nature of such interchanges, with intriguing implications for pre-Hispanic times. As in the pioneering approach of Cal Riley, insights from all these sources are sought to better recognize and understand multi-ethnic relationships and interactions in the Hohokam archaeological record. We explore two contrasting arenas in which multi-ethnic participation may have been key elements: 1) subsistence intensification and sustainability, and 2) institutional transfer and innovation.

Fish, Suzanne [131] see Fish, Paul

Fisher, Chelsea (University of Michigan)**[142]** *Three Walks Through Tzacuil: Engaging the Rural Landscape of Central Yucatán 2000 Years Ago, 1000 Years Ago, and Today*

Tzacuil is a small archaeological site in the hinterlands of Yaxuná, a major center in the central Yucatán region of the northern Maya lowlands. Excavations of Tzacuil's nine house groups suggest that a community formed here twice: first during the Late Formative period (250 BCE—250 CE) and again in the Terminal Classic period (700—1100 CE). Both of these occupations coincide with population peaks at nearby Yaxuná. Judging by the ample open spaces surrounding the site's house groups, people living "out there" at Tzacuil may have been drawn to the opportunities presented by the relatively uninhabited intra-settlement landscape. With these open spaces as a starting point, this paper explores how people at Tzacuil physically moved within the intra-settlement landscape of their rural community. The transformation of intra-settlement spaces through the construction of formal and informal walkways suggests that the two chronologically distinct communities engaged with the rural landscape in remarkably different ways. Finally this paper extends the study of continuous human-landscape interactions at Tzacuil by sharing the results of a new community-based approach to landscape archaeology in the northern Maya lowlands, made possible by ongoing collaboration with the people of the modern town of Yaxunah.

Fisher, Christopher T. (Colorado State University)**[169]** *Characterizing Purépecha Urbanism*

At the time of European contact the Lake Pátzcuaro Basin (LPB) was the geopolitical core of the Purépecha (Tarascan) Empire (A.D. 1350–1520), and has long been recognized as a Mesoamerican core region. Cities were an important component of Purépecha statecraft but comparatively little is known about their general characteristics, organization, and evolution. Here I explore the use and division of space within the ancient city of Angamuco to document the development of social complexity, complex societies, and urbanism in the Michoacán region. I rely heavily on airborne LiDAR data to document the 'urban plan' to show that 1) Angamuco is hierarchically organized in space; 2) These spatial arrangements are associated with commoner and elite residential sections, ceremonial zones, and large public spaces; 3) Angamuco is multi-noded and vertically organized on a distinctive malpais landform.

Fisher, Christopher T. [31] see Harris, Edwin

Fisher, Christopher T. [31] see Simpson, Nick

Fisher, Lynn (Univ of Illinois Springfield)**[140]** *Lithic Production and Consumption in a Chert-Rich Upland: Exploring Local Patterns on a Neolithic Landscape in Southern Germany*

The intensity of extraction activities at Neolithic quarries and mines in Central Europe has fueled debate about the scale and organization of chert and flint extraction and exchange during this period. However, most studies of stone consumption and exchange in the region have been based on lowland settlement assemblages at some distance from stone sources. This paper presents results of a regional project combining survey, remote sensing, analysis of private collections, and test excavation to explore Neolithic use of locally abundant chert on the Swabian limestone uplands in southwest Germany. At the center of the studied region is a quarry landscape of pits and debris piles extending over 6 hectares. Radiocarbon dates on charcoal in pit fill indicate that the quarry was used in several episodes from 5000 to 2500 B.C. We combine attribute analysis of the quarry assemblage with comparisons to excavated and surface assemblages from surrounding locations to explore local variations and change through time in the use of the quarry and in the spatial distribution of lithic production activities across a settlement landscape. Results of this project contribute to an understanding of diversity in local patterns of lithic production, consumption, and exchange in the Central European Neolithic.

[140] *Chair*

Fissel, Mark (Augusta University)**[78]** *Marine Archaeology's Influence on Interpretations of Early Modern Warfare, 1975–2020*

Each succeeding generation of historians discovers and taps new types of evidence, prompting reconceptualization of what constitutes "history" and spawning new fields of study. Marine archaeology (and the overlapping fields of maritime archaeology and conflict archaeology) are instrumental not only in recovering new primary materials, but also in reconstructing historical interpretation and historical debates. To cite a solitary example, the teaming of marine archaeologist Colin Martin and historian Geoffrey Parker in evaluating artifacts recovered from wrecks of the Spanish Armada (1588) altered the courses of the military revolution debate and the relatively new theoretical fields of counterfactuals and virtual history (in the latter cases perhaps a fortuitous intersection of archaeology and postmodernism). This paper offers (1) a brief consideration of how marine archaeology has transformed the writing of the history of early modern warfare, and (2) a more substantial report on how marine archaeology is currently enhancing the

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study of early modern amphibious warfare in riverine, lacustrine, and littoral physical environments. The purpose is to spark interdisciplinary and cross disciplinary discussion of how marine archaeology is shaping the interpretation of the past in the 21st century.

Fitton, Tom (University of York, UK)

[210] *Comparative Evidence of Maritime Activity in the Early Swahili Harbours of Zanzibar*

The Swahili of East Africa are regarded historically as a maritime culture, whose coastal sailing networks and prosperous Indian Ocean trade connections can be dated back to at least the 7th century CE. Archaeological investigations have demonstrated that maritime elements were deliberately embedded in the architecture of the famous second millennium Swahili stonetowns, but a focus on urban areas has sometimes been at the expense of areas of potential maritime infrastructure within settlements, or of the broader maritime cultural landscape.

This paper presents the results of the author's recent PhD on the development of harbour areas and maritime activity in the coastal settlements of the Zanzibar Archipelago, using a GIS comparison of archaeological data drawn from previous investigations, remote sensing, and geophysical surveys. The research has demonstrated a pattern of harbour features and the preservation of a series of shoreline maritime activity areas through multiple phases of urbanisation, settlement decline, and redevelopment. The paper offers a hypothetical perspective on the development of a common spatial organisation within these settlements, as well as the growing maritimity of Swahili society, based around the activities and roles of communal maritime areas.

Fitts, Mary (NC Office of State Archaeology) and John Mintz (NC Office of State Archaeology)

[228] *Transcending Borders: A New Approach to Prehistoric Contexts in North Carolina*

The North Carolina Office of State Archaeology reviews information about hundreds of newly-identified archaeological sites each year and advises the State Historic Preservation Office regarding their ability to provide important information about the past. The need to synthesize accumulated data so that assessments of site significance can better reflect our potential state of knowledge is both pressing and daunting. Updating prehistoric contexts for North Carolina is a particularly challenging task due to the state's regionally diverse ecological settings and its position at the intersection of distinct sociopolitical networks centered to the north, south, and west. In this paper, we review existing spatiotemporal systems used to organize the study of North Carolina archaeology and propose modifications that take into account the research potential of border regions. By calling explicit attention to such boundary zones through time, we invite site assessments to address the potential for studying how American Indian communities in North Carolina creatively negotiated cultural, political, and economic differences. While such an approach requires the synthesis of a considerable amount of information, the rewards in our understanding of past social dynamics will be considerable.

Fitts, Mary [231] see Blewitt, Rosemarie

Fitzgerald, Curran (Department of Anthropology, University of North Carolina at Greensboro), Cyrus Banikazemi (Department of Anthropology, University of North Ca) and Donna Nash (Department of Anthropology, University of North Ca)

[211] *A Galactic Empire: Celestial Bodies and Imperial Ideology on the Wari Frontier*

The consolidation of Wari imperial power in the Osmore Valley was predicated on the perceived legitimacy of a common ritual ideology that situated elites and their subjects within an ordered cosmos. Recent archaeoastronomical surveys of the administrative and ceremonial citadel on Cerro Baúl and elite contexts on neighboring Cerro Mejía have identified alignments of ceremonial architecture with recurrent astronomical phenomena at both sites, suggesting that observation of the heavens reinforced the ritual power structure of imperial Wari society. The celestial alignments of Cerro Baúl's Temple of Picchu Picchu and Temple of Arundane represent a hegemonic syncretism, subsuming the worship of local apu into the imperial orthodoxy of the Wari cosmos. Additionally, a newly identified solar calendrical complex on the summit of Cerro Mejía may have further served to expand the ideological authority of Wari elites. By structuring a social and ritual calendar around the observation of astronomical phenomena, the elite class legitimized their cosmological paradigm through elaborate public ceremony.

Fitzgerald-Bernal, Carlos (Universidad Santa Maria La Antigua)

[260] *El Gran Chiriquí desde Veraguas: dinámicas fronterizas y definición subregional*

Se presenta una re-evaluación de la frontera oriental del Gran Chiriquí y su relación con la sub-región de Veraguas del Gran Coclé en Panamá Central. A partir de hallazgos recientes de petrograbados en el sur de Veraguas y una revisión de la literatura, se reconocen las limitantes inherentes a una definición estática de fronteras culturales y se analiza la "chiricanidad" de la cultura material veraguense como ejemplo de las dinámicas históricas en la conformación de entidades regionales. Se contrasta la información lingüística, genética y etnohistórica con el registro arqueológico no publicado contenido en Estudios de Impacto Ambiental a fin de reconocer particularidades subregionales relevantes. Finalmente, se analizan las interpretaciones sobre la conformación de sociedades jerárquicas en Veraguas y se comparan con las trayectorias mejor conocidas de los cacicazgos del Gran Coclé a fin de evaluar si la singularidad iconográfica y simbólica evidentes en la orfebrería, cerámica y lítica de Veraguas durante el último milenio antes de la conquista europea son un correlato de identidad sociopolítica subregional.

Fitzhugh, Ben [83] see Gjesfeld, Erik

Fitzhugh, William

[79] *Shock and Awe: An Insider's View of the "Stanford Phenomenon"*

In the early 1970s Clifford Evans created a "Paleoindian Program" at the Smithsonian's National Museum of Natural History. Clovis was well-established in the literature, but its origins and antecedents were mysterious. Dennis Stanford had just received his PhD on Thule culture studies in Barrow, Alaska, but his real love was Paleoindians. After arriving at the SI he picked up the mantle of the Institution's pioneering Paleoindian researcher, Frank Roberts, and instituted large-scale projects at Jones-Miller, Dutton-Selby, and other sites. Decades of federal funding provided resources for long-term research. Year-after-year, his papers, reports, and lectures (many to amateur and popular audiences) generated solid data and tested intriguing and sometimes highly controversial hypotheses. He served as chair of the Anthropology Department, trained students, and built a Paleoindian collection that became a national resource and attracted worldwide attention. This paper presents an insider's forty-year perspective of the "Stanford Phenomenon"—how it changed Smithsonian science, challenged his colleagues, and brought public awareness to America's first peoples.

Fitzpatrick, Scott (University of Oregon)

[170] *Banking on Stone Money: The Influence of Traditional "Currencies" on Blockchain Technology*

Centuries ago in western Micronesia, Yapese islanders began traveling to the Palauan archipelago to carve their famous stone money from limestone, which they then transported back to use in a variety of social transactions. While commonly referred to as 'money', these disks were not currency in the strict sense, though their value is not dissimilar to other traditional and modern objects where worth is arbitrary based on both real and perceived attributes (e.g., size, shape, quality, pedigree, or other factors). These characteristics have corollaries in today's society for material culture and electronic cryptocurrencies that use blockchain technology—essentially, digital ledgers that track financial transactions in real time across a computer

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network to ensure that they are seamless and incorruptible. Here I argue that transactions involving traditional forms of 'money' or exchange valuables are the precursor to Bitcoin and other technologies that demand a unified and continuous chain of information to ensure that the value is known and ownership indisputable. This research suggests that Yapese stone money is just one of many cases in the ancient past of humans, through social networks, attempting to create accurate and unbroken lines of communication so that economic relationships can be established, maintained, and rectified.

Fitzpatrick, Scott [13] see Kingrey, Haden

Flad, Rowan (Harvard University)

[181] *Little Bronze Things: What They Do and How They Do It in the Early Bronze Age in NW China*

Small bronze objects, some tools, others ornaments, and yet others of undetermined function, are the earliest known Bronze objects in China. Many of these objects are found in sites from Northwest China that date to the early part of the second millennium BC. Their manufacture seems to have been conducted locally on a small scale in this region, and yet the transformation of matter that their production entailed played a role in large scale transformations of society—ultimately culminating in the massive production of metal later in the same millennium by the expansive, highly centralized, literate state of the Shang. What did these little bronze things do in the Qijia and other cultural contexts in which they are found during this early stage? Did they play a role in transformations of political power? Or did they remain rather ineffective in the political realm until later manifestations of metallurgy emerged? How do the roles of these things relate to similar objects in imperial contexts?

Flad, Rowan [45] see Wu, Xiaotong

Fladd, Samantha (University of Arizona, University of Cincinnati), Saul Hedquist (University of Arizona), E. Charles Adams (Arizona State Museum) and Stewart B. Koyiyumptewa (Hopi Cultural Preservation Office)

[122] *Symbolic Associations: Assessing the Co-occurrence of Ash and Turquoise in the Ancient U.S. Southwest*

Ash provides a ritually meaningful medium through which to alter or close spaces. In the U.S. Southwest, the patterned deposition of ash in archaeological contexts has been linked to practices of purification and the preservation or suppression of social memory. Turquoise also carries important symbolic meanings in the region, with notable links to moisture, sky, and personal and familial vitality. In archaeological contexts of the Pueblo Southwest, turquoise is often associated with ash or related features like hearths, suggesting an intentional link. This material linkage may represent a broader North American pattern as the association of ash/hearth and turquoise is apparent in multiple cultural contexts. We explore evident connections throughout North America before intensively examining co-occurrences at sites in the Homol'ovi Settlement Cluster, a late prehispanic series of ancestral Hopi pueblos in northeastern Arizona. We address the prevalence and contextual patterning of ash, hearths, and turquoise within the Homol'ovi pueblos to assess their potential role in feature and structure closure practices. We consider the likely symbolism of archaeological patterns using traditional Pueblo perspectives.

[218] *Chair*

Fladd, Samantha [91] see Huntley, Ashley

Fladeboe, Randee (University of Florida)

[217] *Investigating Feather Harvesting of Captive Macaws at Wupatki Pueblo, Arizona*

Macaws were imported into the pre-Hispanic American Southwest from central Mexico for hundreds of years; it is generally projected that the purpose of this practice was to supply feathers for ritual purposes. Recent zooarchaeological research has demonstrated that the wing feathers of Southwestern turkeys were regularly plucked, as evidenced by significant scarring on the birds' ulnae. The author observed the presence of this scarring on the wing elements of archaeological macaw specimens from Chaco Canyon, New Mexico. This paper details a macroscopic analysis of macaw skeletal remains from another major husbandry center, Wupatki Pueblo in Arizona, to provide further evidence that Pueblo peoples from different regions were engaged in the regular harvesting of feathers from live macaws. This information lends insight into the practices of macaw husbandry in the prehistoric Southwest and the nature of interaction between different groups engaged in the care and utilization of these transplanted birds.

Flammang, Amandine [270] see Serra, Margot

Fleet, Paige [21] see Cottreau-Robins, Catherine (Katie)

Flegenheimer, Nora (CONICET-Área Arqueología y Antropología, Museo de Ciencias Naturales, Necochea), Natalia Mazzia (CONICET-Área Arqueología y Antropología, Museo de), Celeste Weitzel (CONICET-Área Arqueología y Antropología, Museo de) and Salomón Hocsman (CONICET- UNT)

[120] *Recycling on Fishtail Points: Morphological and Fatty Acids Analysis*

Fishtail points constitute a flexible type that exhibits morphological variability, in part unrelated to spatial and chronological factors. Assemblages from the Argentinian pampas include small, medium and large points, produced either on a flake blank or by bifacial thinning on a biface, with or without fluting, with rounded or angular shoulders, that is, presenting variable sizes, design and manufacturing techniques. These variations were partly the result of the production of objects intended for different functions and partly of point life history. Regarding this life history, we here address a conservative strategy affecting Fishtail points in several localities in South America: recycling. Under the term recycling, we consider points modified by retouch to produce a different tool. Fifteen artifacts recovered at Cerro El Sombrero Cima, representing 16% of the point assemblage at the site, are considered recycled tools made on Fishtail points. They were identified through macroscopic observation of traits on edges and tips and the general artifact shape; possible uses of these recycled tools are studied through fatty acid analysis. Although points are transformed into different artifacts, such as side scrapers, knives, notches or drills, the characteristic Fishtail shape is recognizable, reinforcing the importance this design played in early societies.

Fleischer, Malu (Ilisimatusarfik University of Greenland) and Michael Nielsen (Ilisimatusarfik University of Greenland)

[15] *Ersersaaneq Project: Creating Knowledge Through Images*

In 2016, the Ersersaaneq project was instigated by three students from the University of Greenland to create an online repository of 3D models of the Gustav Holm collection.

In Greenlandic the word ersersaaneq captures the idea of producing knowledge through the creation of visual images.

The goal is to digitally re-unify parts of the collection and develop coherency within a global context. Project partners include Greenland National Museum, The Smithsonian Institution and The National Museum of Denmark. These institutions house parts of the collection and will make the artifacts

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available for the project.

The Ersersaaneq team has tested and developed a cost-effective strategy to create an online database of 3D images to be a universally accessible educational resource. Brief descriptions accompany the images in both English, West Greenlandic and East Greenlandic to provide historical and cultural context, ensuring the local community easy accessibility.

Making these materials universally accessible also demonstrates that these materials are not only important to Greenlandic history, but are also part of a larger global collection of indigenous world heritage.

Fleisher, Jeffrey (Rice University) and Stephanie Wynne-Jones (University of York)

[170] *The Copper Coins of the Kilwa Region, Tanzania, AD 1000–1500: Creating a Regional Currency in an Indian Ocean World of Coins*

The residents and rulers of Swahili towns along the eastern African Swahili coast fashioned cosmopolitan worlds through their participation in long-distance trade both across the Indian Ocean and into the continental interior, their conversion to Islam, and the construction of cities that incorporated styles from across the Indian Ocean world. The creation and use of a local coinage—silver from the 8th-10th centuries, and copper from the 11th century onward—is often viewed as a way that town leaders emulated features in the Islamic heartland thus linking towns to it. Although the copper coins of the Kilwa region clearly referenced and emulated coin systems in the Indian Ocean world, they were not, we argue, meant to connect Swahili towns to that broader world. This coinage, minted at Kilwa Kisiwani, was used only in a small region of the coast, and found at three towns (where they are plentiful in the archaeological record). We argue that the leaders of these towns created their local coinage as a medium of everyday exchange among the general populace, cognizant of the usage of coins more broadly within the Indian Ocean world, but as an effort to materialize power and authority locally.

Fleming, Arlene (World Bank)

[247] *Challenges for Archaeologists: A Changing Climate Is Only One Development*

There is general awareness among cultural heritage professionals, including archaeologists, that a drastically changing climate requires re-examination of our responsibilities and practices for identifying, documenting and managing sites and objects. The occurrence and effects of phenomena such as warming temperatures, sea-level rise, desertification, violent storms, and flooding, are frequently discussed. However, the socio-economic ramifications of a changing climate and severe weather events, and their potential effect on heritage and archaeology, are less often considered. These effects include conflict, migration and displacement of populations, and economic dislocation, as well as weakening governmental authority and structures. Such effects are already apparent, and they may worsen as climate disturbances become more severe. Most international agreements relating to these situations are based on national governing authority and date to a time when climate change and its effects were not considered. What are the limitations of these agreements, and how effective are they for current and future stewardship of heritage and archaeological resources?

Fleskes, Raquel (University of Pennsylvania), Frankie West (University of Tennessee-Knoxville), Graciela Cabana (University of Tennessee-Knoxville) and Theodore Schurr (University of Pennsylvania)

[14] *Ancient DNA Perspectives on Kinship and Racialized Labor at a 17th Century Delaware Frontier Site*

The Avery's Rest archaeological site near Rehoboth Beach, Delaware, represents an early phase of European colonization in North America. Previous archaeological and osteological analysis conducted by the Archaeological Society of Delaware and the Smithsonian Institution, respectively, indicated the presence of two burial clusters containing 11 excellently preserved individuals, one containing individuals of European ancestry and the other individuals of African ancestry. Ancient DNA (aDNA) analysis was subsequently undertaken to identify the phylogeographic origin of and possible kinship between individuals at the site. We successfully extracted and sequenced the mitochondrial DNA (mtDNA) control region for all 11 individuals. Our results confirmed the geographic ancestry assigned to these individuals through osteological analysis. In addition, they revealed that half of the eight European individuals shared the same mtDNA haplotype, suggesting they were maternally related, while the three African individuals appear to have originated from different areas of Africa. Together, the aDNA data and burial organization of Avery's Rest provides insights into the organization of labor at the site, suggests that kinship was an important influence during the early colonization of the New World, and reveals new details about slave trade origins on the 17th century Chesapeake frontier.

Fletcher, Beatrice (McMaster University), Aubrey Cannon (McMaster University), Scott Martin (McMaster University) and Eduard Reinhardt (McMaster University)

[224] *Revealing Woodland Period Landscape Use at Rat Island, Hamilton Ontario Using Itrax™ XRF Soil Chemical Analysis*

With its ability to identify slight changes in chemical signatures from small easily obtained soil cores, Itrax™ core scanning provides an unparalleled opportunity to understand anthropogenic impacts on soils and explore the history of landscapes. Located in Lake Ontario less than 500 meters off the shore of Cootes Paradise, Rat Island (AhGx-7) enabled the integration of multi-element x-ray fluorescence analyses into a traditional excavation program. This small island, initially surveyed and excavated in 1969, 2001, and 2002, yielded artifacts representative of the surrounding Princess Point Archaeological Complex. Our project produced evidence of variable intensities of occupation across the site and within specific strata. This method minimizes environmental impact and field collection time while extending the boundaries of site investigation beyond those typical of small-scale traditional excavation. The method's low impact and ease of collection has also allowed us to compare Rat Island to other sites in the area and contrast patterns of landscape use between Archaic and Woodland time periods. Overall, our study shows how Itrax™ core scanning can extend site-based research and develop a basis for articulation with regional landscape-based research programs.

Fletcher, Brittany (Barnard College of Columbia University), Aliya Hoff (School of Human Evolution and Social Change, Arizona), Samuel Mijal (California State University, Chico), Jason King (Center for American Archeology) and Jane E. Buikstra (School of Human Evolution and Social Change, Arizona)

[66] *Processing Personhood: Mortuary Activity from the Middle to Late Woodland in the Lower Illinois River Valley*

While archaeological engagement with the body as a locus of embodied agency has proliferated in recent years, this study is the first to rigorously apply theories of personhood to the lengthy burial rituals documented within interment facilities of Woodland burial mounds from the North American Midcontinent. This study aims to explore conceptions of the body, dividuality, embodiment, and personhood through the analysis of skeletal material from the Middle Woodland Gibson Mounds Site (n=19) and the Late Woodland Helton Mounds Site (n=2). Osteological data gathered in this study includes an inventory, as well as the estimation of sex, age, and minimum number of individuals. Through the study of skeletal material recovered from these sites, we show the prevalence of hand and foot bones in Middle Woodland processing pits as well as the continued prevalence of extended treatment for adult males. These trends, as well as those concerning long bone frequency and the positioning of final interments, are explored through theoretical frameworks of embodiment, performativity, and dividuality. Our analyses provide insights into Woodland peoples' perceptions of personhood and contribute to the growing body of literature that embraces the benefits of a thoroughly social approach to the interpretation of archaeological and osteological data.

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Fletcher, Roland (University of Sydney)**[213]** *Low-Density, Dispersed Urbanism in the Tropical World: Some Global Implications*

Though low-density, dispersed urbanism is conventionally understood as a feature only of modern industrial societies there was actually substantial low-density, dispersed urbanism in the agrarian world of Central America, Sri Lanka and SE Asia during the 1st and early 2nd millennia CE. These cities, such as Tikal, Anuradhapura and Angkor with areas between 200 and a 1000 sq km, substantially altered their natural environment and were dependent on massive infrastructure. They were then impacted by severe climate change which picked out their basic operational vulnerabilities. The trajectories of agrarian-based large, low-density cities tell a disturbing story. Despite their diverse histories and economies the demise of the great cities led to a similar outcome. Their entire urban heartland regions, covering thousands of square kilometres, reverted to village-scale life. Low-density urbanism never recovered. The long-term story of large, low-density settlements is not an encouraging indicator of the long-term viability of the giant, low-density, industrial-based urban agglomerates of the 21st century. Our present-day circumstances are disturbingly similar. We should beware if the same outcome were to happen to our present-day, giant low-density cities.

[175] *Discussant*

[213] *Chair*

Flint, Richard (Latin American and Iberian Inst., Univ. of NM) ()**[131]** *Crossroads of Disciplines: Precipitating Causes and Latent Causal Conditions*

Historians and archaeologists are habitually drawn to one or the other of two very different types of causal explanation. Those habits arise in great measure from the two distinctly different kinds of data that the two disciplines deal with. Archaeological causal explanations are frequently limited to "latent causal conditions," that is, environmental and cultural (thus anonymous and collective) vulnerabilities or proclivities, broad-scale physical and societal pushes and pulls that set the stage for changes in human behavior. Historical causal explanations, on the other hand, typically emphasize "precipitating causes," the acts or reactions of individual people that constitute in aggregate any societal change. Satisfactory explanations of changes effected by humans require both modes of explanation.

Flood, John [5] see Herrmann, Edward

Flores, Atasta [173] see Smith, J. Gregory

Flores Esquivel, Atasta [252] see Reese-Taylor, Kathryn

Flores-Fernandez, Carola (Center for Advanced Studies in Arid Zones), Veronica Alcalde (Department of Anthropology, Universidad de Tarapac), Laura Olguin (Department of Anthropology, Universidad Católica), Jimena Torres (Universidad de Magallanes, Chile) and Diego Salazar (Department of Anthropology, Universidad de Chile)**[34]** *Shell Fishhooks on C. chorus Mussel Shell (7500 to 4500 Years BP) from the Atacama Desert Coast (Chile)*

Fishing was a crucial aspect in the lifeway of ancient coastal societies. Along the Pacific Coast, the appearance of shell fishhooks has been interpreted as part of different contexts of growing population, economic specialization, and social complexity, among others. Along the coast of the Atacama Desert (18° to 26° Lat. South), fishhooks on *Choromytilus chorus* shells (mussel) appear in archaeological sites located along 1.6 thousand kilometers of coast with dates around 7500 years BP. Around 4500 BP, shell fishhooks disappeared from the Chilean archaeological record and were replaced by hooks made of cactus spines and animal bones. During the ~3000 years that hooks on mussel shells were present, archaeological deposits show evidence of increasing social complexity, specialized maritime economy and semi-sedentary settlement systems. Changes in hook's shapes are also identified. Observed changes in fishing technology suggest deep changes within ancient fishing communities of South America, which were probably linked by long distance movements of people along thousands of kilometers. The present work will discuss the archaeological context of mussel shell fishhooks within the transitions experienced by Middle Holocene fishing communities of the Northern Coast of Chile.

Flowers, Kataryna (University of North Carolina at Charlotte)**[241]** *Inequality and Consumption Patterns in the North Carolina Piedmont*

Rural farmstead archaeology is often overlooked in favor of research into larger, urban centers. Rural archaeology is an important area of research because for most of American history, the majority of the population lived in rural settings. In addition, the late-19th and early-20th centuries were periods of rapid change in the American South. Farm modernization and southern urbanization affected people at all levels of the socioeconomic ladder. This poster will display the results of an economic scaling analysis of ceramic assemblages from two different late-19th century sites in the piedmont of North Carolina. The analysis will include both locally produced ceramics as well as non-local wares that were mass produced and available commercially throughout the U.S. A statistical comparison of the overall value of the ceramics at each site will be used to explore how patterns of consumption in the rural South were affected by commercialism, socioeconomic status, and inequality.

Flynn, Erin (PAL)**[294]** *The Cutting Edge: Versatility and Preference for the Semi-lunar Knife in the Southern New England Archaic*

Semi-lunar knives, or ulus, have been considered a diagnostic tool of the Laurentian Late Archaic in the Northeast since William Ritchie's 1940 report on the Robinson and Oberlander No. 1 sites in upstate New York. Archaeological research conducted since Ritchie's definition of the Laurentian Aspect demonstrate semi-lunar knives were used in New England long before 5,000 B.P. and occur in both coastal and interior settings. Recently identified semi-lunar knife fragments from a coastal Laurentian site on Block Island, Rhode Island resulted in a new research project addressing the introduction, dispersal, and functions of this tool form. PAL reviewed archaeological literature and artifact collections containing semi-lunar knives from southern New England. Our analyses included basic attributes, such as use wear, material type, manufacturing process (chipped vs. ground), decoration, and hafting elements, combined with site location, cultural attribution, and radiometric dating, where available. Use wear analyses were supplemented by protein, starch, and phytolith residue analyses of two specimens from curated collections. Although semi-lunar knives can no longer be considered "diagnostic" of the Laurentian Late Archaic, their broader association with northern fishing and maritime cultures remains.

Foecke, Kimberly (The George Washington University), Douglas Meier, Edward Vicenzi, Russell Graham and Adam Creuziger**[77]** *Microanalysis of Taphonomic Alteration on Skeletal Material—A Novel Approach to Identifying Damaging Sulfur Compounds*

The geochemistry of taphonomic alterations affecting buried bone has been little studied, yet has vast implications for scientific interpretation of archaeological and paleontological specimens in a world now embracing chemical methods in geoarchaeology. This investigative study of black surface staining on mammalian sub-fossil bone excavated from the bed of the Santa Fe River in northern Florida exemplifies the need to carefully evaluate post-depositional alteration. Such stains typically are attributed to secondary mineralization of manganese oxides, however microanalysis revealed no evidence for manganese but instead identified crystals of pyrite within a thick red and black banded stain, identified as iron oxide and a ferric tannate complex respectively. Based upon multiple analytical methods, reaction mechanisms are proposed. This study debuts a novel sample preparation method for high-vacuum analysis of bone material, and demonstrates a cost-effective method to differentiate between damaging pyrite and

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other inert sulfur compounds in specimens. Results indicate that fossil coating types are extremely dependent upon the chemistry of the environment in which they are buried. Further, it is proposed that staining phenomena affecting fossils may pose risk to collections if not properly identified, treated, and curated.

[315] *Discussant*

Fogelin, Lars (Univ. of Arizona)

[197] *Tibetan Mani Stones and the Materiality of Text*

Mani stones are large stone slabs with Buddhist prayers carved into their surface. In many parts of Tibet, Buddhist pilgrims carry these heavy stones during pilgrimage as an act of devotion. Pilgrims subsequently dry stack Mani stones into large structures including temples, walls and piles outside major religious intuitions. These structures lay, both literally and figuratively, outside of monastic control. In this paper I examine the varied ways Buddhist pilgrims use Mani stones, materialized prayers that most pilgrims cannot read, to shape and alter their religious lives—acts of individual devotion that organically create a shared sacred landscape.

Foguth, Adesbah [190] see Murphy, Beau

Folan, William [30] see Ek, Jerald

Follensbee, Billie (Missouri State University)

[19] *Is That Awl? Olmec Jade Artifacts as Elite Tools, Ornaments, and Inalienable Goods*

Recent research has re-identified certain enigmatic Gulf Coast Olmec greenstone artifacts as elite versions of textile-making tools. These artifacts, which include Middle Formative picks, figural celts, clamshell and plaque pendants, and objects designated as “spoons,” were likely used by elites as both functional objects and high-status adornment, as illustrated in the contemporary sculpture. Most examples of these artifacts are found in caches and graves of distant and/or later civilizations, apparently after they had experienced long use-lives; while still identifiable, most are extensively reworked and could no longer function as tools, becoming primarily symbolic—or their symbolism had been co-opted and transformed through recarving and recycling. Analysis of the few examples found in Formative period graves reveals considerable use-wear and breakage, re-sharpening, and reshaping; some were reworked to the point where they are barely recognizable, apparently retired only after they were largely unidentifiable. Such find contexts suggest that these artifacts functioned as inalienable goods—revered, elite possessions that were reserved, inherited, and treasured as symbols of association and status. Perhaps even more significant, the fact that these tools also served as status symbols suggests that in these Formative societies, social status could be gained through personal agency as well as heritage.

Follett, Forrest, Adam Barnes (CAST, University of Arkansas), Katie Simon (CAST, University of Arkansas) and Carla Klehm (University of Washington in St. Louis)

[286] *Toward an Automated Model for Archaeological Site Detection in Eastern Botswana, a Clustering Method*

This paper is an effort to create a predictive model for archaeological sites in an area of Eastern Botswana. With a rather arid climate, much of Botswana's ground surface (and archaeology) is easily visible to airborne and spaceborne sensors. Without sufficient training data for supervised classification, an iterative spectral clustering method was used to group spectrally similar pixels from multispectral imagery into a large number of spectrally distinct but unknown classes. By visually assessing and removing classes that do not correlate with known sites in the region, the remaining classes provide a map for prospective site locations. This work illustrates how satellite imagery and digital remote sensing methods enable the inspection of large areas with little processing time, something that would be impossible from the ground in a single field-season. Also illustrated by this work is the need for on-the-ground inspection of the prospective sites to confirm their existence and to improve the model.

Follett, Forrest [210] see Klehm, Carla

Fontana, Federica (University of Ferrara—Department of Humanities)

[174] *Southern Alpine Late Paleolithic and Mesolithic landscapes*

Thanks to the intense fieldwork carried out by different institutions since the 1970s, the south-eastern Alps represent one of the most detailed case-studies in Europe documenting the occupation of mountain areas by foraging groups. The known sites and find-spots attesting the Late Paleolithic and Mesolithic occupation of this area amount to several hundred. This evidence shows that foraging groups settled in the Southern Alpine region following the melting of glaciers and the re-colonization of mountain slopes by vegetation and fauna during the Lateglacial starting around 17,000 years cal. BC. As environmental conditions became more favorable human occupation intensified. At the same time seasonal displacements towards alpine pastures reached progressively higher altitudes. In the early Holocene Mesolithic hunter-gatherers are attested along the belt of territory spanning between 1,900 and 2,300 m a.s.l. Although most of the currently available archeological evidence consists of lithic scatters the development of multi-disciplinary studies has allowed the reconstruction of a thorough frame-work. Despite the need for a higher investment of energies—both in biological and technological terms—the upland environments of the Southern Alps have represented an ideal opportunity for the last hunter-gatherers-fishers of the Italian peninsula allowing expansion to newly exploitable territories.

Fontes, Lisa (University of New Mexico)

[191] *Moderator*

Forbes, Hamish [54] see Chesson, Meredith S.

Ford, Anabel (UCSB), Linda Howie (HD Analytical Solutions/ The University of Western) and Josh Inga (UCSB)

[95] *Recipe for Daub? A Comparative Petrographic Study of a Common Construction Component in the Maya Area*

Daub is characterized as a mixture of a plastic substance, like natural clay or plaster, and an organic, fibrous binder, which is applied and smoothed against a stick or wood structure to construct a wall. This building strategy is used extensively throughout the world, past and present, yet studies have tended to focus exclusively on identification of component ingredients, rather than compositional and provenance characteristics that offer insights related to resource procurement patterns, variability in daub compositions across time and space, and what contiguous and divergent compositions suggest about development and traditions of construction practices. In this study, we present the results of a comparative petrographic analysis of clay artifacts commonly identified as ‘daub’ from Late Classic Maya residential buildings situated in three different environmental zones around the site of El Pilar, Belize. We identify and compare the compositional components of artifacts from valley, foothill, and ridgeland environments and consider their compositional and provenance characteristics in light of formal definitions of daub as a building material, daub recipes, and the nature and significance of variability in these artifacts across the landscape.

[254] *Discussant*

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Ford, Anne (University of Otago)

[20] *Meet the Neighbours: Evidence for Interaction between the Austronesian Lapita Culture and Non-Austronesian Communities in Papua New Guinea*

The Lapita colonisation was the greatest seafaring migration in human history, occupying all the major island groups in their eastward migration across the Pacific, where they became the ancestors of the Polynesians. The orthodox model for their origin is as an Austronesian movement out of Asia, from where they moved into Island South East Asia, and then into the islands of the Bismarck Archipelago of Papua New Guinea, where the culture that we recognise as Lapita was born. Yet major questions still remain as to the nature and origins of Lapita, particularly how much of their culture was a Neolithic package brought out of Asia, and how much has been influenced by contact with Non-Austronesians. This is an important question as it cuts to the core of identifying the development of Pacific cultures.

The Triple-I model proposes that the Lapita Cultural Complex evolved from intrusion into new territories, innovation of new technologies, and integration with established communities. Yet most Lapita sites are found on previously uninhabited Pacific islands, therefore what actual evidence is there for interaction with other communities? This paper will examine this fundamental assumption by investigating potential links between Lapita and non-Lapita communities on mainland Papua New Guinea.

Ford, Ben (Indiana University of Pennsylvania)

[78] *Public Engagement through Maritime Landscapes*

The future of American Archaeology lies in its ability to engage the public and demonstrate the field's relevance to a broad range of communities. One way that maritime archaeology can contribute to this future is through identifying and interpreting maritime landscapes. A maritime landscape approach draws on the "lure of the sea" that attracts many people to shipwreck studies, but engages larger constituencies through place-based history. Geographic space is one of the things that all people share and maritime landscapes loom large for many cultures due to the power, beauty, bounty, danger, and opportunity that water bodies hold. Maritime landscapes also allow for alternative histories to exist in the same space because landscapes are interpreted through a cultural lens. Groups that may be disenfranchised by the colonial histories often associated with shipwrecks can connect with maritime archaeology through the physical remains of their ancestors' maritime occupations and beliefs. In these, and other ways, a maritime landscape approach gives maritime archaeology a broad church perspective that will help ensure a long, productive, and engaged future.

Ford, Ben [39] see Schwarz, George

Forde, Jamie

[36] *Commensal Politics, Intersectional Politics: Serving Ceramics at Early Colonial Achiutla, Oaxaca, Mexico*

In this paper I present findings from recent excavations of a high-status indigenous residence at the site of San Miguel Achiutla, Oaxaca, Mexico. The data show that, contrary to typical expectations, frequencies of elaborate indigenous Mixtec polychrome serving wares rise considerably from the Postclassic to the Early Colonial period, rather than these ceramics being replaced by European style ceramics. Nevertheless, residents of Achiutla did indeed have access to European glazed wares, and used tin-enameled majolicas with considerable frequency, in particular. I attribute this pattern to indigenous nobles having served as primary interlocutors between Spanish authorities and their broader native constituencies following the social upheaval of the Conquest. As such, they would have negotiated with and attempted to appease the demands of both of these different groups simultaneously. I suggest that the ceramic patterning indicates they did so in part through commensal politics, entertaining these various groups at feasting events. I contextualize the archaeological data with ethnohistorical evidence to illustrate how this made for a rather delicate balancing act for colonial indigenous elites.

Forest, Marion (Arizona State University)

[169] *Houses in the City: Domestic Economy and Space at Malpaís Prieto, Michoacán*

Compared to other Postclassic cultures, not much attention has been given to the organization of daily life and domestic space in the Tarascan tradition. The political, religious and economic systems have been the focus of most archaeological and ethno-historical research, leaving the household systems understudied. It is yet critical to understand the fundamental role of household in the community organization, specifically in the context of the growing social and political complexity that led to the emergence of the Tarascan State. In this paper we synthesize the data collected at different domestic units (commoner and elite houses) excavated at one of the earliest Tarascan city: Malpaís Prieto, located in Northern Michoacán, Mexico. We examine the spatial organization (e.g. architecture, activities), the production and consumption of goods (e.g. ceramics, lithics and faunal remains), in order to reconstruct the daily life at this early urban site, discussing the social, economical and spatial systems of households, and their role in the urban community structure.

[169] *Chair*

Forest, Marion [169] see Dorison, Antoine

Forrester, Robert [91] see Turnbow, Christopher

Forsythe, Kyle (McGill University), Pierre Desrosiers (Parks Canada), James Savelle (McGill University) and Arthur Dyke (McGill University)

[16] *Comparing Lithic Procurement and Use Within the Foxe Basin, Nunavut*

This paper presents a systematic review and update on the nature of stone tool use in the Foxe Basin region throughout the Paleo-Inuit period (2,500 BCE-1,600CE). The Foxe Basin was previously thought to have been a core area of ecological stability/predictability that supported an uninterrupted occupation throughout the Paleo-Inuit timespan. Given the untenability of the core area model and that populations fluctuated over time and space, a reevaluation of lithic technologies and their change through time can help distinguish how the transfer of cultural information took place, and in turn how social life responded to drastic demographic change. Paleo-Inuit use of stone tools was a varied and highly skilled discipline involving intimate knowledge of the land, the properties of stone, and the appropriate ways of crafting tools. Using data from recent surveys and excavations, this talk seeks to identify and contrast patterns of lithic raw material procurement and tool production, and their relationship with key demographic changes that took place throughout Pre-Dorset and Dorset occupations of the region.

Forte, Maurizio (Duke University)

[118] *Digital and Poly-sensing Archaeology: From Remote Sensing to Smart Trowels*

Duke University started in 2014 a multidisciplinary archaeological research project involving the use of advanced digital technologies and focused on the Etruscan and Roman site of Vulci (Italy). Vulci, (10th–3rd c. BCE), in the Province of Viterbo, Italy, was one of the largest and most important cities of ancient Etruria and one of the biggest cities in the 1st millennium BCE in the Italian peninsula. The project integrates the use of multispectral cameras by drones/UAV, georadar, digital photogrammetry, image modeling, and laser scanning. GIS, Web-GIS, and online repositories guarantee the integration and standardization of all of the data. In this domain, Duke is developing a specific Web-GIS platform in Geonode for the integration and sharing of spatial and georeferenced archaeological data. New digital tools, such as special trowels (named "smart trowels") with multiples sensors are experimented during the archaeological excavations. The main goal is to collect geometric data but also additional information concerning the features

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and components of the soil. High-resolution sensors coupled with novel photogrammetry processing techniques allow for the reconstruction of landscapes in three dimensions and for virtual reality applications such as the DIVE (Duke Immersive Virtual Environment).

[320] *Discussant*

Forton, Maxwell (Binghamton University)

[73] *House of Shields: Social and Spatial Trends of Rock Art in the Tsegi Region*

This study examines the spatial patterning of shield iconography at late Pueblo III sites (A.D. 1250–1300) in the Tsegi Canyon system, as an indicator of shared group identity. In the mid-13th century, the Tsegi Canyon region of northeastern Arizona followed a greater regional trend of communities coalescing into defensive high canyon alcoves, accompanied by the adoption of shield iconography, likely influenced by Fremont traditions to the north. These images are variously interpreted to represent clan symbols, warning signs to enemies, or magically imbued protective icons. In the Tsegi area, this motif followed a strict spatial pattern of placing large, usually white, shield imagery on the right side of cliff dwellings. By comparing the spatial placement of shield imagery on Pueblo III sites throughout the Northern Southwest, it is evident that the communities of the Tsegi Canyon system may be differentiated through their commitment to the placement of these iconic, highly visible pictographs on the right side of cliff dwellings. Rather than the imagery adorning the shields, group affiliation among Tsegi populations is best demonstrated by this formalized placement of the motif on defensive sites.

Forward, Kathleen (Trent University)

[37] *Community Complexity and Collapse: A Settlement Analysis of the Ancient Maya Site Contreras Valley, Belize*

The city-state of Minanha, located in west central Belize, reached its zenith and most culturally complex stage by the Late Classic period, 675–810 AD. Only a century later, its royal court had “collapsed”. Contreras Valley is a small farming community in the settlement region of Minanha. Decades of research at Minanha and the analysis of artifact frequencies from commoner households allows for a better understanding of the intra- and inter-community social practices occurring at the site of Contreras Valley and within the greater Minanha area. A community archaeology framework is utilized to explore the integrative social, political, and economic strategies of this commoner population. This framework allows for a peripheral perspective on the “rise” and “fall” of the royal court, providing a more holistic analysis of Minanha’s history. As Contreras Valley was able to sustain a population whilst its royal court disintegrated, the resilience of this group of individuals will generate an increased cognizance of how a community copes with and continues to thrive in a climate of political chaos and instability.

Foster, David [294] see Doucette, Dianna

Foubert, Jacob (University of Iowa)

[188] *From Excavations to Occupations: Characterizing the Faunal Assemblage of a Late Woodland Site*

Analysis of a faunal assemblage gives us direct evidence of a subsistence base of archaeological occupation. Woodpecker Cave is a Late Woodland rockshelter site used by the University of Iowa as a field school for student education. The site was first excavated by Warren W. Caldwell after his initial surveying in 1956. In the subsequent years since the university first began excavations in 2012 with Jim Enloe as supervisor, students have expanded the excavation area horizontally leading to portions of levels being excavated throughout different years. The site is excavated in arbitrary ten centimeter levels below datum. To present, each year’s faunal assemblage has been examined by a succession of students for annual reports submitted to the Army Corps of Engineers (CoE). For research purposes, we have chosen to look at level five, excavated during three different seasons, because it appears to have coherent spatial structure, anchored by a hearth with different tasks indicated by distributions of various classes of artifacts. This analysis combines several years’ collections of animal bones from level five to give an integrated, coherent faunal assemblage. This will be viewed in the context of the evident spatial structure for interpretation of site function.

Foubert, Jacob [89] see Stroth, Luke

Fournier, Patricia [69] see Castillo, Karime

Fowler, Madeline (Queensland Museum Network and James Cook University)

[78] *The Indigenisation of Maritime Archaeology*

Indigenous peoples remain under-represented in maritime archaeology. What strategies are maritime archaeology practitioners using to increase Indigenous participation? This paper introduces the concept of Indigenisation—institutionalised (normative practice) change efforts towards Indigenous inclusion underpinned by principles of recognition and respect for Indigenous peoples, knowledges and cultures—to the discipline of maritime archaeology. Drawing on the Design and Evaluation Framework for Indigenisation (Rigney 2017), this paper identifies five change efforts for maritime archaeology: assembling resources, engagement, working together, building confidence and excellence and equity. It recommends the deliberate involvement of Indigenous peoples in the study, research and management of maritime archaeology, while shifting accountability for Indigenous inclusion to maritime archaeology practitioners. Indigenous maritime archaeology is everybody’s business.

Fowler, Tom [217] see Sykes, Naomi

Fowler, William (Vanderbilt University)

[257] *Discussant*

Fowles, Severin (Barnard College, Columbia University)

[259] *The Aquatic Imaginary of Ancestral Tiwa Landscapes*

In this paper, I explore Ancestral Tiwa rock modifications and linguistic conventions to identify what might be referred to as an “aquatic imaginary” governing Pueblo engagement with the northern Rio Grande landscape. The movement of water, it is argued, emerged out of a preceding Archaic preoccupation with the movement of animals as the dominant new way of both conceptualizing ecological systems and intervening in those systems through the organization and modification of stone. Evidence from both the early twentieth century linguistic research of John Peabody Harrington and the more recent archaeological research of the Gorge Project in the Rio Grande del Norte National Monument is used to support the argument.

Fowles, Severin [259] see Morris, Julia

Fox, Amy (University of Toronto)

[22] *Conceptualizing Lithic Technological Variation in the Late Archaic Period: A Case Study of the Broadspear Assemblage Type*

The archaeology of the Archaic Period in Northeastern North America is dominated by site-based research used as a springboard for discussing regional and pan-regional concepts and ideas. New results are often understood using paradigms created from these studies of singular origin. The present paper takes a different approach and discusses the author’s exploration of the broadspear lithic toolkit phenomenon across the Northeast. The

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collections-based study in question updates known datasets of broadspear-context sites to reflect recent research, and takes advantage of these robust datasets using an outline-based geometric morphometric analysis to inform metric variation across the study region. This paper summarizes the results of this research program to date with an emphasis on learning networks and large-scale cultural dynamics in the Late/Terminal Archaic Period.

Fox, Georgia (California State University, Chico)**[208]** *Poison or Pleasure: The Archaeology of Tobacco and Sugar*

The deep history behind what anthropologist Sidney Mintz refers to as the “stimulant or drug foods” reflects collective choices that transformed the socioeconomic fabric of early modern life. The archaeological record can reveal the physical manifestation of such choices through the myriad assemblages of artifacts that bear witness to the adoption of stimulant foods and also the tragic outcomes from the production of these commodities. In this paper, I will discuss my long-term archaeological research in the Caribbean on both tobacco and sugar in the context of foregrounding consumer desire, which provoked a series of events and changes that resulted in structural inequalities, new forms of materiality, and varying impacts on landscapes and people. The Caribbean region provides an excellent laboratory in which to study the impacts of the production and adoption of stimulant foods. As a gateway to the New World, the Caribbean was a frontier where novel ideas, commodities, and the adoption of new habits converged and were amplified through emerging identities and acts of resistance in a variety of colonial contexts.

Fox, Georgia [70] see Peasley, Ariel

Fox, Sherry (Eastern Michigan University), Sandra Garvie-Lok (University of Alberta) and Steve Friesen (University of Texas)**[298]** *An Osteological and Isotopic Assessment of Diet at Ancient Corinth and Ancient Paphos*

Corinth and Paphos were two key centers of the ancient Mediterranean during the Hellenistic and Roman eras. While the commercial and political lives of these communities have been studied, less is known about aspects of day to day life such as diet and health. Here we present some insights based on paleopathology and collagen stable isotope analysis.

This study ($n = 275$ individuals for Paphos; 94 individuals for Corinth) suggests populations that were under a certain amount of stress. Mean statures were relatively low, and rates of cribra orbitalia and porotic hyperostosis suggest that periods of dietary deficiency were fairly common.

Collagen stable isotope values were obtained for 34 humans and 17 comparative fauna from Corinth. Due to preservation issues, only six human values are available for Paphos. These are similar to those found for Corinth, suggesting a broadly similar diet at the two sites. Overall the human collagen values show a distinctive pattern of low $\delta^{13}C$ and high $\delta^{15}N$ compared to human values observed elsewhere in Greece. Carbon routing models and documentary evidence suggest that this pattern may reflect a largely grain- and oil-based diet whose modest protein component included marine products such as dried fish and garum.

Fox, Steve (Northern Arizona University) and Jaime Awe (Northern Arizona University)**[30]** *The Bonds that Bind Us: The Analysis of Terminus Groups in the Belize River Valley*

Previous archaeological investigations of terminus groups in the Maya Lowlands concluded that these architectural complexes served either cosmological, ritual, or economic purposes. In an effort to test these models, we investigated causeway terminus groups at Cahal Pech and Baking Pot. Subsequent comparisons of the Cahal Pech and Baking Pot data with that from other sites in the Belize Valley, Caracol and Tikal, strongly suggest that while there was some regional diversity in the significance of these architectural complexes, their primary role was likely to produce ideological messages that politically and ritually connected hinterland communities with their site cores.

Foxhall, Lin (University of Liverpool)**[54]** *Greeks in the Mountains: New Insights on the Landscapes of Ancient Greek ‘Colonization’ in Calabria, Southern Italy*

This paper investigates the political and economic landscapes of Greek ‘colonization’, using as a case study the upland and lowland landscapes investigated by survey and excavation by the Bova Marina Archaeological Project. The study region lies between two neighbouring ancient Greek city-states, Rhegion and Locri Epizephyrii, established in the late 8th-7th century BCE. Ancient classical texts present a picture of deep, long-term hostility between them, as well as with the indigenous population. Following the historical narrative derived from texts, traditional scholarly thought places Greek settlement largely in lowland areas close to the coast. However, there is evidence of Greek settlement dating back to the 6th century BCE high in the Aspromonte mountains (1300m asl) as well as on the coast. The archaeological evidence reveals more complexity than text-based narratives, with significant differences in political and social organization between upland and lowland zones. Material cultural evidence suggests that notions of ‘Greek’ and ‘indigenous’ need to be questioned and problematized. Sovereignty of the urban centres over the lands in this ‘in-between’ zone appears constrained and patchy. Applying modern concepts of boundaries and borders is probably anachronistic, and our evidence suggests that the inhabitants simultaneously enacted multiple, alternative constructions of ‘territory’.

Foxhall Forbes, Helen (Durham University)**[54]** *Caught between East and West: Southern Calabrian Political Landscapes and the Mediterranean World, 400–900 CE*

Calabria in the first millennium CE does not fit easily into many of the established narratives that are usually applied either to the western or the eastern Mediterranean, nor yet into standard categories of periodisation, which often carry implicit assumptions related to these narratives. Using material, visual, and textual evidence, this poster explores fifth- to ninth-century southern Calabrian political landscapes, particularly the area around Bova Marina, in their broader Mediterranean contexts. In this period, Calabria experienced some continuity with the western Roman Empire alongside changes brought about by Byzantine (re)conquest of southern Italy and its absorption into the Eastern Roman Empire; but the longstanding presence of Greek culture had never been completely erased by Romanisation in any case. Calabria’s settlements, economy, and religious life in this period show links to both Rome and Constantinople. Caught between East and West, however, Calabria in the period 400–900CE is usually perceived as being marginal to both of these centres and is therefore frequently neglected in scholarship. By showing the extent of Calabria’s connectivity to both East and West in this period, this poster suggests new ways of understanding the contribution of southern Calabria’s political landscapes to the Mediterranean world in the period 400–900CE.

Frachetti, Michael (Washington University in St. Louis)**[283]** *Mobility and Migration as Ecological Processes in Ancient Eurasia*

New research in the field of aDNA has re-invigorated debates about migrations across Eurasia in prehistory. Emerging data in this field demands that we interrogate how mobility and migration from an ecological and demographic perspective, since these factors influence our interpretation of the still emerging genetic data. In this paper I present the archaeological conditions of the Eurasian steppe ca. 3000–2000 BCE applied to a spatial model with the goal of generating a more complex ecological picture of mobility, migration, and demographics in Early Bronze Age Eurasia.

[336] *Discussant*

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Fraga, Tiago Miguel (Archaeofactory), Jorge Freire (EV2) and Tiago Dores (Divefactory)**[68]** *Reading the Unseen: The Lagoa de Óbidos Maritime Cultural Landscape*

Lagoa de Óbidos is an example of a decaying sea body that has influenced human occupation since, at least, the Mesolithic period. In fact, in historical times, humankind has been fighting, and losing, against the natural disappearance of this body. This has led to the continuous adaptation of the local populations, and in fact reinventing innovative ways of cooperation with the environment. Starting from harvesting resources in pre-historical times, to building maritime infrastructures in classical and medieval times, to present day maritime leisure touristic activities. Our research stems from a CRM project that spanned almost three years of research. Within this project was done remote sensing, underwater archaeology, cultural and ethnographic studies, resulting in several interesting finds and a better understanding of this Lagoon. We intend to present a journey into this area in its broader concept. Starting with its rich ethnographic material, following with historical knowledge and presenting the archaeological evidences that demonstrate its uses along the ages. The underlying understanding is that this environment led to an insular maritime culture, one of the many that add to the greater diversity of the Portuguese Maritime Culture tapestry.

Frahm, Ellery (Yale University)**[137]** *Pack Your Boots, Trowel, and Ray Gun: Advances in Portable XRF for Archaeological Science*

Portable XRF instruments have advanced considerably over the past decade, and many of their technical advancements are highly useful for the archaeological sciences, especially compared to fields like art conservation. The newest generation of detectors and their processing electronics, for example, make measurements significantly shorter, allowing characterization of much larger assemblages. Other advances, though, involve more than mere speed. Ruggedized instruments are dust-proof, water-resistant, and drop-protected. Vacuum pumps or helium tanks are no longer needed to measure light elements. Instead, a built-in barometer can measure air pressure to automatically correct measurements whether at sea level or high altitude. Other advances improve accuracy and reproducibility. New detectors, for example, minimize X-ray peak overlaps, as do sophisticated fundamental parameters correction algorithms. Certain instruments even use simulated photons, sent through the system milliseconds before each measurement, to maximize repeatability between the first and 500th measurements. Other advances aid collaborations and innovative research designs. For example, an embedded GPS receiver geo-tags each measurement for integration with GIS, and wireless networking enables real-time data sharing via the cloud. Discussed applications include ceramic analysis, sourcing hundreds of obsidian artifacts per day as they are excavated, soil and sediment analysis, and mapping outcrops in the field.

[177] *Chair***France, Christine (Smithsonian Museum Conservation Institute) and Haiping Qi (United States Geological Survey)****[88]** *Hydrogen Isotopes in Archaeological Bone Collagen: Potential Combined Influence of Meteoric Water and Protein Intake*

Hydrogen isotopes in archaeological bone collagen (i.e. $\delta^2\text{H}$ -collagen) are poorly understood, but can potentially facilitate new understanding of the complex relationship between trophic level (i.e. animal protein consumption) and meteoric water controls on hydrogen isotopes in omnivorous humans. These concurrent influences on human $\delta^2\text{H}$ -collagen values were examined in 11 North American archaeological sites. The $\delta^2\text{H}$ -collagen values were compared to bone hydroxyapatite oxygen isotopes (i.e. $\delta^{18}\text{O}$ -HAP) and bone collagen nitrogen isotopes (i.e. $\delta^{15}\text{N}$ -collagen), which are proxies for meteoric water influence and amount of consumed protein, respectively. Pooled site data yield moderate correlation between $\delta^2\text{H}$ -collagen and $\delta^{18}\text{O}$ -HAP and moderate correlation between $\delta^2\text{H}$ -collagen and $\delta^{15}\text{N}$ -collagen. Conversion of $\delta^2\text{H}$ -collagen and $\delta^{18}\text{O}$ -HAP to meteoric water values yielded a similarly moderate correlation with a $\delta^2\text{H}/\delta^{18}\text{O}$ slope below 8, the expected value observed in meteoric water. Conversion to theoretical hydrogen isotope values free of trophic level influences resulted in a weak correlation with $\delta^{15}\text{N}$ -collagen, suggesting that direct trophic level enrichment/depletion is not controlling the disparity between expected and measured values. The deviations are hypothetically caused by non-local food sources and a decoupling of expected $\delta^2\text{H}/\delta^{18}\text{O}$ relationships as individuals consumed more meat and decreased in vivo non-essential amino acid production.

Franchetti, Fernando (University of Pittsburgh), Miguel Giardina (Conicet), Loukas Barton (University of Pittsburgh) and Clara Otaola (Conicet)**[249]** *Hunter-Gatherer Adaptation in the Deserts of Northern Patagonia*

Arid environments (marked by scarce water and heterogeneous resources) constrain human adaptation. In this paper, we explore changes in the use of land in the Diamante Valley, Mendoza province, Argentina, during the Holocene. The principal aim of this exploration is to test the validity of a perceived intensification process in the area of North Patagonia where we conducted a systematic random surface sampling in three ecological zones: the Highlands, the Piedmont and the Lowlands. Within these zones, three 100km² areas were selected along with a sample of 400 hectare units in each to make meaningful comparison of each environment. Here, we present the results of lithics analysis that compares the different proportions of units with archaeological materials from each ecological zone. With this, changes in subsistence and settlement patterns in the Late Holocene are monitored through differences in raw materials proportions, as well as in the densities of instruments, debitage and cores.

Francis Brown, Suzanne [51] see Galle, Jillian

Franco, Teresa [6] see Benson, Kristin

Franco Salvi, Valeria and Carlos Angiorama (ISES-CONICET)**[132]** *The Inca State from the South. Agricultural Landscape and Transformations in Pozuelos (Jujuy, Argentina)*

The aim of this paper is to discuss the results of the research conducted at the Moreta settlement in the Pozuelos (Jujuy, Argentina) where we have detected an extensive agricultural area built by the Incas. A critical reading about agrarian landscapes is fundamental in order to recognize the different strategies that Inca state applied in its conquest and control of the Argentinian Northwest. This region experienced a series of transformations during the second millennium CE; in this sense, the landscape constitutes an important line of analysis to understand how powerful political (imperial) structures changed the daily life of small-scale villages.

Franco Salvi, Valeria [295] see Salazar, Julian

Franklin, Jay, Frédéric Surmely (DRAC Auvergne-Rhône-Alpes, Clermont-Ferrand), Sandrine Costamagno (université Toulouse Jean-Jaurès), Maureen Hays (College of Charleston) and Lauren Woelkers (East Tennessee State University)**[41]** *Discovery of a New Middle Magdalenian Site at Enval in the Massif Central of France*

We present the discovery of a new Middle Magdalenian site at Enval, a rock shelter site in the Massif Central of France. Radiocarbon dates indicate a tight chronology at 17,000 years ago. The site is significant for several reasons. Faunal elements indicate the site is largely intact and not a palimpsest. Faunal studies also indicate the site was occupied during the winter. This is important because it demonstrates that late Pleistocene humans occupied the Massif Central during harsh conditions. Lithic artifacts indicate far ranging contacts from hundreds of kilometers in multiple directions. Many items of personal adornment and mobility art were also recovered.

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Franklin, Jay [35] see Randall, Connie

Franklin, Kathryn (The Oriental Institute at the University of Chicago)

[220] *Landscapes of the Silk Road: Written, Imagined, and Embodied Spacetimes*

This paper approaches Silk Road-landscapes as imagined topographies, a particular inheritance of the medieval culture of travel, and of its representations of the world(s). How we imagine the 'Silk Road' landscape is therefore rooted in assumptions about categories and conditions of agency (social and historical), and about space. These include mobility, transcendence, and visibility—both in the landscape and in the record. Travel and cosmopolitan encounters along roads (Silk or otherwise) are chrono-topoi (spacetimes) which structure our historically-situated regard of spaces, such as mountain valleys and expansive deserts.

Working in local landscapes of medieval Armenia, I problematize the idea of Silk Road space, thinking not only about mobility and contact, but also about spaces of care, hospitality, and comfort. Critical to the theme of this session, these spaces and practices are gendered, embodied, they depend on vulnerable spacetimes and 'quotidian' actors, as well as particular ideas of 'culture' and 'nature.' In this paper I will explore how picking at the gendered structuring of Silk Road narratives both requires that we deploy archaeological data in different ways, and also leads to larger-scale untanglings of understandings about large-scale exchange, culture 'contact' and the distinctions between pre-modern and modern worlds.

Franklin, Paris (Pacific Lutheran University), Mitchell E. McElwain (Pacific Lutheran University), Bradford W. Andrews (Pacific Lutheran University), Amanda K. Taylor (Pacific Lutheran University) and Dennis Lewarch (Suquamish Tribe)

[242] *An Analysis of Obsidian Consumption in the Postclassic Coatlan del Rio Valley*

This poster presents a technological analysis of obsidian artifacts from two Aztec-period surface collections in the Coatlan del Rio Valley, located in what is now the modern state of Morelos, Mexico. The deposits are from residential terraces collected in 4 x 4 m units. Designs on ceramics collected with the lithics indicate primary occupation after 1400 CE. This study has two primary objectives: first, we technologically classify the artifacts in the collections; second, we evaluate whether there is any evidence to suggest that flaked stone tool production took place on the residential terraces. If blades were produced in these contexts, we would expect to find prismatic blade cores and discarded blades with production errors; if bifaces were produced, we would expect to find thinning debitage. Our analysis will allow us to infer whether the assemblage is indicative of household workshops or goods obtained through a market system. The results of this study will provide a new perspective on exchange during this time, such as the production stage in which lithic materials arrived in the valley. Using prior data from Yautepec, Cuexcomate, and Capilco communities, this research adds to comparative information available about Aztec period household-based obsidian consumption in Prehispanic Morelos.

Frantz, Laurent (Queen Mary University London)

[212] *Ancient Dog Genome Preserved in Tumor Provides Novel Insights into the Domestication of Dogs*

Transmissible cancers are mostly known from Tasmanian devils, soft shell clams and dogs. In dogs, the Canine Transmissible Venereal Tumors (CTVT) manifests as genital tumors and spreads between dogs (usually during mating) by the transfer of living cancer cells. This tumour first originated in the cells of an individual dog, up to 11,000 years ago, and possesses the genome of that founder dog. As such, CTVT cells contain an ancient living genome (the founder's dog genome) that was passed along dogs for thousands of years. Interestingly, with CTVT cells have now infected dogs all across the world, yet the genome of these tumors has largely preserved the features of the founder's dog genome. Here I will present results obtained from novel ancient dog genome sequences that were analysed alongside CTVT genomes. I will show how the CTVT genome can be utilized not only to reveal the evolutionary history of the founder dog but also to provide novel insights into the domestication history of dogs, especially in the Arctic.

Frantz, Laurent [212] see Larson, Greger

Fraser, Lu-Marie [32] see Daggett, Adrienne

Frasier, Brenna, James Woollett (Laval University), Céline Dupont-Hébert (Laval University), Michael Buckley (University of Manchester) and Vicki Szabo (Western Carolina University)

[16] *Genetic and ZooMS Identification of Marine Mammal Bone from Norse Sites in Iceland and Greenland: Insights into Historic Ecology and Norse Economies*

Evidence from Arctic and North Atlantic archaeological sites shows marine mammals were frequently used by Norse settlers in Greenland, Iceland and the Faroe Islands. Archaeofaunal assemblages often yield a wealth of complete bones, however, species-level identification is not possible for heavily fragmented specimens. Therefore, specific details about marine mammal utilization are often unquantified and marine species identification largely remains unverified. This paper reveals utility of ZooMS (zooarchaeology by mass spectrometry) and genetic analysis of ancient mtDNA to examine Norse uses of whales at an array of sites in Iceland and Greenland over the course of the Middle Ages (~800–1500 CE). The analysis of mtDNA and collagen collected from these sites yields new information on the importance of cetaceans and pinnipeds during this period. Comparison of samples and their suitability for mtDNA analysis also underscores the loss and degradation of genetic material in rapidly degrading Arctic contexts. With this loss, it is challenging to detect changes in marine mammal utilization and species composition through periods of climate change. Additionally, these data provide critical insight into premodern economies, and a snapshot of mammal community ecology and levels of genetic diversity prior to the advent of industrial-scale exploitation beginning in the 16th century.

Frazer, William (Binghamton University), James Bourke (Binghamton University), Timothy de Smet (Binghamton University) and Alex Nikulin (Binghamton University)

[156] *Seismic Survey of Poverty Point Mound A*

Poverty Point is a UNESCO World Heritage Site known for its monumental earthworks. The largest and most significant feature on the site, Mound A, is over 21 meters high and 200 meters long. Currently, it is believed to have been built in three months at most. This supports the idea that there was a central leader directing its construction, a more socio-politically complex society than previous hunter-gatherer populations in North America. Evidence of stratigraphic layering, however, is an indication of a slow mound construction over centuries. Gaining insight of the construction style and timeline of Mound A will lead to an improved understanding of the site. Mound Builders have been known to cap mounds built in stages. If Mound A was built in stages it is likely capped with more dense material than the dirt surrounding it. To better understand the construction history of Mound A, we conducted a seismic reflection survey over the mound. The seismic data had a normal moveout correction, it was stacked, and migrated. Additionally, with the application of quadcopter-based photogrammetry, a three-dimensional digital model of Mound A was developed to display and assist in further understanding of these data.

Frederick, Charles [59] see Yelacic, David

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Frederick, Jennifer, Ray Hewitt (Bureau of Land Management) and Marilyn Walker Cunningham (Bureau of Land Management)**[261]** *Unmanned Aerial Systems in Federal Cultural Resource Management*

Although use of Unmanned Aerial Systems (UAS), or what are commonly known as drones, has become popular among the general public over the years, federal land management agencies are just beginning to realize their potential for cultural resource management. The Bureau of Land Management, Las Cruces District Office (LCDO), has recently obtained UAS resources and trained staff capable of collecting data that is useful for a variety of resource management issues. In particular, the LCDO UAS team has provided high resolution imagery to assist in resource documentation, site monitoring, and mapping of resource degradation. The data collected via UAS has enabled resource specialists to calculate rates of erosion at a damaged Pueblo site situated on an arroyo bank. Areas of the site that are at high risk of being lost to erosion can be targeted using this data. This is one example of the utility of UAS for cultural resource management, but the implications of this technology are enormous for land managing agencies. Large areas can be covered in a short period of time. The data obtained is high quality, allowing the agency to use the best science available for its mission objectives.

Frederick, Kathryn (Michigan State University)**[133]** *Identifying Subterranean Storage Features: A Cautionary Tale*

Recent research in northern lower Michigan systematically tested the ability to identify subterranean food storage features using surface criteria. Subterranean storage features were used during the late Late Woodland period (AD 1200–1600) in parts of the Michigan Inland Waterway. Such cache features prolong the availability of food stuffs and mitigate against the risk of food shortage. This paper discusses the research methodology required for identifying such features. While many are identifiable by their symmetrical circular depression, and apparent spatial clustering, an insufficient number have been ground truthed. Recent fieldwork revealed that identifying subsurface features may be more elusive than believed. Excavation of suspected cache pits resulted in negative results, leading to a re-evaluation of the sampling criteria and methodology, and resulting in a multi-disciplinary approach employing the soil sciences to create a more efficient ground truthing strategy. This presentation discusses the necessity for reliable and efficient ground truthing, and provides a refined multi-disciplinary sampling methodology.

Frederick, Melissa (VCP St. Louis) and Grace Gronniger (VCP St. Louis)**[326]** *Artifact Highlights from the Yeo Site (23CL199): A Kansas City Hopewell Site*

The St. Louis Veterans Curation Program has close to 50 investigations currently being processed in our lab. One of these investigations is from the Smithville Lake Project area in the Kansas City District. This investigation alone contains materials from 27 different sites including the Yeo Site (23CL199) and dates to the late 6th to 7th century A.D. The site was excavated by Kansas State University archaeologists ca. July 1976 and this past year, veteran technician began processing the materials. The technicians came across many diagnostic artifacts, including a largely intact ceramic bowl and cup, ceramic rims, bone awls, and projectile points. Their work combined with the materials still to be processed in our archives will be available on The Digital Archaeological Record (tDAR) and aid future researchers interested in the only known single component Kansas City Hopewell site within Smithville Lake.

Freeman, Jacob (Utah State University)**[105]** *The Effects of Economic Complexity and Temperature on the Long-Term Energy Consumption Dynamics of Human Societies*

Increases in energy consumption correlate with social and political development in human societies, as well as increasing human impacts on ecosystems. Thus, understanding the underlying drivers of energy consumption in human societies may provide insights into the processes of social evolution and rapid social change (collapse). In this paper, we develop a model of energy consumption in human societies based on population size, economic complexity and temperature. We demonstrate the usefulness of the model with global data on contemporary societies. Next, we use a large sample of radiocarbon dates to estimate changes in energy consumption by human societies over the last 8,000 years in Utah. Following the predictions of the model, we use assemblages from Utah caves to measure changes in economic complexity and paleoenvironmental datasets to estimate changes in temperature. We use these estimates of economic complexity and temperature to explain variation in the Utah radiocarbon curve over the last 8,000 years. Our results illustrate the importance of understanding the underlying dynamics of energy consumption in human societies to explain social and political development, as well as rapid reorganization in human social systems.

[105] *Chair*

Freeman, Jacob [105] see Latorre, Claudio

Freeman, Jeremy (Great Basin Institute)**[168]** *Using Rock Art as a Medium for Teaching STEM Concepts*

As budgets grow slimmer and curricula become more rigid, teachers are often faced with the necessity to either eliminate or limit the number of school fieldtrips. With tightened budgets teachers are compelled to choose which fieldtrips to retain and which ones to eliminate. These choices are often based on cost, availability of transportation, or are based on what the teacher hopes students will gain from the experience. The goals of the fieldtrip generally align with the educational guidelines provided by each state. This often means that archaeological modules or archaeology-themed fieldtrips are eliminated or reduced from curricula. Though archaeology-based curricula may not be a teaching priority, the multi-disciplinary nature of archaeology can be easily implemented for STEM concepts. Although most teachers are aware of this they lack the experience to implement these concepts in archaeology-themed modules. This paper describes how two rock art sites were used to teach Montessori students about scientifically-based classifications. First, students were introduced to the process of archaeological classification. Then working in groups students worked together to classify rock art figures. Students were then given an opportunity to refine their classifications through a peer review process and then implement what they had gained from the discussion.

Freeman, Mark (University of Tennessee) and Jeanne Moe (Bureau of Land Management)**[286]** *Project Archaeology: Assessing Paper and Digital Approaches to Online Learning*

Project Archaeology is a comprehensive national archaeology education program, jointly sponsored by the Bureau of Land Management and Montana State University, which uses 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. To date it has reached more than 15,000 educators with curriculum guides, activity guides, and professional development. These educators reach an estimated 300,000 learners each year in classrooms and informal settings.

Since 2003 the Investigating Shelter units—teacher-led and designed for upper elementary to middle school students—have been available both digitally online, and as printed materials. The units present both archaeological practice and discoveries through different types of shelter—a Tipi, a slave cabin, and an Earthlodge. The online version allowed for the addition of interactive elements and media, potentially supporting different learning styles. Based on classroom research, and situated in a broader literature, this paper will discuss the comparative strengths and weaknesses of the digital component and traditional models for teaching archaeology and digital literacy, and consider plans for future assessment.

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Freire, Jorge

[78] *The Future of Maritime Archaeology of Portugal: The Strategy for Socialization and Education. The Example of Cascais*
Cascais Municipality has developed a comprehensive program management and valorisation of Underwater Cultural Heritage. Based on Maritime Cultural landscape epistemology it aims to enable a novel approach to integrated management with a dual goal of knowledge and enjoyment. Within methodological lines of this program have grown the actions related to education. From the theory of actor network—has been introduced the theme in the local community, allowing for public enjoyment in situ but, also, through the educational sector of the Museu do Mar Rei d. Carlos. Other related experiences at sea, such as biology and engineering, have created their own sensory elements, developing forms of communication and awareness under “Lab”. Furthermore, within the relationship of identity with memory, we have two shipwrecks with strong historical connections to the Portuguese Armada. This has served as a starting point for awareness-raising initiatives and deeper valorisation of these sites. In addition, we have implemented educational policies following the guidelines set by the Monitoring Committee of the UNESCO 2001 UCH Convention. These educational policies will set the groundwork for project growth through the UNESCO associated schools Network and the network of Learning Cities.

Freire, Jorge [68] see Fraga, Tiago Miguel

Freire, Shannon (University of Wisconsin-Milwaukee)

[215] *Six Impossible Things before Breakfast: Understanding Space and Place at the Milwaukee County Poor Farm Cemetery*
From 1878 through 1974 Milwaukee County utilized four locations on the Milwaukee County Grounds for burial of more than 7,000 individuals, primarily paupers, the institutionalized, and the unidentified. Two archaeological excavations in 1991 and 1992 and again in 2013 resulted in the recovery of over 2,400 individuals from one of those cemetery locations. A comprehensive understanding of the spatial organization and use life of this site has been complicated by the cemetery's history of anonymization and neglect. Nevertheless, the identification of specific 'keystone' individuals has proved possible, providing a fruitful avenue of inquiry to discern burial patterning and internal dates through comparison with the Register of Burial, a document that outlines date of burial and grave location. Strontium isotope analysis has been successfully utilized as part of a multifaceted tool kit to identify individuals in both expected and unanticipated ways. This paper presents several case studies featuring the contributions of strontium research to successful identifications and thereby our understanding of space and place at the Milwaukee County Poor Farm Cemetery.

[107] *Chair*

Freiwald, Carolyn (University of Mississippi), Kara A. Fulton (University of South Florida), Nicholas Billstrand (Center for Archaeological Research/University of M) and Destiny Micklin (University of Texas at Arlington)

[129] *Making an Ancestor at Actuncan: Exploring the Origins, Health, Burial Treatment and Taphonomy of a Late Classic Maya Residential Eastern Structure*

The patio adjacent to the eastern structure of Group 1 at the site of Actuncan served as a burial ground for generations. At least twelve individuals in more than seven graves were buried at one of the oldest residential groups at the site during the Late Classic period (AD 600–900). Eastern structures were used to bury revered ancestors in the Belize River Valley, but nearly all of the Actuncan Group 1 burials were disturbed by later burials. When was it acceptable to disturb an ancestor, and how did appropriate treatment of the dead change after burial? This paper explores the relationship between burial practices and the identities of the dead, including osteological analysis of early childhood health and evidence for diet and migration using strontium, carbon, and oxygen isotopes. The re-use of important places over generations shows how ancestors played a role in maintaining memory in the urban landscape.

Freiwald, Carolyn [155] see Alsgaard, Asia

French, Charles [224] see Whitlock, Bethany

French, Kirk (Pennsylvania State University)

[222] *Cheap Beer and Generic Weenies vs. Craft Brews and Artisan Sausages—The Archaeology of Tailgating at Penn State University*
Although arriving early to an event and consuming food and beverages outside of an arena arguably has its origins in ancient Rome and Greece, the popular and ritualized tailgating associated with American college football is a behavior that warrants archaeological investigation. The Tailgating Behavior Project is attempting to better understand these communal events through ethnographic interviews and garbological/archaeological surveys at Penn State's Beaver Stadium at University Park, Pennsylvania. Interviews of tailgaters were conducted on game days at multiple locations that were selected based on parking price (\$20—\$500 per game). The following morning a crew of undergraduates returned to the same areas to record the refuse left behind. The project offers valuable data on consumer behavior while providing a unique opportunity to demonstrate the basics of archaeological research to students.

French, Jennifer (University College London)

[329] *Opening Remarks: The Archaeology and Palaeoanthropology of Non-modern Humans*

The study of archaic hominins (non-modern humans) poses some unique challenges to archaeological interpretation, and relies on close integration of archaeological data with those from other allied fields including palaeoanthropology, genetics, primatology, and ethnography. In this opening paper, I reflect on some of the recent advances and discoveries in these fields which are changing the ways in which we both conduct and conceptualise research in to non-modern humans in archaeology. I then introduce the main themes of the symposium, including models of interaction between different hominin species, the interpretation and analysis of material culture produced by archaic hominins, and the question of the cognitive abilities of non-modern humans and how these can be inferred from archaeological data.

[329] *Chair*

Freund, Kyle (Indian River State College)

[152] *Moderator*

[152] *Discussant*

Frey, Alex

[86] *Tastes of Home: Food Cultures of Roman Britain Auxiliary Soldiers*

This study addresses the influences that culture and ethnicity have on dietary patterns, specifically looking at the variances in food culture amongst the myriad of ethnicities comprising the ranks of the Roman Britain auxiliary troops. The following research correlates ethnic identity with food culture by analysing the variances in archaeological food remains from 15 Roman forts garrisoned by auxiliary troops and comparing these variances to other published archaeological work from throughout the Roman Empire. Faunal data is represented by the Number of Individual Specimens Present (NISP), Minimum Number of Individuals (MNI), and distinguishable butchery patterns. Floral data is represented by varying frequencies of species in the macrofossil plant record. Statistical and graphical representations of both the floral and faunal data test the significance and strength of the outliers and patterns. The results demonstrate statistically significant variations in the faunal data, along with unique patterns in the floral data, suggesting a direct

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correlation to the cultural regions from which the soldiers originated. This research ultimately demonstrates how the international identities of the Roman Britain auxiliary soldiers are represented through their food consumption patterns in the archaeological record, adding to contemporary food studies of dietary relations to culture and identity.

Friberg, Christina (University of California, Santa Barbara)

[26] *Think Locally, Act Globally: How a Local Perspective Informs the Broader Narrative of Mississippianization in the American Midwest*
The 'Mississippianization' of the Midwest unfolded during the late 11th and early 12th centuries as interactions with Cahokia influenced aspects of local community organization, ceremonialism, material culture, and access to exotic raw materials. For local peoples, these encounters and affiliations also facilitated interactions between Mississippian groups beyond Cahokia. The direct proximity of the Lower Illinois River Valley (LIRV) to the Greater Cahokia area enabled certain social, political, and economic interactions with American Bottom Mississippians that did not transpire with more distant groups, resulting in the closer adoption of Mississippian lifeways than observed further north. However, new data from the Audrey-North site (11Ge20) in the LIRV (AD 1100–1150) illustrate the localization of Mississippian practices in a village uniquely positioned within a vast network of long-distance exchange and sociopolitical interaction. This research adds to the growing narrative of local innovation and interregional interaction in the Mississippian Midwest. This paper further seeks to demonstrate the complexity of cross-cultural encounters and the value of the local perspective.

Fricke, Felicia

[67] *Slavery in the Dutch Caribbean: A Case for the Use of Qualitative Data in Sensitive Archaeological Contexts*
Qualitative data are often overlooked in archaeological research in favour of quantitative data which can provide statistical results. However, there are many contexts where qualitative data (such as oral historical accounts) can provide valuable information on meaning and personal significance. This is beneficial in projects addressing topics such as inequality and colonialism. The author therefore presents qualitative data from her doctoral thesis in order to demonstrate the importance of this sensitive approach, which encourages archaeological research to have a positive social and political impact.

The research discussed here addresses the lifeways of enslaved individuals on the Dutch Caribbean islands of St Eustatius, St Maarten and Curaçao. It incorporates data from material culture, oral history, and osteology into a thematic analysis. Often used in the social sciences, this approach allows diverse datasets to be combined through their organisation into 'themes'. Through this, the researcher gains an impression of the information that is meaningful and important for descriptive purposes.

The author encourages archaeologists to consider qualitative data in their own research, especially the utilisation of oral history interviews which promote community involvement and contribute to the decolonisation of the discipline.

Fridberg, Diana (Proyecto Regional Arqueológico La Corona)

[337] *The Zooarchaeology of La Corona: Sustenance and Symbol*
The tropical lowland surroundings of La Corona support a wide range of indigenous fauna. Zooarchaeological analysis demonstrates that the site's ancient inhabitants made use of this diversity, exploiting many terrestrial and aquatic taxa in subsistence and ritual activity. This paper summarizes major zooarchaeological findings from the duration of the La Corona Regional Archaeological Project. Excavations at La Corona have not targeted areas expected to be "fauna rich" and have produced approximately 5,000 specimens, but this relatively low count belies the interpretive value of the material. Zooarchaeological remains at La Corona from a discrete feasting event and palace middens reveal dietary flexibility and breadth by the high elite, including exploitation of smaller-bodied mammals. Animal bodies in these contexts operate as symbol as well as subsistence. This symbolic role is also present in faunal remains from burials at La Corona, where both fresh- and saltwater aquatic species associate the deceased with the watery Underworld. The diversity of remains found at La Corona, coupled with the rich information that deposits have provided to date, indicate the site's noteworthy potential to inform our understanding of ancient Maya human-animal relations.

Friedel, Rebecca (The University of Texas at San Antonio) and M. Kathryn Brown (The University of Texas at San Antonio)

[76] *Communing with the Gods: The Paleoethnobotany of Fire Rituals*
The importance of fire in Maya rituals is well-known, both archaeologically and ethnographically. Fire, which is symbolic of the life cycle in Maya ideology, has been used as a means of communicating with the supernatural world in order to manage specific aspects of everyday life, such as the success of the agricultural season. In the archaeological record, we find evidence for ancient fires as features consisting mostly of burnt plant remains, some of which resemble modern Maya fire altars both materially and spatially. In this paper we present archaeological and paleoethnobotanical evidence from fire features recently excavated within E-Group complexes at the sites of Early Xunantunich and Buenavista del Cayo. We argue that the characteristics of these features suggest that these fires were ritual in nature. Therefore, the types of plants used to start and fuel these ritual fires likely held special significance to the ancient Maya as they were "sacrificed" to the Gods. Paleoethnobotanical studies are often focused on reconstructing the ancient environment and subsistence strategies. This study highlights the important use of paleoethnobotanical data to shed light on past ritual activities and ideologies.

Fries, Eric (UNLV)

[11] *Testing a Multi-Modal Remote Sensing Approach for Detecting Ancient Maya Sites With Low-Resolution Data*
In the absence of LiDAR and similar high-resolution data products, an alternative approach was developed to model and predict site location information from low-resolution, publicly available datasets such as ASTER, LANDSAT, and aerial photographs. Manipulating and combining the analyses of multiple datasets permits refinement of modeling and detection capabilities. A large database of known sites, in assorted topographic and vegetative conditions and degrees of exposure, was used as a training model to test and improve the accuracy of the method, followed by ground truthing of initial results and subsequent model refinement. In addition to use of this model for detection on its own, the method results could also be used for quickly identifying and targeting areas of interest in higher resolution products such as LiDAR, if and when they become available.

Friese, Crystina [239] see Mierswa, Emily

Friesen, T. Max [16] see Mereuze, Remi

Froese, Tom (Universidad Nacional Autónoma de México) and Linda Manzanilla (Universidad Nacional Autónoma de México)

[31] *A Network Model of Co-Rulership and Community Ritual in Teotihuacan: From Neighborhoods to Districts*
Experts remain divided about the nature of the sociopolitical system of ancient Teotihuacan, which was one of the earliest and largest urban civilizations of the Americas. Excavations hoping to find compelling evidence of a powerful dynasty of rulers, such as a royal tomb, keep coming away empty-handed. However, the alternative possibility of a corporate or collective government, perhaps headed by a small number of co-rulers, also remains poorly understood. A third option is that the city's collective government began as a fully decentralized network of neighborhood representatives, but this kind of arrangement seems susceptible to the problems of cooperation and action coordination. Previously we used a computational model to show that in principle this latter worry is unfounded, as long as we assume that the network's topology could be transformed via community rituals and was not strongly subdivided (Froese, Gershenson, and Manzanilla 2014). Here we extend this model to investigate whether

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centralized hierarchy could mitigate the negative effects of strong divisions. The new results reveal a peculiar synergy between hierarchy and community ritual in that only their combination improved the extent of coordination, which is consistent with portrayals of the elite as religious specialists serving the public.

Frost, R. Jeffrey (California State University-Stanislaus)

[260] *Continuity and Change in Chiriquí Period Village Organization*

Chiriquí Period (700–1500 CE) archaeological sites have been the subject of systematic scientific research for more than 50 years. However, archaeologists are only recently beginning to define and understand regional and temporal variations in artistic styles, settlement patterns, and village organization. In this paper, I summarize emerging patterns in village placement, cemetery organization, and the construction of public space. Continuities in the elements of constructed spaces, such as the use of conical house forms, cobble pavements, and public plazas, endure for the duration of Chiriquí, but the ways that these architectural features were interpreted and arranged changed dramatically, particularly during the tenth and fourteenth centuries, likely signaling the key changes in ideology and social dynamics that occurred across the region.

Frouin, Marine (RLAHA, University of Oxford, UK), Jean-Luc Schwenninger (RLAHA, University of Oxford, UK) and Tom Higham (RLAHA, University of Oxford, UK)

[41] *New Insights into the Chronology of Late Middle Paleolithic Occupations in Southwestern France*

The southwest of France is well-known for the wealth and number of sites attributed to the Middle Paleolithic. The archaeological sequences reflect an apparent heterogeneity of Neanderthal behaviors, based on the apparent variability of the lithic technological systems adopted by human groups over time. This has led to a range of different interpretations of the archaeological evidence. What is apparent is that a reliable chronology is key if we are to understand Middle Paleolithic lithic variability throughout this time period and its relationship to change in paleoclimate and paleoenvironment. In this study, absolute dates were obtained from several major archaeological sites (e.g. La Ferrassie, Roc de Marsal, La Quina) by applying improved luminescence dating methods. By measuring the time elapsed since minerals were last exposed to daylight, this technique enables the direct dating of sediments associated with archaeological remains and periods of human occupation at an individual site. The combination of luminescence results with other absolute techniques allows us to establish new chronological frameworks for these sites. In this paper, we will present results which provide new insights for our understanding of Neanderthal adaptation strategies, activities and cultural change in European populations during this period.

Frouin, Marine [41] see Higham, Tom

Fruhlinger, Jake (Idaho National Guard)

[232] *Moderator*

Fuhrmann, Sven [331] see Pettitt, Alisa

Fuka, Matthew (Purdue University)

[185] *Entheseal Changes in Bronze and Early Iron Age Mongolia*

Extensive bioarchaeological research has addressed questions about stress, pathology, and activity in agricultural and semi-agricultural populations throughout the archaeological record, yet comparable studies pertaining to nomadic pastoral and semi-pastoral groups are relatively rare. During the Bronze Age in the Eurasian Steppes, archaeological evidence suggests a transition of lifeways from semi-sedentary agricultural to nomadic pastoralist. Entheseal analyses in bioarchaeology introduce an exciting avenue to ask new questions about the physical effects these lifeways have on those who practice them. This study aims to investigate the extent of enthesal changes among Bronze and Early Iron Age populations in Mongolia as both sedentary and pastoral groups were contemporaneous. Entheses of the upper and lower limbs were scored for 54 individuals dating from the Bronze Age and Early Iron Age. Scores between and within the two periods were compared and enthesal differences between sexes, age, body size, and site location were analyzed. The goal of this study is to answer if there are differences between the two periods and which factors influence the differences.

Fuka, Matthew [3] see Parrish, Deborah

Fuld, Kristen and Terry Ozbun (AINW)

[140] *Cultural Landscapes of Glass Buttes, Oregon*

Located on the northern fringe of the Great Basin, in Lake County, Oregon, the Glass Buttes volcanic complex is the most important obsidian toolstone source in North America. Glass Buttes obsidian is world renowned because it is colorful, abundant, available in large pieces, and of extremely high quality for making flaked stone tools. Throughout the late Pleistocene and Holocene, Native Americans have continuously used Glass Buttes obsidian, and it was widely traded in the Pacific Northwest and beyond. Glass Buttes obsidian has also been historically instrumental in pioneering archaeological lithic technology research and is of special importance to the modern flintknapping community. Now, new research shows that in addition to being a major obsidian toolstone source, Glass Buttes is also a focal point in a Native American spiritual landscape punctuated by hundreds of rock features. These rock features comprise a complex associated with the prominent Glass Buttes peak. This spiritual landscape overlays the lithic landscape and the two are inexorably linked together. On-going ethnographic research conducted by Native American tribes is revealing another dimension to this important place and elucidates the relationships between the cultural landscapes of ancient times as well as in the present.

Fullen, Brittany (Binghamton University)

[300] *What's a Niche Got to Do with It? Spatial Analysis of Nched Structures at Patipampa and Other Middle Horizon Sites*

Excavations at the Middle Horizon (AD 500–100) capital city of Huari in the summer of 2017 focused on understanding processes of urbanization and the resulting realities of everyday life in the domestic sector of Patipampa. Several of the architectural spaces exposed during excavation were more intensively investigated. This paper focuses on the architectural space containing niched walls in order to understand how the Wari utilized this type of space in comparison to the uses of the other rooms excavated in this residential sector. I will discuss the diversity of materials recovered from the unit as well as compare the ceramic cache located in this unit with one encountered in a different compound. Additionally, I will use the preliminary findings to explore the similarities and difference this space shares with niched structures reported from other Middle Horizon Wari sites.

[300] *Chair*

Fuller, Dorian [86] see Garay-Vazquez, Jose

Fulminante, Francesca [146] see Lozano, Sergi

Fulton, Deirdre [86] see Zori, Davide

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Fulton, Kara A. (University of South Florida), David Mixer (Binghamton University) and Borislava Simova (Tulane University)

[129] *Residential Trajectories of Commoner, Elite, and Noble Spaces at Actuncan, Belize*

This paper summarizes the archaeological investigations of ten residential units at Actuncan that likely represented three distinct social strata: commoner, elite, and noble. We explore the trajectories of these residences from the Preclassic to the Terminal Classic period. Data suggest that although political authority in the Mopan River valley shifted throughout Actuncan's long occupation, many commoner residences maintained local identities and residential continuity through time. However, the exact patterns of prosperity varied between residential groups. In contrast, elite residences show evidence of abandonment and reoccupation while the noble residence was occupied for a relatively short period. Elite and noble trajectories appear to have been strongly tied to shifting power structures, whereas commoner trajectories were less dependent on political transitions. Understanding strategies employed by residents during shifts in local political authority is an important foundation for interpreting broader political dynamics, including relationships between residents and rulers, and how rulers were able to create, legitimize, and maintain power and authority.

Funkhouser, J. Lynn [168] see Stewart, Ashley

Furlong, Julia (Eastern Washington University), Jerry R. Galm and Stan Gough

[47] *Identifying Lithic Technological Strategies at the Late Paleoindian Sentinel Gap Site Using 3D Digital Morphometrics*

The Late Paleoindian Sentinel Gap site, located along the Columbia River in central Washington, provides a unique data set of bifaces and projectile points/knives (pp/ks) from a single occupation episode dating to c. 10,200 radiocarbon years BP. In addition to over 60 partial and complete bifaces and 11 pp/ks recovered during excavations, 15 lithic debris accumulations interpreted as debitage "dumps" were excavated. The refitting of flakes from one of these features revealed the original core as well as compelling evidence that at least some dump features represent single biface reduction episodes. Most recovered pp/ks were manufactured from non-local materials, indicating construction elsewhere and curation on-site. This study aims to identify technological techniques associated with biface and pp/k manufacture using data derived from 3D models. In addition, the potential for different knappers is examined using 3D digital morphometrics. Comparison of the technological details of lithic tool reduction strategies within the samples of locally manufactured bifaces and introduced pp/ks provides fresh insights on lithic tool manufacturing strategies and the applicability of 3D digital morphometrics as an investigative tool.

Furlong, Mary [14] see Wright, Sterling

Furo, Larry [89] see Sterner, Katherine

Fux, Peter [299] see Fecher, Franziska

Gabelmann, Olga (FU Berlin, Germany)

[141] *Investigations on the Chaîne Opératoire, Technique and Practice: Formative Period Pottery Workshops in the Cochabamba Valley*

The High Valley in Cochabamba yields two different ceramic wares, which on first sight may demonstrate a homogeneous society. But by investigating the chaîne opératoire, the two wares each show a different set of variables on technique and practice in the production process, and, therefore, must have been produced in separate workshops. Although there is a functional aspect of each ware on the one hand, the differences can also be interpreted as expressions based on a "habitus" of technical practices and routines of physical behavior on the idea of how to produce an object, on the other hand. Thus, the wares may be linked to different social, economic or political groups inhabiting the valley, which maintained a local distribution system for the acquisition of each of the products.

Gade, Susan [239] see Marcucci, Derrick

Gadsby, David

[231] *Approaches, Rationales, and Challenges to Maintaining Site Inventory in the National Parks*

For over a century, the National Park Service (NPS) has worked to preserve natural and cultural resources in more than four hundred park units for future generations. In addition, the National Historic Preservation Act (NHPA) requires all federal agencies to maintain inventories of their historic properties. For decades, the NPS has relied upon three inventory systems: The List of Classified Structures, the Cultural Landscapes Inventory (CLI), and the Archeological Sites Management Information System (ASMIS). These systems began decades ago as paper files and continue today as electronic databases accessed via the internet.

The inventories allow NPS to maintain and update critical information including resource type, location, condition, threats, and disturbances. As the relevant technologies continue to develop with what seems like increasing rapidity, even these relatively modern databases are being rapidly rendered obsolete. The NPS Cultural Resources, Science, and Partnerships directorate has begun work to modernize these systems, and to facilitate their further integration with GIS technologies and other NPS programs, and incorporate elements of the now defunct Ethnographic Resources Inventory (ERI). This paper discusses the issues faced as NPS updates these crucial tools for a second century of service.

[276] *Moderator*

Gagnon, Celeste [270] see Rivera Prince, Jordi

Gaikwad, Nilesh [256] see King, Adam

Gaitan Ammann, Felipe [14] see Wesp, Julie

Gajewski, Scott (GAI Consultants, Inc.) and Corry Laughlin (GAI Consultants, Inc.)

[268] *Warren Grove Survey and Evaluation Project: A Study of Historic Charcoal Production within the Pine Barrens of New Jersey*

Throughout two field seasons (2015–2017), the University of Montana and GAI Consultants (UM-GAI) conducted a Section 110 archaeological survey and evaluation project at Warren Grove Gunnery Range (WGGR), Burlington County, New Jersey (9,911 acres). The UM-GAI team completed archaeological survey of all accessible areas of the range making it one of the most expansive survey projects within the New Jersey Outer Coastal Plain. The study identified and evaluated a total of ten sites and recommended two sites relating to historic charcoal production as eligible for listing in the National Register of Historic Places. UM-WG-1, a probable collier's camp site, and UM-WG-9, a cluster of at least 8 potential charcoal kiln remnants, were investigated through a combination of historical background research, pedestrian survey, close-interval shovel testing, geomorphological sampling, and ceramic analysis. These sites represent a mid-to-late nineteenth century charcoal production complex, only a few of which have been archaeologically investigated in this portion of the Pine Barrens. With the collaboration of academic and business institutions, the Warren Grove Survey and Evaluation Project serves as an example of an efficient approach to the identification and protection of cultural resources in a region relatively unknown to the archaeological community and the public alike.

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Gajewski, Scott [334] see Pfau, Justin

Gakii, Mercy [140] see Zipkin, Andrew

Galaty, Michael [169] see Cohen, Anna

Galban, Maria (National Museum of the American Indian)

[139] *Going Retro: Reconstructing NMAI Collections Histories*

The National Museum of the American Indian and its predecessor, the Museum of the American Indian, have long suffered a reputation for poorly documented collections. Assuming that documentation never existed or was at some point discarded; researchers have been largely unable to take full advantage of the scientific and research value of NMAI collections. In 2010, NMAI staff began a project to overturn this reputation. By retroactively implementing an accession lot system and creating virtual accession files of digitized documents, we have reunited documentation stored in NMAI archives with associated objects. The project reverses the typical methodology of starting with an object and searching for its related documentation; instead, we have systematically reviewed archival documents, matched them with objects, and connected sometimes far-flung and previously lost bits of information. As a result, we have uncovered detailed and complex connections between our objects and hundreds of collectors and archaeologists not previously visible in our museum catalog, all of which is readily available to researchers. To date, 88% of NMAI collections have been re-associated with their documentation, providing us with new understandings of our collections and creating new opportunities for research use of NMAI's vast collections.

Gale, Sara

[236] *Moderator*

[151] *Discussant*

Galke, Laura (George Washington Foundation)

[53] *Resurrecting Mother Washington: The Dissonance of Washington's Youth*

Powerful messages concerning ideal gender roles feature prominently, if latently, in Washington biographies. Most contemporary narratives suggest that George succeeded despite the "selfish" efforts of his widowed mother. Archaeological investigations at Washington's childhood home underscore the dissonance between the material culture of his youth and popular stories about his upbringing. This site was wrested from strip mall development thanks to the persistent efforts of preservationists. Archaeological investigations supported by The George Washington Foundation were designed to discover the location of the remains of Washington's original boyhood home. However, these excavations have accomplished something far more significant: they are producing copious evidence that demonstrate adroit management of the household and plantation by mother Washington. Despite these discoveries, narratives that dismiss mother Washington's efforts not only persist, but continue to thrive; the legacy of a powerful, patriarchal political environment.

Gallardo, Francisco [141] see Vidal-Montero, Estefanía

Gallareta Cervera, Tomás (Kenyon College) and Brett A. Houk (Texas Tech University)

[30] *A Tale of Two Cities: A Comparison between Preclassic and Classic Formation of Two Maya Cities*

Research on ancient Maya cities is generally modeled after large sites with massive architecture, dynastic burials, and written records documenting the activities of divine rulers. However, the development of these cities is the exception, rather than the norm, since the majority of Maya sites did not reach such enormous proportions, yet many of them likely qualified as cities from a functional standpoint. Hence, a research on non-massive cities, "from the bottom up," is crucial to understand the development of ancient Maya urbanism. Investigations at the archaeological sites of Chan Chich, in northwestern Belize, and Kiuic, in the Puuc zone of the Yucatán Peninsula, have recovered evidence of emerging and established monumental precincts during the early Middle Preclassic and Late Classic period, respectively. The different social and political developments of these sites are in tandem with the construction of architectonic complexes defined as royal courts, the heart of ancient cities. In this paper, using stratigraphic, architectural, and artifactual evidence, we examine the role of non-dynastic cities in the urbanization of the Maya lowlands. Research at these two sites illustrates distinct social processes, at different times and places, both of which resulted in local traditions of cities and court authority.

Gallareta Negrón, Tomás [18] see Ringle, William

Galle, Jillian (The Digital Archaeological Archive of Comparative Slavery), Lindsay Bloch (Florida Museum of Natural History), Jeffrey Ferguson (Archaeometry Laboratory, University of Missouri Re), Fraser Neiman (Monticello) and Suzanne Francis Brown (University of West Indies)

[51] *Ceramic Manufacturing and Distribution Networks in Early Jamaica: Interpretive Implications of LA-ICP-MS and NAA Analyses on Coarse Earthenwares from 18th-Century Plantation Contexts*

Archaeologists have long been intrigued by hand-built, open-fired coarse earthenwares found on 18th- and 19th-century sites occupied by enslaved Africans in the Caribbean and United States. In Jamaica, these hand-built coarse earthenwares, often referred to as Yabbas, were likely manufactured and marketed by enslaved specialists. Several different varieties of glazed and/or kiln-fired coarse earthenwares, not easily assigned to a known ware-type, are also routinely found in plantation contexts. Their origins, and the role they played in local markets, are debated. This poster explores the interpretive implications of the results of laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) and neutron activation analysis (NAA) on nearly 400 coarse earthenware sherds from eighteenth- and early-nineteenth-century plantation contexts across Jamaica. Using comparative datasets from the UK, US, and Caribbean, we pinpoint sources for the coarse earthenware and explore the temporal and spatial patterns in the use of earthenware from different sources. Finally, we assess how changing consumer demand by both enslaved Africans and plantation owners influenced ceramic manufacturing and distribution networks in early Jamaica.

Galle, Jillian [51] see Neiman, Fraser

Gallivan, Martin (William & Mary)

[119] *Violence, Dislocation, and Social Transformation in the Chesapeake, AD 1300–1500*

Beyond the Mississippian frontier in Southwest Virginia, Algonquian and Siouan societies in the Chesapeake pursued their own culture histories, evidently independent of developments in the American Midcontinent and Southeast. And yet, between AD 1300 and 1500 a set of social changes cascaded from the Blue Ridge Mountains to the Chesapeake Bay which may correspond with developments highlighted in this symposium. How did the late precolonial collapse, social fragmentation, and violence of the broader Eastern Woodlands intersect with Chesapeake culture histories? This paper begins to assemble the evidence from which to explore this question. In the Ridge and Valley province, ceramic distributions point toward rapid population shifts while stoutly-fortified settlements began to appear with frequency by the fourteenth century. Piedmont and Coastal Plain communities

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also began to raise palisades at the same time that they adopted communal burial practices, ramped up maize production, and constructed ceremonial ditch enclosures at central places. Not all of these developments link directly to the collapse of Mississippian mound centers and resulting social dislocation, yet it is also clear that Native societies in the Chesapeake were entangled within historical processes which played out over multiple scales.

Gallivan, Martin [328] see Shephard, Christopher

Galm, Jerry R. [47] see Furlong, Julia

Galvan, Melissa (Tulane University), William Ringle (Davidson College) and Betsy Kohut (Millsaps College)

[162] *Recent Research on the Formative and Early Classic Periods in the Yaxhom Valley, Yucatán*

Previous investigations by the Bolonchen Regional Archaeological Project demonstrated that the Valle de Yaxhom, in the Puuc region of Yucatan, was a significant locus of monumental construction during the latter Middle Formative and early Late Formative. Two large acropoli, the Acropolis Yaxhom and the Acropolis Lakin, were previously mapped and tested, but the nature of accompanying residential construction remained unknown. Two other sites with megalithic architecture, Nucuchtunich and Nohoch Cep, suggested a transitional occupation from the Late Formative to the Early Classic period based upon limited reconnaissance. LiDAR coverage of the region in May of 2017 facilitated the identification of a great many more structures as well as contextualizing them in their physiographic settings. As a result, we identified two large platforms that were anomalous in form and located close to the Acropolis Lakin as candidates for test excavations. Five other sites were intensively surface collected. Given our uncertainty as to the date of the megalithic sites and our lack of an Early Classic ceramic sample, we also targeted the main civic structure from Nucuchtunich for testing. This paper reviews the results of this work together with comments on the ceramics collected.

Gamble, Lynn (University of California, Santa Barbara)

[170] *Origin and Use of Shell Bead Money in Southern California*

The Chumash Indians of southern California made and used beads of stone, bone, and a variety of species of shell for over 8,000 years. A noted shift in shell beads occurred about 800 years ago with the appearance of a new bead type, cupped beads, made from the thick callus of the *Callianax biplicata*, a portion of the shell that had previously not been used. These types of beads were common throughout the Chumash region and elsewhere during the Late period and have been identified as money beads on the basis of their distributions in cemeteries and other contexts. They are more widely distributed than other bead types, indicating that most individuals had access to them, although certain individuals were buried with hundreds or thousands of cupped beads while others had significantly fewer. Ethnographic and ethnohistoric accounts document that shell bead money was used for many types of transactions, including the purchase of subsistence items such as fish, acorns, seeds, and otter skins; most manufactured goods, including steatite ollas and digging stick weights; and some services, such as transporting people or goods in plank canoes between the islands and the mainland.

Gamblin, Katherine (Florida State University)

[102] *An Analysis of the Industrialization of the Bourbon Industry in Kentucky: 1870s-Prohibition*

Bourbon has been distilled in Kentucky throughout the state's history and has influenced how cities in Kentucky have grown over time. Throughout the 1870s, a major rise in the number of distilleries in the state grew as wealthy patrons began buying up small, family-run distilleries and expanding them into a large-scale, booming industry that aimed to answer the demand for bourbon throughout the US. In order to fit the demand, bourbon barons began crafting ways to make more gallons per day, allow for consistency in flavor during aging from barrel to barrel, permit production to occur at a year-round basis, and ensure that customers would be consuming safe liquor. This poster presents some of the archaeological and historical evidence of innovations that allowed for the industrialization of the industry by looking at the Old Fire Copper (OFC) Distillery site, the R.P. Drake (later Turner Springs) Distillery site, and the Eagle (later Green River) Distillery site. Particular attention will be paid to how the sites adapted to the Prohibition period in the state of Kentucky and the US.

Gan, Yee Min [29] see Schulting, Rick

Gancz, Abigail (University of North Carolina, Chapel Hill)

[47] *Raw Material Quality and Spatial Patterning at Shawnee-Minisink*

The Shawnee-Minisink Site is one of the most spatially intact Paleoindian sites in eastern North America. Located in the Upper Delaware Valley of Pennsylvania, the site includes an occupation area spanning 60 x 95m which dates to circa 12,900 CalBP. Over 18,000 point-provenienced lithics have been excavated from a 360 meter-squared area. The lithic artifacts consist primarily of the local black flint as well as of various exotic cherts. Because it is well dated, spatially intact, and likely represents a single occupation, the Shawnee-Minisink site is an optimal candidate for spatial analysis research. As part of an ongoing project examining the Paleoindian level of Shawnee-Minisink site, this work investigates the spatial patterning of lithic raw materials which may relate to the organization of activity areas, variation in tool manufacturing techniques, and group composition.

Gandy, Devlin and David Robinson (UCLAN)

[214] *The Gordian Knot: Novel Methods for Digitally Identifying, Defining, and Separating Unique Rock Art Elements*

In rock art research the stratigraphy of a rock art panel can offer great insight into the temporality of a panel, which can then inform many other aspects of analytical inquiry. Yet, making the necessary distinctions between elements is often difficult—as images fade and are worn by time, or the subjective nuances of the recorder. This paper explores novel means of identifying, defining, and separating unique rock art elements in digital space within different digital methodologies.

Gandy, Devlin [214] see Robinson, David

Gann, Douglas (Archaeology Southwest)

[218] *Digital Public Archaeology at Homol'ovi: The Arizona State Museum's Contributions to the Digital Humanities*

Under the guidance of E. Charles Adams and Richard C. Lange, the Homol'ovi Research Program (HRP) was one of the first archaeological research programs in the southwest culture area to incorporate three-dimensional computer aided drafting (3D CAD) into their archaeological practice. By the adoption of a 3D modeling strategy, the HRP was able to foster concurrent developments in new media technologies to better share archaeological research with the general public. Through the use of 3D modeling of deposit-based archaeological data, digital conjectural reconstructions, animations, and even virtual reality applications have been utilized to both further the interpretation of the archaeological record and share this record with an interested public audience. The experiences resulting from this effort serve as a model of a variety of best practices and lessons learned for future research in digital public archaeology.

[320] *Discussant*

Gárate, David [285] see Rivera, Luz Stephanie

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Garay-Vazquez, Jose (University College London), Michele Wollstonecroft (University College London) and Dorian Fuller (University College London)

[86] *"Tell me what you are eating and I tell you who are you": Differences in Subsistence Systems of Elite and Non-Elite Gamo Society of the Ethiopia Highlands during Historical Times*

There is little archaeobotanical data from Ethiopia, in this presentation, we will be comparing samples from two historic domestic archaeological sites spanning from late seventeenth centuries to the late eighteenth century A.D. within the same environment (Gamo highlands in Southern Nations, Nationalities, and Peoples Region (SNNPR), Ethiopia) with the intention of examining status differences through subsistence remains. The food habits of past human societies are of importance because the act of cooking is a central task for humans, and various social phenomena influence the activities of food procurement and production. The research question guiding this investigation is What status differences can be identified between Gamo Mala and Gamo Tsoma-mala society through the archaeobotanical analysis of charred plant remains, and to what extent does this information reflect aspects of social identity and community boundaries". The status differences were not identifiable since the archaeobotanical assemblages were composed of similar taxa. Detailed examination of samples using scanning electron microscope analysis provided data of processing practices, and cooking preferences of tuber foods from non-elite contexts on the southwestern highlands. The presence of cotton in both archaeological sites raises the possible cultivation of a cotton species indigenous to the highlands.

Garbellano, John Michael and Christopher Wolff (University at Albany)

[50] *Maritime Archaic Spearpoints: A New Examination of Their Context and Chronology*

This research focuses on the morphology, chronology, and provenience of nipple-based spear points found in Newfoundland and Labrador. Nipple-based points are primarily thought to date between 7500–6000 B.P. and are associated with the early Maritime Archaic tradition, Newfoundland and Labrador's earliest inhabitants. A recent find of a nipple-based point at the Stock Cove site (CKAI-3) in eastern Newfoundland suggests that, based on a series of new AMS dates, the chronology of this point type either extends deeper into the Archaic period or eastern Newfoundland was colonized earlier than previously thought. Lithic analysis of the Stock Cove artifact will be discussed and the results will be put into the larger cultural context of Maritime Archaic lithic technology and what it might mean about the colonization process of eastern Newfoundland.

Garber, James [43] see Bentley, Heath

Garcia, Yesenia [54] see Ullah, Isaac

García Ugalde, Francisco Javier [55] see Castillo Flores, Fernando

García Velasco, María [282] see Pacheco-Forés, Sofía

Garcia-Des Lauriers, Claudia (California State Polytechnic University, Pomona)

[209] *Towards a More Systematic Approach to Analyzing Artistic Influences: A View from the Pacific Coast of Southeastern Mesoamerica*

Artistic evidence of interactions is among the most salient and most debated in terms of the relationships that it represents between different polities and regions. Traditionally, the focus of analysis is on stylistic and iconographic influences and a discussion of retention of original meanings or evidences of disjunctions. Based on my research on the topic of Classic Period interactions from the Pacific Coast of Chiapas, I have come to the conclusion that our perspectives are much too narrow. In Mesoamerica, color, composition, medium, style, and iconography among other elements of art must be taken in consideration as well. Each of these components can be potentially leveraged to signify specific meanings and relationships in artistic form. In this paper, I would like to propose a more systematic approach to understanding interactions and their artistic manifestations using evidence from the Pacific Coast of Chiapas and Guatemala as a case study.

[112] *Discussant*

Garcia-Des Lauriers, Claudia [19] see Hinojosa, Marlen

Garcia-Putnam, Alex (University of Wyoming), Melissa Murphy (University of Wyoming) and Christopher T. Fisher (Colorado State University)

[169] *Bioarchaeological Insights into Social Resilience and Change during the Postclassic at the Ancient Purépecha City of Angamuco, Michoacán, Mexico*

Little is known about the impact of Purépecha Empire formation on the skeletal health and well-being of communities within the core zone of the Lake Pátzcuaro Basin, Michoacán, during the Postclassic period (AD 1000–1500). Here we report on recent bioarchaeological investigation of 19 mortuary contexts from the ancient Purépecha city of Angamuco located within the imperial heartland. We have identified at least seven different mortuary treatments from Angamuco and we compare these contexts with what is known from other Tarascan sites. A total of forty individuals were examined from the burials, including four males, thirteen females, thirteen individuals of indeterminate sex, and ten subadults. All of the individuals were examined for evidence of nonspecific indicators of physiological stress (porotic hyperostosis, dental enamel defects, periosteal reactions), disease and systemic stress, traumatic injury, degenerative diseases, and body modification, among other conditions. These pathological conditions, coupled with the results of stable isotopic analysis of bone carbonate and collagen, yield important insights regarding the impact of empire formation on the Angamuco population.

Gardner, A. Dudley (Western Wyoming College)

[43] *Apishapa Structures and Subsistence Strategies in Purgatoire Canyon Colorado*

From 2002 to the present we excavated five Apishapa Structures in the Purgatoire Canyon. This presentation will provide a brief synthesis of structural types and food ways of the sites inhabitants. It appears that maize and a variety of wild plants made up a considerable portion of the Apishapa diet. Analysis of the floral remains from these sites indicate the sites inhabitants relied heavily on available edible plants but also consumed exotics such as pecans. This brief synthesis puts forth our initial analysis of macro and micro floral samples from excavations along the Purgatoire River.

Gardner, Robert (University of Texas at San Antonio) and Robert Hard (University of Texas at San Antonio)

[91] *Creating 3D Models of Artifacts and Features using Photogrammetry*

During the 2015 and 2016 University of Texas at San Antonio Field Schools we made use of new low-cost photogrammetry techniques to document metates and rock ring features at Early Agricultural period sites along the Upper Gila River in southeastern Arizona. We systematically photographed a number of ground stone tools and rock ring features using point-and-shoot cameras. These photos were then processed using Agisoft's Photoscan software to produce colored 3D computer renders of the artifacts and features. We were able to demonstrate that our method produces models that are accurate to the shape and scale of the physical items. This method also allowed us to document them with minimal impact to the features and without collecting the artifacts. While still in the early stages of development, this approach may have long-term potential to enhance archaeological documentation and collaboration.

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Gardner, Robert [105] see Hard, Robert

Garnica, Marlen [176] see Robinson, Eugenia

Garrard, Karen (POWER Engineers, Inc.)

[183] *Where Are the Boot Marks? Evaluating the Overmountain Victory National Historic Trail*

The Overmountain Victory National Historic Trail is a Revolutionary War route used by an estimated 1,040 patriot militia during the Kings Mountain campaign of 1780. It totals approximately 272 miles from the mustering point near Abingdon, Virginia, to Sycamore Shoals (near Elizabethton, Tennessee); from Sycamore Shoals to Quaker Meadows (near Morganton, North Carolina); from the mustering point in Surry County, North Carolina, to Quaker Meadows; and from Quaker Meadows to Kings Mountain, South Carolina. Almost none of the route exists as an original and discernible trail and there are many places where the route has been heavily disturbed or encroached upon by modern land uses. There are currently 19 National Historic Trails in the United States, delineated to follow as closely as possible the original overland or water routes important to the history of the nation. How do you best evaluate, protect, and preserve not only an extremely long linear cultural resource but also one that has little to no physical manifestation?

[183] *Chair*

Garraty, Christopher (Logan Simpson)

[69] *Non-native Incorporation of Native American Technologies in Historic Period Arizona*

Numerous archaeological studies of European-Native American interaction in the Americas during the colonial and historic eras focus on the processes by which Native American households and communities procured and adopted (or resisted the adoption of) European technologies and material culture. Comparatively few studies have addressed instances in which non-Native households incorporated Native American technologies and material culture. Recent archaeological investigations in Tempe and Phoenix, Arizona, show that many non-Native households procured and used Native American pottery during the late 1800s and early 1900s, including undecorated pots designed for domestic use. Some pots might have been obtained as souvenirs or art pieces, but the majority appear to have been obtained for utilitarian purposes, indicating a clear recognition and appreciation of the technical qualities of Native American-made pottery among many non-Native households. Examinations of the ceramics and their recovery contexts, in conjunction with a review of the historic record, help clarify the technical attributes, chronology, ethnic affiliations, and the social and economic contexts in which non-Native households adopted and used these Native American technologies.

Garraty, Christopher [39] see Graves, William

Garrett, Zenobie (New York University)

[197] *The Diachronic Landscape of Ceremony at the Irish "Royal" Site of Dun Ailinne*

The site of Dún Ailinne (Knockaulin) in County Kildare is one of four major ceremonial sites of the Irish Iron Age. Although numerous ceremonial centers of various size dotted the Irish landscape, Dún Ailinne, along with Teamhair (Tara), Emain Macha (Navan Fort), and Crúachain (Rathcroghan,) stand out due to their size and location. These characteristics indicate that the sites would have been major foci of ceremonial activity, and would have impacted the ceremonial activity itself. Although excavations have largely focused on the sites themselves, archaeologists have long acknowledged the importance of the larger "sacred" landscape in which these major ceremonial sites are situated, postulating that their proximity, visually and physically, to other sites in the landscape would have had an important effect on the performance and experience of ritual and ceremony. As such, these landscapes are not "monolithic" entities of sacredness, but have unique developmental trajectories that may have played an important role in shaping and reflecting emerging ideas in the local community. This paper seeks to understand how the development and evolution of the larger landscape would have impacted the local performance and experience of ritual and ceremony at Dún Ailinne.

Garrido, Francisco (Museo Nacional De Historia Natural) and Diego Salazar (Universidad de Chile)

[100] *The Diversity of Mining Infrastructure and Organization in the Southern Provinces of the Inca Empire*

Despite the importance of mineral and metal production for the Inca's political economy in the Collasuyu, mining infrastructure during this period encompasses a range across scale, spatial structure and labor organization. This diversity reflects both the variability of Inca state interventions and independent enterprises working outside of the imperial political economy. Generally, state mining is evidenced by Inca-style architecture, including formal public spaces or plazas; social-aggregation practices for political ends; Inca-sponsored productive rituals; a functional differentiation in the spatial organization of the campsite (which also reflects social differences within the mining community); a focus on ore extraction rather than multicrafting; and a state-sponsored nonlocal provisioning of agricultural produce.

Yet simultaneously and intriguingly, some sites do not fit these parameters, and maintain a continuity with previous forms of mining exploitation. In some cases, such sites of typically small-scale mining represent the prevalence of local groups of aspiring elites that required a constant supply of sumptuary goods for their social differentiation. Thus, this presentation argues that these different mining modes represent the diversity of economic conditions during the Late Horizon in the distant provinces of the Inca empire.

Garrison, Amanda (Central Michigan University)

[205] *Bones at the End of River Street: A Graphic Ethnography of a Bridge in Lansing, Michigan*

There are bones of a bridge in Lansing exposed on the muddy banks of the Grand. In this cityscape, a "Sortatropolis", a once urban space now emaciated and exhausted. There would have been nothing special about this bridge to make its 1987 demolition, its absence, a remarkable tragedy, except that its disappearance can be directly connected to the long exhale of this once thriving capital. The Sortatropolis is haunted by the ghosts of auto industry moguls, lumber barons, and boot-strapping millionaires, and in the mix of dirt and time, the stories of those that escape history's telling outnumber those presented; the same ghosts labored for the sake of those who are privileged to make their own destinies. There are politics to and in forgetting. This paper will be a graphic presentation of the story of this bridge: the River Street bridge in this Rust Belt city of Lansing, Michigan reveals the interests embedded with racism, misogyny, class politics, and the State, along with concrete and steel that used to span the Grand River and connect the city to itself. The bones mark the consequence of change, the making of "progress," and an unleashing of capitalism on the Sortatropolis.

[205] *Discussant*

[205] *Chair*

Garrison, Ervan [177] see Cutts, Russell

Garrison, Thomas (Ithaca College)

[80] *Living in a Contested Landscape: Adapting Settlement Decisions in the Buenavista Valley, Peten, Guatemala*

Conflict pervaded the civilizations of ancient Mesoamerica from an early time. In the Maya lowlands, the physical vestiges of defensive fortifications date to the Late Preclassic period, while textual evidence of conflict comes from the subsequent Early Classic period. This paper examines settlement changes within the context of a contested landscape. The Buenavista Valley, largely controlled during the Classic period by the kingdom of El Zotz,

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extends out west from the great city of Tikal. However, the Preclassic city of El Palmar preceded this kingdom, established by the first lowland settlers on the western edge of a large wetland. Originally considered a minor site, LiDAR data reveals that El Palmar was in fact a sizeable early community that would have rivaled the emerging kingdom at Tikal. El Palmar was suddenly abandoned between AD 100–200 and a century later, elite settlements emerged on heavily fortified, escarpment edge hilltops. The pervasive Preclassic residential platforms on the valley floor were never matched during the Classic period. Household construction techniques varied by elevation during the Classic period, suggesting that the geopolitical interactions of the local dynasty at El Zotz did in fact affect the greater population and not simply elites.

Garrow, Duncan [113] see Sturt, Fraser

Garvie-Lok, Sandra [298] see Fox, Sherry

Gary, Jack (Thomas Jefferson's Poplar Forest)

[39] *Regular Irregularity: Archaeological Evidence at Thomas Jefferson's Poplar Forest for Intersecting Garden Traditions*
The geometric structure of 17th through 19th century designed landscapes in Virginia has been well documented archaeologically. The composition of elements in these landscapes shows how their designers manipulated geometric forms, architectural conventions, and standardized measurements to impose order in the garden. By the end of the 18th century fashionable American gardens tended towards irregular picturesque compositions, however the arrangement of individual garden elements to achieve that effect was rooted in the established traditions of geometric regularity. The interplay between these two styles can be seen explicitly at Poplar Forest, Thomas Jefferson's retreat and plantation in Bedford County, Virginia. Not only does the overarching structure of the designed landscape exhibit this quality but archaeological evidence also shows how geometric forms structured individual garden elements. Archaeological remains of "tree clumps", a staple of picturesque English landscapes, reveal Jefferson's use of various geometric forms to create a naturalistic composition. This paper will contextualize this archaeological evidence through a synthesis of period gardening treatises in Jefferson's possession and an examination of his other designed landscapes. The result is a more nuanced understanding of the evolution of early American garden design.

Garza, Elisandro (CUNY)

[77] *Spondylus Shells in Pre-Columbian Copan: Their Religious and Economic Significance*
This work offers a brief discussion on the importance of *Spondylus princeps* and *Spondylus calcifer* in the ceremonial, and economic life of ancient Copan. Archaeological contexts at the site indicate that the uses of *Spondylus*, either as non-worked valves, or finished artifacts was restricted to a small high-status sphere of Copan society. Additionally, contextual data indicate that the *Spondylus* was used in a least three ritual activities: as offering in burials; caches; and canceling of building. These uses of *Spondylus* shells appear to be constant from the Early Classic to the Late Classic period. The lack of information from the Postclassic period, hinders conclusions regarding the commerce of *Spondylus* shells during this time. The two species of *Spondylus* analyzed in this work are found in the Pacific Coast, from California down to Ecuador. Defining the chronology of the *Spondylus*, chain of production, and the frequency of acquisition offers an opportunity to add new data on economic, and political interaction between Copan and others neighboring settlements in the Maya and non-Maya area.

Garzon-Oechsle, Andres (Department of Anthropology, Florida Atlantic University)

[324] *Results of Survey and Analysis of Manteño Archaeological Sites with Stone Structures in the Upper Río Blanco River Valley, Manabí, Ecuador*

This paper will present the results of a three-year effort to survey and document Manteño archaeological sites with stone structures within the limits of the Upper Río Blanco River Valley in Southern Manabí. The region is home to 40 known Manteño sites with more than 100 stone structures across the river valleys of La Encantada, Las Tusas and La Mocora that carve the foothills of the Bola de Oro mountain. The Florida Atlantic University Archaeological Fieldschool in Ecuador, directed by Valentina Martinez, recorded 23 of these sites and 94 stone structures in the summers of 2015, 2016 and 2017. The analytical portion of this study utilizes the dimensions and features along with the location and orientation of each structure to create categories that will serve to better understand how the Manteño utilized their space. Geostatistical tools in GIS helped create categorical maps for interpretation. Our results suggest that the Manteño maximized their ability to utilize the limited available flat space and densely occupied the area. These Manteño settlements in the foothills of Bola de Oro are not small peripheral occupations but mirror the large dense populated foothills of other Manteño centers such as Jaboncillo y Hojas in central Manabí.

Gastelum-Strozzi, Alfonso (UNAM), Ingris Peláez Ballestas (Servicio de Reumatología Hospital General de México), Jesús Zarco Navarro (Centro Inah-Michoacán, Instituto Nacional de Antro) and José Luis Punzo Díaz (Centro Inah-Michoacán, Instituto Nacional de Antro)

[55] *Tomography and Photography Studies of Funerary Urns from South Central Michoacán México*
This poster presents the results of the application of computational methods to classified archaeological deposits contained within cinerary urns. The method uses morphological properties and textural parameters to create quantitative descriptors that can be related to archaeological interpretations of the objects. The Pre-Columbian cinerary urns were discovered in the municipality of Huetamo, Michoacan, Mexico. The method uses information obtained from a Computed Tomography scan of each urn and photography of fifty bones separated into five sets classified by anthropology experts with respect to their color and the relation of the color to the temperature at which the bone was burned. From the scans and photographs, topological, morphological, and textural parameters are obtained. The CT-scan provides form and textural information related to density values and the photograph provides mean color values of each set of bones related to the temperature. Finally, the relation of voxel intensity (CT-scan) is related to bone color image textures. To simplified this section of the research a phantom is proposed where an artificial cinerary urn was build using bones from the excavation providing with an urn where the bone color of each volume obtained from the CT-scan is known.

Gastelum-Strozzi, Alfonso [55] see Castillo Flores, Fernando

Gatenbee, Amy (University of South Florida) and Thomas Pluckhahn (University of South Florida)

[94] *Making Theory Fun: Combining Archaeological Theory with Active Learning Exercises in Teaching North American Prehistory*
Active learning opportunities within undergraduate archaeology courses enable students to move beyond memorizing culture history. In a North American Archaeology course taught at the University of South Florida, we combine concepts from archaeological theory with active learning exercises specific to North American culture areas. Examples include students weighing the costs and benefits of hunting megafauna with atlatls from varying distances, playing a game centered on Great Basin-themed optimal foraging decisions, recreating a Pacific Northwest Coast potlatch, and partaking in a Cahokian game of chunky. By incorporating a variety of active learning opportunities, with lectures that welcome student discussion, and readings from popular archaeology topics, a North American Archaeology course becomes an interactive opportunity for undergraduate learning and community-building.

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Gauthier, Nicolas (Arizona State University)

[221] *Agricultural Niche Construction in Roman North Africa: Simulating Irrigation and Deforestation on a Desert Margin*

Earth system models are climate models capable of simulating land-atmosphere feedbacks and the complex biogeochemical and biogeophysical processes that drive them. These models are particularly well-suited to studying the impact of preindustrial land use on regional climate change, as they explicitly resolve the impacts of irrigation, deforestation, and agropastoral production on the flow of water and energy between the land and atmosphere. Generating realistic maps of past land use is a difficult task, so paleoclimatologists often rely on static, coarse-resolution estimates derived from present-day conditions. In this poster, I present agent-based modeling as an alternative method to generate dynamic land-use maps that continuously contribute to and adapt to environmental variability. Using Roman North Africa as a case study, I show how such a coupled modeling approach is indispensable for understanding the coevolution of human societies and their natural environments.

[234] *Discussant*

Gauthier, Rory P. [269] see Van Vlack, Hannah

Gauvin, Ingrid-Morgane (University at Albany, SUNY)

[22] *Technological Know-How and Lithic Production in the Mid-Hudson Valley: Observations from the Terminal Archaic*

Know-how is an archaeologically observable counterpart of the knowledge of technological agents, as it is the material capacity of an agent to apply known techniques. Both elements are not necessarily in exact equivalence, as an agent's aptitude and willingness to apply techniques may not reflect their full knowledge. Know-how is identifiable by the stigmata left by applied techniques on artifacts and materials. Separating aptitude (or "skill") from the examination and interpretation of know-hows can allow for a non-hierarchical and non-classificatory examination of technological variation, allowing for the comparison of seemingly different technological traditions without overt judgement of past agents. This paper examines and contrasts spatio-temporal trends of technological variation within Terminal Archaic Narrow Stemmed Point Tradition (4 500 calBP- 3 200 calBP) and Broadpoint Tradition (3 900 calBP—3 200 calBP) lithic assemblages in the mid-Hudson valley of New York, with a focus on the utilization of Normanskill chert.

[22] *Chair*

Gavette, Peter (National Park Service)

[179] *Resurrecting Bentley: Etiology of a Surgeon's Detritus*

Seven years ago the National Park Service rehabilitated several of the oldest remaining buildings at Point San Jose (now Fort Mason) in San Francisco. On October 25, 2010, while monitoring lead remediation efforts around the former Army hospital (1863–1903), archaeologists discovered a pit containing hospital waste which included the commingled human remains of multiple individuals. Diagnostic bottles recovered from the feature support a deposit date of between 1860 and 1890. Historic research on the Point San Jose hospital and staff reveals that Edwin Bentley, a surgeon stationed there between 1869 and 1875, was responsible for the illicit burial. Further forensic research on the human remains provides amazing insight into the origin and identity of the deceased, as well as the developing field of anatomy in the late 19th century.

[179] *Chair*

Gay, Brandon and Paul Goldstein (UC San Diego)

[100] *A Sense of Place: A GIS Study of Late Intermediate Period and Inca Settlement Patterns in Moquegua Peru*

This study investigates geospatial relationships among Late Intermediate Period (1000–1400 CE) and Inca settlement patterns within the Moquegua River drainage of southern Peru which were first identified in the 1990s by the Moquegua Archaeological Survey (MAS). A prevalence of walls and defensive locations and a largely vacant no-mans-land between downvalley Chiribaya and Chiribaya-San Miguel and upvalley Estuquiña settlements likely evidences an increased level of inter-cultural conflict in the region during the LIP that may have continued in the Late Horizon. Inca influence locally appears to be indirect, and primarily through interaction with some Estuquiña sites, suggesting connections with highland partners. Using viewshed and comparative least-cost analyses in ARC-GIS, this study explores how Chiribaya, Estuquiña and Estuquiña-Inca settlements interacted or competed for the surrounding river valley through their direct or indirect control of resources, and their ability to defend against each other. Through the identification of these prime factors, this study aims to understand how the placement of settlements corresponds to the larger web of social interactions.

Gayo, Eugenia (Center for Climate and Resilience Research (CR)2), Calogero Santoro (Instituto de Alta Investigación, Universidad de Ta), Claudio Latorre (Departamento de Ecología & Centro UC del Desierto), Virginia Mcrostie (Programa de Antropología, Instituto de Sociología) and José M. Capriles (Department of Anthropology, Pennsylvania State)

[105] *Assessing Impacts of Late Holocene Environmental Variability on the Demography of Prehispanic Societies in Northern Chile (18°-29°S)*

Agricultural communities began to spread over much of the Atacama Desert (18°-29°S) at 3.5 ka BP, triggering unprecedented levels of population growth. In inland areas and particularly along desert oases, this phenomenon featured increasing complexity in food-production systems and sedentary lifestyles with population aggregating in architecturally complex villages. Whereas, littoral populations maintained marine foraging and fishing strategies with limited inland food-resources. Both lifestyles persisted up to the European conquest, which came on the heels of significant population decline throughout the entire continent. Here, we bring together paleoecological, archaeological and paleodemographic evidence to explicitly explore the role of past ENSO-induced climate changes in determining spatial convergences/divergences in demographic trajectories, temporal continuities/discontinuities in resource exploitation (i.e. subsistence-strategy), and technological/cultural innovations of Atacama Prehispanic populations. Results show that over the previous three millennia these societies underwent important centennial-scale demographic fluctuations. As agrarian and foraging strategies are highly sensitive to water availability and ecosystem productivity in this arid bioclimate, both coastal and inland groups experienced boom-bust cycles. Changes observed during the last 3.5 ka BP correlate with variations in the activity/intensity of ENSO, a major driver for modern bioproductivity and variations in hydroclimate. Acknowledgments: FONDAP #1511009, CAPES FB-0002–2014, Anillo SOC1405, PCI PII20150081, PFB-23 (IEB).

Gayo, Eugenia [86] see Mcrostie, Virginia

Gearheard, Shari [195] see Strawhacker, Colleen

Geber, Jonny [296] see ODonnabhain, Barra

Geib, Phil (University of Nebraska-Lincoln)

[164] *The Kaiparowits Puebloans: Kayentan or Virgin Migrants?*

More than 50 years ago archaeologists identified a high-density of Puebloan habitations on the Kaiparowits Plateau in southern Utah. Analysis of pottery from these habitations by James Gunnerson and Florence Lister resulted in conflicting interpretations of cultural affiliation. Gunnerson argued for a Virgin affiliation whereas Lister argued for a Kayentan affiliation. Lister's interpretation triumphed and the Puebloan occupation of the Kaiparowits

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was attributed to migration from the south during Pueblo II. Architectural and artifactual evidence fails to support a Kayentan migration but rather an expansion of Puebloan groups from the west and southwest.

Geiger, Elspeth (University of Michigan)

[36] *Contact, Exchange, and Identity Revisited: A Closer Look at Michigan's Garden Peninsula Archipelago*

There has been a growing recognition within studies from across the US that the dynamics of contact-period interactions are not a homogenous process. Instead, the diversity inherent in these interactions points to the need for further research on local manifestations of these European and Native contact situations.

In this paper, I analyze material recovered from the Summer Island Site off the coast of Garden Peninsula in MI. The Anishinaabeg communities within Northern Michigan were connected through complex kin networks and trade relationships that allowed clans to take advantage of new trading opportunities. The goal of this paper is to discuss archaeological implications of ethnic and social boundaries at the periphery of the Straits of Mackinac.

Gentil, Bianca (The Pennsylvania State University)

[48] *The People's Response to Change: Settlement Patterns During the Classic-Postclassic Transition in the Puebla-Tlaxcala Valley, Mexico*

The Puebla-Tlaxcala Valley in Central Mexico went through significant settlement, economic, and political shifts during the Classic-Postclassic transition, yet there is no clear picture of what happened during the Epiclassic (600–900CE) or the Early Postclassic (900–1250CE) outside of large primary sites such as Cacaxtla and Cholula. A multi-faceted study was developed to target this issue, with a particular focus on rural sites that supported known large centers. Since the early years of archaeology, settlement pattern studies provide a regional perspective necessary to fully comprehend the social, economic, and political dynamics of a particular society. Based upon surveys conducted in the 1960s and 70s, presented here are the results of a key-site survey of 20, small, mid-level, and large sites in the Puebla-Tlaxcala Valley and the analysis of site associated surface material. This survey provides a foundational step in the overall goal of anchoring the chronology, exchange networks, and understanding of the overall development of the region during a time of strong social, ecological, and economic fluctuation.

Gentil, Verna (Georgia State University)

[330] *Settlement Patterns at the Ancient Maya Port Site of Conil*

The ancient Maya port site of Conil is located in the modern community of Chiquilá on the north coast of Quintana Roo, Mexico. In 1528 Francisco de Montejo, a Spanish conquistador, reported that Conil was a large town consisting of 5,000 houses. William Sanders was the first archaeologist to work at the site in 1954, but the site core was not formally mapped until 2005 by Glover. Further work was conducted in 2014, 2016, and 2017 as part of El Proyecto Costa Escondida (PCE). Data collection and analysis for these surveys was conducted through the use of advanced geospatial technologies. Based on the findings of this work, Conil appears to have been one of the largest settlements along the northern coast of the Yucatan during two periods of occupation, the first dating to the Late Preclassic and the second, dating to the Late Postclassic. This paper will discuss the settlement patterns observed at this site as they relate to the periods of occupation and known sites within the region.

George, Nicole (University of Nevada, Reno)

[92] *A Geochemical Analysis of Concave Base and Western Stemmed Tradition Projectile Points in Southeastern Oregon*

The relationship between concave base and Western Stemmed Tradition (WST) projectile points in the Great Basin is not well-understood. They may represent sequential Late Pleistocene technologies, coeval technologies used by different ethnolinguistic populations, or different components within the same toolkits. To explore the latter possibility, I collected geochemical sourcing data for both types of artifacts recovered from three adjacent valleys in southeastern Oregon: (1) Warner Valley; (2) Guano Valley; and (3) Hawksy Walksy Valley. I compared source provenance to determine if there are significantly different toolstone conveyance patterns, with the expectation that there should be no differences if concave base and WST points were part of the same toolkit. The results provide insight into what the two Late Pleistocene technologies may tell us about how and when groups colonized the northern Great Basin.

Geraldes Teixeira, Wenceslau [116] see Rebellato, Lilian

Gerard, Paul (California State University, Los Angeles), Matthew Napolitano (University of Oregon), Geoffrey Clark (Australia National University) and Scott Fitzpatrick (University of Oregon)

[13] *Tracking Changes in Nearshore Ecology over 2000 Years in Southern Yap, Western Caroline Islands*

The initial human settlement of Yap, Western Caroline Islands (northwest tropical Pacific), is one of the least understood in Pacific prehistory, although new archaeological research is beginning to address this issue. Excavations at the southern site of Pemrang in Yap, western Caroline Islands (northwest tropical Pacific) have revealed multiple rich, well-stratified deposits of shell and pottery spanning the known occupation sequence of Yap and extended the date of early human activity by ca. 400 years to ca. 2400–2200 cal BP. A stark difference in the type of shell recovered from two deposits, supported by a suite of new radiocarbon dates, suggests rapid environmental change in southern Yap. This paper presents preliminary results of isotopic analysis (^{13}C and ^{18}O) of radiocarbon dated shell to identify nearshore ecological conditions in southern Yap at the time of initial human settlement.

Géraud, Manon (TRACES UMR5608—Université de Toulouse Jean Jaurès), Florian Téreygeol (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa) and Florent Hautefeuille (TRACES UMR5608, Université Toulouse—Jean Jaurès,)

[23] *An Integrated Approach to Ceramic Material: An Example of Interdisciplinary Research on Commingeoise, a French Late Medieval Ware (13th–16th c.)*

"Commingeoise", a Late Medieval domestic ware of southern France, is a very current but problematic diagnostic artifact, as it has thus far been poorly defined. The chronology of its production is first of all not precisely established. Furthermore, a simple macroscopic description has historically been used to identify this ceramic type. A more rigorous characterization is necessary in order to clearly define Commingeoise. Finally, although dispersed throughout a large and relatively well-defined geographic area, no production workshop of the Commingeoise has been identified so far, and the domestically utilized pots characteristic of this ceramic type are generally produced locally. Thereby, this research discusses new developments in answer to the questions on its origins, homogeneity, and organization of production and diffusion.

To answer all these different issues, and to develop a broader understanding of Commingeoise ware, this research employed multidisciplinary methods. A typo-chronological study was carried out to standardize chronological data on Commingeises. It was completed by technological study and experimental archaeology to identify the technologies used in the chaîne opératoire of this ceramic type. In addition, bulk chemical analysis (of both ceramics and sampled raw materials) and petrography enabled advancements in characterizing and determining the origins of Commingeoise ware.

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Geurds, Alexander (University of Oxford)**[108]** *The Original Is (Still) the Winner: Replicas and Fakes as Bound by Authenticity*

Authenticating relations are defined by artisanship, temporality, value-making and ethnographic authority. These relations are visible in contemporary museum settings as well as in the art world as such, and may be particularly poignant in the case of the Caribbean and Central America with its diverse manifestations of emotive styles and materials such as wood and stone. Historically deep and widespread, 19th and 20th century Central American trafficking of pre-Columbian things was tied to foreign-owned plantations and centred on San Jose, Costa Rica, leading to a scarcity of a 'Nicaragua' provenance indicator in current-day museum signage. Eventually, archaeology emerged from such uncontrolled collecting and now works to counter looting, yet market demand for objects remains stable.

This paper explores the ongoing resilience of authenticity and its persistence in the global art market. I argue that this is in part due to the ascribed inspirational value Amerindian objects hold in modern art, as argued in the notion of primitivism. Primitivist art is seen in opposition to modernity, ascribing it legitimacy through temporal or cultural distance. With some exceptions, programs focussed on revitalizing artisanship and producing high-quality copies or working on stylistic and technical innovations are countered by rendering this primitive authenticity.

[263] *Chair*

Geurds, Alexander [323] see Donner, Natalia

Ghaheri, Fatemeh**[86]** *Neo-Assyrian Empire: Agriculture and Agricultural Strategies Based on Phytolith Analyses*

The Neo-Assyrian empire is known as one of the major empires in the Ancient Near East. Ruling in Mesopotamia during the Iron Age, they had a well-organized agricultural system. In this paper, I will utilize phytolith analyses to investigate the impact of the Neo-Assyrian empire on agriculture and land-use. I will compare the elite-controlled agriculture with the crop choices of peasant farmers. It's likely that the peasant farmers would have chosen more resistant and reliable types of plants for their own food which would reduce the risks of unexpected natural disasters such as droughts and floods. In order to conduct this research, I use phytolith data from Iraqi Kurdistan, at on-going excavations of Assyrian-period sites in the Peshdar Plain, including two main sites: Gird-I Bazar and Qalat-I Dinka, directed by Professor Karen Radner, University of Munich. These two sites are very promising for this research. Gird-I Bazar is a non-elite farming and production village, and Qalat-I Dinka is an administrative center being sustained by Gird-I Bazar. Thus, the two will cover the empire's impact on agriculture and the farmers' choices in cultivation and production.

Ghasidian, Elham (Leverhulme Centre for Human Evolutionary Studies, University of Cambridge) and Saman Heydari-Guran (Leverhulme Centre for Human Evolutionary Studies)**[174]** *Cultural Diversity in the Zagros Mountains and the Expansion of Modern Humans into the Iranian Plateau*

Located in western Eurasia, at the crossroads of human migrations out of Africa during the Pleistocene, the Iranian Plateau stands at the centre of models of anatomically modern human dispersals out of Africa. This paper aims to understand the cultural diversity among the first modern human populations in the area, and the implications of this diversity to evolutionary and ecological models of human dispersal through the Iranian Plateau, by re-examining four key UP lithic assemblages from the sites Warwasi, Yafteh and Pasangar of the west central and Ghār-e Boof Cave of the southern Zagros Mountains of Iran.

The results demonstrate that there is a significant degree of cultural diversity rather than homogeneity among the UP throughout the different Zagros habitat areas as a result of the relative geo-topographical isolation of the different areas occupied favouring different ecological adaptations. Based on the chronological and geographical patterns of Zagros UP variability, we propose a model of an initial phase of localised and patchy development of the early UP in the region, with limited subsequent contact among these first UP groups. This has important implications for the origins of biological diversity in the early phases of modern human colonisation of Eurasia.

Giaccai, Jennifer [139] see Harrison, Ainslie

Giacinto, Adam [225] see Hale, Micah

Giardina, Miguel [249] see Franchetti, Fernando

Gibb, James (Smithsonian Environmental Research Center)**[42]** *Pig Manure and Swizzle Sticks: Defining an Archaeological Site Type*

Low-density scatters of historic-era artifacts can be interpreted as byproducts of manure spreading. These are pieces of trash inadvertently mixed with food refuse that was fed to pigs. While most of these artifacts were not ingested, they became mired in the resulting manure which farmers spread on their fields as fertilizer. Whether or not a scatter of late historic artifacts represents manure spreading or some other kind of behavior can be tested archaeologically, and that is the subject of this paper. Archival data confirm that archaeological findings at the Ellsworth K. Russell farm site (18AN917) in Maryland connect World War II era commercial and institutional kitchens in Washington, DC, with the feeding of pigs and subsequent use of their manure on nearby fields.

Gibbon, Elizabeth [211] see Jennings, Justin

Gibbons, Kevin (University of Maryland)**[195]** *Pervasive Landscapes of Inequality: Want and Abundance within a Hyperobject*

As globalization matures, environmental, social, and economic factors continue to create ever-expanding landscapes of inequality. Among these drivers, human-driven environmental degradation has, for centuries, operated as a significant producer of inequality. Anthropogenic climate change today perpetuates and strengthens these multi-generational, regional-scale phenomena of landscape change. These processes, such as sediment erosion in Iceland during the past millennium, create a 'second nature' landscape of human design that create and reinforce resource scarcity and thus, social and economic inequality. These 'second nature' landscapes are self-perpetuating; their cause so viscous and nonlocal that they regularly defy our perception. Timothy Morton has referred to objects such as climate change as 'hyperobjects.' This paper discusses the implications of hyperobjects for archaeology and historical ecology in the context of the long-term roots and intersectional character of resource justice issues. Further work to understand and contextualize the multi-generational human-environmental feedbacks that perpetuation landscapes of inequality and resource scarcity has the potential to generate insights into contemporary dilemmas and provide archaeologists with anchors for advocacy strengthened by data over the longue durée.

[195] *Chair*

Gibbons, Kevin [195] see Perez, Erina

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Gibbs, Martin

[275] *The People of Solomon: Performance in Cross-Cultural Contacts between Spanish and Melanesians in the SW Pacific 1568–1606*

In 1568, 1595 and 1606 Spanish expeditions out of Peru explored the Solomon Islands (S.W. Pacific) with the intention of establishing colonies. The motivations for these voyages were an uneasy amalgam of ambitions for Imperial and familial advancement, attempts to find the gold mines of Ophir, and religious fervor for converting indigenous populations. Despite repeated historical retelling, little attention has been paid to the structures of the cross-cultural encounters described in the original narratives. Ethno-historical analysis reveals an extraordinary diversity of responses in these interactions, from prosaic trading, through to willful acts of physical and sexual aggression, and highly charged spiritual contests. While the Spanish presence was largely ephemeral, with even the nascent colonies lasting only several weeks, the sometimes dramatic shifts in status from transitory explorer, to colonist, to survivor often resulted in similarly significant transformations in relations with indigenous groups. Beyond the documentary record, the archaeological record also shows evidence of longer-term repercussions and attempts by indigenous groups to mitigate these transitory exchanges. In particular this paper will follow in the tradition of Australian Pacific ethno-historians such as Denning and Clendinnen in exploring the nature of performance within these cross cultural encounters.

Giblin, Julia I. [245] see Parditka, Györgyi

Gibson, D. (El Camino College)

[37] *When Irish Eyes View Maya Classic Period Political Systems*

Several debates have endured for decades within the field of anthropological archaeology as to the character of lowland Classic period Maya political organization. Scholars have been struck by the contrast between Maya regal-ritual centers possessed of impressive monumental architecture with the minimal references from the documentary record to any kind of bureaucratic organization. There is disagreement as to the scale of the larger Maya polities and whether or not some polities had begun to move away from kinship as a central organizing principle. There are even more fundamental disagreements as to whether some or most Maya Classic period political systems could be termed states, and if so, the degree to which political power was centralized in the institution of kingship.

The political systems of early medieval Ireland resemble those of the Classic period Maya on many grounds. The scalar, organizational and demographic attributes of Maya and Irish political systems will be compared systematically in order to tease out the factors that may account for their similarities. Models pertaining to chiefdoms and states will be evaluated as to their suitability.

Gibson, Samantha (Florida Gulf Coast University, Dept. of Marine and Ecological Studies), Kylie Palmer (Florida Gulf Coast University), Sasha Linsin Wohlpart (Florida Gulf Coast University), Michael Savarese (Florida Gulf Coast University) and Karen Walker (Florida Museum of Natural History)

[224] *Late Holocene Oyster Reef Development and Its Impact on Calusa Natural Resource Utilization, Estero Bay, Southwest Florida*

The Horseshoe Keys are an extensive oyster reef ecosystem within manageable paddling distance from Mound Key, Estero Bay, Southwest Florida, the site of the Calusa's political center beginning ~AD950. The Calusa thrived in this bay, partially due to the natural resources available, including these oyster reefs. Sediment cores from this region show a rich history of reef development dating to ~2200 yBP. The reefs exhibit an ecological succession shifting from a vermetiform gastropod community to oysters ~600 yBP, a time when Calusa exploitation of oysters began at Mound Key. Reef history varies between the northern and southern regions of Horseshoe Keys. Northern reefs developed upon mangrove peats and began their history with a rich molluscan fauna indicative of a higher, near marine salinity. Alternatively, the southern reefs developed upon a graminoid marsh with subsequent bay and reef faunas dominated by brackish mollusks. These differences suggest that the Estero River was a formidable freshwater source near Mound Key with more marine conditions located short distances away within the reef tract. Studying these gradients from the geological perspective combined with findings from the archaeology of Mound Key allows for a holistic understanding of environmental change and resource utilization by the Calusa.

Gibson, Taylor [293] see Sugiyama, Nawa

Gidusko, Kevin, John Schultz (University of Central Florida) and Mason Branscome (University of Central Florida)

[88] *Close-Range Photogrammetry Applications in Outdoor Forensic Scene Documentation*

The use of close-range photogrammetry (CRP) for 3D documentation is becoming a standard practice for archaeological site documentation. Less explored, however, is the utility of CRP to document forensic scenes, especially those involving skeletal remains. Since digital camera documentation is already a standard practice at forensic scenes, additional data captured for CRP can be included alongside standard site photography. The purpose of this research is to demonstrate the utility of incorporating CRP into already established scene documentation protocols. To exhibit the process of outdoor scene documentation, three mock scenarios using faux human osteological material were created in a typical Central Florida pine flatwood environment: limited and large surface scatters, and a partial exhumation. Each scene was documented with a digital camera, both hand-held and mounted, as well as with and without ground control points. Overall, the 3D models constructed of the burial proved to be more conducive to CRP due to the uniformity of the ground surface. The models constructed of the ground surface scatters proved more difficult to create due to the complex nature of the ground surface vegetation. Additionally, an overview of best practices for field data collection, post-processing standards, and output capabilities will be further discussed.

Giersz, Milosz (University of Warsaw)

[211] *The Force Awakens: The Nature and Chronology of Wari Presence in the Huarmey Valley*

Since the fundamental work of Dorothy Menzel, it has been suggested that a new center of power and prestige arose on the North-Central Coast of Peru during the late Middle Horizon, and that its focal point was probably located in the Huarmey Valley. Unfortunately, this hypothesis has not been empirically confirmed for more than 40 years, due to the lack of strong evidence based on systematic archaeological research. Since 2010 an international team of scholars performs multidisciplinary research at Castillo de Huarmey, a Middle Horizon coastal provincial center and Wari necropolis, where imperial mausoleum with the first undisturbed Wari high elite women's multiple burial was discovered. Using a broad methodological spectrum, including bioarchaeological and biogeochemical analyses, archaeometry, geoarchaeology, 3D HDS scanning and architectural analysis, the archaeologists brought to light local Middle Horizon cultural panorama and the nature and chronology of Wari imperial presence in its northwestern province.

[211] *Chair*

Gifford, Chad [98] see Connell, Samuel

Gifford-Gonzalez, Diane (University of California, Santa Cruz)

[338] *SAA's Efforts to Create a More Inclusive Climate: Educating to Prevent Sexually Motivated and Other Forms of Harassment and Violence*

In 2015, the Executive of SAA discussed the need for action on its part to define SAA's position regarding sexual harassment and violence, as well as harassment and violence based upon other real or perceived attributes of personal identity. On the one hand, the Board deemed it the moment for a

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brief general statement on these matters, as was the case with many professional organizations over this span of time. One the other hand, the Board believed that, as a professional organization with an educational mission, it should gather and provide its members with resources on U.S. laws relevant to these matters, and summarize some steps for recourse that persons experiencing such behavior could take. Details of this multi-phase effort, as well as of the Board's decision to present a new Principle of Archaeological Ethics for a membership vote, will be outlined in the presentation.

[292] *Discussant*

Gifford-Gonzalez, Diane [189] see Hutson, Jarod

Gijanto, Liza (St. Mary's College of Maryland)

[201] *Slavery and Colonialism: Selectively Embracing and Erasing the Past in The Gambia*

Banjul was founded in 1816 as part of the British efforts to block the slave trade on the Gambia River. A planned urban center, the city developed around a series of neighborhoods designated as colonial, merchant, and African laborer spaces. Amongst the most prominent settlers were the Aku (Liberated Africans) from Sierra Leone and French traders from Goree who were instrumental in the growth of the colonial economy. The Banjul Heritage Project seeks to highlight contributions of the different residents to Banjul to the unique character of its neighborhoods, through community engaged research. This was at odds with the former Jammeh government which sought to exploit the nation's connection to the slave trade via Alex Haley's Kunta Kinte while erasing most physical traces of the nation's colonial past in the capital. Entire narratives have been created and imposed on the landscape around Kinte's home village of Juffure, and remnants of British rule in the capital were systematically removed. This paper addresses some of the challenges encountered during three field seasons in Banjul including the absence of an engaged community in the face of a rapid dissolution of a resident population and the legalized destruction of colonial period sites.

Gil, Adolfo (CONICET-IANIGLA Grupo Vinculado San Rafael), Gustavo Neme (CONICET-IANIGLA Grupo Vinculado San Rafael-UTN FRS), Ricardo Villalba (CONICET-IANIGLA) and Jacob Freeman (Utah State University)

[105] *Contrasting Human Demography Trends between Hunter-Gatherers and Farmers as Response to Climate Change: Central Western Argentina as Study Case*

The Late Holocene archaeological record of central western Argentina shows a mosaic of human strategies, ranging from farmers to hunter-gatherers. This presentation evaluates if differences in subsistence practices among groups in a similar biophysical environmental generated different demographic and socio ecological responses to climatic change over the last 3000 years. We use radiocarbon dates as a proxy for human population size and growth rates and ^{13}C and ^{15}N stable isotopes on human bone as proxy for human diet. We observe correlations between these proxies in relationship to the paleoecology of the region. We expect a stronger increase in radiocarbon frequency (SPD) in "northern farming areas" than in "southern hunter-gatherer" areas. On the other hand, a decline of radiocarbon date density will start around ca. 500 years BP in all areas but more abrupt falls could be recorded in "northern farming areas". This drop in density is discussed in relationship with LIA climatic pattern. In terms of human diet, we expect decreasing diversity as the SPD curve approaches its peak and then "collapses".

Gil, Adolfo [105] see Byers, David

Gil, Adolfo [9] see Salgán, Laura

Gilbertson, Christine [222] see Domeischel, Jenna

Giles, Bretton (CEMML, Colorado State University), Eric Skov (CEMML, Colorado State University) and Shannon Koerner (CEMML, Colorado State University)

[332] *Prehistoric Use of the Wind Creek Locality at Fort Riley, Kansas*

Fort Riley Army Installation in northeastern Kansas is bordered by Wildcat Creek, a tributary of the Kansas River that has a high density of prehistoric sites, including Smoky Hill hamlets and base camps. We review the CEMML surveys and site exams along Wind Creek—a tributary of Wildcat Creek—that have produced an unexpected density of upland prehistoric sites.

In this context, we discuss the prehistoric sites types found along Wind Creek and explore how they are part of settlement patterns within the larger Wildcat Creek watershed. We also examine differences in the artifact assemblages from 40 sites along Wind Creek, including the presence/number of hafted bifaces, scrapers, expedient tools and various types of debitage. Notably, the diagnostic hafted bifaces found along Wind Creek indicate that the area was used, at least sporadically, during the Archaic, Woodland and Late Prehistoric periods. A number of scrapers found at sites along Wind Creek conversely indicates the importance of hide-processing or perhaps wood-working in the area. We suggest that the Wind Creek locality contained important resources, perhaps available seasonally, that were exploited by prehistoric groups with habitations and base camps along Wildcat Creek.

Giles, Bretton [332] see Koerner, Shannon

Gill, Lucy (University of California, Berkeley)

[263] *Towards a Nonlinear History of Lake Cocibolca, Nicaragua*

Traditional narratives within Nicaraguan archaeology, based on primarily ethnohistoric rather than archaeological evidence, have privileged the arrival of external actors from Central Mexico at the expense of indigenous developments and have emphasized imposed change rather than situated continuity. Especially given that as archaeologists, our primary sources are material culture, we should approach mobility from a materialist engagement with the flows and hardenings of matter, *sensu* Manuel De Landa. This framework will allow for more nuanced interpretations of multidirectional movement, as well as an acknowledgement of the emergent properties that may have arisen from these interactions. Such a nonlinear approach will require a redefinition of the spatial logics of orientation posited by culture-areas, aided by employing the concept of landscape as defined by historical ecology. It will move towards a re-entanglement of humans and environments, which I argue are enmeshed and inseparable. My research centers around Lake Cocibolca, tracing flows of lacustrine resources between the multiple communities of practice situated around and within it and the sedimentation of these flows in the landscape. It is an explicit attempt to illustrate the vital role of multiple forms of localized movements, which have been overlooked in favor of unidirectional trans-isthmus migrations.

Gill, Rachel (University of Central Florida), Brigitte Kovacevich (University of Central Florida) and Michael Callaghan (University of Central Florida)

[302] *Reflectance Transformation Imaging: New Methods in Documenting Preclassic Maya Graffiti from Holtun, Guatemala*

In the late 19th century, explorers identified graffiti etched in stucco walls of residences, palaces, and temples in the Maya Lowlands. By the mid-20th century, scholars acknowledged that the ancient Maya produced these incised images. Today, archaeologists struggle with documenting these instances of graffiti with precision and accuracy, often relying solely on to-scale line drawings to best represent the graffitied image they see before

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them. These images can be complex, multilayered, and difficult to see so identifying the sequence of creation of the incisions can be challenging. Reflectance Transformation Imaging (RTI) is a method that uses a moving light source and photography in order to visualize, interact with, and analyze a three-dimensional object in a two-dimensional image. Performed on a series of 20 unique graffiti from the Maya archaeological site of Holtun, RTI showed promise as a viable technique for documenting and preserving graffiti as cultural heritage and for providing new information about an enigmatic aspect of Maya archaeology. Additionally, RTI is compared to other common methods used to document incised graffiti in the Maya lowland area including to-scale line drawing, tracing, photogrammetry, and scanning to determine what unique information, if any, can be gained using this method.

Gill, Rachel [33] see Callaghan, Michael

Gillam, J. Christopher (Winthrop University), Nicolas Zwyns (University of California—Davis), Masami Izuho (Tokyo Metropolitan University), Tseveendorj Bolorbat (Institute of Archaeology, Ulaanbaatar, Mongolia) and Evgyny Rybin (Institute of Archaeology, Novosibirsk, Russia)
[41] *Shedding New Light on Upper Paleolithic Cultural Landscapes of Northern Mongolia*

Ongoing research on the Pleistocene of northern Mongolia has revealed intriguing patterns in the Upper Paleolithic cultural landscapes of the region. The distribution of sites suggest that maintaining social networks was potentially as significant as subsistence and shelter considerations for these early nomadic hunter-gatherers. In 2017, fifteen new Upper Paleolithic sites were documented in the Ikh Tolboriin Gol (Big Tolbor River, n=45) and Naryn Tolboriin Gol (Narrow Tolbor River, n=9) valleys of the greater Selenge River Basin that feeds Lake Baikal farther north, bringing the total number for the Tolbor locality to 83 sites (including 29 sites from the neighboring Kharganyn, n=17, and Altatyn, n=12, rivers). Site distributions indicate a settlement preference for south- and east-facing slopes, warmth from solar exposure and shelter from cold northern winds, with prominent viewsheds of surrounding terrain for game monitoring, and locations near either mountain passes or confluences with the Selenge River, or secondary and tertiary drainages, for maintaining social networks.

Gillam, J. Christopher [81] see Morrow, Juliet

Gilleland, Sarah (Binghamton University), Jennifer Amico (Binghamton University), Anna Patchen (Binghamton University), Tiffany Raymond (Binghamton University) and Rebecca Hunt (Binghamton University)

[156] *The Rings of Poverty Point, UNESCO World Heritage Site: A Geophysical Investigation.*

The concentric ring features at the Poverty Point World Heritage site are monumental structures a kilometer and a half in diameter at their widest point. Though these impressive structures went unnoticed for many years after the identification of the area's other archaeological resources, they are now recognized as a unique attribute of an already remarkable site. Here, we use multiple geophysical methods to attempt to characterize the construction of these features. Initially assumed to have been created in a single construction episode, we argue that these earthworks experienced several iterations before appearing in their current configuration, and what we see now is the most recent stage of a more dynamic process. We also use these methods to evaluate prior claims of other features present within, under, or on top of the rings to assess whether there is evidence of habitation on the rings.

Gilleland, Sarah [13] see Blank, John

Gillreath-Brown, RPA, Andrew (Washington State University), Kyle Bocinsky (Crow Canyon Archaeological Center), Simon Goring (University of Wisconsin—Madison) and Tim A. Kohler (Washington State University)

[221] *Paleotemperature Reconstructions of the Upland United States Southwest for the Last 2,000 Years*

While paleoclimate reconstructions have improved across the last decade, the data and models are often still difficult to access, process, and interpret. However, improvements in these techniques, and the increasing breadth of paleoclimatic proxies available have furthered our understanding of the effects of climate-driven variability on past societies. Here we introduce a model being implemented by the SKOPE Project—Synthesizing Knowledge Of Past Environments. This application (openSKOPE.org) allows users to select a geographical extent and time interval, and subsequently obtain paleotemperature reconstructions for a given climate parameter. We use pollen data from the Neotoma Paleocological Database (neotomadb.org) to produce low-frequency temperature reconstructions from the Modern Analog Technique (MAT). MAT builds a relationship between modern climate data and associated modern pollen spectra, and relates this pairing to fossil pollen assemblages based on the use of an appropriate multivariate distance metric. While the application is designed to cover the continental United States, our initial efforts focus on the upland United States Southwest during the last 2000 years. The MAT reconstructions can be used to modify productivity reconstructions for temperature-sensitive plants such as maize within social-environmental models, and to explore a variety of questions surrounding social and cultural responses to climate change.

[279] *Discussant*

Gilman, Patricia (University of Oklahoma) and Jakob Sedig (Department of Genetics, Harvard Medical School)

[91] *Similarities and Differences Between Upper Gila and Mimbres Valley Ceramics in Southwestern New Mexico*

Although both the Mimbres and the Gila valleys are within the Mimbres region and are not far apart, they seem to have rather major differences in the numbers of rooms per room block, the numbers of room blocks per site, and the designs painted on Mimbres black-on-white pottery. In this poster, we report similarities and differences between Mimbres Valley (MV) and upper Gila/western Mimbres (UGWM) pottery designs. We start by defining and quantifying style elements seemingly more common in the UGWM—herringbone lines, triangular faces with white circle eyes, rim triangles, square scrolls, rim band number, and absence of figures. To determine if these elements truly are more common on UGWM pottery, we analyzed bowl data in several ways. First, we examined every documented bowl excavated from UGWM sites to measure element frequency. Then, we observed the presence/absence of these elements on bowls sourced to the UGWM through NAA, regardless of where they were excavated. Finally, we analyzed a sample of bowls excavated and sourced to the MV to determine if these elements appear at the same frequency as on UGWM bowls. Ultimately, we hope this study will illuminate why these differences between valleys might have occurred and their significance.

Gilmore, Kevin P. (HDR), Elizabeth Leclerc (HDR), Peter Hille (HDR), Hiro Kurashina (University of Guam) and James Carucci (USAF AFCEC)
[13] *Illuminating the Obscure: Using Legacy LiDAR Data to Define and Interpret a WWII Airfield on the Island of Tinian, Commonwealth of the Northern Mariana Islands (CNMI)*

Tinian International Airport in the CNMI is a repurposed portion of West Field, a WWII U.S. airbase constructed in 1944 for B-29 operations against Japan. In 2017, HDR conducted a cultural resource inventory for proposed airport infrastructure improvements, focusing on West Field and the adjacent Japanese-built Gurguan Point Airfield. Survey was complicated by dense secondary forest that obscures the two airfields, rendering many features invisible from the air. To assist with mapping these features, legacy LiDAR data collected in 2006 was obtained from the USACE. Although these data required considerable processing and classification prior to use, they allowed mapping of large features with greater speed and accuracy than could be accomplished in the field. Additionally, 21 LiDAR anomalies identified as potential features were uploaded to tablets used to navigate in the field. Consequently, the most common anomalies (“10m-diameter round pits”) were verified as bomb craters created during the U.S. invasion. Recognizing that clusters of craters should indicate heavy bombardment of a specific target, HDR investigated a cluster in the LiDAR data and located

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a previously unidentified Japanese gun position. This demonstrates the economic and scientific value of older “found” datasets for documenting and interpreting cultural features large and small.

Gilmore, Zackary (Rollins College) and Kenneth Sassaman (University of Florida)

[95] *Clay Resource Variability and Stallings Pottery Provenience along the Savannah and Ogeechee Rivers*

An understanding of the raw materials available to ancient potters is essential to archaeological considerations of vessel production and provenance. Consequently, the collection and analysis of raw clay samples has become a common component of such studies. This poster presents the results of compositional analyses of clays from along the Savannah and Ogeechee Rivers in Georgia and South Carolina via petrographic point-counting and neutron activation analysis (NAA). These analyses were conducted as part of a larger project focused on reconstructing the ceramic social geography of Late Archaic Stallings societies, makers of North America's oldest pottery technology. While multiple studies have demonstrated the feasibility of geochemical sourcing in other parts of the American Southeast, this is the first such investigation centered in the Savannah River Valley and the first systematic attempt to determine the provenance of Stallings vessels. Our results show that clear patterned differences in the mineralogy and chemistry of clay resources exist both between Savannah and Ogeechee Rivers and along the length of the Savannah. These data suggest a high potential for not only distinguishing between local and nonlocal vessels but also determining the direction (i.e., upriver versus downriver) of pottery movement.

Gilstrap, William (Massachusetts Institute of Technology)

[152] *Discussant*

Gingerich, Joseph A. M. (Ohio University)

[124] *Modeling Discrete Paleoindian Work Areas*

At many archaeological sites, discrete concentrations of artifacts or the clustering of similar tool types are often interpreted as individual work areas or evidence of specific activities. Using sets of refitted artifacts from the Shawnee-Minisink site, representing individual knapping and tool use events, I examine the relationship between known work areas and areas with varying artifact densities, where activities are less defined. By examining the relationship between refit distance, artifact density, raw material use, and the spacing of features the location of certain features or activity areas may be predictable at other hunter-gatherer sites. These results are considered in concert with the duration of site occupation and the spacing of activity areas at other Paleoindian sites.

[124] *Chair*

Giomi, Evan (University of Arizona)

[184] *The Chronology of Goat-Springs Pueblo*

The site of Goat Springs Pueblo, in Socorro County, NM, is unusual for a relatively low density of artifacts compared to a large investment in architecture at the site. Consequently, the development of a site chronology is necessary to establish whether the low density of artifacts is attributable to a short period of occupation (or series of short occupations)—despite the considerable investment in architecture—or if another explanation is necessary. Complicating the construction of a chronology for the site is the difficulty in using conventional ceramic typologies at Pueblo IV and early Colonial Pueblo sites in southern New Mexico. While the Rio Grande Glaze Ware sequence has chronological utility for sites in northern New Mexico, the chronological associations of the ware are much less secure for sites in southern New Mexico. As such, careful examination of stratigraphy, non-local diagnostics, and possible building events is necessary to establish a chronological sequence for Goat Springs Pueblo. This research is also potentially useful in a wider sense for improving the chronological utility of the Rio Grande Glaze Ware sequence at sites in Southern New Mexico.

Giomi, Evan [91] see Picard, Taylor

Giosa, Dominique [168] see Connolly, Robert

Giovas, Christina M. (University of Queensland)

[125] *Thieves, Stowaways, Hitchhikers, and Hangers-On: The Commensal Niche in the Prehistoric Caribbean*

Prehistoric commensal animal relationships are understudied for the Caribbean, with little explicit consideration for the defining attributes of the insular commensal niche or what taxa may be rightly considered commensal. Here, I address these issues by clarifying the nature of Caribbean commensalism with respect to synanthropy, domestication, animal management, and phoresy. I consider which vertebrate and invertebrate taxa most likely enjoyed commensal relationships with humans in the pre-Columbian era and argue that many native mammals were probably ill-suited for synanthropy, in contrast to certain birds, reptiles and invertebrates. The more prominent mammalian commensals in the Caribbean are introduced synanthropes—species which were likely transported to the islands specifically because of this relationship and the degree of mutualism it conferred.

[237] *Discussant*

Giraldo Tenorio, Hernando (Universidad del Cauca)

[75] *Defensive Landscape and the Naturalization of Social Inequalities in Southwestern Colombia (2200–1800 BP)*

The prehispanic societies from the Cauca river Valley, Colombia, have been portrayed as classical examples of the development of political complexity caused by intergroup conflict for basic resources in constrained environments. However, the existence of warfare in the region itself has not been backed by strong archaeological evidence. The re-analysis of the earth structures of the archaeological site of Malagana, in southwestern Colombia, suggest the existence of regional warfare, which provided the social context for the institutionalization of hierarchical positions. The spatial arrangement of the defensive structures in Malagana became both political and ideological strategies to mask and naturalize relationships of inequality. This was achieved by segregating and limiting the access of most of the population to public areas.

Giron-Ábrego, Mario (Boston University)

[48] *Points of Early Human Mobility: A Preliminary Synthesis of Paleo-Central American Sites*

This poster addresses an understudied area relevant to the initial peopling of the Americas: what are the earliest indications of human activity in Mesoamerica (particular emphasis on Guatemala)? Its geographic location and its relatively narrow expanse make the southern half of Middle America the natural stage to funnel terrestrial and coastal/riverine routes of early human migrations. Despite this consideration, archaeological research targeting Paleoamerican horizons [pre-12,800 BP] in this area has only witnessed intermittent treatment, in part due to a rich tradition intensely focused in Maya archaeology, mainly in Guatemala and Belize. An intriguing aspect of the Paleo-Central American legacy is the coexistence of two great contemporary lithic traditions of the American continent: South American “Fishtail” points and North American Clovis assemblages. This may suggest that Central America was a zone of technological innovation where traditions merged. A preliminary analysis of available fluted points from Central America vs. North American Clovis points to an expansion of this techno-complex at least as far as Venezuela. Moreover, morphological similarities between Central American lanceolate points and Clovis collections from the U.S. South-Eastern/Gulf regions indicate that a set of cultural connections may have existed along a now submerged Late Pleistocene Atlantic coast.

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Gísladóttir, Guðrun Alda [167] see Woollett, James

Gjesfjeld, Erik (McDonald Institute for Archaeological Research), William Brown (University of Washington) and Ben Fitzhugh (University of Washington)

[83] *A Probabilistic Approach to Constructing Networks in the Kuril Islands*

One of the persisting challenges in archaeological network analysis is how to incorporate both temporal and spatial information into network models generated from the archaeological record. This paper tackles this issue by introducing a protocol that places probabilistic weights on potential network connections between archaeological sites, combining time-varying probabilities quantifying contemporaneous site occupation and space-dependent probabilities based on geographic distance. The construction of such network models will be illustrated using radiocarbon data from the Kuril Islands of Northeast Asia. Previous work in this region indicates episodic fluctuations in population density over time, with the breakdown of social networks likely playing a pivotal role in adaptive vulnerability and population decline. By creating a multivariate time series comprising thousands of fine-grained probabilistic networks, we examine long-term trends in network structure in the Kuril archipelago and interpret how these changes relate to demographic transitions. Ultimately, we argue that the data-driven, probabilistic approach to network construction we introduce will better prepare archaeologists to interpret network models across broad temporal scales.

Gjesfjeld, Erik [103] see Marwick, Ben

Glascock, Michael D. (University of Missouri)

[152] *Discussant*

Glascock, Michael D. [288] see Oliveira, Diogo

Glascock, Michael D. [9] see Wallis, Neill

Glass, Aaron (Bard Graduate Center) and Judith Berman (University of Victoria)

[206] *Reassembling The Social Organization: Uniting Museums, Archives, and Indigenous Knowledge around Franz Boas's 1897 Monograph*
Franz Boas's 1897 report, *The Social Organization and the Secret Societies of the Kwakiutl Indians*, was a landmark in anthropology for its integrative approach to museum collections, photographs, and sound recordings as well as text. However, both Boas and his Indigenous collaborator George Hunt remained dissatisfied with the published text, laboring for decades to correct and supplement it. They left behind a vast archive of materials related to the book's creation and afterlife that are now widely distributed across institutional, disciplinary, and international borders. This paper discusses a collaborative project to create an annotated critical edition of the work that unites published and unpublished materials with museum collections and with Kwakwaka'wakw knowledge in an interactive, multimedia website. Archival revelations about the truly co-authored nature of the original text allow us to better situate the contexts and methods of creating ethnographic knowledge in terms of the Indigenous ontologies it purports to represent. We are harnessing digital technologies to return sensory richness to Boas and Hunt's synthetic text, to reactivate disparate and long dormant museum collections, and to restore cultural patrimony to its Indigenous inheritors.

Glass, Sarah (National NAGPRA Program)

[322] *Discussant*

Glassow, Michael (Univ of Cal-Santa Barbara)

[38] *Seasonal Mobility Patterns During the Middle Holocene on Santa Cruz Island, California*

Data derived from oxygen isotope profiles of mussel shells suggest that sites in the interior of Santa Cruz Island dating between 4700 and 3400 cal BC, the period of the island's "red abalone middens," were occupied during the spring through early winter, with little or no occupation during the main winter months. In contrast, a small number of oxygen isotope profiles indicates that a large coastal site was occupied predominantly during the winter and possibly also the fall, with no occupation from late spring through early summer. Floral and faunal remains obtained from another large coastal site, as well as characteristics of its deposits, suggest occupation from late spring through early fall and possibly occupation during winter months. Although data are still scanty, small groups of island occupants appear to have occupied sites in the island's interior during the warm seasons of the year, when various plant food resources would have been available, and also aggregated at a coastal site for acquisition of marine resources. Aggregation also occurred at another coastal site during winter months not only for acquisition of marine resources but also for various social activities.

Glover, Jeffrey B. (Georgia State University), Dominique Rissolo (University of California, San Diego) and Daniel Leonard (HDR)

[162] *Sabanas and the Sea: The Yalahau's Ecological Niches and Preclassic Populations*

The Yalahau region of northern Quintana Roo, Mexico is one of the few regions in the Maya Lowlands where a robust Preclassic population was not followed by the emergence of Classic period polities. For that reason it is an important area when trying to understand the unique characteristics of the Preclassic period in the Northern Lowlands. The Yalahau region is defined physiographically by freshwater wetlands (sabanas), which stand in stark contrast the rest of the Northern Lowlands. These wetlands were utilized by Preclassic inhabitants of the region for agricultural purposes and helped support a dense Preclassic population. The wetlands are framed to the north by the Yalahau Lagoon and Holbox Island. Research by Proyecto Costa Escondida members have revealed the dynamic nature of the coastline during the Preclassic period and there seems to be a correlation between the changing nature of the coastline with the utility of the inland freshwater wetlands for the region's inhabitants. This paper brings together paleoenvironmental and archaeology research from the wetlands and the coast to investigate how these two ecological niches created opportunities for a Preclassic florescence in the region, while subsequently playing a significant role in the region's depopulation in the Early Classic.

[192] *Discussant*

[330] *Chair*

Glover, Jeffrey B. [330] see Ojeda Rodríguez, Elizabeth

Glover, Jeffrey B. [258] see Rissolo, Dominique

Glowacki, Donna [95] see Schleher, Kari

Glowacki, Donna (University of Notre Dame)

[226] *The Great Houses of the Mesa Verde Cuesta*

The Mesa Verde uplift has long been noted for its relative lack of great houses, notwithstanding its geographic position between Aztec and the Great Sage Plain. The notable exception has been Farview House, which has great house attributes, but not all regional archaeologists have agreed that it qualified as one. Yet, the Chaco period (950–1150 CE, also known as the Pueblo II period) was of the densest periods of occupation on the Mesa

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Verde uplift, which at that time also had a higher population density than elsewhere in the region. In Mesa Verde National Park, recent surveys that focused on reconsidering the social landscape of the Mesa Verde cuesta have produced re-configured village maps for the largest ancestral Pueblo villages with Chaco period occupations. This poster presents preliminary results that highlight five sites with great house or great house-like architecture in order to reassess the nature of Chaco on the Mesa Verde cuesta.

[226] *Chair*

Glowacki, Mary

[17] *Wari's Hallowed Ground: Interpreting the Mortuary Complex of Cotocotuyoc, Cuzco, Peru*

The Wari settlement of Huaro, located southeast of the Cuzco Valley in the Southern Highlands of Peru, contains a mortuary complex known as Cotocotuyoc. This towering plateau site, which overlooked the entire Huaro Wari settlement, was one of several urban components that made up a more than nine hectare Wari center, occupied for over 500 years. Excavations at Cotocotuyoc generated telling evidence for who built and occupied this settlement and how they were treated upon their deaths and in the afterlife. This presentation examines these data in order to shed light on the individuals interred at Cotocotuyoc and their potential roles as members of the greater Huaro Wari provincial node. Burial style and construction, individual age, sex, and health, and accompanying grave goods are described and discussed. It is argued that Cotocotuyoc served as both an early and late Wari cemetery, and as a place of ancestor worship with ties to the watery underworld and the mountain spirits or apus, as they are known today. Additionally, it is proposed that Cotocotuyoc was considered a hallowed burial ground for both the early founding societal elite and the last of the imperial community from the Valley.

Gnivecki, Perry and Mary Jane Berman (Department of Anthropology, Miami University)

[123] *Were the Lucayans a Creole Society?*

"Were the Lucayans a creole society?" Can creolization be inferred from Lucayan material culture during the Early and Late Lucayan Periods? Through the examination of ceramics and other remains, such as duhos and shell and stone artifacts, we will attempt to determine whether this was the case. Can Lucayan cultural expressions, unique to the Bahama archipelago, be viewed as byproducts of the processes of creolization, and if so, why?

Godden, Bianca [241] see Anderson, C. Broughton

Goebel, Ted (Texas A&M University) and Bryan Hockett (Bureau of Land Management)

[47] *Raw Material Procurement and Biface Production at Bonneville Estates Rockshelter, Nevada: A Long-Term Diachronic Approach*

During the decade-long excavations at Bonneville Estates Rockshelter, eastern Nevada, a well-stratified sequence of cultural components spanning from Paleoindian times to the late Archaic was documented. In this poster we present the results of a comprehensive analysis of the biface and bifacial point assemblage from the shelter, exploring temporal variability in raw-material procurement and selection, production, and use of this artifact class from 13,000 years ago to the late prehistoric period. These results are considered in the context of analyses of other materials recovered (e.g., faunal remains) to interpret long-term changes in the use Bonneville Estates by its prehistoric inhabitants, their subsistence and settlement organization, and relationships to environmental and climate change.

Goebel, Ted [155] see Pratt, Jordan

Goepfert, Nicolas [153] see Bermeo, Nicolas

Góes Neves, Eduardo [116] see Watling, Jennifer

Goff, Sheila

[138] *Exhibit Development through Partnerships with American Indian Tribes and Museums*

Decisions regarding the use of museum collections in exhibits that interpret the history and culture of American Indians have often been made by non-natives, without the input of the people the exhibits are about. History Colorado was recently presented with a situation that allowed the museum to do the opposite. The Ute Indian Museum is one of History Colorado's community properties and is one, if not the only, state-owned museum dedicated to an American Indian group—the Ute people. In 2013, the state provided funding to expand the 56-year old museum and challenged the museum to raise funding to completely renovate the exhibits. From the very beginning of the project, the three Ute tribes were active partners. This paper details the process agreed upon by the partners to complete the building expansion and new exhibits. Our collaboration has produced a vibrant, gathering place for Ute and non-Ute people alike, with exhibits that tell the past and contemporary stories of Ute people in their voices.

Gokee, Cameron

[210] *Multispectral Satellite Imagery for Mapping, Modeling, and Interpreting the Archaeological Landscape of Bandafassi, Senegal*

The Bandafassi Plateau of southeastern Senegal today defines a landscape in which ethnic identities (Bedik, Peul, and Malinke) appear to be grounded in "traditional" patterns of settlement and land use, and yet oral histories speak largely of movement at multiple scales—from the fission and fusion of villages, to the migrations of hunters and merchants, to the arrival of foreign invaders and colonial powers. Seeking to better chart the interplay between natural environment and social history across this region over the past two millennia, the Bandafassi Regional Archaeological Project (BRAP) has since 2013 begun to integrate survey and excavation data on past human activities with spatial analyses of the relations among sites and geographical features. This paper explores three applications of Landsat 8 OLI/TIRS satellite imagery within the BRAP research program: (1) mapping geomorphological features across the regional landscape; (2) developing a predictive model of site locations for future survey; and (3) interpreting how the physical landscape has historically enabled and constrained the social production of identity, including "traditional" ethnic boundaries, in southeastern Senegal. The paper concludes by raising methodological caveats and ethical concerns about the use of satellite imagery in the archaeology of Africa.

[160] *Discussant*

[210] *Chair*

Goldberg, Kelly (University of South Carolina)

[67] *Exploring the Material Culture of the 19th Century Slave Trade in Coastal Guinea*

As the British Navy patrolled the West African coast in an effort to enforce the cessation of the Atlantic Slave Trade beginning in the early nineteenth century, several American and European traders shifted their focus a slightly inland, establishing trading sites on the more visibly protected tidal branches of the Rio Pongo of coastal Guinea. This paper explores the material culture used and maintained by one of these establishments at the site of Gambia, considering how material consumption is affected by the political and social ramifications of the continuation of the slave trade in such secluded areas.

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Goldberg, Paul (Boston University)**[182]** *Soils, Sediments, Archaeology, Micromorphology, and Vance Holliday*

Soils are different from sediments. Many of these differences have been revealed by Vance Holliday during his career, through field work and numerous publications that have significantly influenced all disciplines. Nevertheless, there is a tendency to treat any soft stuff that is being excavated as "soil", and this confusion needs to be continuously corrected. Here, I present a number of examples of the use of archaeological micromorphology to highlight the distinctions between soils and sediments and show that sometimes, things that look like soils aren't really. I will use examples from sites in the US and the Old World to illustrate these points.

Goldberg, Paul [177] see Patania, Ilaria

Golden, Charles (Brandeis University), Alejandra Roche Recinos (Brown University) and Andrew Scherer (Brown University)**[109]** *Flows of Value, Debt, and Goods in the Usumacinta River Basin*

Scholars considering Classic period Maya economies have long viewed acquisition, production, and trade primarily through the dual lenses of tribute to royal courts and barter among the populace. Recent archaeological discoveries and theoretical models have broadened our perspective to allow the Classic Maya the marketplaces and market economies that were once believed to be innovations of Postclassic Mesoamerica. Yet, we still know little about notions of currency, value, and debt—well documented in cases like the Aztec Empire—that might make better sense of the currents that energized and kept moving the flow of goods from Highlands to Lowlands, and center to periphery, in Classic Maya kingdoms. In this paper we draw upon the archaeological data from urban and hinterland sites in the Piedras Negras and Yaxchilan kingdoms of the Western Maya lowlands to develop a framework model for understanding the relationship between the flow of value and debt, and the production and exchange of long-distance goods and local materials in the Usumacinta River Basin.

[163] *Chair*

Golden, Charles [163] see Scherer, Andrew

Goldhahn, Joakim (Linnaeus University)**[113]** *Towards an Archaeology of Prows—An Ontological Approach to Geoglyphs and Petroglyphs in the North European Bronze Age*

This paper will explore the relationship between animated boat prows in different stone media—petroglyphs and geoglyphs—from an ontological perspective. It explores chronological changes in these media and argues for both similarities and differences in how stones participated in unfolding peoples' life-worlds or worldings during the north European Bronze Age.

[113] *Chair*

Goldhahn, Joakim [113] see Nimura, Courtney

Goldstein, Lynne (Michigan State University)**[1]** *Discussant***Goldstein, Paul (UC San Diego)****[181]** *Walking in Tiwanaku Shoes: Small Things, Quotidian Cues and Tiwanaku Identities in Diaspora*

In the absence of living interlocutors for the Andean Tiwanaku state society (AD 500–1000), we ask how Tiwanaku peoples imagined and reproduced themselves as social beings. A conventional view poses that Tiwanaku civilization at its apogee was unified by common membership in, or allegiance or aspiration to, an elite political culture, as evidenced by a high culture of specialized craft production, elite ritual functions, and religio-political iconography. This paper instead applies practice theory to preserved quotidian items from Tiwanaku personal spaces, positing that Tiwanaku identities were also inscribed, and can be reliably read, in the material record of daily life. Quotidian Tiwanaku material culture represents the countless repetitive tasks that make up most of humans' days on earth—the "small things forgotten" that James Deetz described, considered through lenses of habitus, structuration and materiality. Utilitarian artifacts from recent household and mortuary excavations at the uniquely well-preserved town sites in Tiwanaku's lowland provinces are considered. We will walk in Tiwanaku people's shoes, both figuratively and literally, and consider the meaning of uniquely "Tiwanaku ways of doing" in everyday attire, instruments, toys, and agrarian, craft, culinary and household tools and tasks.

[207] *Discussant*

Goldstein, Paul [100] see Gay, Brandon

Goldstein, Steven (Max Planck Institute for the Science of Human History)**[198]** *Resilience Theory and Human-Environment Interactions during the Early Holocene at Lothagam-Lokam, Northern Kenya*

The pluvial conditions during the African Humid Period of the Early-to-Mid Holocene profoundly influenced environments across northern and eastern Africa, expanding lakes, rivers, and grassland ecologies. Archaeologists have often explained human responses to these increasingly aquatic environment as in terms of an increasing reliance on fisher-hunter-gatherer economies. Similarly, once the AHP ended, humans abandoned these lifeways. These perspectives are overly deterministic; in this paper, we approach this problem by adapting a Resilience Theory framework to examine a (type site?) case-site on the Lothagam-Lokam site near Lake Turkana, Kenya. New excavations at Lothagam-Lokam have uncovered a sequence of small-scale local environmental shifts with interstratified cultural horizons that spans the entire Holocene. We argue that people's decisions to intensify or re-organize their economic strategies shaped their options and cultural attitudes in responding to subsequent stresses when faced with small-scale environmental fluctuations around Turkana. The interconnected cultural and economic systems gradually assembled through multiple resilience cycles ultimately conditioned responses to more extreme events such as the 60 m drop in Turkana's lake level at the end of the AHP. Our application of Resilience Theory at Lokam provides a potential path forward for more nuanced discussions of human-environment interactions during the AHP.

[198] *Chair***Golitzko, Mark (University of Notre Dame), James Zimmer-Dauphinee (Vanderbilt University) and John Edward Terrell (Field Museum of Natural History)****[83]** *A Dagger to the Heart? Testing Assumptions of Archaeological Network Analysis with New Guinean Ethnographic Collections*

Progressive cultural and biological diversification and divergence over space and time is one of the grand meta-narratives of archaeological thought. Much of the method and theory employed in support of this narrative is arguably at odds with what Emirbayer and Goodwin label the "anti-categorical imperative" at the heart of social network relational thinking. Here we utilize spatial network models within the broader family of Exponential Random Graph Models (ERGMs) to examine the relationship between style and technology of ethnographic material culture from Papua New Guinea (decorated bone daggers), language, and a set of more or less plausible geographically patterned social network formations derived from ethnographic data and network theory. We argue that material cultural diversity, language patterning, and social network structure are inextricably linked, but may

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each be governed and shaped by differing processes and motivations. Our analysis of ethnographic material culture also lays bare some of the issues inherent in using archaeological material culture as a proxy for social network structure.

Gollup, Jasmine (TRC Environmental Corporation), Robert Wall (TRC Environmental Corporation), Patrick Walters (TRC Environmental Corporation) and Timothy Sara (TRC Environmental Corporation)

[22] *Cobble Reduction and Tool Manufacturing along the Atlantic Coastal Plain: An Example from Prince George's County, Maryland*
Cobble extraction and systematic lithic reduction activity areas are commonly found along the Atlantic coastal plain from the Early Archaic through Woodland periods. This process, typically involving the collection of high quality quartz and quartzite cobbles for processing, was documented 100 years ago by William Henry Holmes for the Piney Branch quarries in Washington, D.C. Excavations conducted by TRC at the Accokeek sand and gravel mine in 2014 identified 12 archaeological sites, two of which (18PR1079 and 18PR1081) were further examined through Phase II investigation in 2017. Excavations yielded large quantities of quartz and quartzite debitage and staged bifaces likely sourced from exposed cobble beds in an adjacent streambed. The sites represent intensive lithic reduction activity areas dating from the Early Archaic through the Early Woodland periods. The predominance of locally available raw material in the lithic assemblage indicates extraction of local raw materials and on-site cobble reduction and tool manufacturing. Several contemporaneous sites that also represent local raw material extraction areas and cobble reduction stations are located in the project area vicinity. Analysis of the lithic assemblage from this extraction site furthers our understanding of cobble reduction activity in a broader perspective of Atlantic coastal plain sites.

Goman, Michelle [84] see Kajankoski, Philip

Gomes, Ana (ICArEHB, University of Algarve), Brandon Zinsious (University of Connecticut, EUA), Mussa Raja (Eduardo Mondlane University, Maputo, Mozambique), Nuno Bicho (ICArEHB, University of Algarve, Portugal) and Jonathan Haws (University of Louisville, EUA)

[221] *Holocene Palaeoenvironmental Changes in Southeastern Mozambique: The Case of the Inhambane Bay*
Geoarchaeological surveys were conducted in 2016 and 2017 to better understand the environmental history and landscape evolution of the Inhambane coastal area, Southeastern Mozambique, aiming to know the environmental context of human occupation of the Tofo, Praia da Rocha and Chibuene archaeological sites. To reach this aim, 4 cores were collected in a mangrove area of the Inhambane estuary, an area both influenced by sea-level and climate changes. All the boreholes were georeferenced and the study area was overflown with a drone to collect photogrammetric data. Core samples were used for geochemical, texture and diatom analysis. Diatoms will be used as the main palaeontological proxy, because they are unicellular algae with a short-live cycle and largely sensible to environmental variables such as salinity, sediment texture and duration of the tidal inundation. Preliminary data on the cores sedimentological description (encompassing the last 4700 years), geochemical and diatom results are presented. These results are mainly showing changes due to the mangrove lateral progradation, which is probably responsible by an environment alternation between more and less hydrodynamic environments.

Gomez, Maria [142] see Pantoja, Luis

Gómez Mejía, Juliana [66] see Bongers, Jacob

Gómez Peña, Mónica [293] see Hsu, Teresa

Gonçalves, Célia [124] see Bicho, Nuno

Gongora, Claudia [142] see Pantoja, Luis

Gonlin, Nan (Bellevue College)

[142] *Discussant*

Gonzales, Alicia (Oregon State University), Jeffrey Blomster (George Washington University) and Ricardo Higelin Ponce de León (Indiana University)

[306] *Taphonomic Examination of the Skeletal Collection from Etlatongo, Mixteca Alta, Oaxaca*
Recent excavations at the Middle Formative (850—400 BCE) site of Etlatongo, in the Mixteca male bearing striking red stains on the anterior cranium. These findings may suggest alteration of remains associated with burial rituals. However, human remains may be modified through several post-mortem taphonomic effects, including: trauma, rodent activity, discoloring, staining, cultural modification, interment rituals, damage throughout archaeological investigation procedures, biological and environmental effects. Here we present a preliminary assessment of taphonomic variability among the Etlatongo sample, using a combination of quantitative and qualitative bioarchaeological methods to distinguish skeletal modification resulting from cultural practices vs. post-depositional alteration. We propose that from this sample there is high variability attributed to cultural modification and environmental factors. However, the state of decomposition and completeness of this collection makes distinguishing post-mortem practice indistinct in many cases.

Gonzalez, Edith (The Graduate Center CUNY)

[208] *There's Sugar in Them There Hills: Bio-prospecting in the 18th-Century Caribbean*
In an effort to discover the next big viable cash crop, the Codrington family of Antigua hired a botanist to implement a strategic introduction of species from the four corners of the British empire to Barbuda as an 18th-century living laboratory. This paper draws on historical documents to explore the dynamic and sometimes conflicting motives for agricultural experimentation—those of food security in times of drought or war versus finding the next “sugar.”

Gonzalez, Juan [89] see Skowronek, Russell

Gonzalez, Sara L. (University of Washington, Seattle)

[114] *Finding a Grand Ronde Way: Building Epistemological Bridges through Collaborative Field Practice*
In the language of self-determination, an indigenous archaeology is an expression of the sovereignty of a tribal nation to determine how its heritage will be cared for, now and into the future. Tribes, however, encounter several capacity-related challenges in developing tribally-specific heritage management plans. These challenges include the lack of funding for tribal historic preservation and repatriation, shortage of qualified staff, and, most significantly, operating within a heritage framework that was not designed with the needs or interests of tribes in mind. Given these significant challenges, how can an indigenous nation make archaeology work for and in accordance with tribal needs and values? Using the case study of Field Methods in Indigenous Archaeology, this paper evaluates how community-based research with the Confederated Tribes of Grand Ronde Community of

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Oregon contributes to a uniquely Grand Ronde way for doing archaeology. Preliminary outcomes from FMIA suggest that indigenizing archaeology not only transforms our discipline's relationship with and to indigenous communities, but builds our—archaeologists' and tribes'—collective capacity to care for and protect tribal heritage for future generations.

[60] *Discussant*

Gonzalez, Silvia (Liverpool John Moores University), David Huddart (Liverpool John Moores University), Isabel Israde Alcantara (Universidad Michoacana de San Nicolas de Hidalgo) and Gabriela Dominguez Vazquez (Universidad Michoacana de San Nicolas de Hidalgo)

[59] *Paleoindian Sites from Central Mexico: Paleoenvironment and Dating*

During the last 20 years we have studied systematically several important Paleoindian sites from Central Mexico doing detailed stratigraphic studies, paleoenvironmental reconstructions (pollen, diatoms, tephra studies) and radiocarbon dating. The sites include: Peñon Woman III skeleton, Santa Isabel Iztapan Mammoths with associated lithics, Tlapacoya Man Skull, Tocuila Mammoths, Tequixquiatic Late Pleistocene Fossils and Tepexpan Man Skeleton.

We present here a general model of strong environmental changes occurring during the Late Pleistocene-Early Holocene transition that affected human and megafaunal communities in this area. Together with the presence of large volcanic eruptions from Nevado de Toluca and Popocatepetl Volcanoes that produced important tephra markers in the Basin of Mexico. The earliest directly dated human, Peñon Woman III (Age: 10, 755 +/- 75 BP) is one of the most complete and well preserved Paleoindian skeletons from the Americas.

The Santa Isabel Iztapan Mammoths I and II were found together with lithics of Scottsbluff, Lerma and Angostura types and obsidian prismatic blades but not with Clovis type points normally associated with mammoth kill sites and butchering. The lithics were found in a layer after the Pumice with Andesite tephra layer (PWA) and they have an estimated date between 14,500 BP and 10,900 BP.

Gonzalez, Toni (University of California, Santa Barbara)

[157] *Chair*

Gonzales, Toni [157] see Waldo, Brian

González, Lissandra [55] see Valdes, Alejandro

Gonzalez Herrera, Ulises Miguel [323] see Chinique De Armas, Yadira

Gonzalez Lauck, Rebecca B.

[70] *State of Conservation of the La Venta Stone Sculpture Corpus*

The stone sculpture corpus originally found in La Venta is one of the most important collections of Olmec art in Mexico. It is currently exhibited in five different museums in Tabasco and Mexico City. The state of conservation of the almost 50 sculptures (whole and fragments) at the Parque Museo La Venta in Villahermosa are of particular interest because they have been exhibited in an open air museum for the last six decades. A summary of a recent and detailed study of the state of conservation of this corpus will be presented, as well as recommendations for its better presentation and conservation.

González López, Angel (UC Riverside)

[31] *The Imperial Stone Sculpture of Tenochtitlan: Changes and Organization*

The rise of the Aztec Mexica Empire is well represented in the archaeological record, especially through the wide spread evidence of stone sculptures in the main Precinct of the imperial capital. In less two hundred year of history, the island became the principal producer of these artifacts. Its workshops created not only numerically more pieces, but also monumental pieces and sculptures with complex iconography and new discourses. This paper will discuss the problem of using the term "Aztec" to describe this art style, which has resulted in the homogenization of diverse groups and factions in and around the basin. I will analyze the nature and direction of its change through time and across space, such as sculptures from Tula, Culhuacan, Azcapotzalco, and other urban centers inside the Basin of Mexico. Here, I will deal with iconographic changes to develop stages of time, as a methodological tool. Units of cultural similarities present in one specific area serves as a more useful way of organizing changes than the traditional periods of time in archaeological research. This shift will facilitate the organization of the profuse evidence of stone sculpture and analysis from a stylistic approach that also draws on contextual and calendric information.

González Venanzi, Lucio [7] see Castro, Juan

Good, Walker [332] see Walder, Heather

Goodale, Nathan [97] see Super, Clare

Goode, Charles, Cynthia V. Goode (Commonwealth Heritage Group, Inc.), Thomas J. Loebel (TJL Archaeological Consulting Services) and Daniel P. Wagner (Geo-Sci Consultants, LLC)

[328] *Subterranean Homesick Blues: Excavations at Site 51SE071, a Native American Settlement along the Anacostia River, Washington, D.C.*

Construction of DC Water's new Poplar Point Pump Station in southeast Washington, D.C., led to the discovery of a buried river terrace under an I-295 interchange that contained Native American artifacts dating from the Middle Archaic period through the Late Woodland period. Archaeologists working more than 15 feet below ground in the construction footprint of a large subterranean structure recovered more than 7000 artifacts and identified the remains of a cooking hearth feature. This paper will explain how the geoarchaeological investigation identified the site in this complex urban environment and will report the results of the excavations. Use-wear analysis performed on chipped stone tools has provided evidence about the types of activities that occurred at this location. This paper will also discuss how the investigation of this site contributes to more than 100 years of Native American archaeology along the Anacostia River.

Goode, Cynthia V. [328] see Goode, Charles

Goodman-Tchernov, Beverly [330] see Beddows, Patricia A.

Goodrich, Arabella (The College of Wooster) and Olivia Navarro-Farr (The College of Wooster)

[98] *Rooms in Rome: Production, Function, and Conservation of Ancient Roman Mosaics and Frescoes*

In this poster, we explore the production and conservation of mosaics and frescoes, examining their co-occurrence in high elite domestic spaces and how they reveal the varying function(s) of these spaces. Citing both archaeological examples from Villa Cotanello and Villa di San Cesareo, each about

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a day's journey from Rome, as well as museum collections, we emphasize the importance of conservation. Standard archaeological practice often consists of removing objects from in situ contexts and transferring them to a lab for further research. Unfortunately, in many cases, the objects are poorly stored and forgotten, leading to deterioration over time. We argue archaeological projects must prioritize proper storage to avoid deterioration and enhance conservation efforts. This will positively impact how projects approach delicate contexts while strengthening interpretation.

Goodwin, Graham (University of Nebraska-Lincoln), Heather Richards-Rissetto (University of Nebraska-Lincoln), Kristy Primeau (State University New York Albany) and David Witt (State University New York Buffalo)

[40] *Soundscapes and Visionscapes: Investigating Ancient Maya Cities with GIS and 3D Modeling*

Researchers have been applying Geographic Information Systems (GIS) to examine the roles of visibility and movement in archaeological landscapes around the world. However, few studies have investigated the role sound potentially played in structuring experience in ancient cities. To begin to fill this gap, this paper builds on our initial investigations to develop new geospatial and virtual reality (VR) methods to examine ancient acoustics. For the ancient Maya, sight and sound worked in concert to create synesthetic experiences that influenced daily life and shaped society. To explore this interaction, we apply a combination of GIS modeling: viewshed analysis, soundshed analysis, and an Urban Digital Elevation Model (Urban DEM) generated from airborne LiDAR and 3D modeling data. This approach provides an opportunity to perform computational analysis on a simulated ancient landscape rather than the contemporary landscape. We then take these GIS-derived computational data into a VR environment to combine sound and vision to illustrate the complementary roles of visual and auditory experience at ancient Copan.

Goodwin, Whitney (Southern Methodist University)

[299] *Ceramics Inside and Out: Food, Style, and Identity in Coastal Northeastern Honduras during the Selin Period (AD 300–1000)*

Prehispanic populations of northeastern Honduras were positioned at the border of Mesoamerica and Lower Central America. Previous research on ceramic style suggests local affiliation shifted over time from north to south as part of an adept strategy to navigate the complex political and social landscape of the region through the promotion of an inclusive group identity. This study explores the actual implementation of that strategy by investigating communal feasting contexts where symbolically significant ceramics were used and incorporates new information about local identity and affiliation through a complementary study of foodways. Tracing changes in these traditions over time elucidates the ways in which these materials were articulated in practice to create enduring symbols of identity. Recent findings from the 2016 field season of excavation at the Selin Farm site are presented and directions of future research in the Guaimoreto Lagoon area are outlined.

[299] *Chair*

Goodwin, Whitney [299] see Elvir, Wilmer

Goralski, Craig T. (Cypress College)

[107] *The Ethics and Practice of Forensic Archaeology, Unfunded Mandates, and the Unidentified*

In 2001, California passed SB 297, which mandated that coroners "shall collect samples for DNA testing from the remains of all unidentified persons and shall send those samples to the Department of Justice for DNA testing and inclusion in the DNA data bank." This legislation, which was largely unfunded by the state, expanded existing DNA testing programs to include remains from cold cases that were being stored by state agencies and remains that had been interred in cemeteries throughout the state. This paper will discuss the challenges of creating a prioritized list of individuals to be exhumed from a potter's field in San Bernardino, California, when various stakeholders approach questions of ethics and identity from different perspectives. The results of a multi-year project will be summarized, with attention given to how the realities of forensic fieldwork and early successes in identification contributed to reconsiderations of who could and should be included in this attempt to identify the unknown.

[62] *Discussant*

Goranson, Steve [39] see Myster, James

Gorden, Mary

[136] *Role of Rockshelters and Caves in Yokuts and Western Mono Cultures*

Yokuts and Western Mono tribes of central California had close cultural ties. While the Yokuts were the most numerous and the dominant culture, many people were bilingual. They shared themes in their pictographs, petroglyphs, and cupules, which are cultural traits of a ceremonial nature that are archaeologically identifiable, and are generally agreed to have magico-religious significance. Forty-one percent of the paintings in their territory occur in shallow caves and rockshelters, which vary in size. Size restricts the number of paintings, as well as the number of people viewing them. Some rock shelters can accommodate a dozen people, while others only one to two. Many sites include cupules and/or bedrock mortars, which suggest women's participation. The surroundings also vary. Many of the rockshelters and shallow caves are hidden, while others could have been viewed by the village, which suggests that there are public and private sites. This paper discusses the relationships between site size, surroundings, and contents. The physical similarities and differences of each site are compared within the tribal area, and across dialect borders. The performer's and audience's roles in the production of rock art, as well as, the purpose and beneficiaries of the performance will be addressed.

Gordon, Falcia and A. Brooke Persons (Office of Archaeological Research)

[63] *Recent Investigations at the 18th Century Fort Frederik Archaeological Site and Cemetery, St. Croix, US Virgin Islands*

In 2010, a tropical storm disturbed human remains and archaeological deposits at the Fort Frederik Archaeological Site, a multicomponent site consisting of dense 18th-19th century midden deposits associated with Fort Frederik, a two-story fortification (est. 1760) dating to the colonial development of St. Croix, then a part of the Danish West Indies. Subsequent investigations, including a geophysical survey, subsurface testing, and osteological analysis, have identified a cemetery within the site and clarified the chronological association of the disturbed remains. This presentation summarizes recent investigations, contributing to a broader understanding of the site, colonial St. Croix, and events associated with Emancipation.

Gore, Angela (Center for the Study of the First Americans, Texas A&M University)

[250] *The Lithic Landscape of the Nenana Valley: Investigating Land-Use and Toolstone Procurement Activities in Interior Alaska*

Investigating prehistoric landscape use is significant in answering questions about the adaptive strategies and behaviors of prehistoric Beringians. How can we define the lithic landscape? How did humans provision themselves in eastern Beringia, and how did these provisioning behaviors change through time? Toolstone procurement and selection behaviors influence toolkits, mobility, and settlement strategies; therefore, they are important in explaining prehistoric behavioral adaptation and the complexities of landscape use. We can begin to explore toolstone procurement in the Nenana Valley of central Alaska through geochemical sourcing studies. Portable x-ray fluorescence (pXRF) is a useful geochemical tool for characterizing non-obsidian volcanic materials (basalts, dacites and andesites). In an effort to define the lithic landscape in the Nenana Valley and explore hunter-gatherer land-use strategies, this paper presents results of a raw material survey conducted during the 2015–2017 field seasons aimed at mapping the distribution of knappable volcanic materials in the valley. It then compares results of geochemical (pXRF) analyses of artifacts from several Late

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Pleistocene and Holocene sites with both primary (outcrop) and secondary (alluvium) sources within the valley to understand and explore how local materials were utilized by prehistoric Alaskans in Eastern Beringia.

[250] *Chair*

Goring, Simon [221] see Gillreath-Brown, RPA, Andrew

Gorman, Alice [118] see Walsh, Justin

Gorman, Alicia (UC Santa Barbara), Laure Dussubieux (Integrative Research Center, Field Museum) and Patrick Ryan Williams (Department of Anthropology, Field Museum)

[265] *Results of a Pilot Study on Wari and Loro Ceramic Pigments from Southern Peru*

In this poster we summarize the results of a pilot study applying LA-ICP-MS analysis to the pigments of 50 Middle Horizon (AD 750–1000) ceramic sherds, with the goal of investigating shared ceramic technologies between people of the Wari and Loro cultures. The sample was taken from four sites: one local site in the Nasca region (Huaca del Loro), and three Wari sites, two located in the Nasca region (Pataraya and Pacheco) and one in the highlands (Jincamocco). INAA conducted on the same sherds has revealed a similarity in paste composition between Loro and Wari ceramics. This is particularly interesting as 1) this paste source may have had symbolic significance to the Nasca, and 2) the relationship between Wari and Loro peoples appears otherwise strained, though there are indications that the local Nasca culture received some deference from the Wari. In this study we ask whether Loro and Wari potters also shared pigment recipes, with implications for how extensively potters interacted, shared their technological practices (and possibly meanings), and how the Wari presence might have influenced Loro access to pigments. The answer to this question will in turn inform broader understandings regarding the interactions of these two groups.

Gosden, Chris [29] see Schulting, Rick

Gosner, Linda (University of Michigan)

[117] *Iberian Mines and Imperial Matters: Re-conceptualizing Labor, Technologies, and Communities of Practice in Roman Iberia*

The landscapes of the Iberian Peninsula were famous in antiquity for their richness in metals, and scholars have long claimed that these metals were a draw for colonial interest in the region from early on. This is especially true following the Roman conquest of Iberia in the late 3rd century BCE, when the scale of mining increased dramatically to accommodate the growing needs of the Roman empire. This was made possible through dramatic shifts in the organization of labor and the technological practices surrounding mining. Scholars often attribute these changes to Roman innovation, ignoring the long-term history of indigenous mining in many areas and the potential significance of local people in the successes of the industry. In this paper, I challenge this conventional interpretation and explore the diverse contributions of local people to the mining industry, from their knowledge of local resource distribution to their work as laborers in mining and subsidiary industries. I argue that Roman conquest transformed the everyday lives of local people, who in turn participated in the diverse communities of practice in Roman mining landscapes, contributing knowledge, skills, and resources that fueled an industry that was key to the creation of the Roman empire.

Goudge, Charlotte (University of Bristol)

[208] *"Do you think I am an automaton?": Post-emancipation Caribbean Factories and Social Industrialism*

Studies of industrial production have taken a prominent position within social theory. Social implications of factories and productive landscapes in the Caribbean have often been obscured by the socio-cultural palimpsest of plantation environments. Material culture studies of Caribbean factories, both structures and machinery, can be vital descriptors regarding enslaved and emancipated labour narratives. The connection between industrialisation, machinery, slavery, and manumission underlies major themes of the plantation organism. The industrialisation of the factory complex generated a newly habituated space and altered perceptions of workspaces from one of slavery and semi-artisanal, cottage-manufacture to constant mechanised motion, noise and 'free'-production. Using the term anthropomorphic-machinism to cover both the relationship of workers to technologies being manipulated, it is possible to characterise the effect of machinery on the organisms themselves (labourers). Despite their continued financial confinement, Abolition marked the 'freedom' of the labourer from the yolk of oppressive production. The introduction of industrialised steam machinery replaced the corporeal labour of the enslaved. The relationships developed between the labourer and the workplace is depicted within their interaction with procedure, machinery, technology and, eventually, the product. This paper will discuss the major themes displayed within archaeological processes and the material life of industrialised Caribbean factories.

[208] *Chair*

Gough, Stan [47] see Furlong, Julia

Gover, Carlton (University of Wyoming)

[241] *An Archaeological Perspective on Oral Traditions, Regarding Migration, of the Northern Caddoan Speaking Tribes*

Affiliating prehistoric archaeological sites with contemporary indigenous communities in American archaeology is often met with skepticism and criticism. As a means for overcoming the inherent criticism; I utilize the oral traditions, regarding migration, of the Northern Caddoan speaking tribes as a means to construct a relative chronology for which these populations moved across the landscape in prehistory. Then I compare the relative chronology with the archaeological record. By comparing site assemblages and settlement patterns of affiliated historic sites with archaeological sites in regions suggested as being prehistorically occupied by the Northern Caddoan speaking tribes. This research offers a means for corroborating the archaeological record with indigenous oral traditions regarding migration.

Goytia, Andrea [132] see Kim, Lynn

Gradante, Ilenia [130] see Tanasi, Davide

Graesch, Anthony (Connecticut College), Annette Davis, Sarah Harris, Andrew Prunk and Hector Salazar

[223] *An Experimental Archaeological and Digital Approach to Understanding the Manufacture of Slate Fishing Knives in Southwestern British Columbia*

Despite longstanding anthropological concerns with the origins of intensive delayed-return subsistence economies on the Northwest Coast, the use and production of slate fishing knives has received little attention. Owing to specific design attributes, thin slate fishing knives were critical to the necessarily efficient and rapid processing of tens of thousands of salmon in a span of only three or four months. Although anthropologists have a reasonably good understanding of how slate knives were used, there is a paucity of ethnographic and historical data addressing how these critical tools were made. This poster highlights experimental archaeological research addressing the stages, techniques, and organization of slate knife production with an eye toward understanding variability in the byproducts of knife-making activities. A key feature of our project is a companion study of the tool-making process using large-scale, digital, multimedia data gathering and analysis techniques. Digital video and digital photography are used to capture

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important information on how toolmakers change their bodily orientation to stage-specific crafting work, the tool-making implements they use, and the social interactions and discourses that mediate the work. We argue that these data are crucial to an understanding of the embodied, tactile, and otherwise sensorial experiences of tool production.

Graesch, Anthony [153] see Lane, Amanda

Graf, Kelly, Julie Esdale (CEMML-Colorado State University) and Ted Goebel (Texas A&M University)

[332] *2017 Excavations at McDonald Creek (FAI-2043), A Multicomponent, Open-Air Site in the Tanana Flats Training Area, Fort Wainwright, Central Alaska*

In 2013 our team began a 3-year testing project to assess the research potential of the recently-discovered McDonald Creek archaeological site (FAI-2043). The site is located in the Tanana Flats of Central Alaska south of Fairbanks. Site testing indicated a well-stratified and reasonably preserved multicomponent site situated in unconsolidated eolian sand and silt deposits atop an ancient alluvial landform. Three cultural components have been identified so far, dating to the early Allerød, Younger Dryas, and Middle Holocene intervals, respectively. Thousands of archaeological materials, including lithic debris and faunal and floral remains, associated with domestic features such as hearths and possible dwellings abound in the lower two components.

In June and July of 2017 we began large-scale block excavation of the site in an area where we found living floor debris during the testing phase of the project. We excavated 21 m² through the Younger Dryas-aged living floor. Here we report results from the 2017 field season as well as preliminary analyses of various material remains from work conducted to date.

Graf, Kelly [177] see Henry, Aureade

Graham, Anna (University of North Carolina at Chapel Hill)

[35] *New Insights from Old Wood: A Case Study from the Southeastern United States*

In the southeastern United States, as well as in North America more broadly, archaeological wood charcoal continues to be an underutilized data source. In this paper, I review previous North American studies and models of prehistoric fuelwood collection. I use these past studies to highlight how wood charcoal data might contribute new insights on the archaeological record. I also present findings from a recent analysis of wood charcoal from three sites in the North Carolina Piedmont. This new data is framed as a case study to demonstrate how such information can be put to use.

Graham, Elizabeth (Institute of Archaeology), Richard Macphail (University College London), Phillip Austin (University College London) and Lindsay Duncan (University College London)

[224] *Marco Gonzalez, Ambergris Caye, Belize—Evidence for Salt Production*

Investigations carried out at Marco Gonzalez, a Maya site on Ambergris Caye in Belize, were aimed at examining site formation processes, particularly the dynamics that led to dark surface and subsurface soils (Maya Dark Earths), which have a higher nutrient capacity than would be possible under natural conditions. Sediments of critical interest in soil formation were those deposited in the Late Classic period and associated with intensive processing. Features of the ceramics in the deposits as well as the coastal location led us to suspect salt processing. The evidence that resulted from soil micromorphological investigation of these deposits provided further supporting evidence in the identification of tidal flat muds, some of which adhered to the vessel interiors. The tidal flat sediments were likely collected to concentrate salt as brine, and the brine was then heated in the ceramic containers to drive off water and produce salt for shipment.

Graham, Russell, Dennis Stanford (Smithsonian Institute), E. James Dixon (University of New Mexico) and Thomas W. Stafford Jr. (Stafford Research)

[79] *Paleoecology of the Late Pleistocene Fauna from the Lamb Spring Site, Colorado*

The Lamb Spring site located in central Colorado is a late Quaternary locality with stratified Pleistocene and Holocene faunal remains. The late Pleistocene component is dominated by mammoth (*Mammuthus columbi*) but contains other grazing taxa like horse, bison, American camel, Harlan's ground sloth, etc. The general lack of microfauna from this horizon makes detailed paleoecological interpretations difficult. However, the megafauna point to a dominance of grassland with the possibility of scattered trees. This grassland/savannah environment and the Lamb Spring fauna are similar to other faunas throughout the plains region. It is similar structurally to the Arctic Steppe biome but it can be clearly differentiated from it by species composition. We suggest that the more "southern" environments of the central and southern Great Plains may have been a different super province, the Mammoth Grassland/Savanna.

Graham, Russell [77] see Foecke, Kimberly

Graham, Shawn (Carleton University) and Damien Huffer (University of Stockholm)

[118] *Machine Learning the Visual Rhetoric of the Trade in Human Remains*

There is a thriving online trade, and collector community, that seeks specimens of numerous categories of human remains. This commerce is facilitated by posts on new social media such as Instagram, Facebook, Etsy, and, until recently, eBay and operates within a complex ethical and legal landscape. This presentation will share key results of ongoing work to data mine these online markets on both new social media and multi-lingual e-commerce platforms. In particular, we are interested in the possibilities presented by machine learning and other ways to 'train' the machine to identify the illicit, the illegal, and the unethical. Can we design ethical archaeological machines? We will discuss the relevance of applying digital humanities tools, how to do so, key findings from previous research on the Instagram collecting community, and ongoing work expanding beyond Instagram. At the very least, we believe that machine learning does reveal important, otherwise hidden, aspects of the visual and textual rhetoric that underpins the sale, trade, auction (and sometimes forgery) of the dead.

Granados Vazquez, Geraldine (PhD student, Posgrado en Antropología Física, ENAH), Isabelle Ségué (Cultures et Environnements Préhistoire, Antiquité) and Lourdes Marquez (Escuela Nacional de Antropología e Historia)

[302] *The Risk of Dying in Ancient Societies. Vulnerability from a Bioarchaeological Approach, Theoretical-Methodological Model*

The goal of my research is to design a theoretical-methodological model to evaluate the vulnerability to death in past urban societies. Every human being is exposed to risk, but depending on the social and biological characteristics of individuals may be more or less susceptible to irreversible damage. The risk is a dynamic concept; thus, vulnerability may only be evaluated in terms of relative parameters. In this study, I will focus specifically on the risk of death in past urban societies in connection with the everyday life, using the archaeological contexts to create social variables. This theoretical and methodological model proposes four areas to assess vulnerability as follow: Demographic dynamics, Frailty, Inequality, and Embodiment. The first three areas are used to apply statistic model, while the fourth area, is based on qualitative analysis.

To test this theoretical and methodological model that I am proposing, I am applying this model of Vulnerability in a Mesoamerican sample, at Monte

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Alban city, the most ancient urban settlement in Mexico. Wherein, preliminary results already shows that the propensity of risk of death during the adulthood increased, in correlation with house size and location of the house.

Grant, Christopher (University of Chicago)

[190] *Perspectives from a Privy Past: Neighborhood and Race in Late Nineteenth-Century Creole New Orleans*

The Faubourg Tremé is often referred to as America's oldest African-American neighborhood and has been the site of significant social, cultural, and political developments in New Orleans for the past two hundred years. From the colonial period onward, the neighborhood fostered the growth of the city's Creole population and displayed a distinct cultural and demographic makeup unmatched in other parts of the American South. In recent decades, scholars have considered the Tremé as a rich site of cultural production, situating the history of the neighborhood within wider discussions of immigration, creolization and race. But as the twentieth century neared, the city's ancient population entered a period of diminishing social and economic prosperity—an era often subject to literary tropes of decay and decline. Privy finds from a household in the Tremé provide an alternative perspective—one that situates the neighborhood's residents in wider networks of urban and demographic change. This poster re-examines the historical and symbolic importance of the Tremé by close examination of a single late-nineteenth/early-twentieth-century privy. The privy deposits offer a hidden history of the neighborhood as well as renewed insight into the methodological value of the privy as a central resource in historical archaeology.

Grant, Madison (University of California, Santa Barbara) and Jacqueline Pittman (Rowan University)

[223] *An Experimental Approach to Fracture Variation Attributed to Weapon Morphology Using Replica Chankan Maces*

The use of stone weapons is prevalent throughout the history of the Chanka (C.E. 1050–1400), a civilization that inhabited the Apurímac region in Peru and once rivaled the great Incan Empire. Accordingly, the impact fractures such weapons create provide direct evidence to deciphering the deaths of these Andean warriors and their violent past. This project seeks to provide experimental evidence of fracture variation attributed to differences in weapon morphology, which can be compared to the blunt force trauma identified on recovered skulls. The study focuses on two distinct weapons frequently observed in the Chankan archaeological record: the star mace and the circular mace. The weapons were reconstructed in accurate weight and form from casts of authentic artifacts and will strike 10mm-thick casts of dental plaster, which mimic the frontal bone—a probable surface for impact damage in hand-to-hand combat. To achieve an accurate result, the experiment will consist of no less than 100 trials. Preliminary assessment suggests the star mace will result in the most fractures due to its several points, rolling across the frontal bone to create multiple areas of impact damage; however, the greater weight of the circular mace is expected to result in wounds of greater depth.

Grap, Rachel (University of Kentucky)

[238] *Landscape Scale Ground Penetrating Radar and Magnetometry at Tel Shimron, Jezreel Valley, Israel*

Situated in Israel's Jezreel Valley, Tel Shimron holds the remains of occupations from the Early Bronze Age through to the 20th century. It is one of the largest tels in the region, but had not been excavated before this summer. The Tel Shimron Excavation project aims to investigate tel stratigraphy and better understand regional dynamics with the Galilean Hills and the Mediterranean agricultural economy. We began in 2016 by conducting geophysical surveys over much of the tel to investigate the uppermost strata. Desiccated soils, modern constructions, steep terrain, and tall vegetation in many areas severely limited options for instrumentation and data collection strategies. Our choice to use ground penetrating radar and magnetometry over 6 hectares of the tel proved to be very successful. The combination of features identified in the geophysical data and recent excavations have revealed occupations from the Middle Bronze Age, Byzantine, Mamluk, and early 20th century. This poster illustrates these results and explores how features and stratigraphic layers are manifest in GPR and magnetometry data.

Grattan, John [4] see Jenkins, Emma

Grávalos, M. Elizabeth (University of Illinois at Chicago) and Emily Sharp (Arizona State University)

[211] *Enduring Traditions, Material Transformations: Understanding Wari State Influence in Highland Ancash, Peru*

Scholars have debated the nature of Wari state expansion during the Middle Horizon in north-central Peru for decades, suggesting both top-down imperialism and local resistance. While our paper does not aim to resolve this issue, we put previously reported datasets into conversation to examine both social change and cultural resilience in the Middle Horizon (MH). We draw on ceramic and mortuary evidence from the Callejón de Huaylas region of highland Ancash and identify the incorporation of a "Wari international identity" into local practices, embedded in previously developed Recuay (Early Intermediate Period) traditions. Specifically, we question the nature of Wari statecraft and extent of ideological influence by contextualizing changes in material culture within traditions and practices that endured during the MH. We end our discussion with an overview of findings from the 2017 excavation season at the Recuay site of Jecosh, situating results within a broader regional context. Jecosh offers an ideal case study to examine Wari presence in the region due to its strategic location along important trade routes. Although the Recuay kaolin ceramic tradition faded during the MH, certain cultural practices continued, suggesting resilience via syncretism and the development of new social and economic relationships with foreign groups.

Grave, Peter [175] see Heng, Piphah

Gravel-Miguel, Claudine (Arizona State University)

[83] *Taught or Copied? Using 2-Mode Network Visualization to Distinguish between the Two*

Traditional research on European Upper Paleolithic social networks rely on raw material sourcing as well as the distribution of similar "artistic" styles. This project aims to improve the methods of the latter. While similar representations found in different sites have often been assumed to represent the presence of social contacts between those sites, the possibility that such representations were exchanged or even simply copied without direct contact has always loomed over researchers' head. In this research, I use an experiment to evaluate the retention of motor habits in the production of different designs, and demonstrate the potential of using 2-mode analysis of design and technique when studying art to differentiate between copied and taught designs. I then apply this method to portable art objects of the Cantabrian Magdalenian to shed light on the social networks that may have taken place during that period. These networks are compared to the ones identified solely through design to demonstrate the importance of considering technique when looking at cultural transmission.

[234] *Discussant*

Graves, Devon [323] see Ciofalo, Andrew

Graves, William (Logan Simpson and University of Arizona) and Christopher Garraty (Logan Simpson)

[39] *A Prelude to Displacement: An Archaeological Reconstruction of Community History at San Pablo and Barrio del Hoyo in Tempe, Arizona*

Recent excavations on the Arizona State University Tempe campus provide a glimpse into the early 20th-century Mexican-American neighborhoods of San Pablo and Barrio del Hoyo. Located next to the original campus grounds, San Pablo and Barrio del Hoyo were residential and commercial hubs of

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early Tempe. After World War II, urban development and renewal efforts by the university and land developers targeted these two neighborhoods for campus expansion and displaced their residents, quickly destroying the neighborhoods with the construction of apartments, dormitories, and other university buildings. Domestic features excavated in these two neighborhoods show us that, in the decades preceding their destruction, both neighborhoods were thriving, with residents of a variety of different incomes who pursued various economic pursuits—not unlike the Euro-American neighborhoods of early Tempe. San Pablo and Barrio del Hoyo were not blighted or in need of renewal and the eventual fates of these neighborhoods reflected their status as minority communities within Tempe, a lack of political power, and structural racism. In this way, San Pablo and Barrio del Hoyo are similar to other examples of the destruction of Mexican-American communities in the West, such as Barrio Libre in Tucson and Chavez Ravine in Los Angeles.

Grayeyes, Willie (Utah Dine Bikeyeh)

[96] *Discussant*

Greaves, Russell (Peabody Museum, Harvard), Karen Kramer (Department of Anthropology, University of Utah) and Christopher Dore (College of Social and Behavioral Sciences, School)

[63] *Ethnoarchaeology of Water Resources in a Landscape without Rivers: Using Limestone Solution Cavities to Study Settlement and Subsistence Activities in a Yucatec Maya Community, Mexico*

Ethnoarchaeological investigations in the Yucatec Maya community of Xculoc recently included inventorying the location and uses of a range of small-large water sources. This karst landscape has no surface rivers, ponds, or lakes. Currently, the community uses a deep well at the former hacienda in this location. However, at least 60 years ago most families that coalesced into this village were distributed in relation to smaller reliable water sources near the current community location. Field research located the known water sources and their uses. These solution cavities in the limestone bedrock range from large and deep sources that contain water year-round fed by vadose water flow to small and ephemeral pockets that are seasonally filled by rainfall. All of the identified water sources (sartenejas, aguadas, and cenotes) are maintained and still used at least periodically for apiaries, incidental agricultural use, laundry washing, drinking water sources for groups working away from the village, and as locations to check for game during hunting trips. Our research addresses how these sartenejas and aguadas can be used to study past settlement in the region of Xculoc, as well as past and present economic activities.

Gredell, Erin

[322] *Discussant*

Green, Adam (University of Cambridge)

[121] *Introducing Urbanism, Technology, and Identity: Celebrating the Comparative Archaeology of Rita P. Wright*

In this talk, we introduce the papers of the session, which reflect the many threads of Rita P. Wright's contributions to archaeology. Prof. Wright has established a suite of concepts and critiques that generate a comparative framework that is not restricted to a single geographical area. In her early work on ceramic production and craft, Wright synthesized the anthropology of technology with the archaeology of the Indo-Iranian borderlands, laying the foundation for a technological approach that transformed the archaeology of South Asia. Her critical re-evaluation of early cities, states, and complex societies incorporated past people and groups previously omitted from investigation, bringing to the forefront the political and economic dimensions of households and other social entities. Her work also drove the archaeology of identity and gender, correcting traditional approaches that too often left humanity out of explanations of the past. She has also established a landscape approach that examines the social relations that connected the city of Harappa to its many surrounding settlements, she has revealed rural/urban interactions that drove the emergence and transformation of urbanism. The impact of these contributions is ongoing, and has set the agenda for a new generation of comparative archaeology.

[121] *Chair*

Green, Adam [121] see Petrie, Cameron

Green, Jennifer (University of Tennessee)

[111] *Evaluating Dietary Change: Adaptive Strategies within the Northern Everglades and Surrounding Areas*

Throughout the past several millennia South Florida has been subject to profound environmental changes. As such, by examining paleoenvironmental change on seasonal and climatic scales, we can further understand this unique environment and infer how it has shaped human and animal histories of the past. This work will be carried out by employing broad spectrum ecological theories which shall provide the necessary framework to understand past resource scheduling, seasonal mobility patterns, and fluidity of resource utilization by the paleo-inhabitants of the region. Inferences based on several sites across South Florida will illustrate the paleo-resiliency of the regional inhabitants to adapt to variable environmental change including fluctuations in water levels and vegetative communities. A broad regional framework analyzing zooarchaeological materials from sites within the Northern Everglades and surrounding areas will contribute to the knowledge-base of the area from the Late Archaic Period to the present. Accordingly, this research has implications for conservation biologists in understanding prehistoric human exploitation of white-tailed deer in Southwest Florida prior to significant anthropogenic changes over the past several hundred years.

[90] *Chair*

Green, Kirsten (University of Montana) and Meradeth Snow (University of Montana)

[338] *Title IX from a Researcher's Perspective*

No one expects to face any sort of harassment or discrimination and we can feel blindsided when something occurs that puts us, and/or our career, at risk. The question of 'what next?' can be daunting, especially in the face of choices that have massive repercussions personally and professionally. Frank discussion of the variety of ways to best maneuver a harassment situation, based on the literature and the experience of peers and colleagues, will be discussed. Additionally, how harassment and discrimination affects an individual's choices and career options in research and academia will also be touched on. There are options available to people who face Title IX violations—and while the decision on how to respond is up to the individual—the importance of being informed of the options and ideas allows for a clearer perspective of how one may proceed.

Green, William (Logan Museum of Anthropology, Beloit College), Steven DeVore (Midwest Archeological Center, National Park Service) and Adam Wiewel (Midwest Archeological Center, National Park Service)

[301] *Geophysical Survey and Remote Sensing at Gast Farm, Southeast Iowa: Hidden Mounds and Middle and Late Woodland Community Plans*

Gast Farm (13LA12), situated on a Mississippi River valley alluvial fan, has been a focus of interdisciplinary study since 1990. Surface collections and excavations documented two Woodland communities and one mound. The Weaver community (Late Woodland, ca. A.D. 400) was determined to have been a circular village with a central plaza, but details of the Havana community (Middle Woodland, ca. A.D. 100) and mound structure were not clear. Aerial imagery seemed to indicate the presence of geometric earthworks. Magnetic survey in 2016 confirmed the circular-plaza layout of the Weaver village and discovered that the Havana community was apparently organized as a ca. 130 x 110-m ring of domestic features surrounding a central

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plaza. This may be the first complete plan of a Havana village (as opposed to a hamlet) to be documented. The 2016 survey also found no evidence of geometric earthworks but discovered six additional mounds.

Greene, Janaka (Texas State University)

[127] *Investigating the Cody Complex at the Capshaw Site, a Late Paleoindian Site in Texas*

This paper presents the results of an investigation conducted at the Capshaw site, a lithic scatter site, located within the Southern High Plains region in the panhandle of Texas. The Southern High Plains region is well-known for its rich archaeological record of Paleoindian peoples, however the Cody period remains relatively poorly understood. The paper will first describe the history of the site from its discovery in 2013 through archaeological surveys with explorative field school excavations conducted in 2015. Magnetometry survey was conducted in 2017 as an attempt to locate buried cultural features. Further excavations were carried out later in the Fall of 2017. However, the focus of this paper is to present the results of the lithic and geoarchaeological analyses of the material from the Capshaw site in order to interpret whether Cody peoples used the site as a residential camp, a kill site, or a special activity site by comparing the assemblage to models derived from archaeology and ethnology. The Capshaw site represents a unique set of data which could help answer broader questions regarding Cody period settlement and social organization in the Plains region. Lastly, this paper also comments on the direction of future research about Cody peoples.

Greenfield, Haskel (University of Manitoba), Justin Lev-Tov (The Alexandria Archive Institute, San Francisco), Ann Killebrew (The Pennsylvania State University) and Annie Brown (University of Manitoba)

[90] *Sacrificing and Eating Dogs in the Ancient Eastern Mediterranean World*

In the late 1990s and early 2000s, Walter Klippel and his former student Lynn Snyder published finds of butchered dog bones from the Dark Age site of Kavousi in Crete. Other researchers, both before and after that published work, noted such finds elsewhere in Greece as well as in Cyprus, and dating to a wide range of post-Neolithic periods. Butchered dog bones are also known from several Philistine sites in Israel. Here, we consider present a detailed discussion of a butchered, apparently sacrificed, puppy found at the site of Tel Miqne-Ekron in Israel. Finds of disarticulated dog bones bearing butchery marks at Philistine sites in Israel has led, alongside the sacrificed puppy, to discussions regarding the significance of this practice, possible ethnic implications or connections with other regions in the eastern Mediterranean.

Greenlee, Diana [156] see Hargrave, Michael

Greenwald, Alexandra [65] see Shimada, Izumi

Greer, Matthew (Syracuse University)

[67] *Black Virginians and Locally Made Ceramics in the Shenandoah Valley*

One thing for which Virginia's Shenandoah Valley is known is its active antebellum ceramic industry. While predominantly German and Scots-Irish peoples colonized the region from the 1730's onward, it was the Germans who brought their potting traditions to the Valley. By 1745, German potters began to fill local needs for ceramics, a trade which grew in importance over the next century and a half. These vessels took on more than just utilitarian roles, as choosing to purchase locally made ceramics over imported wares allowed Valley residents to perform various ethnic, regional, and racial identities. As a result, researchers portray these pots as inherently White things, made by Germans for Germans (and their Scots-Irish neighbors). This does not hold up, however, when we add Black Virginians into the picture. From free Black potters and enslaved peoples who labored for White potters to enslaved consumers who bought local vessels for themselves, Black Virginians in the Valley regularly interacted with these ceramics. This paper explores the connections between Shenandoah Valley ceramics and free / enslaved peoples, allowing us to view these vessels in a new light—one which better reflects the region's diversity.

Gregory, Carrie J. [261] see Barnes, James

Greig, Karen (University of Otago)

[125] *Living on the Edge: Dogs and People in Early New Zealand*

New Zealand is situated on the southern margins of the Polynesian triangle in the Pacific Ocean. Its temperate climate and environment differs greatly from the tropical central East Polynesian islands, from where its first human colonists originated. Although possessing plentiful bird life, sea mammals and other marine taxa, people faced challenges adapting their tropical horticultural practices to this new land. This paper explores the changing fortunes of people and dogs during the settlement and occupation of New Zealand, and the extent to which early dog populations may reflect the economic success or otherwise of associated human communities.

Greiman, Nora [268] see Dempsey, Erin

Gremillion, Kristen [137] see Wales, Nathan

Griffith, Cameron S. (Texas Tech University)

[101] *3D Scanning the Virgin Mary in the Toast: Using Handheld Digital Imaging Technologies to Explode the Myth of Pareidolic Illusions in the Ancient Maya Underworld*

Cave archaeologists around the world are increasingly utilizing many new platforms and techniques to document subterranean artwork, including digital imaging and scanning technologies. In this presentation I demonstrate a portable and cost-effective approach to digital imaging of parietal art. To this end, I used an Occipital Structure Sensor 3D scanner, mounted on an iPhone 6, to document various monumental modified speleothem sculptures in the subterranean realm of the ancient Maya of Belize, Central America. In addition to comparing and contrasting the methodologies, results, costs, time, and logistics involved with this system to other popular scanning systems, I provide ideas suggestions for those who may be interested in carrying out similar initiatives in the future.

[101] *Chair*

Griffiths, Michael [213] see Buckley, Brendan

Grillo, Katherine [297] see Hildebrand, Elisabeth

Grimes, Vaughan [16] see Harris, Alison

Grimstead, Deanna [187] see Mendel, Catherine

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Grinnan, Nicole (Florida Public Archaeology Network)**[194]** *Discussant*

Grinnan, Nicole [78] see Scott-Ireton, Della

Grody, Evin and Darryl Wilkinson (University of Cambridge)**[259]** *Fleeced Landscapes: Colonial Herding Practices in Northern New Mexico*

Investigating how the presence and use of herded domesticates shaped life and the landscape in the Rio Grande gorge, this paper draws on a particular case study to explore the interactions between the endemic and the introduced within colonial herding practices. One strand of analysis will involve zooarchaeological and taphonomic data from colonial domestic contexts—predominantly based upon excavated midden deposits from selected sites in the Embudo Valley. This will be coupled with a consideration of archaeological survey data pertaining to herding encampments identified across the broader northern Rio Grande region. By combining both these distinctive, but complementary, lines of evidence we will offer a multi-scalar account of the impact of colonial modes of pastoralism within a New Mexican context. Themes to be examined will include changes in dietary practices within the home and village, patterns of labor and movement with respect to herding economies, and transformations in entire landscapes wrought via the large-scale introduction of new species of domesticates. Each of these themes will be brought together in order to think about the impact of colonial herding on the deep ecologies of the broader American Southwest.

Gronemeyer, Sven [142] see Eberl, Markus

Gronniger, Grace [326] see Janesko, Sarah

Grooms, Seth, Edward Henry (Washington University in St. Louis), Kelly Ervin (Washington University in St. Louis) and Tristram Kidder (Washington University in St. Louis)**[291]** *Beyond Good Grey Culture: Rethinking Early Woodland Origins in the Lower Mississippi Valley*

The origins of Early Woodland cultures have long been poorly understood, but recent data from sites in the Yazoo and Tensas basins, and from sites along the coast are providing new perspectives on the development of the Woodland tradition in the Lower Mississippi Valley. In this paper we summarize Steve Williams' contributions to understanding Woodland origins and update his work with new data. In contrast to earlier thinking, recent research shows that Woodland peoples in the Lower Mississippi Valley have complicated ancestries with multiple histories. These aren't monolithic Good Grey Cultures; instead, the Early Woodland is a period of dynamic change as vibrant populations adapted to novel environmental and social circumstances following the collapse of Poverty Point.

Gruber, Anya**[104]** *A Palynological Approach to Colonial Agro-Pastoral Activities at LA 20,000, New Mexico*

The local environment at LA 20,000 played a major role in influencing what kinds of activities could take place at the ranch built by Spanish colonizers in the 17th century. Palynological analysis is used here to understand how the environment changed over the course of the colonial era and, in turn, inform what types of activities were performed at the site. My research identifies and quantifies plant taxa using palynology in order to understand land use at LA 20,000, a 17th century rancho site in New Mexico, and asks how the local environment and natural resources offered opportunities as well as limitations to the people living on the land. A diachronic approach will characterize plant populations before and after the establishment of LA 20,000, while a synchronic approach focusing on the 17th century colonial period will assess pollen signatures from different activity areas around the site, including the house, barn, and corral, in order to understand the specifics of Pueblo and Spanish land use practices, such as field crop production and livestock management. Together, these approaches inform the relationship between Spanish colonialism and the creation of social identity through food production and consumption.

Gruntorad, Kelsey A. [187] see Tappan, Katie K.

Grunwald, Allison (Independent Researcher)**[204]** *Analysis of the Faunal Remains at the Arch Street Cemetery Site*

Prior to moving the burials within the First Baptist Church of Philadelphia cemetery to a new location in 1860, a local newspaper of the time documented that the neighboring tenement houses used the open space as a dumping ground. Artifacts recovered from this deposit include pottery sherds, pieces of glass bottles, leather shoe soles, metal objects, and the remains of shellfish and domesticated animals. Many of the animal bones show signs of butchery, indicating that the remains are from food waste. Oyster, clam, sheep (mutton and lamb), and cattle were consumed by these tenants, as well as medium and large fowl, likely chicken and turkey. The goal of this paper is to quantify and analyze the faunal remains and compare the data to what we know of contemporary nineteenth-century Delaware River Valley resident diets.

Gruver, Stephanie (Northern Illinois University)**[221]** *Mesodesma donacium as a Paleoclimatic Archive on the Coast of Peru*

Quebrada Jaguay is one of the earliest maritime settlements in the New World. The southern Peruvian coastal site was occupied from the Terminal Pleistocene to the Middle Holocene ~13 to 8 ka and demonstrates a society highly dependent upon marine resources. Archaeological deposits excavated in the 1990's and 2017 contained high volumes of marine faunal remains, predominantly the surf clam *Mesodesma donacium*, which accounts for 99% of the shell remains. *M. donacium* are used in this study to examine seasonality of occupation and paleoenvironmental conditions. Incremental stable oxygen isotope ratios from the calcium carbonate of the shells allow for sea surface temperature (SST) reconstruction from the onset of shell development until harvest.

Reconstructing SST from multiple shells allows for the development of monthly averages during site occupation. The final temperature sequence of each shell defines the season of harvest, which then informs on the seasonality of human occupation. Periods of environmental instability, such as El Niño events, are identifiable as significant deviation from the monthly SST averages. Paleoenvironmental reconstructions of Quebrada Jaguay provide insights on occupation patterns as well as how early inhabitants of Peru responded to environmental instability.

Gu, Haibin**[284]** *The Character of Carbonized Rice in Hunan Archaeological Site*

Based on the comprehensive analysis of grain shape and embryos of carbonized rice from archaeological sites, the author draws conclusions as follows:

- There is a difference in shape of spikelet base between cultivated rice and wild rice, but it is difficult to make comparable measurements. Therefore, it is possible to identify rice by using the characteristics of the spikelet base based on one's experience, but it is difficult to make comparisons between different researchers.
- According to my study, some wild characteristics still can be observed on the cultivated rice of the Qujialing Culture dated to 5000 years ago. This

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suggests that some changes of morphological characteristics may have lagged during the process of rice domestication.

c. Based on the results of discriminant analysis, the percentage of cultivated rice gradually increases :47%→67%→79%→92%. This pattern suggests that the morphological characteristics of rice changed gradually during the process of rice domestication. The origin of cultivated rice is therefore a long evolutionary process.

d. However, in the rice domestication process, the evolutionary speed of change differs for grain shape, awn, and embryo.

Gu, Muxin [43] see Buckley, Michael

Guagnin, Maria (FU Berlin & Max Planck Institute for the Science of Human History) and Angela Perri (Department of Archaeology, Durham University & Dep)

[212] *Dog-Assisted Hunting Strategies in the Early Holocene Rock Art of Saudi Arabia*

The UNESCO world heritage sites of Shuwaymis and Jubbah, in northwestern Saudi Arabia, are extremely rich in early Holocene rock art. Hunting scenes illustrate dog-assisted hunting strategies from the 7th and possibly the 8th millennium BC, predating the spread of pastoralism. The engravings represent the earliest evidence for dogs on the Arabian Peninsula. Though the depicted dogs are reminiscent of the modern Canaan dog, it is unclear if they were brought to the Arabian Peninsula from the Levant or represent an independent domestication of dogs from Arabian wolves.

A substantial dataset of 147 hunting scenes shows dogs partaking in a range of hunting strategies adapted to the environment and topography of each site. All depicted dogs appear to share the same phenotypic traits, and hunting scenes show up to 21 dogs in a single group. Particularly notable is the inclusion of leashes on some dogs, the earliest known evidence in prehistory. The leashing of dogs not only shows a high level of control over hunting dogs before the onset of the Neolithic, but also that some dogs performed different hunting tasks than others.

Gualdi, Emanuela [23] see Tafani, Aurelien

Guandique, Coralia [56] see Liu, Chin-hsin

Guarino, Michael [120] see Sellet, Frederic

Guderjan, Thomas (University of Texas at Tyler)

[173] *Albarradas, Solarés, and Classic Maya Land Tenure in Northwestern Belize*

The traditional, but yet poorly-defined, view of Classic Maya (AD 250–850) land tenure was that control was somehow vested in the royal and elite parts of society with “commoners” occupying land at royal pleasure. The exceptions to this pattern were known in “urban” cities such as Coba and Chunchucmil in the northern Yucatan and some coastal locations such as Playa del Carmen and Cozumel. However, the latter instances are commonly thought to date to the Postclassic period and were believed to be a departure from the Classic period pattern.

A LiDAR survey in 2016 of northwestern Belize revealed large blocks or groups of residences with boundary walls at the sites of Xnoha, Grey Fox and Blue Creek. Several hundred residential houselots have boundary walls enclosing areas of 1000–1500 square meters. The potential implication of this discovery is that Maya “commoners” had very different principles of land tenure than we understood and that they were more akin to our private ownership than we previously understood.

[173] *Chair*

Guderjan, Thomas [173] see Krause, Samantha

Gudiño, Alejandra [132] see Lippi, Ronald

Guedes, Carolina (Museum of Archaeology and Ethnology/USP)

[73] *The Rock-Art of Central-West Brazil: New Studies from Chapada dos Guimarães / MT*

A new project carried out in the region of the Rio Vermelho / São Lourenço river basin in the central-western region of Brazil started in 2016. This project focus on the studies of the initial stages of the establishment of the hunters gathers groups in this region. It is intended through excavations, surveys and research in rock art to show patterns of the peoples who inhabited that region. The first systematic field surveys within this project, entitled “Archeology in the Pantanal region” recorded a total of 12 rock-art sites. Here it will be presented the first systematic approaches in these sites, considering the character of the diversity of rock art in this region, still little explored.

Guengerich, Anna (Vanderbilt University)

[178] *The Messy East: Regional Models and Their Complications in the Chachapoyas Area of Peru*

The Chachapoyas area has long been considered an internally coherent archaeological and sociohistorical region, one of the few associated with the Eastern Andes. Recent research, however, reveals significant environmental and cultural diversity and calls into question whether “Chachapoyas” can meaningfully be understood as a single region. There is little evidence for any practices that both unified it internally while distinguishing it from others, and ongoing research at the site complex of Tambillo in comparison with other areas of Chachapoyas indicates that the most productive approach at this stage is to focus on characterizing social and cultural patterns at the local level. Determining how, or whether, higher-order sociocultural units were constituted at the regional level requires greater bodies of data than those currently available. In this situation, it is both analytically productive and potentially more accurate to understand all interactions as inter-regional, even among groups that were once considered to belong to the same “region.” Similar geographical and environmental conditions found in many parts of the Eastern Andes suggest that it is important to more broadly evaluate the importance of scale and landscape in characterizing inter-group interactions, and to reconsider models developed from coastal and highland contexts.

Guenter, Stanley [252] see Hansen, Richard

Guernsey, Julia (University Of Texas At Austin), Andrew D. Turner (Yale University Art Gallery) and Michael Love (California State University Northridge)

[264] *Feline Pedestal Sculptures, Cacao, and the Late Formative Landscape of Mesoamerica*

Pedestal sculptures featuring supernatural felines with cacao drupes projecting from their foreheads dotted the Late Formative landscape of the Pacific slope and adjacent Guatemalan Highlands. In this paper we consider the implications of the replication of this sculptural form, its role in articulating an elite agenda linked to the production of cacao, and its pertinence to sites of varying scale and relative regional authority. A similar suite of meanings

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engaged with cacao and supernatural characters persisted during the Classic period, especially in courtly circles. Yet the iconographic and social antecedents for these concepts emerged far earlier, likely between 500–300 BC. We explore the ways in which these Late Formative messages of elite authority, expressed metaphorically but laden with the economic implications of cacao production, proliferated across the physical landscape of Mesoamerica by the advent of the Late Formative period. We also consider what they tell us about the porous boundaries between cultivated and “wild” spaces and the ways in which they factored into elite rhetoric.

Guerra, America [15] see Drake, Stacy

Guerra, Rafael [28] see Collins, Renee

Guiducci, Dario (Université de Montréal)

[219] *A GIS Approach to Landscape Legibility and Its Role in Late Pleistocene Hominin Dispersals*

The large-scale colonization of unfamiliar environments by Late Pleistocene humans would have required advanced navigational abilities. Archaeological signatures of spatial cognition are difficult to identify in Prehistory, although the presence of well-dated sites can help us track human mobility across the landscape. In this research, we test whether structural properties of the environment played an important role in helping humans navigate new landscapes, providing affordances for wayfinding that enabled people to quickly assimilate and make sense of their surroundings. To this end, we model a key geographic concept: landscape legibility. We present the results of a multi-scalar spatial analysis of Proto and Early Aurignacian site distribution in Western Europe, testing whether landscape legibility was a key factor in conditioning where people settled.

[219] *Chair*

Guillem, Anaïs [130] see Lercari, Nicola

Guiry, Eric (University of British Columbia)

[125] *Archaeological Rat Diets Reflect Settlement Density: An Isotopic Investigation of Historical Rat Bones from Urban and Rural Sites in Upper Canada*

Over the past 1000 years, rats have spread out globally to become among the most ubiquitous and prolific pests in the world. While the global success of rats is largely owed to their ability to exploit human societies for food, shelter, and transportation, there has been relatively little research exploring rat behavior in urban contexts, where rat populations have been most successful. In this study, I use stable carbon and nitrogen isotope analyses of archaeological rat (*Rattus* sp., n=87) bone collagen from 10 nineteenth-century urban and rural sites around the historical city of York (now Toronto) in Upper Canada (now Ontario, Canada) to assess past rat diet and foraging behavior. Rat stable isotope values show significant differences in dietary composition and diversity between urban and rural sites. Results from analyses of rats are interpreted within a framework of isotopic data from domestic animals including cats, dogs, and raccoons to better understand how different anthropogenic habitats influence the urban ecology of rats. These findings highlight the potential for using isotopic analyses of archaeological fauna to explore ecological and commensal relationships between humans and animals in urban spaces through time.

Gunchinsuren, B. [24] see Ciolek-Torello, Richard

Gupta, Amita and Vinod Nautiyal (HNB Garhwal University, India)

[3] *Trans-Himalayan Material Culture of India: Special Reference to Steatite Bead*

Trans-Himalayan archaeology was always neglected by the historians and Archaeologist. But some recent excavations and my Ph.D. field work presented an interesting view of Trans-Himalayan culture. The burial culture of this region dated back to 600–200BCE. I found here the remains of Pyro-technological activities. Steatite bead was first time found in Trans-Himalaya. They are in size from 2 to 4 mm in diameter, 1to3 mm in height, and hole width is about 1 mm. The beads were examined by using SEM and XRD. XRD examines shown that the beads are prepared of enstatite, a Mg-bearing pyroxene, and cristobalite, a high-temperature polymorph of quartz, formed when quartz is heated at 900–1470 °C. Our primary results suggest that the beads were prepared by heating talc to a high heat. First a paste was made from milled talc, water and a binding material. The paste was then molded into elongated shape and heated at a high temperature. This firing process made the paste hardened and transformed the talc into enstatite and cristobalite. Lastly the shape was cut into the form of beads. I would like to present this work and also few other metallurgical activities which were also take place here.

[3] *Chair*

Guralnick, Rob [217] see Emery, Kitty

Gusick, Amy (Natural History Museum of Los Angeles)

[283] *Lessons from the Past: The Grand Human Journey to the New World*

Migration is a fundamental aspect of humanity and archaeologists have long been interested in studies of human mobility. Some archaeologists have taken a historical ecological approach to understanding human movement and how a deep history can inform on mobility in contemporary society. By leveraging knowledge from a variety of disciplines, these archaeologists have made great strides in our understanding of past human movement as it relates to postglacial human dispersals and climate change, a pertinent topic for today. The initial human migration into the New World is an early human dispersal that has become a focal point in mobility research that strives to understand the impacts that climactic change and shifting environments have on human's ability to successfully migrate and adapt to new lands. This presentation considers our current state of knowledge not only on how humans may have migrated into North and South America and adapted to their new surroundings, but also on what may have caused this initial migration to occur. Decades of interdisciplinary research, including more recent innovative projects, provide a wealth of data to consider how and why humans made the grand journey to the New World, and what this may mean for today's society.

Gustas, Robert (University of Victoria) and Kisha Supernant (University of Alberta)

[239] *Theoretical Frameworks for Modelling Late-Pleistocene Coastal Migration into the New World*

Spatial modeling of early prehistoric maritime movement on the Pacific Northwest Coast is important in contemporary archaeology because it can help locate new sites in a landscape which has radically changed over the last 20,000 years. Here we present the theoretical framework used in a research project which modeled maritime movement using least cost path analysis (LCP) to determine the routes most likely to have been traveled by the inhabitants of the Dundas Islands, British Columbia over the last 16,000 cal yr BP. Two cases studies are presented to illustrate how this framework which hybridizes elements of landscape and migration archaeology can be used to suggest maritime migration routes. The resulting movement paths were systemically analyzed and locations with high probabilities of use as movement corridors and stopping points were identified. This work is some of the first to apply LCP to seascapes and marine migration in North America and the results have the potential to lead to a better understanding of migration during the Late Pleistocene. Increasing our ability to predict the location of drowned sites on the Northwest Coast is an important step in furthering our understanding of this areas human history.

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Gutiérrez, Belkys [153] see Bermeo, Nicolas

Gutiérrez, Gerardo (University of Colorado at Boulder, Department of Anthropology) and Mary E. Pye

[136] *Were-Jaguars, Birdmen, and Community Performance in the Rain Petition Ceremonies in the Caves of the Upper Balsas River, Eastern Guerrero, Mexico*

In this paper, we address the role of leaders and their communities during the performance of ceremonies associated with rain petition in a network of caves located in the Mixtec-Tlapanec-Nahua region of Eastern Guerrero. We present newly discovered archaeological evidence in the caves of Pozo de Muerto, Casa de la Lluvia, Cauadzidziqui, Juxtlahuaca and Gobernadores de Techan, as well as ethnographic analogy to shed new light on the use of caves as arenas of ritual and political performance from the Archaic to the Postclassic periods.

[158] *Discussant*

Gutiérrez, Gerardo [248] see Hinojosa-Balino, Israel

Guzman, J. ((NAU) Northern Arizona University)

[38] *Mapping Prehistoric Behavior Patterns at a Lithic Tool Stone Source in the Colorado Desert: Results of Geospatial Analysis at CA-IMP-008/H*

This paper sets out results obtained following a Geographic Information Systems (GIS) analysis of the spatial patterning of stone tools at a study area in the Colorado Desert of southern California. Stone tools are examined based on their utility for an explanation of their use and importance in the lives of prehistoric foragers. Current efforts to understand the prehistory of the region is undertaken, mostly, by environmental consultants in the private sector of archaeology as part of a formal [legal] obligation prior to large land development in the form of green energy projects. The results of such analyses seldom make it to the public as published material. This study employs an academic lens to extrapolate qualitative information from quantitative data from previously unpublished cultural resources management (CRM) investigations in the region. The application of optimal foraging theory, to this study, allows for the examination of human and environmental factors and constraints facilitating predictions and interpretations of prehistoric forager behaviors and their occurrence and frequency in the archaeological record at the study area.

Guzmán, Paulina [293] see Ruvalcaba, Jose Luis

Gyucha, Attila (The Field Museum of Natural History)

[245] *Blending Traditions: A History of Collaborative Prehistoric Research in the Carpathian Basin*

The past two decades have seen a remarkable increase in the number of joint prehistoric archaeological research programs of US and local scholars in Eastern Europe. These collaborative projects are featured by the innovative blend of profoundly different theoretical and methodological traditions. In our introductory paper to the session, with a focus on the Carpathian Basin, we illustrate similarities and differences in North American and Eastern European perspectives and approaches to explore the archaeological past, provide an overview of collaborative research projects in the later 20th century, and address how these projects have facilitated in understanding specific, major anthropological questions. Finally, we discuss how these investigations have impacted US and local anthropological scholarship and paradigms from a broader perspective.

[245] *Chair*

Gyucha, Attila [245] see Parkinson, William

Haakanson, Sven

[277] *Discussant*

Haas, Jennifer

[235] *Discussant*

Haas, Randy (University of California Davis), Todd Surovell (University of Wyoming) and Matthew O'Brien (California State University Chico)

[124] *Behavior from Spatial Structure in Archaeological Sites: A Working Model Based on Dukha Ethnography*

Archaeologists commonly observe clear qualitative structure in the spatial distribution of artifacts deposited in archaeological sites. Quantification and interpretation of such structure remains a major challenge. Drawing on multiple field seasons of observation among the Dukha—residentially mobile reindeer herders of the Mongolian Taiga—we present a likelihood based method for quantifying site-level structure in the use of space. This ideal ethnographic case in which behavior-structure relationships are well defined, allows us to explore the extent to which behavioral inferences may be derived from archaeological structure. Behaviors of particular interest here include general activity types and seasonality of occupation.

Haas, Randy [124] see O'Brien, Matthew

Haber, Noah [12] see Ramsay, Jennifer

Habicht-Mauche, Judith (UC-Santa Cruz)

[291] *Viewing Ceramic "Types," "Varieties," and "Modes" from a Practice-Based Perspective: Case Studies from the Greater Southwest*

As a student of Jimmy Griffin and Irving Rouse, much of Stephen Williams' early archaeological research involved the typological analysis of pottery collections from the American Southeast to reconstruct regional culture history. Later, as Director of the Peabody Museum, he played an important role in facilitating the development of a new generation of archaeological and materials science approaches to pottery analysis at Harvard with the construction of the Putnam Laboratory. This paper uses current ceramic materials analysis techniques and case studies from the Rio Grande and Casas Grandes regions of the Greater Southwest to explore how mid-century taxonomic units, such as "type," "variety," and "mode," can have continuing usefulness as conceptual frameworks for understanding pottery technology and production sequences as socially learned and culturally embedded practice. We reconstruct these shared communities of knowledge and practice at varying local, regional, and inter-regional scales and discuss how these practices inform our archaeological perception of standard cultural historical typological categories.

[259] *Discussant*

[291] *Chair*

Habicht-Mauche, Judith [104] see Huerta, Danielle

Habu, Junko (University of California Berkeley)

[1] *Discussant*

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Hackenberger, Steven (Central Washington University) and Lourdes Henebry-DeLeon (Central Washington University)**[253]** *Paleoarchaic Cultural Affiliations on the Columbia Plateau*

Two decades of mortuary and bioarchaeology studies have built evidence for determinations of cultural affiliation for human remains and artifacts associated with the Paleoarchaic and Early Middle Archaic periods. Background studies (under NAGPRA: Kennewick by 2000 and Marmes in 2004, 2010, and 2012) outline major lines of evidence for determining probable affiliation. Sufficient and necessary evidence are subjects of healthy debate. Diversity in burial practices and artifacts unites more than divides Columbia Plateau communities from early times. Patterns in the locality and stages of mortuary practice (including cremation), combined with shell and ochre grave goods, strengthen models of dynamic social networks. Traditionalists and scientists are reconciling the personal identities of early ancestors. Their identities are complex and can include their status as elders and survivors, as well as their roles as individuals and explorers. Bioarchaeological studies (DNA, isotopes and trace elements), supported by Native Americans, will no doubt refine models of interaction spheres inside and outside of the Columbia Plateau. Advances in these analyses help better explain the interactions of culture and environment in shaping populations and personal life histories. Therefore, such studies will contribute to fuller understanding of the compelling identities of individuals we commemorate.

Hadden, Carla (Center for Applied Isotope Studies, UGA), Margo Schwadron (National Park Service Southeast Archeological Cent), Alexandra Parsons (National Park Service Southeast Archeological Cent) and Taesoo Jung (Georgia Museum of Natural History, UGA)**[217]** *Paleoecology, Paleoclimate, and Paleoecology at the Turner River Mound Complex, Everglades National Park*

The Turner River Mound Complex is an intensively modified landscape consisting of numerous shell mounds and other shell work features such as ridges, walkways, canals and ponds. Located in the Ten Thousand Islands region of Everglades National Park, a subtropical mangrove estuary, the complex is an unusual example of the prehistoric tradition of shell-built architecture in Southwest Florida. In this project we combine traditional zooarchaeological analyses, stable isotope sclerochronology, and direct dating of faunal remains to address two key questions: (1) What was the paleoenvironmental setting at the time settlement began, and when and why was it abandoned? And (2) is there evidence of sea-level or paleoclimatological change associated with site abandonment? Vertebrate and invertebrate faunal remains indicate a resilient resource base, consisting of animals that were well-suited to dynamic coastal environs, such as oysters and sea catfish. Preliminary data indicate that accumulation of domestic refuse began ca. AD 220–570 and ended ca. AD 690–1000, and that some vertical mixing has occurred within the 110-cm stratigraphic column. Oxygen isotope sclerochronology on modern and archaeological oysters indicate changes in climatological and hydrological conditions at the Turner River locale over time, potentially related to changes in sea level and/or precipitation.

Hadden, Carla [111] see Hawthorne, Paige

Hadi Curti, Giorgio [72] see Dongoske, Kurt E.

Hadick, Kacey**[130]** *Archaeological Storytelling: Narrative Construction Using Virtual Reality*

Virtual reality (VR) is an exciting new medium for interactive storytelling and holds great promise as a way to raise awareness of heritage sites and the conservation challenges they face. VR can also be used as a way to provide virtual access to parts of an archaeological site that may be too sensitive for traditional tourism activities. In 2017, CyArk developed three virtual reality experiences of geographically diverse archaeological sites around the world that are being adversely impacted by climate change. The application includes Mesa Verde National Park in the American Southwest, the archaeological complex of Chavin de Huantar in the Peruvian highlands and the historic Ayutthaya in Thailand. The application will be available via mobile device on the Samsung Gear VR and the Oculus Rift virtual reality platforms. Each experience will combine 360 degree video interviews with scientific experts, dynamic audio interviews with site managers, digitized objects from several museum collections as well as fully navigable virtual environments of the archaeological sites. Brought together in VR the diverse multimedia contribute to a richer narrative. CyArk will show example content from the experience and will share the results of the public launch.

Hadley, Dawn (University of Sheffield)**[87]** *Chair***Hagerman, Kiri (UCSD)****[25]** *Changing Representations of Gender in Ceramic Figurines during the Emergence of the Teotihuacan State*

This paper investigates transformations in the construction and expression of gender in the Basin of Mexico from the late Middle Formative through Classic periods (approx. 600 BC- AD 600). Ceramic figurines from the sites of Teotihuacan, Axotlan, Cerro Portezuelo, and Huixtoco are used to explore how elements of gender were constructed and communicated in the region over the course of a millennium, and how these practices underwent a radical transformation during the emergence and expansion of the Teotihuacan state. The selection and combination of sexual attributes and decorative elements such as clothing and jewelry were changeable strategies for depicting social identity. In contrast to earlier methods for depicting feminine and masculine bodies, Teotihuacan period figurines emphasized decorative cultural attributes over physical ones—a strategy that quickly spread to rural communities in the region. The most striking transformation occurred in representations of women, which were nude and commonplace during the Formative periods, but became fully clothed and scarce during the Classic period, when the Teotihuacan state was at its height and Basin of Mexico society was increasingly socially stratified.

Hagopian, Janet [164] see Roberts, Heidi

Haile, James [212] see Larson, Greger

Haines, Julia (University of Virginia)**[308]** *The Archaeology of Mauritian Indentured Labor: Social Life and Death*

This paper provides a comparative case study for archaeological studies of slavery and indenture. I investigate the 19th century landscape and material culture of indentured laborers on the Bras d'Eau sugar estate in northeastern Mauritius, Indian Ocean. After emancipation, indentured laborers lived and worked within the same physical plantation landscapes as the enslaved individuals who came before them. However, Asian indentured laborers in Mauritius were immigrants and migrants: one-third returned to their homeland at the end of their five-year contracts and the other two-thirds remained on the island and eventually became the demographic majority. In spite of the relatively shallow period of occupation in Bras d'Eau, indentured laborers left a material imprint on the landscape. Mapping and excavations of industrial building, laborers' barracks, houses, and courtyards revealed possible Southeast Asian roots in the spatial organization of the living quarter and artifacts of mixed Asian, Indian and European origins. To better understand this particular context of unfree labor, I bring Patterson's conception of "slavery as social death" into conversation with literatures on transnational identities and migrations. These two theoretical perspectives frame indentured laborers' material practices as the processes of social life that emerge out of processes of social death.

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Halcrow, Sian (University of Otago, New Zealand)[87] *Discussant*[87] *Chair*

Halcrow, Sian [87] see King, Charlotte

Hale, Micah (Dudek), Adam Giacinto (Dudek) and Nicholas Hanten (UC Davis)[225] *Micro Currencies Can Rapidly Appear Among Energy Maximizers: A Case Study from the Southern Sierra Nevada Foothills*

A recent, large-scale archaeological investigation in the southern Sierra Nevada foothills revealed the development of a locally circumscribed steatite bead-making industry. Made from a local steatite source, these rough, thin, square beads are accompanied by the entire range of production debris and bead making tools, collectively dating to the post-Mission historic period. I argue these steatite beads represent a micro-currency developed as an energy maximizing response to decreased availability of California's shell bead money.

Haley, Brian [265] see Lopez, Kirsten

Halford, F. Kirk (BLM, Idaho Deputy Preservation Officer/State Archaeologist)[261] *Getting out of the Box: New Horizons for Cultural Resources Data Management and Analyses*

Following the 50th anniversary of the National Historic Preservation Act of 1966 (NHPA), we are compelled to take both a retrospective and introspective view of the NHPA, and in particular the implementation of Section 106. Though making great strides, Section 106, the primary driver of Cultural Resource Management (CRM), is still boxed in by rote inventory and unimaginative interpretation and implementation. This paper will suggest ways we can break out of the box through better data management and analytical application. We'll review a national initiative by BLM to create cultural heritage resource data standards and the importance of applying more rigorous data management principles to landscape level planning and data modeling, facilitating proactive versus reactive resource assessments and the development of appropriate treatments of cultural heritage values.

Hall, Amanda (University of Florida)[81] *Uncovering the Mystery of the Lamar-like Clay Objects*

For decades, stamped and plain clay objects recovered from post-contact Native American sites between the 1950s and 1990s in the Florida panhandle have puzzled researchers. The objects are believed to have been produced by the Apalachee Indians living in the region. However, little is known about the techniques used to manufacture them or what purpose they served. These artifacts are generally referred to as Lamar clay balls owing to some having stamped patterns similar to Lamar-like stamped pottery associated with the Apalachee missions culture. The objects are unique in the sense that they do not resemble other types of baked clay objects found in the Southeast. A recent analysis of over 300 Lamar-like objects recovered from eight different sites, combined with archival and ethnographic data, has provided information regarding their manufacturing and possible function. The results of analyses are presented in this paper.

Hall, Sarah (Arizona State University), Eric Bartelink (California State University, Chico) and Julia Prince-Buitenhuys (University of Notre Dame)[179] *Dietary Variation at Point San Jose, San Francisco: Stable Isotope Evidence from a Late 19th Century Medical Waste Pit*

This study used stable carbon and nitrogen isotope analysis to evaluate dietary variation among 30 adult individuals from a commingled assemblage recovered at Point San Jose (now Fort Mason), California (1863–1903). These remains comprise mostly middle-aged adults, both male and female, and two or more ancestral groups. The assemblage was recovered from a medical waste pit with evidence of anatomical dissection, suggesting that these individuals were likely of low socioeconomic status. Right tali (MNI=22) and eight skulls, a total sample of 30, were sampled for isotopic analysis.

Stable isotope data from the Point San Jose (PSJ) sample were compared to two other contemporaneous samples: the Santa Clara Valley Medical Center (SCVMC) cemetery sample in California and a multi-regional, North American sample. Analyses suggested that PSJ $\delta^{13}\text{C}$ collagen values were distinct from all groups except SCVMC, while $\delta^{15}\text{N}$ values were notably different from all groups except SCVMC and the southern U.S. sample. Bone apatite carbon values further contextualized these results. Despite diverse ancestries and different burial contexts, this study tentatively suggested that Bay Area Californians of low socioeconomic status shared a similar diet during this period.

Hall, Tegan [175] see Penny, Dan

Haller Von Hallerstein, Sophia (Institute for Archaeological Sciences, Paleoanthropology, Universität Tübingen), Dorothee Drucker (Paleobiology, University of Tuebingen, Germany) and Kurt Rademaker (Northern Illinois University, USA)[2] *Multi-isotopic Paleo-diet Reconstruction in a High Altitude Rockshelter of Southern Peru*

Expanding on a previous report, we expand the results of the analysis of stable carbon, nitrogen, and sulfur isotope analyses from collagen of three Early and two Late-Middle Holocene adult human burials with coeval fauna remains of Cuncaicha rock shelter in the Peruvian Puna. We also reconstruct important aspects of the ecology of the Pucuncho Basin, in which Cuncaicha is located, using new and published isotopic values of archaeological and modern fauna and plants. Sulfur isotope values indicate a distinct local geochemical signal, and contribute to the development of models for the interpretation of paleo-diet. Nitrogen and carbon isotope values show a human consumption of protein from local highland animals and plant, adding to our understanding of human behavior in extremely challenging environments. We address issues of aridity and altitude in isotope signals, and chronological variation in productivity and foraging. As one of the oldest archaeological sites in South America for which stable isotope data are available, the apparent prolonged occupation of the Pucuncho Basin is important for understanding early forager settlement strategies and resource exploitation in puna ecosystems, and thus for the onset of adaptations to high altitude.

Halligan, Jessi (Florida State University)[244] *Terminal Pleistocene Climate Change and Shifting Paleoindian Landscapes in North Florida*

Much of the Southeastern United States suffers from poor organic preservation. Direct dating of archaeological components is often impossible, and intact paleoenvironmental sequences are very rare, especially for the terminal Pleistocene. Inundated terrestrial sites in the Aucilla River of northwestern Florida can overcome both of these difficulties, with archaeological materials buried within directly-dateable intact strata containing well-preserved paleobotanical and faunal remains. Strata from different inundated sites can be correlated regionally by soil development and radiocarbon dates. These sites can provide high-resolution and in-depth multi-proxy records for environmental changes occurring during the terminal Pleistocene and early Holocene (ca. 18,000–7500 cal BP). Because these paleoenvironmental data are also associated with cultural materials, these records can also shed light on Paleoindian and Early Archaic lifeways.

[102] *Chair*

Halligan, Jessi [78] see Waters, Michael

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Halling, Christine (Louisiana Department of Justice) and Ryan Seidemann (Louisiana Department of Justice)**[107]** *Following the Storm: Ethical Considerations for Historic Cemetery Disruptions after Natural Disasters*

Louisiana is known for its historic and iconic cemeteries which feature above ground monuments, vaults, and tombs. However, equal numbers of cemeteries are in-ground, and are often lost or forgotten. Due to the accessibility of the above-ground cemeteries, these spaces make for easy targets of vandalism, are used for religious worship, impede construction efforts, and become impacted by natural disasters. The in-ground cemeteries are often encountered in urban development and during disaster reconstruction. Each of these scenarios present ethical conundrums when planning archaeological responses. For example, when do religious practices venture too far and become vandalism? When should urban development become more important than the history and protection of the dead? When a disaster requires months of effort, how are recovery efforts and cemetery preservation balanced? Working in Louisiana's historic cemeteries presents a unique sphere where interaction with the dead and living communities is intertwined so deeply, they cannot be separated. This presentation addresses that situation, following the recent natural disasters so often encountered in Louisiana; and how ethical considerations and the affected communities succeed when both groups align with intended action.

Halmhofer, Stephanie**[14]** *The Blown Glass Beads of Garden Bay, British Columbia*

In May 2015, a disturbed burial was uncovered in Garden Bay, British Columbia, within close proximity to the large shíshálh village site of Sexwamin (DjSa-3). Found in association with the burial were 244 intact smooth, unadorned mold-blown (SUMB) glass beads and 40 SUMB glass bead fragments. Due to their extremely fragile nature, blown glass beads are rare in archaeological contexts and the beads from Garden Bay are from one of only five sites in North America where SUMB glass beads have been found. The beads from Sexwamin are: 1) the first of their kind found in British Columbia, 2) first of their kind reported in Canada, 3) the first of their kind found in a mortuary context, and 4) the largest collection from the five North American sites. These beads were likely manufactured during the late 19th century in the western region of the Czech Republic formerly known as Bohemia, which by this time had become the world-leader in blown-glass bead manufacture and exportation. This presentation will discuss this unique style of glass bead and what they might begin to tell us about Sexwamin.

[313] *Chair***Halperin, Christina (Université de Montréal), Jean-Baptiste Le Moine (Université de Montréal) and Enrique Perez Zambrano (Universidad de San Carlos)****[230]** *Infrastructures of Moving Water at a Terminal Classic Maya Site in Petén, Guatemala*

What are the temporal dynamics of water infrastructures? Recent research at the Maya site of Ucanal in Petén, Guatemala, has identified several water management features, such as canals, dams, baffles, and roads, many of which drain water away from the site core and towards a nearby river, the Río Mopan. The heavy focus on water drainage rather than water storage is seemingly incongruous with paleoclimate data, which reveal evidence of droughts during the height of the site's occupation. This paper considers the historical context of waterways at the site from different temporal scales: the *longue durée* in which infrastructure construction is placed within a broad temporal framework of the site's development and paleoclimate data, the temporal fluctuations of dry and wet seasons, the temporality of monumental time, and the everyday of water infrastructure use and maintenance.

Halstad McGuire, Erin (Department of Anthropology, University of Victoria)**[94]** *Cultivating Curiosity: Experimental Archaeology in Undergraduate Courses*

This poster examines the use of experimental archaeology as a teaching tool in undergraduate courses. It looks at issues relating to the design, implementation, and assessment of experimental archaeology projects in upper division courses ranging from 30 to 70 students. The case studies examined here involve group-based projects centred on topics in medieval archaeology from the University of Victoria. Methods for monitoring student projects and assessing diverse experiments will be discussed. Experimental archaeology projects, though potentially challenging for instructors, are a powerful means to engage deeper student learning both in terms of archaeology as a discipline and within specific regional/topic areas of archaeology.

Hambacher, Michael**[133]** *Traverse Ware: A Case Study in Ceramic Regionalization, Style Horizons, Interaction Patterns, and Ethnicity in the Late Prehistoric Upper Great Lakes*

Among the many changes that take place during the Late Prehistoric period in the Upper Great Lakes are greater levels of regionalization and shifts in region-wide interaction patterns. These changes are generally viewed as being reflected in varying degrees of similarity and dissimilarity in ceramic wares, decorative styles, and technology seen across the region during this period. Suites of ceramic types and decorative styles have also been used to link particular ceramic groupings with specific ethnic or tribal groups and their protohistoric antecedents. Using Traverse wares from northwestern Lower Michigan as an example, this paper will explore a number of aspects about the nature and meaning of Late Prehistoric ceramics in the region. Characterization of Traverse ware provides a basis for examining patterns of group identity and intergroup interaction patterns, as well as the meaning of stylistic horizon markers that aid in unifying and differentiating archaeological groups and broader implications about the relationship between ceramics and ethnic identity in the region.

Hamblin, Andrew [238] see Baxter, Carey

Hambrecht, George (University of Maryland College Park)**[195]** *Zooarchaeology, Shifting Baselines and a Rapidly Changing Climate*

Anthropogenic climate change will both aggravate existing and create new situations in which local communities encounter the power of larger networks looking to either exploit or manage resources in their area. This paper will discuss a variety of ways in which zooarchaeological data investigated in a historical ecological mode might be useful in such circumstances. Zooarchaeology creates a deep context for human and animal dynamics. It investigates anthropogenic as well as environmental influences on communities in the past. Due to this, zooarchaeology should be in a position to help mediate future conflicts over the exploitation and management of animal species that will only increase in the face of anthropogenic climate change. This paper will focus on the relevance of shifting baseline data and zooarchaeological approaches to this phenomenon in the context of local communities and anthropogenic climate change.

Hamilton, Derek (Scottish Universities Environmental Research Centre), Kerry Sayle (Scottish Universities Environmental Research Centre), Colin Haselgrove (University of Leicester) and Gordon Cook (Scottish Universities Environmental Research Centre)**[29]** *Application of Multi-Isotopic Analysis ($\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$) to Examine Mobility and Movement of People and Animals within an Iron Age British Society*

The middle of the Iron Age in southern central Britain (c. 400–200 cal BC) is a period that is often seen as becoming regionally inward-looking. A primary focus of the mixed agriculturalists is on building and maintaining massive hillforts. There is very little long-distance exchange or trade noted in the archaeological record, and the metalwork at the time takes on insular forms (e.g. involuted brooches) that separate it from the Continental connections observable in both the Early and Late Iron Age.

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This paper will present the results of recent multi-isotopic work ($\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$) on human and animal bone collagen from the Wessex sites of Suddern Farm and Danebury hillfort, which alter this narrative. We suggest that the high variability in $\delta^{34}S$ observed within the horses is directly related to these animals being used to cover large distances, while these same numbers in cattle are indicative of them being moved potentially upwards of 100–300 km prior to their death and deposition. The scale of the mobility within the animal populations leads us to question the broader economy and social connections at this time.

Hamilton, Marian (University of New Mexico), Cyler Conrad (University of New Mexico), Patricia Crown (University of New Mexico), Wirt Wills (University of New Mexico) and Emily Lena Jones (University of New Mexico)

[115] *Carbon, Nitrogen, and Oxygen Stable Isotope Ratios from Room 28 Lagomorphs*

Stable isotope analysis is a powerful tool for investigating ecological change and human impact in the past. Here, we present carbon, oxygen, and nitrogen stable isotope results from lagomorphs excavated from Room 28 alongside those from two other archeological sites within Chaco Canyon (Pueblo Bonito middens and the Bc57 site) as well as modern lagomorphs collected opportunistically during archeological survey. Oxygen isotope ratios remain consistent between time periods and locations, which is inconsistent with the idea that oxygen isotopes can be used as an indicator of long-distance procurement of small mammal fauna in ancient Chaco Canyon. Carbon isotopes are enriched for archeological versus modern fauna suggesting a heavier C4 plant component to past lagomorphs' diets. Room 28 lagomorphs are also significantly more enriched and more highly variable in their nitrogen isotope ratios than those from modern collections. This pattern of enriched carbon and nitrogen isotopes archeologically is not observed in rodents, suggesting that the lagomorph differences are not purely the result of ecological change. Rather, these results are consistent with the garden-keeping hypothesis, in which ancient people in Chaco Canyon supplemented the diets of lagomorphs with agricultural crops (maize) from fertilized fields.

Hamilton, Michelle [90] see Devlin, Joanne

Hammer, Emily (University of Pennsylvania)

[230] *Water and Pasture Infrastructure of Mobile Pastoralists in Southeastern Turkey*

Archaeology has long seen mobile pastoral societies as largely materially "invisible" both in the realms of portable artifacts and of infrastructure projects such as buildings and landscape modification. Recent studies have sought to alter this impression as part of larger trends that seek to ground our understanding of pre-modern pastoralists in concrete faunal, botanical, isotopic, landscape, and historical data, which clearly show the effect that pastoral practices and infrastructure have had on cultural landscapes through time. I draw on ethnographic and archaeological case studies from the Middle East to discuss some general political, social, and environmental issues affecting the elaboration of pastoralist infrastructure in seasonal territories and the complex relationships transhumant people have with the infrastructure of surrounding sedentary communities. Drawing on archaeological survey data, I also discuss water and pasture infrastructure of the last 500 years in southeastern Turkey and the changing political environment in which this infrastructure was used by mobile pastoralists to live in a "marginal" area under the Ottoman and modern Turkish states.

Hammerstedt, Scott (University of Oklahoma), Amanda Regnier (University of Oklahoma) and Marc Levine (University of Oklahoma)

[248] *The Discovery of a New Buried Building on Monte Albán's Main Plaza*

Large-scale geophysical survey was conducted at Monte Albán's Main Plaza during the summer of 2017. The results suggest the presence of a substantial, but previously unknown, building with associated features located in the west-central portion of the plaza near Building H. In this paper, we describe our findings and present our preliminary interpretation of the geophysical data.

Hammerstedt, Scott [119] see Savage, Sheila

Hampton, Ashley (University of Montana)

[239] *A Stone Throw(n) Away: Examining the Interconnection between Identity and Division of Labor through an Evolutionary Analysis of Household Spatial Organization*

This study examines issues of cultural change/continuity as embodied within a singular multi-generational housepit (Housepit 54) located within the Bridge River site in the Mid-Fraser Canyon, British Columbia, Canada. Previous research has focused on understanding the changing social dynamics at both a village and household-level, examining shifts from a more collaborative to competitive framework in response to external environmental pressures. As interpersonal dynamics within Housepit 54 were renegotiated within a context of increased competition, this study will address how—if at all—such changes beget corresponding shifts in identity-defining tasks in order to better understand the recursive relationship between culture, environment, and individual agency. If hunter-gatherer identities were tied to resource-extraction activities (i.e. individuals who hunted had identities based around such hunting practices) then changes in resource access may have caused subsequent, measurable shifts in identity. This study uses ArcGIS in order to examine the fine-grained detailed evolution of spatially-defined activity within HP54 in order to illuminate the interplay between personal identity, cultural transmission, and emergence of inequality.

Hampton, Ashley [239] see Bobolinski, Kathryn

Haney, Emily (BLOOMSBURG UNIVERSITY OF PENNSYLVANIA)

[302] *Mortuary Vessels at the Maya City of El Peru-Waka'*

Residential burials are useful tools that help archaeologists better understand domestic ritual practices at the household level. With the household acting as a unit of social identity, funerary practices help archaeologists relate said practices to prominent trends of the time. These include, but are not limited to social and religious structures, identity, power, and social reproduction. One of the many types of artifacts that often appear in Classic Maya burials that are significant to burial practices are ceramic vessels. Through the utilization of several whole ceramic vessels uncovered during the 2017 field season at the Maya city of El Peru Waka', this poster will attempt to explore the use of ceramics in funerary contexts at the site. In looking at mortuary vessels recently excavated in El Peru's Chok Group, funerary contexts can help to reveal domestic ritual trends and purposes. After recovery of the vessels in the 2017 field season, they were brought to the lab where they were cleaned and analyzed. By using the type variety method, examining the vessels for presence of use ware, and original funerary context (through drawings and photographs) a better narrative of ceramic use in domestic funerary contexts is revealed.

Haney, Jennifer [135] see Walker, Karen

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Hankins, Sharon and Megan Skillern (University of Texas at Austin)**[243]** *Experimental Ceramic Technology: Colha, Belize*

We have been very fortunate this year to have Dr. Fred Valdez, Luisa Aebersold and their team graciously contribute to our research program in ceramic technology. They took time during their extremely busy field season to bring clay for our team to prepare and attempt to build pottery at Programme for Belize Archaeological Field School.

We have two different types of clay to research. The first clay is yellow clay CH4444. The second clay is iron-rich, red clay CH2222. Our first task was to visually analyze the artifacts from the two different lots. CH4444 was associated with archaic tools. CH2222 was associated with Preclassic pottery. We designed four different techniques to prepare the clays for our study. Our first group of CH2222 was aged directly in water and hand sieved. Both clays were moist from retrieval. This became problematic for the iron-rich clays. The clays were extremely difficult to break down. We dried them in open baskets.

The remaining CH2222 and CH4444 were prepared by hand. Due to the weather and the iron-bearing clays these processes took several days to accomplish.

Hanks, Bryan (University of Pittsburgh, Department of Anthropology) and Miroslav Kocic (University of Pittsburgh)**[245]** *Reassessing Neolithic Settlement Patterning in Central Serbia through Geophysical and Geochemical Survey*

This paper details the results of recent large scale pedestrian, geophysical and geochemical surveys on Late Neolithic Vinca culture sites in Central Serbia. New data relating to settlement patterning, household organization, and diachronic developments will be discussed through combining surface survey and analysis and remote sensing. Results from these studies are adding a new perspective to conventional models for the Neolithic transition and the emergence of early village societies in southeastern Europe.

Hanks, Bryan [106] see Canaday, Timothy

Hanley, Jacob [21] see Cottreau-Robins, Catherine (Katie)

Hann, Don**[106]** *Obsidian Procurement Patterns in the Strawberry Mountain Wilderness*

Cultural resources in wilderness areas can be difficult to manage due to a lack of dedicated funding and few undertakings which trigger survey through the National Historic Preservation Act. After a series of extensive wildfires in the 1990s the Malheur National Forest surveyed much of the Strawberry Mountain Wilderness Area using volunteers from the Forest Service's Passport In Time program. Crews documented several extensive obsidian dominated lithic scatter sites. The debitage and other artifacts recovered illustrated the full range of lithic reduction stages suggesting a nearby source of natural obsidian. Additional survey failed to locate any usable obsidian sources within the wilderness. X-Ray Fluorescence (XRF) characterization identified the two primary obsidian sources from these sites several miles, and approximately 2000 feet below, the sites in the wilderness. Likely travel routes between the obsidian sources and lithic reduction sites in the wilderness can be inferred from the XRF data.

Hanna, Jonathan**[108]** *Discussant***[108]** *Chair*

Hanna, Jonathan [34] see Mistretta, Brittany

Hannigan, Elizabeth (Boston University), Shintaro Suzuki (Universidad del Valle de Guatemala), Felipe Trabanino (Universidad Nacional Autónoma de México) and Boris Beltran (Proyecto Arqueológico Regional San Bartolo- Xultún)**[306]** *A Biological Profile of an Individual from Xultún Using Bioarchaeological, Starch, and Isotopic Analyses*

Micro and macroscopic bioarchaeological analyses enable archaeologists to generate biological profiles of past individuals, including characteristics such as diet, sex, age, occupational stress, pathologies, and social status, among others. In this paper, we discuss the significance of a Maya individual by constructing a biological profile from both micro and macroscopic analyses. The individual of interest was excavated during the 2012 field season at Xultún, Guatemala in a patio situated in the southeast portion of the site. The burial contained the remains of two additional individuals and was located just outside the Grupo TaaJ structure, a small mural room dating to the Late Classic period. Through the use of microscopic analyses, such as starch and isotopes, and multiple macroscopic analyses, we provide a thorough investigation of this individual's life, as preserved in the archaeological record, in order to provide insight into the importance of the burial and the role of both women and book makers in Maya society. Furthermore, this study expands on the role of an individual in Maya society and how that is reflected in a mortuary context, more specifically in the Classic period site of Xultún.

Hannus, L. Adrien [223] see Behling, Emma

Hanratty, Colleen [173] see Guderjan, Thomas

Hansch, Jakob**[239]** *Quantifying the Qualitative: Locating North-Central Kansas Burial Mounds*

Scattered through parts of northeastern and north-central Kansas are prehistoric burial sites in the form of low rock and earthen mounds located atop bluffs overlooking stream valleys. In Kansas, the Unmarked Burial Sites Preservation Act exists to protect these sites, but this law is only effective if the location of these features is known. Most prehistoric mounds in this region are subtle in appearance, making them difficult to recognize. If sites are not recorded and protected, they may be unintentionally or intentionally destroyed. Using Geographic Information Systems (GIS) software and the Kansas State Historical Society Archaeological Site Inventory, a map was created pinpointing the locations of recorded burial mounds in Clay, Geary, Pottawatomie, Riley, and Wabaunsee counties. Geographic associations of known mounds relative to topographic and hydrologic features were highlighted in order to recognize spatial patterns and simple statistical procedures were used to predict areas with high potential for past use as prehistoric burial sites. Samples of these areas were targeted for pedestrian survey to identify and record additional burial mound features with the overall goal of helping protect prehistoric burial sites in northeastern Kansas. Four burial mound sites were recorded because of these surveys.

Hansch, Jakob [270] see Serra, Margot

Hanselka, J. Kevin [153] see Mauldin, Raymond

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Hansell, Patricia (Temple University)

[112] *Discussant*

Hansen, Daniel (University of Michigan)

[25] *Death and Identity at Monte Albán*

Archaeologists have long striven to interpret mortuary rituals as qualitative signs of a living people—indices of sex, gender, age, status, wealth, and craft. Though the doctrine “as in life, so in death” can have some merit for archaeological inquiry, viewing mortuary ritual in this manner ignores the social act itself, which is one of the most intimate, personal, and weighted actions humans produce, serving, among other roles, to return the society to homeostasis in the wake of the loss of a member. In interpreting mortuary ritual as a means to resolve a social death within a group, close ties emerge with ethnic and group identity. Rather than a passive reflection of a culture in life, mortuary ritual is an act constitutive of ethnicity.

This paper examines inhumation practices at Monte Albán in the Oaxaca Valley from ca. 500 BCE until Spanish conquest, traditionally periodized as Monte Albán I-V. Drawing on primary data from past excavations, including those of Alfonso Caso in the early 20th century, it is an attempt to synthesize an identity-driven interpretation of mortuary ritual in Monte Albán, an urban center whose ethnic history is a source of ambiguity.

Hansen, David (Nazarbayev University) and Elissa Bullion (Washington University in St. Louis)

[185] *Cranial Modification in Medieval Central Asia*

This study examines the practice of cranial modification at the 12th-13th century site of Kalmikkilgan in modern day Uzbekistan. According to historical sources, the medieval period in Central Asia was a time of reshaping ethnic, religious, and political identities: Islam spread widely across the region, waves of Turkic peoples migrated into the region, and a series of large territorial states rose to power. This period has been understudied from an archaeological perspective, leaving gaps in our understanding of how groups and individuals expressed identity in these shifting social landscapes. One practice that bioarchaeologists have focused on in the examination of identity is cranial modification, due to its highly visible nature. Cranial modification has been identified in several individuals from the Kalmikkilgan site in the Khorasm region. To document the types and degrees of modification present, we digitized three-dimensional cranial landmark data and analyzed shape difference between individuals using finite element scaling analysis. Our results indicate that at least two types of cranial modification are present, with one individual lacking evidence of modification. This range may be indicative of a desire to visibly express identity in a period during which social changes were occurring rapidly across many spheres of life.

Hansen, John (American Museum of Natural History)

[138] *When Is “Near” Close Enough? Old Data, New Interfaces and an Imperfect Present*

The Division of Anthropology at the American Museum of Natural History launched its first online database in 1995. The image-oriented interface proved attractive to an audience with a moderate level anthropological background. Later, in response to numerous requests, unimaged archaeological collections with more technical data were offered through a password protected interface. As of September 2017, 250,000+ files with images were publicly available, the combined online database representing 450,000+ records.

There are continuing issues with the source material, legacy data and user experience. Many database projects were underfunded and resulted in data inaccuracy. Inadequate context discourages novice users. Most frustrating is the lack of definition in object name and provenience. Although the inclusion of scans of original documentation mitigates some user dissatisfaction, the situation limits the use of existing web services.

Even with these problems, the database has proved popular and useful. The web-based interface has permitted an agile, flexible and relatively easily modified presentation of data while maintaining integrity with the original catalogue. The resulting tool is not only the primary means of external access to our collections for students, educators, researchers and casual visitors but has become a valuable resource for divisional staff as well.

Hansen, Richard, Edgar Suyuc-Ley (Mirador Basin Project), Carlos Morales (FARES Foundation; Université la Sorbonne, Paris), Beatriz Balcarcel (FARES Foundation; UNAM, Mexico) and Stanley Guenter (FARES Foundation; Mirador Basin Project)

[252] *The Monumentality of the Preclassic Maya of the Mirador Basin, Guatemala*

Archaeological investigations in 51 ancient sites within the geographical confines of the Mirador Basin of northern Guatemala have identified an extraordinary emphasis on monumentality in art and architecture dating well into the Middle and Late Preclassic periods of Maya occupation. The structure and format of this phenomenon is replicated in early complex societies in other parts of the world, and suggests a consistent human behavior of predictable characteristics. The analyses and forms of the varied demonstrations of monumentality provide an insight into economic, political, and social structure among the Preclassic Maya and, in particular, the unusual and precocious cultural development in the Mirador Basin.

Hansen, Richard [18] see Paine, Richard

Hanson, Kelsey (University of Arizona)

[136] *On the Persistence of Tradition: Caves, Ritual Performance, and Secrecy among Multi-ethnic Communities in the U.S. Southwest*

Discussions of ritual performance in the U.S. Southwest are often restricted to the analysis of architecture in residential settings, leaving the potential role of caves largely absent from regional discourse. As settings that are less accessible to the entire community, caves likely represent important venues for ritual performance whose participation is intended only for a select audience. The aims of this paper are twofold. First, through the reevaluation of select wooden ritual assemblages from caves in the U.S. Southwest, this paper addresses the distinctive role of these items in ritual performance—from production, use, and appropriate storage in caves. Second, using a case study based on a reevaluation of the ceramic and wooden ritual assemblages from the Point of Pines caves in east-central Arizona, this paper considers the persistence of ritual performance among multi-ethnic communities, asking to what extent the use of these caves represent incompatible imported traditions practiced in secret. By facilitating secrecy, I argue that caves serve as especially important settings for maintaining diverse religious traditions in multi-ethnic communities, allowing for the persistence of otherwise incompatible practices.

[136] *Chair*

Hanson, Kelsey [136] see Moyes, Holley

Hanten, Nicholas [225] see Hale, Micah

Hard, Robert (Univ of Texas at San Antonio), Jacob Freeman (Utah State University), Robert Gardner (University of Texas at San Antonio), Gabriella Zaragosa and Raymond Mauldin (University of Texas at San Antonio)

[105] *Modeling Hunter-Gatherer Population Dynamics on the Texas Coastal Plain during the Holocene*

A radiocarbon database is used to model prehistoric population dynamics on the Texas Coastal Plain in the context of Holocene climate change. Hunters and gatherers participated in a multifaceted social and ecological system that appears to have been highly resilient to climatic impacts by

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utilizing multiple ecological zones and participating in wide-ranging social networks for over 6000 years. Climatic fluctuations include a dry middle Holocene and fluctuating but wetter late Holocene. During the early and middle Holocene the region experienced rising sea-levels followed by stabilization. Expectations from archaeological data indicate populations experienced a number of substantial population fluctuations, peaking during the Late Archaic period (4000–800 BP) and sharply declining during the Late Prehistoric period (800–350 BP). We will compare the patterns in the radiocarbon database to these expectations and Holocene climatic reconstructions.

Hard, Robert [91] see Gardner, Robert

Hardy, Thomas (University of Pennsylvania)

[295] *Assembling Empire: Continuity and Change in the Long-Term Development of the Inca Empire*

This paper explores the use of assemblage theory, derived from the work of theorists such as Deleuze, Guattari, and DeLanda, as a way of overcoming inherent problems in earlier attempts at understanding sociopolitical change. Exploring the implications of this historical materialist approach involves linking processes operating at different scales of time, and tracing historical genealogies of practice and the ways they were assembled to produce political sovereignty. I argue that not only are the conditions for sovereignty necessarily in place long before the emergence of particular regimes, but that the production and maintenance of these kinds of social relations are rooted in material culture over the *longue durée*. Research conducted at Minaspata, a multicomponent site located in the Lucre Basin, Cuzco, Peru, in the heartland of the Inca state, suggests that the emergence of Inca imperialism in the 14th–15th century CE was the result of a complex set of social relations, materialities, cultural practices, and ontologies that were “assembled” over the previous several centuries. These assemblages were produced through the interactions between humans and the broader material world and were transformed as they were drawn together, with distinctive historical genealogies that flowed at different temporalities.

[295] *Chair*

Hardy, Thomas [295] see Berquist, Stephen

Hare, Timothy (Morehead State University)

[80] *Walking through Mayapán*

I present a preliminary analysis of movement through the Postclassic political capital of Mayapán. The architectural features at Mayapán are some of the most densely concentrated of sites in ancient Mesoamerica, but its organizational principles defy explanation. Almost two decades of fieldwork, including using electronic total stations, RTK survey-grade GNSS, UAV-based aerial photography, and an aircraft-borne LiDAR survey of a 40 sq km area centered on Mayapán’s defensive wall, allows mapping of much of the distribution of public architecture, dwellings, platforms, property walls, pathways, and non-residential features across the city and the region. This database is the basis for revealing the forces that drove the development of Mayapán’s urban form. I focus on the role of walled pathways in relation to the locations and forms of key public architectural features, walled houselots, cenotes, the defensive wall, and major gateways.

[320] *Discussant*

Hare, Timothy [190] see Jones, Garrett

Hargrave, Eve and Kristin M. Hedman (Illinois State Archaeological Survey)

[306] *Hoxie Farm: Bioarchaeology of a Late Prehistoric Community in Northeastern Illinois*

The Upper Mississippian (A.D. 1400–1500) Hoxie Farm site is one of the best documented late prehistoric sites in Cook County, Illinois. In 1953, Elaine Bluhm and David Wenner from the Field Museum of Natural History organized a volunteer crew of professional and avocational archaeologists to salvage portions of the site in advance of construction of the first interstate highway (I-80) in Illinois. In 2000–2003, the Illinois State Archaeological Survey (ISAS) conducted additional excavations at this site in response to planned construction activities on I-80. In total, these investigations documented thousands of habitation features, several longhouse structures, and nearly 70 burials. In this poster we highlight the bioarchaeology of the Hoxie Farm site. Mortuary patterns at the site hint at cultural connections with both Fisher and Oneota traditions in central and northern Illinois. Skeletal evidence for violent death and postmortem modification of isolated human elements (burning, cut marks, incised designs) reflect the dynamic cultural environment of Hoxie Farm, one that included conflict. A diet comparatively low in maize, high rates of nutritional stress and infectious disease observed within this population may reflect these challenging environmental and cultural conditions.

Hargrave, Michael, R. Berle Clay (Cultural Resource Analysts Inc.), Diana Greenlee (University of Louisiana Monroe, Poverty Point Site) and Rinita Dalan (Minnesota State University Moorhead)

[156] *New Evidence for Poverty Point’s Complex Developmental History*

Magnetic survey at Poverty Point reveals new information about ritual facilities, ridge construction and use, and a complex developmental history that included both planned and organic growth. Thirty-eight circles (diameters range from 8 to 66 m with a mean of 35 m) in the plaza are interpreted as ritual facilities. Targeted excavation in four circles encountered large postholes in three but the fourth consists of pits. Magnetic images suggest closely spaced postholes in many circles, possibly indicating rebuilding by inserting new posts between older removed posts. Some circles overlap with and—assuming ridge slopes were steep—may predate the inner ridges. The concentric ridges are distinguished by negative magnetic “perimeter” anomalies and habitation materials. Innermost Ridges 1 and 2 have multiple perimeter anomalies suggesting extensive rebuilding. Ridges 3–5 lack that evidence of reconstruction and presumably date later. Planning is evident at Poverty Point, but several stages of ridge construction, extensive rebuilding of some ridges and circles, and overlapping ritual circles and domestic ridges suggesting shifts in activity patterning are inconsistent with interpretations that imply nearly synchronous construction and rigid adherence to a detailed masterplan.

Hargrave, Michael [238] see Baxter, Carey

Harke, Ryan

[266] *The State of the (Conch) Republic: Renewed Archaeology in the Imperiled Florida Keys*

Although the Florida Keys’ archaeological record famously made possible the seriation of south Florida pre-Columbian ceramic styles in 1949, this 356 km² archipelago has been largely ignored by academic archaeologists ever since. Today, Keys archaeological sites and historical properties are plagued by tourism-related development, a multi-faceted issue that is exacerbated by the compounding effects of weekly tidal erosion and seasonal tropical storms. Consequently, an untold number of sites have already been destroyed, and extant sites are at high risk of permanent inundation and/or demolition. Existing collections are therefore a crucial and fruitful resource in an area of such unfortunate circumstance. To be sure, they offer the best—and often the only—opportunity to study the diverse cultures that occupied this region in pre- and proto-historic times. With this poster, I highlight the history of terrestrial archaeological investigation in the Florida Keys; present a summary of ongoing collections-based geochemical research; and

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most importantly, demonstrate how and why these small islands played a significant role in pan-regional maritime networks that extend from the 14th century into contemporary times.

Harkins, Kelly [337b] see Schaffer, William

Harkleroad, Eric

[29] *New Perspectives on Warfare in the Iron Age of Wessex*

Wessex, a region of southern England, has been the subject of more study than almost any other region of the UK. While much excavation has focused on the Iron Age little work has focused on the role of warfare at that time. Discussions of warfare have led to antithetical conclusions by researchers utilizing the same material with much of the disagreement stemming from fundamentally different interpretations of equivocal evidence and assumptions about life in the period. Some of this is ultimately founded on untested models and questionable historic accounts. I propose a new method of approaching warfare utilizing what I am calling bellicose references as a way of cutting through and resolving many of the issues that have complicated the study of warfare. Based in Practice Theory, specifically the idea of habitus, bellicose references are a conceptual tool that shifts focus away from the presence or absence of warfare and instead puts the focus on how these materials manifest socially, putting the focus on human action and practice. I demonstrate the usefulness of this approach utilizing data from Wessex and show how this, in conjunction with other information from the region, gives a more holistic understanding of violence and conflict.

Harmand, Sonia [329] see Duke, Hilary

Harmsen, Hans (Nunatta Katersugaasivia Allagaateqarfialu//Greenland National Museum & Archives), Jørgen Hollesen (National Museum of Denmark), Henning Matthiesen (National Museum of Denmark), Bo Eberling (CENPERM, University of Copenhagen) and Christian K. Madsen (Greenland National Museum and Archives)

[135] *Climate Change and the Rapid Loss of Organic Deposits in West Greenland*

The REMAINS (REsearch and Management of Archaeological sites IN a changing environment and Society) of Greenland project has explored a number of factors that currently threaten Greenland's archaeological landscape in the coming decades. This paper reviews recent work as well as the problems and threats to coastal and inland middens along the country's West coast and adjacent inner fjord systems. Information gathered in recent years provides a baseline for "ground-truthing" predictive models of preservation and deterioration of material such as bone, antler, baleen, wood, leather and feathers frequently observed in relative states of decay in the middens. Loss of organic integrity in West Greenland is variable but overall the preliminary data suggests that regardless of age and geographical location, archaeological deposits within the study area are vulnerable. Discussion of these data are situated in the context of the next ten, twenty and fifty years intervals from a heritage management perspective and the possible scenarios we can expect as climate uncertainties continue to eradicate Greenland's once outstanding archaeological legacy. The underlying theme is that there is a crucial need for greater international attention around the rapid loss of archaeological sites, features and deposits in the circumpolar North.

Harrelson, David [331] see Edwards, Briece

Harrington, Lucy (Mercyhurst University)

[22] *Measuring Mobility by Proxy: Use and Maintenance of Lithic Tools in Pennsylvania from Paleoindian to Middle Archaic Times*

Archaic peoples in Pennsylvania were less mobile than their Paleoindian predecessors. One form of evidence supporting this argument is the increased use of local lithic raw materials in the Early and Middle Archaic. The utilization and retouch of unifaces and bifaces is a second form of evidence of mobility. The production of tools designed for long-term use and maintenance is associated with highly mobile groups where maximizing tool use-life reduces transport cost and reduces risk when moving into areas with little or only poor quality lithic raw material. This study reports on the examination of changes in biface and uniface resharpening using Andrefsky's Hafted Biface Retouch Index (2006), Kuhn's geometric index for the reduction of unifaces (1990) and a new index for the utilization of unretouched flakes in an effort to examine the relationship between changing levels of use and mobility over time. The materials included in analysis are from 11 lithic assemblages previously excavated from well stratified sites in Pennsylvania dating from the Paleoindian to Middle Archaic periods.

Harrington, Sue [40] see Buchanan, Brian

Harris, Alison (Stockholm University; University of York), Deirdre Elliott (Memorial University of Newfoundland), Tatiana Feuerborn (Stockholm University; University of Copenhagen), Gunilla Eriksson (Stockholm University) and Vaughan Grimes (Memorial University of Newfoundland)

[16] *Inuit Sled Dogs in the Contact Landscape: An Isotopic Investigation of Dog Provisioning in 16th–19th Century Labrador, Canada*

The 16th through 19th centuries witnessed increasing cross-cultural interactions between the Inuit of the Labrador coast and European explorers, traders, and missionaries. The effects of colonialism in this period have been studied with respect to Inuit identity, material culture, gender, and social organization, but the nature of Inuit-animal relationships has received comparatively less attention. In addition to occupying a prominent social role, the sled dog facilitated Inuit mobility and hunting practices, but required considerable care and provisioning. In this paper, we employ carbon and nitrogen isotope analysis of bulk bone collagen and amino acids to examine sled dog feeding practices between the 16th and 19th centuries. We analyze the remains of 60 archaeological dogs from six Inuit winter house sites from Labrador's north and central coasts. While all of the dogs included in this study consumed predominantly marine-based protein, we note a degree of inter- and intrasite variation in both the carbon and nitrogen isotope values of the dogs. This variation is further explored with reference to the settlement history of Labrador, and to other stable isotope datasets from the Eastern Arctic to better understand the changing role of the dog in Inuit society.

Harris, Ashley (University of Wyoming), Jason Toohey (University of Wyoming) and Kirk Scheffler (University of Wyoming)

[240] *GIS Applications in the Analysis of Prehispanic Settlement in Cajamarca, Peru*

The Cajamarca Valley of northern Peru has seen changing settlement patterns throughout its nearly 12,000 year human occupation. Although several archaeological surveys have taken place in and around the basin over the past 70 years, this is the first project to apply the tools of Geographic Information Systems to this existing settlement data. This region-scale analysis is a significant addition to the traditional archaeological research in Cajamarca which has focused largely on the excavation of particular sites. The employment of nearest neighbor, central feature, view shed, and least costs analyses is revealing significant demographic change from the Formative Period through the Late Horizon. Analyses point to significant clustering of sites during the Formative Period with populations focused on large ceremonial mound sites in the basin. During subsequent periods, settlement oscillates between higher and lower elevation zones implying both economic and defensive pressures on settlement. The novel application of GIS tools

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to existing settlement data is allowing us to speak to issues of population movement in the region with greater confidence than has been the case in the past.

Harris, Edwin (Colorado State University) and Christopher T. Fisher (Colorado State University)

[31] *GIS Analysis of the Road Network at the Postclassic Purépecha Site of Angamuco, Mexico*

The growing adoption of LiDAR for archaeological analysis makes determining how ancient peoples modified, interacted and moved through the landscape more practical. Initial analysis of the LiDAR produced imagery covering the Postclassic (1000–1520 CE) Purépecha site of Angamuco, located in the Lake Pátzcuaro Basin of Michoacán, Mexico showed a highly urbanized multi-nucleated settlement sprawled across 26km² of an ancient lava flow, with a complex urban structure. Here I discuss the results from a project to identify and extract road networks from the city. The Purépecha relied upon two primary types of roadways, typical ground level paths and elevated “highways” known as huatizi. By using the GIS software ArcMap, the possible roadways were identified visually by a combination of multiple data visualizations including Hillshade, Sky View Factor, and Openness Factor. A Least Cost Path analysis (LCP) was also applied to the entirety of the site to locate the most economical routes for comparison. The combination of the visually identified road network and the LCP provides a means to determine the pre-planning and organizational decisions involved in control of movement through the city.

Harris, Jacob (Arizona State University), Curtis Marean (Institute of Human Origins, School of Human Evolution), Kiona Ogle (Applied Research and Development, Northern Arizona) and Jessica Thompson (Department of Anthropology, Emory University)

[103] *Employing Bayesian Probability Theory to Diverse Applications Relevant to Archaeology*

The principle of equifinality describes a system where an end state may be reached from a variety of conditions and in a variety of ways and has proved to be a confounding element in several areas in archaeology. Archaeological data commonly occur in both qualitative and quantitative form and Bayesian modeling, coupled with modern computational routines, permits multiple data types to be incorporated into a single synthetic probability model. The Bayesian approach makes probability statements given observed data, constructing posterior probability statements about unknown model parameters including unknown (unobserved) data.

Here we describe how Bayesian inference offers a solution to several areas relevant to archaeology. We use a Bayesian algorithm to make categorical assignments for unknown archaeological samples in three analytically similar contexts: identifying bone surface modifications, distinguishing between heated and untreated silcrete, and distinguishing the chemical signatures from discrete volcanic eruptions. In each example, we use large samples of observed reference data to train the respective models. Out-of-sample cross validation is then used to assess model performance and predictive ability before analyzing archaeological samples. Monitoring posterior distributions of unobserved data result an assignment of probability associated with individual unknown (archaeological) samples, thereby formally addressing the issue of equifinality.

Harris, Jacob [89] see Murray, John

Harris, Kathryn (Washington State University)

[83] *Lithics and the Late Prehistoric: Networks and Interaction on the Southeastern Columbia Plateau*

The people of the Columbia Plateau have been frequently characterized as a homogenous culture despite a 3,000-year depth of history and large spatial extent. Moreover, differences in artifact form, assemblage composition, and household features belie this characterization. The changing natural and social environment can be detected in modifications in cultural technology, and relationships among distinct groups can be inferred. The research presented here tracks these changes. By using concepts from evolutionary and social network theories, this study employs obsidian provenience sourcing and the morphometric analysis of projectile points to trace the ways people dealt with these environmental and social pressures through shifting adaptive strategies and increased intergroup interaction. Ultimately I ask can the cultural learning and adaptive strategies of late prehistoric cultural groups be identified in the variability of southeastern Columbia Plateau projectile points? And, how does obsidian procurement reflect changing cultural interactions and exchange networks in the southeastern Columbia Plateau over the past 3,000 years?

[151] *Moderator*

Harris, Matthew (AECOM Technologies)

[103] *A Site Is Not a Centroid: Modeling Archaeological Landforms and Uncertainty with Bayesian Distribution Regression*

A Bayesian model of Distribution Regression using a Mean Embedding Ridge Regression (MERR) algorithm is developed to address two primary shortcomings of current Archaeological Predictive Modeling (APM) practice; 1) neglecting the richness of archaeological landforms by collapsing a site to a single point or observation; and 2) disregarding the implicit and explicit uncertainty of archaeological data, predictions, and model parameters. This research addresses the first hurdle by developing a Logistic MERR approach to Distribution Regression. This method first samples a distribution of variable measurements from the spatial area of each site, then uses a kernel to project the distributions into a non-geographical feature space to calculate mean embeddings, finally Kernel Ridge Regression estimates similarity coefficients for inference and prediction. The primary benefits of the MERR approach to APM are the consideration of archaeological landform richness and variation, explicitly modeling similarity between sites and the environment, and allowing for similarity metrics specific to archaeological research questions. The second hurdle is addressed by applying the MERR method within a Bayesian framework for probabilistic modeling. As such, the uncertainty of data and parameters can be explicitly modeled with priors resulting in a posterior predictive distribution useful for quantifying and visualizing risk.

Harris, Sarah (Connecticut College), Moriah McKenna (Connecticut College) and Anthony Graesch (Connecticut College)

[303] *(Im)movable Stone: a Comparative Analysis of Fieldstone Concentrations in Southern New England*

Fieldstone concentrations are rarely accorded much significance in historical and archaeological studies of eighteenth and nineteenth century farmsteads in southern New England. This poster highlights research addressing the surface piles of stone remaining in and beyond the abandoned fields of colonial and early American farms. Whereas many have assumed that fieldstone was eventually or meant to be incorporated into the thousands of miles of stone walls that crisscross New England's contemporary landscape, our research suggests that farmers may have allocated stone-clearing labor to a variety of purposes. We present the results of fieldwork aimed at systematically recording and mapping formal variability in fieldstone concentrations in relation to other field attributes—wall height, field size, proximity to barways—at/on three farmsteads. These data are then used to (1) explore how we might discern Indigenous from European stone features and, in cases of the latter, to (2) recognize different forms of labor allocated to field maintenance. In particular, we distinguish between the products of labor allocated to (a) permanent storage of fieldstone outside of stone walls, (b) temporary staging of fieldstone for later removal, (c) creation and management of water supplies for animal herds, and (d) disposal.

Harrison, Ainslie (Virginia Museum of Fine Arts), Harriet “Rae” Beaubien (Museum Conservation Institute), Kimberly Cullen Cobb (KCC Conservation LLC), Emily Kaplan (National Museum of the American Indian) and Jennifer Giaccai (Freer and Sackler Galleries)

[139] *Re-contextualizing Pre-Columbian Gold and Resin Artifacts from Panama in the National Museum of the American Indian*

Until recent years the study of Pre-Columbian gold and resin objects from Panama was slow to progress due to the relative scarcity of archaeological projects excavating these materials. While the original contexts of many museum objects have been lost, the collection of Panamanian gold and resin in the National Museum of the American Indian was re-evaluated for its potential to answer key questions about the ancient craftspeople of this region.

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To ensure accurate provenience information was associated with each artifact, research was undertaken in the archives of the NMAI. The resulting letters and field notebooks provided insight into the fascinating history of these objects. Scientific analysis further contextualized these objects in terms of the materials and fabrication techniques. Compositional analysis of 231 gold objects using XRF revealed significant patterns related to the source of the raw materials and the technological choices that went into making them. Three resin objects also underwent FTIR and GC-MS analysis to identify the plant source of the resin. This project has produced valuable technical data on this region that has been relatively understudied archaeologically and additional detailed information has been added to the museum records for each of the objects in this study.

Harrison, Laura (University of South Florida)**[130]** *Digital Heritage in Archaeology in the 21st Century*

The recent 'digital turn' in archaeology has spurred methodological advances and new research directions, with wide ranging impacts at multiple scales. The proliferation of imaging, remote sensing, laser scanning and photogrammetry applications has, at times, outpaced considerations about data archiving, digital epistemologies, and accessibility. This can lead to circumstances in which the creation of digital datasets is privileged over public dissemination or scholarly output—a situation that ultimately undermines the democratization of science. The future of digital heritage in archaeology thus lies in the integration of methodological approaches to digitization with explicit project outcomes targeted at various communities and stakeholders—an approach that might be thought of as “applied digital heritage.” To illustrate this concept in practice, I offer a case study from the UNESCO World Heritage site of Villa Romana del Casale in Sicily, which was recently digitized with terrestrial laser scanning. These 3D data were incorporated into a research agenda and public outreach activities that bring issues of heritage accessibility, assessment, and digital knowledge production to the foreground.

[130] *Chair*

Harrison, Laura [265] see Donner, Kristin

Harrison, Ramona (University of Bergen, Norway)**[135]** *Saving Siglunes from the Sea*

Siglunes is one of a series of endangered sites in N Iceland where we investigate: the emergence and long-term development of Icelandic fisheries and marine mammal hunting, the changing connections between Eyjafjörður and the larger North Atlantic trade and exchange during the Viking Age and medieval times, processes of marine erosion and its effect on archaeological sites for heritage management efforts in Iceland and the wider region. The site's archaeological and environmental samples can provide us with information on Viking Age fishing strategies in the North of Iceland, and serve as a case study on the origins and subsequent development from artisanal to larger-scale commercial fishing enterprise in the 13th and 14th c. Thus fueling a growing industry that transformed Atlantic economies in the 17th-18th c. and underwrote emergence of the early modern world system. However this site is in immediate danger from ongoing coastal erosion and some of the structures observed in 2008 on the fishing site have since been truncated by the sea. This paper presents new results from ongoing analysis and contributes to the discussion on addressing ongoing cultural heritage as well as scientific data loss due to erosion forces magnified by global climate change effects.

Harrison-Buck, Eleanor [7] see Phillips, Lori

Harrower, Michael (Johns Hopkins University)**[210]** *Discussant*

Harrower, Michael [177] see Dumitru, Ioana

Harry, Karen (University of Nevada-Las Vegas)**[218]** *Shrines, Dedication Practices, and Closure Activities at Lava Ridge Ruin*

Lava Ridge Ruin, located on the Shivwits Plateau near the northern rim of the Grand Canyon, is a late Pueblo II period site associated with the Virgin Branch Puebloan culture. Excavations at the sixteen-room pueblo suggest that its inhabitants used natural and cultural objects to maintain historical connections with their ancestors and with previously occupied settlements, as well as to signify their connection to important places on the landscape. These connections are reflected in the very location of the pueblo, which encircles a shrine (or ritual cache) created more than a hundred years before the settlement was established. The connections are further reflected by dedicatory materials, often associated with the Grand Canyon, placed in the building's architecture during construction; as well as by specific closing rituals that marked the pueblo's abandonment. The implications of these behaviors for understanding the worldview of the people who lived on the Shivwits Plateau is discussed.

[164] *Chair*

Harry, Karen [164] see Perez, Daniel

Hart, Thomas [37] see Trein, Debora

Hartford, Alexis [293] see Fash, William

Hartley, Ralph [239] see Renner, Amanda

Hartman, Gideon [177] see Brittingham, Alexander

Harvey, Amanda (University of Nevada, Reno), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)**[14]** *Maya Diet during the Postclassic to Colonial Transition: Tipu and Baking Pot Oral "Health" and Isotopic Signatures*

The Colonial site of Tipu and pre-contact site of Baking Pot offer a unique perspective of the transition of Maya life in western Belize after Spanish contact. Tipu is a borderland town largely occupied from AD 1541–1704. Baking Pot was a regional civic-ceremonial center continuously occupied from the Late Preclassic (~400 cal BC) to the Terminal Classic periods (cal AD 800–900), and later reoccupied during the Late Postclassic (cal AD 1280–1420).

Oral "health" and carbon and nitrogen isotopic values were assessed from skeletal samples. Baking Pot bone collagen isotopes are lighter than Tipu (-11 (+1.0) and -9.8 (+1.4), respectively), suggesting slightly more consumption of C3 foods. Apatite supports a greater consumption of C3 foods at Baking Pot -6.6 (+0.6) compared to Tipu -5.3 (+1.4). Nitrogen values are the same, Tipu +9.2 (+0.8) and Baking Pot +9.2 (+1.3). Isotopic values are

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indicative of a diet of marine fish and maize at both sites. Oral conditions vary. By tooth count, Baking Pot has more instances of caries compared to Tipu, but more individuals from Tipu experienced tooth loss during life. The differential dietary patterns are reflective of varying oral condition frequency and overall oral "health."

Harvey, Virginia (The University of Manchester), Linas Daugnora (Klaipeda University) and Michael Buckley (The University of Manchester)

[43] *Collagen Fingerprinting on Neolithic Fish from Lithuania*

Archaeological fish remains are more taphonomically sensitive than those of other vertebrates as they are typically smaller and less biomineralised. Therefore, it is essential to retrieve as much information as possible from assemblages that favour their preservation. One of the most time- and cost-efficient methods of objectively achieving faunal identity in ancient bone is collagen fingerprinting technique 'ZooMS' (Zooarchaeology by Mass Spectrometry). ZooMS harnesses the potential of preserved collagen, the most dominant and time-stable protein in bone, to generate peptide mass spectra that are diagnostic of faunal identity. Here, ZooMS is applied to 116 fish bone samples from a ~5000 year old assemblage from the Šventoji region of Lithuania to deduce species identity and construct assemblage compositions. Identifications from ZooMS analysis uncovered incorrect morphological identifications in 14% of the fish samples analysed. Furthermore, through the analysis of over twenty different species, we demonstrate the ability to distinguish between closely diverged members of the *Salmo* spp. (salmon) and *Scophthalmus* spp. (turbot) genera; some of the taxa most frequently misidentified in this assemblage. This research highlights the great potential for applying ZooMS to archaeological fish remains that are otherwise often left unidentified.

Haselgrove, Colin [29] see Hamilton, Derek

Hassam, Stephan [130] see Tanasi, Davide

Hastorf, Christine A. (University of California-Berkeley)

[254] *The Flavors Archaeobotany Forgot*

Archaeobotanists find herbaceous plants in their collected macrobotanical collections regularly. Usually they are associated with animal fodder and fuel. But what if they were condiments? Recently there has been more information on wild herbaceous plants and insects as part of rural people's cuisines. These oft-hidden ingredients should be recalled when taxa lists are studied, as some could have been important if rarely used spices and flavoring ingredients. We see, for example, that some creations in Europe's cuisine are entirely composed of what some might call weedy species. Consider the ingredients of cordials across Europe, drinks that can include up to 15 'wild' taxa. These plants were collected, nurtured and cultivated in and around kitchen gardens and houses. For example, the current Italian kitchen garden weed *Portulaca* was not only eaten in salads in the past and into the present in some rural locations, but it also interestingly has helpful blood pressure lowering capacities, further suggesting that local weeds that grew next to people's houses and in their nearby kitchen gardens were potentially essential to cuisines, flavors, as well as the health of the inhabitants.

[297] *Discussant*

Hastorf, Christine A. [9] see Maline, Sophia

Hatza, Ani [204] see Moran, Kimberlee

Hauser, Mark (Northwestern University)

[123] *Language Shift and Material Practice*

The model of linguistic creolization had a particular impact on archaeological practice. Drawing inspiration from Sidney Mintz's and Richard Price's *Birth of African American Culture* (1992), archaeologists have been quick to recognize how they could use the concept to interpret material culture and relations of power. Indeed, the histories and processes associated with settler colonization in the Caribbean, including indigenous displacement, forced migration of Africans and the appropriation of land and labor of both made it untenable to employ strategies that equated culture, biology, and language. The model helped archaeologists imagine, if not analyze, a less static understanding of social, political, and economic boundaries that shaped the colonial past. In this paper I build on this scholarship to consider a longer term set of processes that shaped Dominica's landscape in the early modern period and that continue to reverberate today. Specifically, I rely on linguistic and archaeological evidence to parse some of the historical threads and relations of power.

[208] *Discussant*

Hautefeuille, Florent [23] see Géraud, Manon

Haverstock, Gregory

[261] *Archaeological Resource Protection: Challenges to Federal Enforcement of Antiquity Law among Land Managing Agencies*

The Archaeological Resources Protection Act (ARPA) of 1979 was partially intended to address shortcomings in previous federal antiquities law. While the act corrected constitutional deficiencies with the Antiquities Act, federal land management agencies still grapple with a number of practical, cultural, and institutional barriers in carrying out archaeological law enforcement. This paper examines issues facing ARPA enforcement from the perspective of a land management agency. Case studies and court opinion will be used to highlight the relevant issues. These challenges include the use of science in a courtroom, logistical issues of carrying out a multi-year legal investigation, getting the support of the United States Attorney, archaeologists serving as law enforcers, facing the court of public opinion, and assigning monetary values to cultural items.

Haviser, Jay (St. Maarten Archaeological Center)

[337b] *Legacies of Syncretism and Cognition: African and European Religious and Aesthetic Expressions in the Caribbean*

Incipient aspects of syncretic processes among Africans and Europeans had begun on the African continent from the fifteenth century, with a particular reference noted for religious practices. Considering the relatively isolated participation of the two groups within the early interactive sphere of West Africa, as well as the in-situ contexts of the African cultures, some syncretical expressions were evident, yet due to the disproportional ratio of populations, were more subtle on the continent. However, once the various African populations were forcibly transported to the Caribbean, eliminating a strong homogeneity of cultural traditions, the degree of interactive exchange between Africans and Europeans increased dramatically, resulting in more complex and open forms of syncretism. This presentation seeks to provide a discussion of how African-European syncretic processes manifested themselves in successful forms, such as with benign cognitive compromises relating to religious practices, as well as how these syncretic processes were also rejected, such as with conflictive cognitive aspects in forms of aesthetic expression. It is proposed here that variable degrees of syncretical effectiveness were based on the fundamental variation of African and European cognitive approaches, with two archaeological case studies presented, one of successful syncretism and another rejected syncretism on St. Maarten.

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Hawkins, Stuart and Sue O'Connor (The Australian National University)

[125] *Pigs by Sea: The Establishment of Pig Husbandry on Wallacean Islands during the Late Holocene*

Domestic pigs play a crucial role in the socioeconomic systems of Island Southeast Asian cultures today. However, the timing of their introduction into the region during the late Holocene and details of their use by prehistoric inhabitants is not entirely clear. The introduction of domestic pigs by maritime Neolithic horticulturalists to the Wallacean island region of eastern Indonesia and Timor-Leste, which has never been connected to a major landmass, appears to have been an advantageous adaptation to these terrestrial depauperate environments. However, the archaeological record is complex with the possibility of independent domestication events in this region. This paper seeks to improve resolution of these issues by reviewing the evidence for pig domestication in Wallacea while adding new zooarchaeological evidence of pig vertebrate remains recovered from cave and rockshelter sites excavated in the lesser Sunda islands of Alor, Timor, Iembata and Pantar.

Hawley, Kirsten [101] see Scheiber, Laura

Haws, Jonathan [221] see Gomes, Ana

Hawthorne, Paige (National Park Service), Margo Schwadron (National Park Service), Alexandra Parsons (National Park Service), Carla Hadden (University of Georgia) and Tanya Peres (Florida State University)

[111] *Paleoecological Continuity and Change Over Time in South Florida*

Florida National Parks preserve millions of acres of wetlands, subtropical estuaries and prehistoric waterways interconnecting thousands of tree islands, middens and shell work islands, comprising one of the largest and most complex prehistoric maritime landscapes worldwide. Recursive human and natural dynamics shaped these landscapes over deep time, but they are now beginning to be impacted by rising sea level and climate change. What can we learn from changes on the landscape and human and animal adaptations? Looking at various data sets as proxies for paleo-ecological and past environmental change from Canaveral National Seashore, Everglades and Biscayne National Parks, we provide several case studies that illustrate differences in sustainability, resilience and changes in resources over time.

Haydon, Rex [335] see Lozada, Maria

Hayflick, Emily (The Field Museum)

[259] *Inscribing and Reinscribing Place: The Persistence of Hot Spring Sites in the Northern New Mexico Landscape*

This paper examines the ways in which humans create meaningful and enduring relationships with significantly unique environmental locations through a discussion of hot springs in the Rio Grande Gorge and Taos plateau. These springs demonstrate continual persistence as meaningful sites of visitation, of marking, and of cultural importance for those dwelling in the Taos area from the archaic to the contemporary. Through an exploration of the markings and constructions around the springs, I hope to elucidate how the layering of culturally significant markers and the residues of past visitations shape the subsequent connections to these sites. The paper will then focus on the capitalistic interventions onto and the post-capitalistic interactions with the sites to elucidate ideas of ownership, restriction, and reclamation of these environmentally and culturally significant locations.

Haynes, Gary (University of Nevada-Reno)

[79] *Elephant-Hunting with D. Stanford*

Dennis Stanford's work at the Dutton, Selby, Lamb Spring, and Inglewood sites was a major part of his lifelong search for breakthrough evidence about North America's earliest human encounters with mammoths. He encouraged me to study the megafaunal bones from those sites, and gave me room to disagree with him. His support allowed me to start looking into new ways to understand how the bones were modified and how such sites came to be. This presentation ties together data from those fossil sites with results of my actualistic research on megafaunal bones, starting with carnivore feedings at the National Zoo, and moving on to field studies of modern bonesites in North America, Australia, and Africa. Thanks to Dennis, critically important lessons have been learned about megafaunal bone assemblages. For example, we know that noncultural processes can spirally break proboscidean bones in ways that may be mistaken for human-caused fracturing, and that mortality profiles of multi-mammoth assemblages may reflect causes of death. Mammoths and other proboscideans feature prominently in debates about the evolution of human abilities to exploit large mammals, and Dennis Stanford has done much to advance the state of our knowledge.

Haynes, Gary [189] see Hutson, Jarod

Hays, Maureen [41] see Franklin, Jay

Hays-Gilpin, Kelley [218] see Barker, Claire

Hays-Gilpin, Kelley [70] see Smith, Jaye

Hayward, Michele (Panamerican Consultants), Michael Cinquino (Panamerican Consultants), Frank Schieppati (Panamerican Consultants) and Don Smith (Panamerican Consultants)

[73] *Shrines, Pilgrims, Pilgrimages in the Caribbean?*

There is some suggestion in the literature, most explicitly developed by Espenshade (2014) for Puerto Rico, that major enclosures, particularly with rock art, at some point in their life cycle could be considered shrines or special religious places that increasingly attracted visitors or pilgrims from non-local on- and off-island locations. Pilgrimage rounds are well-established components of religious systems both past and current in various parts of world, including the incorporation of a prehistoric rock art site in a present-day Voudou sacred journey on Haiti. The degree to which this concept applies in a prehistoric Caribbean setting will be examined through detailing probable archaeological correlates of pilgrimages and comparing rock art locations in the Greater and Lesser Antilles.

[73] *Chair*

Hazard, Rebecca [224] see Field, Julie

He, Xiaoqing [89] see MacDonald, Brandi Lee

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He, Yongshan (University of Toronto) and Chen Shen (Royal Ontario Museum; University of Toronto)**[24]** *What Can Artifacts Do: A Case Study of Miniaturized Architectural Models in Early China Tombs*

One major shift in mortuary practices that happened over the Han dynasty (202 BCE–220 CE) China, from burying bronze/pottery vessels to burying miniaturized architectural models, was usually explained as a result of the contemporary ideology of “treating the dead as alive”, or as a reflection of the social-economic transformation. While these previous interpretations invariably presumed that artifacts were passive representations and projections of ideological/social conditions of their contemporary people, the current paper intends to show the active roles of artifacts by shifting the main question from “what did grave goods represent or reflect” to “how did they influence people and what were their effects”. To do this, the paper first demonstrates that the material context created by existing pottery vessel styles was crucial for the emergence of granary terracotta as the earliest type of miniaturized architectural model; then it discusses how the newly invented granary models, by evoking the cognitive concept of miniaturism through their concrete material forms, resulted in a new category of grave goods being made and popularized, and eventually transformed people’s tomb practices. Thus artifacts should be seen as actively participating in social processes, influencing how people interact with and understand their world.

Headrick, Annabeth (University of Denver)**[209]** *Out of Clay and into Stone: The Emergence of Warriors at Chichen Itza*

In the Early Classic period a distinct characteristic of Central Mexican art is the appearance of warriors in public art. To the contrary, these figures generally appear on more private, personal items in the art of the Classic Maya, though their proliferation on these media distinctly rises in the Late Classic. In a remarkable development, the presence of warriors in public art explodes in Early Postclassic Chichen Itza. While central Mexican influence may have sparked this development, this paper explores the tangled web of cultural traditions, exposing the very Maya origins of many of these “portraits.” Looking primarily at the sculptural art of the Temple of the Warriors, the hybridity of this phenomenon will be emphasized. In addition, the individualization of the various figures testifies that a Maya concept of self within society characterized Chichen’s social organization, even as new segments of society asserted their status within the city.

Healan, Dan [169] see Hernandez, Christine

Heath, Barbara [188] see Upton, Samantha

Hechler, Ryan (Tulane University)**[178]** *Over the Andes, and Through their Goods: Integration Period Relations in Northern Ecuador*

While highland Peru’s Late Intermediate Period (AD 1000–1400) is characterized by community isolation, regional violence and shrinking exchange networks, the contemporary northern Ecuadorian Late Integration Period was a time of large-scale interregional activity that saw the flourishing of market economies. The northern Ecuadorian Andes demonstrated highly diverse cultural practices amongst an intimately connected Barbaocoan world that stretched from between the highlands of northern Ecuador and southern Colombia to the Amazon and the Pacific coast. Late Integration Period groups such as the Caras, Yumbos, Quijos, and Pastos were intimately connected via political affiliation and economic exchange—relations that were built and sustained in highly varied environments. This region proved the most difficult to subdue during the late Inka conquest of the region. The Inkas’ imperial attempts to segregate the subjugated highland Caras from surrounding groups via constructing the highest concentration of fortifications in the Pre-Columbian Andes proved insufficient to quell ties with unconquered selva communities, which maintained complex relations throughout Inka and Spanish colonialism.

[324] *Discussant***[324]** *Chair*

Hecht, Erin [227] see Stout, Dietrich

Heckenberger, Michael (University of Florida) and Wetherbee Dorshow**[161]** *Anthropocene Amazonia, Beyond the Buzzword: Centennial-Scale Anthropogenic Influences on Southern Amazonian Forests, 1000–2000 CE*

The Anthropocene is defined here as the time when human-induced alterations of the environment become a driver of regional and global climate. The Amazon has very deep histories of human alterations of forest systems, but settled occupations that dramatically altered forest structure in regional systems of Late Holocene age, particularly following the Medieval Warm Period (MWP), ca. 900–1300 CE. Global population loss in the Old World, beginning in the 13th century, and the demographic collapse of New World populations, following European contact, resulting in the LIA, creating the closed forest conditions that characterize the Amazon today. During the Current Warm Period (CWP) deforestation threatens to force a near-term tipping event in the southern Amazon and other areas. This paper summarizes data from archaeological and paleoecological work in the transitional forests of the southern Amazon over the past millennium, including past adaptations to warmer climates in the MWP, such as large-scale forest management. These can provide practical solutions to changes afoot today in the CWP.

Heckenberger, Michael [116] see Dorshow, Wetherbee

Heckman, Robert [268] see Heilen, Michael

Hedgepeth Balkin, Jessica (University of Colorado, Boulder)**[192]** *Moderator***[192]** *Discussant*

Hedin, Benjamin [106] see Canaday, Timothy

Hedman, Kristin M. [306] see Hargrave, Eve

Hedquist, Saul (University of Arizona)**[218]** *And the Legacy Continues: Homol’ovi Looking Forward*

This paper honors the anthropological contributions of the Homol’ovi Research Program (HRP) and its directors. We reflect on the conception and implementation of field and curation protocols that enabled years of innovative research into ancient Pueblo lifeways, work that continues today. Though fieldwork in the region has ceased, researchers still benefit from exceptional field recording standards, sound conservation techniques, and an explicitly behavioral project methodology. HRP was particularly meticulous in its attention to nuanced variation in archaeological deposits. In homage to the latter, we outline a case study of depositional content at Homol’ovi I, a late prehispanic Hopi village and the most intensively excavated site within the Homol’ovi Settlement Cluster. Using HRP data, we examine the co-occurrence of marine shell and turquoise—two relatively rare and symbolically important material varieties. Despite their scarcity, however, both were commonly deposited together at Homol’ovi I. We consider the social

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implications of the pairing, past and present, using archaeological and ethnohistorical insights. Our collections-based study demonstrates the lasting benefits of detail-oriented field techniques, an enduring hallmark of the HRP.

[218] *Chair*

Hedquist, Saul [72] see Spears, Michael

Heffter, Eric (The University of Arizona)

[200] *Lithic Analysis of Paleolithic Surface Scatters from Pleistocene River Terraces in the Republic of Serbia*

During the past two decades Paleolithic research in Serbia has rapidly expanded with numerous cave sites currently under excavation. However, this focus on caves in largely upland terrain may create a biased understanding of the Paleolithic record. Typically, open-air sites are integrated into research projects to correct for this bias. Unfortunately, Serbia has very few open-air sites, requiring us to use other sources of evidence as proxies for understanding the Paleolithic record in lowland areas. One underutilized source of data is Lithic Surface Scatters.

This presentation describes the Paleolithic surface material gathered from Pleistocene river terraces in Serbia and how researchers are using it to understand the Paleolithic record in the country outside of cave contexts. In addition to identifying the typological and technological affinities of these artifacts, I will also assess whether the presence (or absence) of surface material in different regions of Serbia is the result of taphonomic factors, differential landform preservation or survey selection bias.

[200] *Chair*

Hefner, Joseph (Michigan State University) and Michael Heilen (Statistical Research, Inc.)

[215] *Establishing Cultural Affinity through Multiple Lines of Evidence*

Repatriation and reburial efforts following the 2006–2008 excavation of the Alameda-Stone cemetery—a multiethnic, historical-period cemetery in downtown Tucson, Arizona—required a determination of cultural affinity for all human remains recovered from the civilian section. Goldstein played a key role in developing for the project a transparent and objective biocultural approach to determining cultural affinity that overcame problems encountered by previous projects in assessing cultural affinity. The approach relied on the equal weighting and assessment of three lines of evidence: contextual (i.e., archaeological evidence for mortuary treatment and social identity), osteological (i.e., the physical characteristics of the skeleton), and historical evidence (i.e., research into how the cemetery was used and the cultural traditions and identities of the people buried there). For each individual, the three lines of evidence were carefully reviewed and compared and a likelihood statement based on the distribution of all three lines of evidence was made (highly likely, multiple affinities, or culturally indeterminate). This model approach led to the identification of cultural affinity for nearly fifty percent of the 1,202 individuals recovered from the Alameda-Stone cemetery and successfully met the requirements of the stakeholder groups that claimed remains from the cemetery and Pima County, the project sponsor.

Heide, Gregory and Stuart Chilvers (Colville National Forest)

[106] *A View to Wilderness—The Salmo Lookout Tower and the Salmo-Priest Wilderness Area*

The Salmo-Priest Wilderness Area is a 41,335-acre wilderness area in the Selkirk Mountains, in northeast Washington. The wilderness area is within the Colville and Kaniksu National Forests. The area is noted for providing habitat for a number of threatened or endangered species including woodland caribou, grizzly bears, and grey wolves. Access to the area is limited to a few trails and visitation to the area is low. The Colville National Forest offers an alternative way to enjoy this wilderness area and explore a unique cultural property by visiting the Salmo-Priest Fire Lookout. Built in 1965, this R-6 flat cabin lookout is listed on the National Historic Lookout Register. The tower is accessible by a road, but is located on the border of the wilderness area. The lookout recently underwent rehabilitation in hopes of turning the tower into a recreation rental. This historic structure's accessibility to the public and unique location next to a hard to access wilderness area, offer an opportunity for all people to both enjoy wilderness and live history, if only briefly, by experiencing a life similar to the fire lookout staff who used to man the tower.

Heidkamp, Blair (University of Cincinnati)

[265] *Spinning through Time: Comparing Spindle Whorl Assemblages from the Southern Levant*

Spindle whorls, a flywheel attached to a shaft used for the production of thread, are one of the only artifacts related to the textile industry which survives in the archaeological record. At the crossroads between Anatolia, Mesopotamia, and Egypt, the southern Levant is at the intersection of cultural and technological change, particularly throughout the chronological scope of my study: the Pottery Neolithic, Chalcolithic, and Early Bronze I periods. There has yet to be a comprehensive study of spindle whorl assemblages covering the entirety of the southern Levant over multiple chronological periods. As a part of my Master's thesis, I collected data from published sources to create a database of whorls. I noticed specific trends in the data, most notably, a shift with primarily ceramic whorls in PN assemblages to a majority of EBI whorls made of stone. Evaluating the observed trends in spindle whorls, along with identifying the materials and potential processes individuals were using to spin thread, I was able to draw conclusions about the prehistoric textile industry in the southern Levant.

Heilen, Michael (Statistical Research, Inc.), Monica Murrell (Statistical Research, Inc.), Phillip Leckman (Statistical Research, Inc.) and Robert Heckman (Statistical Research, Inc.)

[268] *Exploring the Relationship between Surface and Subsurface Contexts in the Permian Basin, Southeastern New Mexico*

Analysis of previous cultural resource management investigations conducted in the Permian Basin of southeastern New Mexico indicate that many data are of poor quality, unstandardized, and of limited utility for comparative purposes or regional planning. Part of the problem is the limited understanding of which methods are best suited for site recording and testing and, more specifically, how observations made at the site surface correspond to subsurface content. This poster presents an experimental project sponsored by the Bureau of Land Management that investigated how survey, site-recording, and subsurface testing methods can be used to improve the analysis and interpretation of sites in southeastern New Mexico. Four previously recorded sites were re-recorded with the transect recording unit (TRU) system, then tested through a continuum of hand and mechanical techniques and subjected to intensive geoarchaeological investigations in order to identify techniques best suited to understanding their significance, integrity, and subsurface potential. The results of these efforts were analyzed to better understand the costs and benefits of the TRU system for survey and site recording, identify analytical procedures for leveraging TRU data in a management context, and assess the utility and reliability of different test methods commonly employed during site testing.

Heilen, Michael [215] see Hefner, Joseph

Heindel, Theresa (University of California—Riverside)

[129] *Ancient Maya Land Use: Water Management and Agricultural Production at Actuncan, Belize*

Research conducted during the 2015–2017 Actuncan Archaeological Project field seasons revealed several land use strategies utilized during the Late and Terminal Classic periods, including terracing, agricultural plots, and cobble mounds. Excavations conducted in the Northern Neighborhood of

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Actuncan exposed two terracing methods: 1) terraforming, in which earthen berms created to facilitate water drainage and 2) two small agricultural plot systems filled with a large amount of redeposited domestic trash. Such high levels of redeposited domestic trash, and the arrangement of these plots, suggest that agricultural and water drainage activity took place at an intra-household or larger community level. In addition, a number of linear cobble mounds have been found east of Actuncan along the Mopan River floodplain. Based on soil chemistry and proximity to the river, this area may have been used as a cacao orchard, thus creating an economic opportunity that could have benefitted the entire community. Together, these systems reflect how the ancient Maya at Actuncan managed water and agricultural production, and the scale at which these technologies were administered. These systems would have required collaboration between multiple households, creating community-wide cooperation towards food production (through terracing and agricultural plots) and for economic activity (through cacao orchards).

Heitman, Carolyn [15] see Reed, Paul

Heitman, Carrie (University of Nebraska-Lincoln) and Paul Reed (Archaeology Southwest)

[122] *An Archaeology of Ash? Exploring Chacoan Contexts and Practices*

The goal of this paper is to bring together disparate data sources on various Chaco-era sites both within Chaco Canyon, NM and outside (Salmon Pueblo) to examine the use of ash in intramural contexts. In light of recent work on the dimensions of animation, precedence, ancestors and heirlooms evident in Chacoan architecture, what patterns emerge regarding the deliberate use and deposition of ash? And how might we use Puebloan ethnographic accounts of ash to help inform our interpretations? This paper aims to contribute to the growing body of research on archaeological ash deposits.

Heizer, Melanie (University of Victoria)

[238] *Photogrammetric Results of Cemetery Inscription Analysis*

Being presented here are the results from the digital work done in the cemetery. Focusing on revealing the lost inscriptions, the goals of this project have been to corroborate the list of people buried in the cemetery, and identify the names and dates of those either not listed or those for whom the records are not complete.

In using photogrammetry, burial monuments in the Emanu-El cemetery in Victoria, BC are being rediscovered and assessed for cultural preservation purposes. This digital technology is being used in conjunction with archival research, looking at the individuals buried in this cemetery. By identifying the names and dates associated with the monuments, we are able to recreate an identity for the individuals buried here. Additionally, we are able to assess which monuments are in danger of environmental damage, and identify them for potential preservation efforts. This digital project has been run alongside other archaeological and cultural surveys in the cemetery.

Heller, Sky [294] see Ingraham, Robert

Helmer, Matthew (US Forest Service) and David Chicoine (Louisiana State University)

[82] *Variations in Settlement Patterns and Neighborhood Organization in Early Horizon Peru*

This paper examines forms of proto-urban settlements in coastal Ancash, north-central Peru, centered on the Nepeña Valley. During the Early Horizon (800–100 BC), the region witnessed the development of culturally and economically interrelated settlements with varying degrees of architectural density and complexity. Most of these centers were organized around clusters of walled enclosures with duplicate domestic facilities interpreted as multi-functional residential complexes, or compounds. Based on spatial, architectural and excavation data, these compounds are interpreted as major foci of daily activities and interactions, as well as public events housed in patios and plazas at the heart of most compounds. Depending on their scale and complexity, some of the compounds can be considered neighborhoods. In this paper, we explore what the neighborhood concept entails for these groups in terms of sociopolitical organization through a review of Early Horizon excavation and settlement pattern data. Major variables include: “compact” and “dispersed” architectural patterns; ephemeral, generational, and multi-generational architectural scales; access patterns; life cycles of compounds; and material patterns of use. We compare these results with other settlements in the region in order to gain comparative insights into the diversity of residential adaptations during the first millennium BC.

Helmke, Christophe [147] see Stanchly, Norbert

Hemer, Katie (University of Sheffield)

[87] *Non-adult Dis/ability and Care in Early Medieval Britain*

A child who is unwell or physically impaired naturally causes concern and anxiety for his or her parents/carers. For many in today's modern society, accessible medical care means that the challenges associated with caring for a sick or disabled child can be overcome or, at least, minimized. But how did parents/carers respond and adapt to the demands of ill-health and physical impairment in children during the early medieval period? In seeking to address this question, this paper will explore evidence for physical impairment (e.g. achondroplasia) from the analysis of non-adult skeletal remains from early medieval Britain. Through an exploration of the burial rites accorded to physically impaired children, this paper will consider whether or not parents/carers put in place any provision for their child either during and/or after life, and whether such evidence offers insight into early medieval attitudes towards dis/ability.

Hemer, Katie [87] see Shiner, Marion

Hemmings, C. A. [35] see Adovasio, J. M.

Henderson, A. Gwynn (Kentucky Archaeological Survey), Linda S. Levstik (University of Kentucky), M. Jay Stottman (Kentucky Archaeological Survey) and Janie-Rice Brothel (Kentucky Archaeological Survey)

[94] *Investigating a Shotgun House: “Who Knew Shelter Was So Emotionally Charged?”*

Investigating a Shotgun House, a Project Archaeology: Investigating Shelter case study, asks students to use multiple data sources (oral history, historical documents, architecture, and archaeology) to examine a single question: what can we learn about the lives of mid-20th century urban working-class people from the study of their homes? In this case, shotgun houses. Formal field testing in elementary school classrooms, and interviews with piloting teachers and their students documented that the unit is a highly motivating teaching tool that promotes deep conceptual understanding of basic historical, anthropological, and archaeological content, concepts, and methods while eliciting empathetic attention to issues of social justice, agency, and civic engagement. Our research also determined that the unit is an excellent model of an active learning, inquiry-based teaching approach. Inquiry-based teaching begins with a question, and requires content, data, analysis, thinking, and drawing conclusions to answer it. For many teachers and students, inquiry represents a major pedagogical paradigm shift. If deep conceptual understanding is a course goal, instructors

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should consider incorporating some aspect of an inquiry-based approach in their teaching. Our poster presents a brief overview of the unit, highlighting its inquiry approach and its social justice aspects. A mini lesson is provided.

Henderson, A. Gwynn [26] see Pollack, David

Henderson, John (Cornell University) and Kathryn Hudson (University at Buffalo)

[299] *Toward an Ulúa World: Defining, Delimiting, and Interpreting Interaction Networks*

Framing the lower Ulúa valley and adjacent regions as part of a southeastern Mesoamerican frontier has always entailed an interest in external relationships, especially those connecting frontier regions with the Maya world to which they were supposedly peripheral. The belief that the periphery was occupied by simple non-Maya societies, lightly "influenced" by their more civilized western neighbors, appeared early in the development of orthodox frameworks and continues to influence archaeological perspectives. The advent of World Systems Theory and other core-periphery perspectives brought an interest in the character of the relationships but little advance in attention to the material remains that might reflect the supposed derivative nature of frontier cultural patterns.

Understanding interaction requires methodologies that move beyond unilateral region-to-region or community-to-community connections and focus instead on the development of innovative approaches to documenting multiple overlapping networks connecting many groups within many communities. Taking ceramic systems as our focal point, we explore the potential of pottery to map links among lower Ulúa valley groups and their counterparts in adjacent regions. Delineating the distributions of these likely traces of interaction illustrates a new and more sensitive framework for assessing the movement of ideas and things in a complex landscape.

Henderson, Lucia (Independent Scholar)

[176] *Looking Beyond Teotihuacan in the Art and Architecture of Early Classic Kaminaljuyu*

This paper examines the foreign connections evidenced by the material record of Early Classic Kaminaljuyu. The author discusses the ways in which public art, architecture, and elite funerary contexts evolved at Kaminaljuyu during this time, evaluating how these changing styles may have tied into evolving relationships with distant sites and regions such as Teotihuacan, Veracruz, and the Maya lowlands. The Early Classic relationship between Kaminaljuyu and Teotihuacan has, in many ways, eclipsed the myriad other relationships evidenced by Kaminaljuyu's material record during this time. The singular scholarly focus on the interaction between these two sites has created the impression that Early Classic Kaminaljuyu had a single, monolithic approach to foreign style and a single, primary foreign relationship. Stepping back to consider this time period more holistically, however, a pattern emerges instead of diachronic change and synchronic variation, with Kaminaljuyu laying claim to evolving sets of relationships with numerous foreign powers through time. In sum, this paper seeks to both dig deeper into the nature of the Early Classic relationship between Kaminaljuyu and Teotihuacan as well as give a stronger voice to other connections encountered in the art and architecture of Early Classic Kaminaljuyu.

Hendon, Julia (Gettysburg College)

[278] *Moderator*

[278] *Discussant*

Hendrickson, Mitch (University of Illinois at Chicago), Stéphanie Leroy (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa), Quan Hua (Australian Nuclear Science and Technology Organisation), Kaseka Phon (Royal Academy of Cambodia) and Enrique Vega (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa)

[175] *Space, the Iron Frontier: Production, Spatial Organization and Historicity of Iron Metallurgy within the Angkorian Khmer Empire, Cambodia (9th to 15th c. CE)*

Iron production was a critical process in the expansion of the Angkorian Khmer Empire. Recent surveys by INDAP around the Phnom Dek region have revealed a massive industrial landscape that appears to have fueled Angkor's expansionist ambitions between the 11th to 13th centuries. This paper presents a spatial and morphological GIS analysis of hundreds of slag concentrations mapped in this region to evaluate changes in the scale and organization of metal production. Combined with pXRF data of tap slags analyzed in the field, we model smelting recipes zones around Phnom Dek to reveal patterns of ore selection and producer practice. The results dovetail with the rigorous artifact-based analyses conducted by IRANGKOR with the overall goal of tracking how the Khmer iron economy functioned and impacted development of the most expansive state in mainland Southeast Asia.

Hendrickson, Mitch [175] see Leroy, Stéphanie

Hendryx, Greg, Joost Morsink (SEARCH, Inc.) and Charlotte Pevny (SEARCH, Inc.)

[140] *From Quarry to Mine: Citronelle Gravel Extraction in Southwest Mississippi*

Excavation was performed on the periphery of a substantial Pliocene-age deposit of Citronelle gravel in southwest Mississippi, 20 miles north of the Gulf Coast. This gravel deposit, which covered hundreds of acres, represents the southern-most exposure in the region. Historic Citronelle mining throughout the twentieth century has extirpated the signature of primary lithic reduction deposits; however, a discrete loci of cultural material spanning two millennia remains intact, and buried beneath the mine tailings. This paper provides information on the activities conducted during stone-seeking forays from the coast and includes a discussion on historic period mining.

Henebry-DeLeon, Lourdes (Central Washington University)

[253] *Born and Bred on the Columbia Plateau: The Ancient One in Time and Place*

In looking at all available population specific data for the Columbia Plateau, the Ancient One falls within the variability exhibited on the southern Columbia Plateau at the same time period and throughout time. He was not outside of the norm for the population existing during the Early Cascade period when he was alive and for the population that followed for which he has a shared group identity. The Ancient One's biological identity, cranial morphology, stable isotope values, and DNA data reflects the most recent and direct lines of evidence establishing a distinct, identifiable earlier group. Biological and other evidence provides a sufficient link to culturally affiliate the identifiable earlier group through time to nearby populations. The same biological evidence, seen in the Ancient One is present within the regional area of the wider Columbia Plateau through time.

Henebry-DeLeon, Lourdes [253] see Neller, Angela

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Heng, Piphai (University of Hawai'i at Manoa), Miriam Stark (University of Hawai'i at Manoa), Peter Grave (University of New England, Australia), Lisa Kealhofer (Santa Clara University) and Darith Ea (APSARA National Authority, Cambodia)

[175] *Angkorian Settlements and Interactions in the Cambodia Middle Mekong Region*

The Middle Mekong Region played a crucial role in the formation of the pre-Angkorian and Angkor states. Most Angkorian centers are concentrated within the open plains with favorable access to rice cultivation and interconnected by landroutes. Settlements of the Middle Mekong Region are predominantly located within a narrow strip of fertile land between the rivers and the highlands historically associated with different groups of minorities. This paper combines multiple datasets including site distribution, inscriptions, stoneware geochemical analysis, as well as a navigation and economic model to discuss Angkorian settlement patterns and interactions along the Middle Mekong.

Heng, Piphai [175] see Carter, Alison K.

Henrik, Hansen [143] see Lynnerup, Niels

Henry, Aureade (CNRS- University Cote d'Azur), Julie Esdale (University of Colorado, USA), Ted Goebel (Center for the Study of the First Americans, Texas), Kelly Graf (Center for the Study of the First Americans, Texas) and Aleksei Teten'kin (Technical State University, Irkutsk, Russia)

[177] *No Fire without Wood? Some Reflections on Late Pleistocene Pyrotechnology in Northern Tundra Environments (East Siberia, Interior Alaska)*

The use of alternate fuels such as grasses, bones or dung has often been interpreted as a typical response of Late Pleistocene (LP) hunter-gatherers to harsh environments, in which woody resources are scarce. In the context of early human dispersal from south-east Siberia into the Americas, the question of prehistoric migration and settlement is closely linked to the one of fuel availability, fire being considered, to the same extent as food, a vital element for survival. However, data regarding the modalities of LP fuel and fire use in Siberia/Beringia are still too scarce to integrate pyrotechnology into the reflection about ancient human behaviour and adaptation to cold climates. New multi-proxy fuel analyses (wood charcoal, phytoliths, burned bone remains) of two LP sites, Kovrizhka IV (Irkutsk region, Russian Federation) and McDonald Creek (Alaska, USA), allowed us to obtain first results on the neighbouring vegetation as well as on fuel management practices in the shrub-tundra zone. Hearth micromorphology is also planned at these sites and will provide valuable complementary data on feature formation and functioning. Our results will be discussed in light of the current hypotheses on prehistoric fuel use as well as ethnographic examples from eastern Siberia.

Henry, Edward [291] see Grooms, Seth

Hepp, Guy (California State University, San Bernardino)

[262] *Coastal-Highland Interaction in Early Formative Period Mesoamerica: The Ceramic Affiliations of La Consentida*

Early Formative period pottery from the site of La Consentida in coastal Oaxaca, Mexico, bears indications of both local developments and interregional influences. In previous papers, I have presented stylistic evidence for interaction between La Consentida and potters from distant West Mexican traditions such as Capacha and Opeño. While some of La Consentida's decorated Tlacuache phase vessels suggest involvement in a system of long-distance interaction along Mesoamerica's Pacific coast, more utilitarian wares such as globular jars and undecorated hemispherical bowls imply affiliations closer to home, specifically with Early Formative period highland assemblages of the Espiridión, Tierras Largas, and Purrón phases. In this paper, I discuss formal similarities between highland pottery and La Consentida's Tlacuache phase assemblage. On the basis of these affiliations, I propose a model in which La Consentida's diverse ceramics are explained as partly the result of the cooperating or even conflicting emphases of overlapping interaction spheres: one along the Pacific coast and one tying the coast to the southern and central Mesoamerican highlands. These patterns suggest that people at La Consentida both maintained some traditional practices of Red-on-Buff potters in adjacent regions and self-consciously participated in a coastal interaction network involving more superficial decorative styles.

Hepp, Guy [306] see Rumberger, Jacklyn

Herbert, Joseph (Cultural Resources Management Program, Fort Bragg), Jonathan Schleier (Center for the Environmental Management of Military) and William Feltz (Oak Ridge Institute for Science and Education)

[332] *Long Leaf, Fire and Hunter-Gatherers of the Carolina Sandhills*

In presettlement times long leaf pine forest dominated the Carolina Sandhills, where frequent wildfire, sandy soil and steep hydrologic gradients produced high biodiversity, but low hunter-gatherer carrying capacity. Land-use models based on the results of systematic shovel testing across 162 square miles at Fort Bragg, North Carolina, indicate continuous occupation throughout prehistory, small group size and short terms of residential tenure. Although the archaeological site is the unit of resource management, most sites comprise multiple components, and comparing component spatial density across presettlement vegetation communities and wildfire-frequency zones provides a means for exploring prehistoric land use. Archaic components are more dense in Xeric Longleaf Pine–Wiregrass Sandhills communities where upland flats offer long sight lines and minimal topographic relief, ideal for overland travel, logistical procurement, large game hunting and family-band migration. The spatial density of Woodland components is higher in Mesic Longleaf Pine–Wiregrass Slope, Small Stream Swamp and Depression Pond communities where less frequent, lower intensity wildfire encourages deciduous mast-bearing trees and richer soil for horticulture. Quantifying cultural component spatial density across vegetative community type also provides a standard for evaluating the research potential of resources, determining NRHP eligibility, and ranking potentially eligible resources for further testing.

Herckis, Lauren (Carnegie Mellon University)

[22] *Archaeology as Anthropology: Chaîne Opératoire and the Analysis of Contemporary Technologies*

The application of archaeological methods to modern contexts is an emergent trend in cultural anthropology. This paper presents a case study of chaîne opératoire methodologies in the analysis of modern technologies. New materialist ontologies and digital archaeologies offer powerful tools for understand the past. Behavioral archaeologists apply method and theory to relationships between people and things in all times. Dawdy, McGuire and others address the current archaeological turn in anthropology. The application of archaeological methods in analyses of contemporary material landscapes and social contexts isn't new. This paper adds to the ongoing discussion, arguing that these efforts provide data to refine our understanding of the past and also contribute to our understanding of the present. Transformations in social and material landscapes are entangled today as they were in the past. Many factors, including acquisition of raw material, discard, refinement, and locality have significant effects on the chaîne opératoire of modern technologies. Social factors contribute to the spatial arrangement of craft production, elaboration, use, and repair at a research university. A chaîne opératoire approach provides an integrated understanding of production processes related to educational technologies, exposing complex relationships between labor, emergence and diffusion of technological traditions, and exploitation of available resources.

[160] *Discussant*

Heredia Espinoza, Verence [31] see Marino, Marc

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Hermes, Bernard [252] see Zralka, Jaroslaw

Hermitt, Elijah J. (Pennsylvania State University), Kirk French (Pennsylvania State University), Carly Hunter (Pennsylvania State University), Cayt Holzman (Pennsylvania State University) and Caitlin Donahue (Pennsylvania State University)

[241] *Where the Devil Don't Stay: The Role of Moonshine Production in the Mountains of North Carolina*

Since the mid-nineteenth century, the vast majority of local whisky production has been unregulated and illegal. Both production and distribution of illicit liquor moved underground with the passing of the 18th Amendment—known as the Prohibition—in 1919. This economic shift occurred in tight-knit mountain communities where knowledge has been vigilantly guarded. This continuous whisky production cycle has resulted in the deep social, economic, and cultural ties that persist in the Catalochee region of Haywood County, North Carolina. The objective of this project is to chronicle this intimate economy through the medium of videography. This is examined through interviews of both current and former “moonshiners,” as well as people who have spent their entire lives in the region. From these oral histories we can begin to extrapolate the impacts—both beneficial and destructive—of illicit alcohol production. The past and present socioeconomic climates share a common denominator in the moonshine production, commercialization, and consumption that is so deeply rooted in western North Carolina.

Hernandez, Christine (Tulane University) and Dan Healan (Tulane University)

[169] *The Ceramics and Chronology of the Ucareo-Zinapécuaro Obsidian Source Area, Michoacán, Mexico*

Sourcing studies conducted over the past 45 years have identified obsidian from the outcrops around Ucareo and Zinapécuaro, Michoacán in archaeological sites located across Mesoamerica including San Lorenzo, Xochicalco, Tula, Chichén Itzá, and Tzintzuntzan. Archaeological investigations including survey and excavation conducted by Tulane University during the 1990s have provided the first detailed information on prehispanic settlement and obsidian exploitation within what is now called the Ucareo Zinapécuaro obsidian source area (Healan 1997, 1998; Hernández 2006). In this presentation, we formally introduce the regional ceramic sequence and chronology established for the source area and adjacent northeastern Michoacán. While based on the sequence and chronology published by Gorenstein (1985) for neighboring Acámbaro, Guanajuato, our investigations have produced a considerably refined and expanded sequence made possible by a much larger data set and chronometric dating of 30 radiocarbon samples. The result is a ceramic and cultural chronology that encompasses nearly 2,000 years of dynamic prehispanic occupation, obsidian exploitation, and long distance exchange.

Hernandez, Christopher (University of Illinois-Chicago) and Joel Palka (University of Illinois-Chicago)

[167] *Examining Environment, Ecology and Patterns of Maya Culture at Mensabak, Chiapas, Mexico*

Our study examines the interplay of the environment, topography, conflict, and social change. Recent research stresses the role of environmental and ecological fluctuations in the Classic Maya collapse (AD 700–1000). Scholars have linked drought cycles and changing climate to increased warfare and culture change at the end of the Classic Period (AD 200–900). However, numerous studies highlight that not all places in the Maya area collapsed, some communities grew and continued to be places of human settlement for many centuries. More local high-resolution environmental data are necessary to understand the interplay of environment, ecology and Maya culture change. This paper examines data from the Selva Lacandona region to understand how climate and ecology may be linked to social transformation within the vicinity of Lake Mensabak. After the collapse, the Maya lowlands were massively de-populated, but during the Late Postclassic (AD 1200–1600) Lake Mensabak became a place of renewed settlement. As Maya migrated to the lake for its aquatic resources and defensible landscape, elites chose islands with elevated terrain to instantiate a cosmological/ideological scheme. People of lesser rank resided near the lake shore and at lower elevations, which were areas of lesser religious importance and more exposed to attacks.

Hernandez, Hector (Universidad Autonoma de Yucatan), Francisco Canseco (Universidad Autonoma de Yucatan) and Joaquin Venegas (Universidad Autonoma de Yucatan)

[173] *Industrial Heritage and Henequen Landscapes: The Social Spaces along the Conkal-Progreso Railway in Northern Yucatan (1886–1950)*

From the second half of the nineteenth century the Yucatecan henequen industry experienced an extraordinary growth that would result in a “Gilded Age”. The most notorious vestiges of this era are the henequen haciendas, which were dispersed across the entire peninsula and whose ruins evoke nostalgia for an era of industrial and commercial splendor. By the end of the century, new developments in communications and construction industries also appeared. Yucatán’s accelerated economic growth, tied to the henequen boom, resulted in new transport infrastructure such as the railroad, which became the force behind the growth of agricultural, industrial, and commercial production on the peninsula. A narrow-gauge railway that ran from the town of Conkal to the Port of Progreso is a clear example of a capitalist project of that epoch which brought changes to the Yucatec landscape and the social relations that impacted native populations. This paper focuses on the survey and register of archaeological evidence along this railway using modern technologies such as UAV’s, as well as excavation, and material culture analysis. Our goal is to illustrate how economic boom and industrialization had drastic environmental, social, and cultural repercussions within indigenous communities of the Yucatan peninsula.

Hernández, Irais [172] see Lucet, Genevieve

Hernández, Laura

[57] *Where Are You Staying? Lodging Facilities in San Juan, Puerto Rico*

In the 19th century there was a large influx of people traveling to Puerto Rico, many stayed in lodgings throughout the capital city of San Juan. This study focuses on the hotels, guest houses and hostels within the walled city, currently known as Old San Juan, during the late 19th century and early 20th century. Using primary sources that include photographs, maps, blueprints and newspaper advertisements, the goal of my research is to establish the location of this type of businesses. Also, to address issues related to the movement of foreigners from various social groups within the city. Once the location was pinpointed, a virtual map was created to include streets views, data related to the location, rates and clientele, and other relevant details. A list of lodging facilities was used to visit the location and photograph the buildings, and to cross reference it with the cultural resources management projects that have been completed. The data produced by this study can be used to develop a larger project that includes excavations in some of these locations.

Hernández, Mario

[260] *Análisis geoespacial de la distribución de sitios arqueológicos en la Sub-Región Diquís, Región Gran Chiriquí*

La Sub-región Diquís de la Región Gran Chiriquí posee a la fecha un total de 1.595 registros de sitios arqueológicos documentados en la Base de Datos Orígenes del Museo Nacional de Costa Rica. El presente trabajo expone los resultados logrados al aplicar un análisis geoespacial diseñado para conocer la distribución de dichos depósitos arqueológicos, en un contexto fisiográfico modelado para tal efecto mediante sistemas de información geográfica (SIG), que permite aproximarse a las características de la ocupación precolombina de la sección noroeste de la región Gran Chiriquí aprovechando los datos de antigüedad y funcionalidad que se consignan en la mencionada base de datos.

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Esta investigación busca conocer la dispersión y concentración de sitios arqueológicos en diferentes unidades paisajísticas de índole fisiográfica, para aportar a la discusión sobre la localización propuesta de asentamientos de la fase Aguas Buenas (500 a.C.-800 d.C.), con una tendencia en las tierras altas de esta sub-región en contraste con la frecuente distribución de yacimientos adscritos a la fase Chiriquí (800–1550 d.C.) en las tierras bajas. La distinción de las distintas funcionalidades de estos yacimientos, según las diferentes fases, ha permitido brindar aproximaciones al uso de la tierra en tiempos prehispánicos para la sub-región bajo estudio.

Hernandez Garavito, Carla (Vanderbilt University)

[257] *From there, a great long time ago, even before the Incas were born: Representations of the Inka Empire among the Lurin Yauyos*
Andean archaeology consistently uses the Spanish colonial written record as a guide in interpreting the characteristics of the different societies that fell under the Inka rule. However, a growing body of scholarship on the material culture of such incorporated societies shows that the nature of their relationship with the Empire was variable, and that Inka control was not territorially continuous. One key strategy through which the Inka incorporated these groups was the entangling and capture of their local religious practices with those of the official state cult. In this paper, I propose to flip this model and ask how local polities interpreted the Inka within their own memory and history. In other words, what were the narratives that some of these polities spanned to define their own standing within the Empire? I focus on the Yauyos people from the highlands of Lima, Peru. Through and archaeological and historical analysis, I argue that local rituals and spaces served as the critical medium through which the Yauyos defined their own interpretation of the Inka and their new position within their empire, thinking of themselves as allies as of the Inka as subjected to their own local deities.

[257] Chair

Hernández Sariñana, Daniela [184] see Buckley, Gina

Hernández Sariñana, Daniela [293] see Carballo, David

Hernandez-de-Lara, Odlanyer (Cuba Arqueológica)

[57] *Documenting the First Battle of the Spanish-Cuban-American War (1898): Insights for an Archaeological Perspective*
The Spanish-Cuban-American War of 1898 constituted not only the events leading to the start of the first modern war but also marked the beginning of the colonialist expansion of the United States throughout the world. The explosion of the USS Maine in Havana's harbor has often been interpreted as the excuse used by the US to get involved in the Cuban War of Independence; a war that Cubans and Spaniards had been fighting since 1895, but rooted since 1868. Previous research has traditionally focused in the naval encounters of the Spanish and US fleets in Santiago de Cuba, or the end of the war with the occupation of Puerto Rico, the Philippines, and Guam, thus underestimating the role of the Cuban troops and leaving the early events of the war poorly explored. Our research focuses on the first battle of the war, which occurred on Matanzas Bay, Cuba, on April 27th, 1898. Historic documentation from Cuban, Spanish, and US archives is analyzed, and compared to the available archaeological data, to deepen the understanding of the defensive and offensive strategies employed, and their impact on the media and their publicist strategies.

[57] Chair

Herndon, Brianna (University of California, Riverside) and Sara Becker (University of California, Riverside)

[270] *Movement in Moquegua: Detecting Differential Activity Types via the Knee in a Tiwanaku Subgroup*
Previous studies regarding femoral fossa morphology center on risk levels and variables associated with non-contact anterior cruciate ligament (ACL) injury. Increased risk of ACL injury is associated with smaller femoral fossa size. While fossa size is influenced by many variables, biologically “plastic” responses to early life experiences, such as traversing local topography or cultural factors, are appearing to emerge as perhaps the most impactful. Due to the crucial nature of the knee, it is one of the most common locations of focus to detect how stressors of daily life (e.g. movement, activity) shape the underlying skeletal structures. Available studies of the skeletal elements of the knee almost exclusively focus on linear landmark measurements as methods for analysis. Such reductive methodology neglects the three-dimensional, dynamic nature of this joint. This research seeks to present an alternative methodology utilizing digital models that tests for skeletal differences at the knee between subsistence/activity groups (settled agriculturalists versus pastoralist/lama caravanners in a Tiwanaku sample). The use of three-dimensional models is intended to more accurately represent the complexity of the knee joint in analytics, results, and interpretations of the movements and activities of past populations.

Herrera, Valentina (Institute of American Indian Arts)

[337c] Discussant

Herrera-Casanova, Lorenzo [131] see Martínez-Tagüña, Natalia

Herring, Erin [38] see Cromwell, Richard-Patrick

Herrmann, Corey (Yale University) and Nicholas Brown (Yale University)

[249] *The Thorny Problem of Spondylus Sourcing in the Ancient Andes*
Archaeologists have long been fascinated with the exploitation and exchange of *Spondylus* spp. across the ancient world. This is especially true for the Andes, where the “thorny oyster” has been found far afield from its tropical breeding sites along the coasts of Ecuador and northern Peru. However, factors such as the uneven development of archaeology between Peru and Ecuador and the persistence of certain myths about Andean *Spondylus* have led to a “black-boxing” effect where exchange from Ecuador to Peru is assumed rather than tested. This paper briefly presents the state of understanding in Andean *Spondylus*, as relates to: its exploitation by ancient people; its exchange through the coast, highlands, and jungle; its production into remarkable artifacts of beauty and importance; and its cosmological significance for numerous Andean societies. This review highlights the potential impact of developing techniques to source *Spondylus* shells from their coastal Ecuadorian and Peruvian breeding grounds on the study of the ancient Andes. The paper will present preliminary results of archaeometric sourcing efforts, the difficulties of extending this technique into the Andean paleoclimate, and the implications of defining the sources of *Spondylus* for exchange in the ancient Northern and Central Andes.

[324] Discussant

Herrmann, Edward (Indiana University Department of Earth and Atmospheric Sciences), Mackenzie Cory (Indiana University Bloomington), Katie Hunt (IUPUI), John Flood (IUPUI) and Josh Myers (IUPUI)

[5] *Chronologies of Paleoindian Site Distributions and Raw Material Use in Indiana: An Analysis of State-Level Data*
In this paper, we present an analysis of all recorded Paleoindian sites in Indiana and place them in a diachronic framework. Our findings are part of a long-term project to construct a Geographic Information Systems database of Paleoindian sites that can be queried for data relevant to a better understanding of the Paleoindian presence in Indiana. Preliminary data indicate that time-transgressive differences exist for where Paleoindians placed themselves on the landscape, and for how Paleoindians exploited lithic raw materials. Due to different reporting standards through time, state-level

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data are inherently difficult to compare, however, our team evaluated each site in terms of landform location, artifact typologies, and when available, raw material types. We also describe our experience with various issues related to state-level data and the use of gray literature to help provide additional data and site context.

Herzog, Nicole (Boise State University), Lisbeth Louderback (University of Utah and the Natural History Museum) and Bruce Pavlik (Red Butte Garden, Conservation Department)

[86] *Comparing Starch Granules from Wild and Cultivated Solanum jamesii to Determine the Effects of Domestication*

The processes, antecedents, and outcomes associated with plant domestication have been central themes in archaeological and interdisciplinary research for the last century. While domesticates can often be readily distinguished from their wild progenitors both genetically and morphologically, the steps leading to domestication (transport, selective harvest, deliberate seed dispersal, active plant management, i.e. cultivation) can be difficult to track archaeologically. Techniques for identifying morphological changes in macrobotanical remains (e.g. seeds, fruits, caryopses) from archaeological sites have been well established, but there are virtually no systematic studies on how to identify morphological changes in microbotanical remains (e.g. starch granules) despite claims that larger granules are characteristic of domesticated species. Here we test the hypothesis that domesticated plants produce larger starch granules than their wild progenitors. We measured granules from the Four Corners potato (*Solanum jamesii*) that were a) grown in the wild, b) associated with archaeological sites, c) propagated in a greenhouse, and d) cultivated in a garden. This systematic approach provides the first attempt to establish a protocol for identifying the domestication process in starch granules.

Herzog, Nicole [86] see Louderback, Lisbeth

Hess, Michael [134] see Lo, Eric

Hewitt, Ray [261] see Frederick, Jennifer

Heydari-Guran, Saman [174] see Ghasidian, Elham

Hicks, Megan (City University of New York), Árni Daniél Juliusson (Reykjavík Academy), Ragnhildur Sigurðardóttir (Reykjavík Academy), Astrid Oglivie (INSTAAR, University of Colorado) and Viðar Hreinsson (Reykjavík Academy)

[167] *A Movement at the Margins: An Icelandic Rural Transformation at the Edge of the 19th Century Atlantic World*

In the early modern Atlantic World, core/periphery mercantile economics ascribed a marginal place for Iceland. The island's role in trade involved the production of low-cost bulk goods destined for markets mostly via Denmark into the 19th century. The focal area of this paper, the rural and upland Mývatn region, was in some ways socially and ecologically marginal even within Iceland. The growing environment was affected by unpredictable cold weather while volatile erosion zones hemmed local grazing land and hayfields. Although the community was home to two small rural municipal centers, it was distant from coastal trading points. Through interdisciplinary archaeology, environmental investigation, and documentary evidence, this paper investigates and describes how people in Mývatn managed ecological productivity and economic engagement at a periphery. We find that their significant efforts to secure abundance from marginal places was inseparable from social transformations through which the community ultimately assumed an influential role in changing the conditions of regional and national trade. This integrated social and ecological approach contributes to understandings of marginality as not an essential property of landscapes and societies, but one that is actively produced and contested through relations at many scales.

[195] *Chair*

Higa, Naoki [24] see Sweeney, Alex

Higelin Ponce de León, Ricardo (Indiana University Bloomington), Alicia Gonzales (Oregon State University) and Jeffrey Blomster (George Washington University)

[288] *Skeletal Health and the Impact of Agriculture within the Mixtec Population from Etlatongo, Mixteca Alta, Oaxaca during the Middle Formative*
Sedentism and agriculture had major impacts on early human societies by increasing social complexity. Some scholars attributed an intensification of inequalities to a greater dependency on agriculture. This dependency, consequently lead to decreased health status of the non-elite/rulers population. Our goal is to address the overarching question of, how did agriculture impact ancient societies? And specifically, does the emergence of agriculture correlate with decreased health? Therefore, we assess the impact of agriculture within the Middle Formative (850—400 BC) population from the Mixtec prehispanic society from Etlatongo, located in the Nochixtlán Valley, Oaxaca. We use archaeological and bioarchaeological data to evaluate health of 21 individuals and compare them with other skeleton collections within the same time period, from the Mixteca Alta, Valley of Oaxaca and the Coastal regions, all from Oaxaca. Through these comparisons, we propose that it is possible to extrapolate that agriculture does impact human health in the Middle Formative Mixteca Alta population.

[337c] *Discussant*

Higelin Ponce de León, Ricardo [306] see Gonzales, Alicia

Higelin Ponce de León, Ricardo [288] see López López, Alba

Higham, Tom (University of Oxford), Thibaut Devièse (University of Oxford), Marine Frouin (University of Oxford) and Katerina Douka (Max Planck Institute for the Science of Human History)

[41] *Neanderthals, Denisovans and Modern Humans: Unravelling the Chronology of the Middle to Upper Palaeolithic of Eurasia*

For more than half a century Paleolithic archaeologists have grappled with radiocarbon-based chronologies that are often contradictory and imprecise. Several key debates in the Palaeolithic have their roots in basic issues related to chronology; did the Aurignacian predate the Chatelperronian in some regions of Europe? When did Neanderthals disappear? How long did anatomically modern humans (AMH) and Neanderthals overlap, and what implications did this have for interaction, acculturation or interbreeding? Without reliable time control, these questions are unanswerable and unravelling the Paleolithic remains a distant and virtually unachievable goal.

Recent research in AMS dating has seen significant improvement in the situation, however. One of the main areas of improvement has been in chemical pretreatment and sample decontamination which has resulted in superior purification, particularly of bone proteins targeted for dating. We have been working on dating >100 sites covering the Middle to Upper Paleolithic transition across Eurasia. We have used optimized techniques of AMS dating as well as OSL dating, coupled with Bayesian modeling, to produce robust site chronologies. Combining results from absolute dating with paleo-genomics results in novel insights into what happened between 70 and 30,000 BP in Eurasia, as we will summarise in our presentation.

Higham, Tom [41] see Frouin, Marine

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Highcock, Nancy (New York University)**[121]** *Dress Pins, Textile Production, and Women's Economic Agency across Early Second Millennium Anatolia*

Nearly seventy years of excavations at Kültepe have yielded a remarkable assemblage of material reflecting the rich and fluid daily lives of the Anatolians, Assyrians, and others who inhabited such a dynamic and cosmopolitan city. A diverse category of objects, metal dress pins, has been recovered from burials at Kültepe and other Middle Bronze Age Anatolian sites, providing tangible connections to the ancient people who wore them. Previous scholarship has focused on the style and origin of these pins, generally associated with female adornment, but both the cuneiform and material records also allow for glimpses into the economic power they held for women during this period. For example, the Old Assyrian mercantile indicate that pins could function as working capital in times of need. Furthermore, the survival of their impressions on crescent-shaped loom weights across Anatolia also demonstrate their importance to the economic agency of women. Through a study of the various types of pins and their associated objects within the contextual framework provide by the texts, this paper will explore the multiple roles of these personal objects and analyze how both Anatolian and Assyrian women used pins to mediate the social, religious, and economic worlds in which they navigated.

Higley, J. H. [35] see Adovasio, J. M.

Hilbert, Klaus**[116]** *A History of Knowledge of the Amazonian Dark Earths*

The anthropogenic origin of the Amazonian dark earths (Terra Pretas) has been a methodologically assured fact for 70 years. Especially during the last 30 years, Terra Preta have been scientifically investigated with increasing intensity and in an ever-widening context. Currently, the dominant concept guiding research is the idea of binding atmospheric carbon which artificially produced dark earths. The large-scale production of terra preta is said to be an efficient instrument to combat global warming. This talk attempts to present a history of the knowledge on Amazonian dark earths (terras pretas) focusing not only on scientific knowledge but also takes into account traditional indigenous knowledge. At the end, I show, that without indigenous knowledge, modern terra preta research would not exist. This has bearings for ethical evaluation of applied modern terra preta research.

[116] *Discussant***Hildebrand, Elisabeth (Stony Brook University)****[297]** *Ritual Sites as Anchors in a Dynamic Landscape: The Social and Economic Importance of Monumental Cemeteries Built by Eastern Africa's Earliest Herders*

In eastern Africa, herding was the earliest form of food production, supplanting fishing-hunting-gathering around Lake Turkana (northwest Kenya) ca. 5000–4000 BP. Fueled by the dramatic recession of Lake Turkana 5300–3900 BP, which made fishing less predictable and exposed vast plains of rich pasture near the lake, early herding probably involved both in-migration of pastoralists and adoption of livestock by local fishers. As herding took hold a mortuary tradition developed, with megalithic 'pillar sites' serving as communal cemeteries. Construction (massive platforms, mortuary cavities >100m² dug into sandstone bedrock, and columnar stones hauled up to 1 km from their source) and use (interment of several hundred estimated individuals over a few centuries, accompanied by adornments and intricately decorated pottery) attest to the sites' commemorative significance. As physical landmarks and settings for unifying rituals, pillar sites would have anchored early herders within an otherwise fluid physical and social landscape as Lake Turkana retreated, rainfall diminished, and mobility increased. Periodic assembly of otherwise dispersed groups to perform ritualized interment would have facilitated diverse forms of social interaction—including information sharing, formation of exchange networks, and negotiations and strategic decisions about herd movements—essential to the success of early pastoral economies in eastern Africa.

[198] *Chair*

Hildebrand, Elisabeth [198] see Goldstein, Steven

Hill, Austin Chad [4] see Rowan, Yorke

Hill, Brett (Hendrix College) and Bernard Siquieros (Tohono O'odham Nation Cultural Center and Museum)**[331]** *Observations on Collaboration between O'odham and Hendrix Students*

Historically, anthropologists have tended to treat Native Americans as subjects more than as colleagues. This tendency is in the midst of reorientation as Native people everywhere assert their interest in heritage through the modes of Western professional discourse. We have recently worked together on a collaborative educational project to bring together O'odham and non-Native students to consider heritage from multiple perspectives. Together, we visited museums, monuments, archaeological sites, and other ancestral locations in Arizona, Arkansas, Washington D.C., and New York. Through shared travel and discussions we experienced diverse places where Native American and Euro-American expressions of heritage are created. We considered the nature of concepts like ancestor and native in different contexts, and discovered new insights. At the same time, we discovered challenges and some solutions to practical problems facing collaboration. Disparities in training, funding, and expected benefits influenced decisions and outcomes. Approaching these challenges with a sense of partnership, we achieved synergy that suggests productive new possibilities for anthropology. Far from producing a compromise, we found exciting new opportunities for anthropology as a field of understanding and relationship building.

Hill, Christopher L.**[224]** *Sedimentary and Taphonomic Contexts of Quaternary Vertebrate Fossils in the Northern Rocky Mountains*

Quaternary vertebrate assemblages from the northern Rocky Mountains can be used to understand the biogeographic consequences of climate change. Some localities contain strata from before the Last Glacial Maximum (LGM), while others consist mostly of Late Glacial and Holocene deposits. The Merrell Local Fauna is from a stratigraphic sequence in Centennial Valley. Radiocarbon dates range from >52,000 to 19,000 BP and fossils are in lacustrine deposits, fluvial sediments, and a debris flow. The Blacktail Cave sequence extends from prior to the LGM to the Younger Dryas (37,000 to 10,270 BP). The fossil assemblage includes large- and small-sized mammals. Strata are composed of silts, clays, sands, and gravels along with rockfall and travertine. Strata at Sheep Rock Springs, Indian Creek, and MacHaffie incorporate fossils that are younger than the LGM and can be compared to Late Glacial-Holocene sequences in Idaho and localities on the Northern Great Plains. A diverse set of sedimentological and taphonomic contexts are associated with these localities which contain cave, alluvial, eolian and paludal/lacustrine deposits. These sedimentary sequences can be used to examine patterns of landscape evolution and ecological change before, during and after the LGM, including conditions associated with the Younger Dryas and the Pleistocene-Holocene transition.

Hill, David (ASET Siftung)**[95]** *Exploring the Interaction of Culture and Technology in the Acoma Culture Province*

The Acoma Culture Province is the geographic expanse of the ancestral homeland of the Pueblo of Acoma documented for adjudication through the Indian Claims Commission and through archaeological research. Pottery made during both the prehistoric and historic periods found within the Acoma Culture Province was made using crushed potsherds as an addition to the pottery clay. The practice of adding crushed potsherds represents a cultural choice for Acoma potters, a choice that has considerable time-depth. Pottery containing crushed pot sherds appears around A.D. 900 in decorated and

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undecorated utilitarian vessels, a practice that continues today. The continued use of crushed pottery sherds as a component of Acoma ceramic technology represents an example of a conservative technology.

Hill, Erica (University of Alaska Southeast)

[216] *Women, Sex and Sacrifice in Moche Iconography*

Moche iconography depicts women in ritual roles as priestesses, objects of sacrifice, and possibly as deities; however, the roles of ordinary women have received much less attention from archaeologists. This paper explores the nature of women's power in Moche society as represented in iconography and as inferred from bioarchaeological data, contrasting the roles of women in elite and non-elite contexts. With the exception of elite women performing rituals, Moche ideology inextricably linked women's power and status to the female body itself, primarily in sexual and sacrificial contexts.

[277] *Discussant*

Hill, Matthew E. (University of Iowa), Cerisa R. Reynolds (Aims Community College), James Mayer (GEI Consultants, Inc.) and John P. Laughlin (Wyoming State Historic Preservation Office)

[182] *A Reexamination of the Nature and Context of the Finley Paleoindian Bison Bonebeds in Southwest Wyoming*

The Finley site is in the western Killpecker dunes in the Green River valley in southwest Wyoming, and consists of at least two Cody age bison bonebeds. For modern Paleoindian researchers, Finley still poses important questions and offers several potential avenues for research. The prior work with the Finley faunal remains, as well as our current investigations, demonstrate that the site is associated with an enormous collection of bison remains that are thought to have been killed on site or nearby. Our reexamination of the site combines a taphonomic-based zooarchaeological analysis of the bison remains from both components with additional field-based investigations of the geoarchaeological context of the bonebeds. This work is being undertaken in order to 1) improve our understanding of the natural and cultural formational histories of the deposits, 2) evaluate prior interpretations concerning site function and season of occupation, and 3) evaluate how the Finley site improves our understanding of regional Paleoindian chronostratigraphy and paleoenvironments. Ultimately, our goal is to evaluate the validity of the prior interpretations of the site and consider the importance of the site to understanding the Paleoindian occupation of North America.

Hille, Peter [13] see Gilmore, Kevin P.

Hillman, Leaf

[321] *Discussant*

Hillman, Lisa

[321] *Discussant*

Hills, Kendall (University of Illinois at Chicago)

[175] *Networks of Power: Sandstone Temple Production in the Provinces of the Angkorian Khmer Empire*

Anthropological research suggests that early states and empires frequently relied on state-sponsored building projects to produce networks of state control and identity on the landscape. The production and use of monumental architecture, however, can also be influenced by local agency, resilience and/or resistance, and degrees of socio-political autonomy. Rather than a homogenous blanket of state/imperial power, the result is a mosaic of core state control and local choices across the landscape. Focusing on the Angkorian Khmer Empire (9th to 15th c. CE), this paper employs a landscape network approach to investigate degrees of state control and evidence of intermediate elite power, thus providing a more dynamic perspective of the imperial landscape. These investigations are informed through an analysis of the assemblage of provincial sandstone temples, which were key loci for the negotiation of state and intermediate elite power within the Khmer Empire. Emphasis is placed on understanding the geographic distribution of temples, the acquisition of sandstone for temple production, and temple form and organization, as variations in these variables may reflect different intermediate elite strategies and levels of agentive decision making.

Hilmer, Hilary (University of Alaska, Fairbanks)

[250] *Subsistence Practices at Healy Lake Village Site*

Healy Lake Village site (XBD-00020), an important multicomponent site with occupations spanning the terminal Pleistocene and Holocene, provides an important opportunity to address fundamental issues of sub-arctic hunter-gatherers economies as they changed through time. To date, there are a limited number of sites in former Beringia with preserved faunal remains. Fourier transform infrared spectroscopy (FTIR) is an analytical method that can confirm the visual identifications of burned bone as well as provide the temperature of the heat source. This paper presents the results from a zooarchaeological analysis that used FTIR to address questions relating to cooking/processing practices in eastern Beringia (and the western Subarctic) for recent Athabaskans.

Hinojosa, Marlen, Claudia Garcia-Des Lauriers (California Polytechnic University Pomona) and Matthew Des Lauriers (California State University Northridge)

[19] *Los Horcones, Offering 1: The Archaeology of Music and Ritual on the Pacific Coast of Chiapas*

Offering 1 from Los Horcones is an assemblage of figurine masks, whistles, rattles and vessels that offers an interesting opportunity for analysis that provides information of the auditory, olfactory, and visual experience of this small ritual. The offering, initially thought to be simply a collection of figurines and masks, were later discovered to be whistles—small musical instruments whose simplicity belies the importance of the meanings they encoded. Experimental archaeological analysis revealed that some made a variety of avian sounds, along with several other unidentified sounds. The whistles were played and recorded using a B-flat tuner that then allowed the recording of the range for each working whistle. Variations in notes and performed sounds varied based on whether the player approached them as whistles, flutes, or trumpets and the body size and lung capacity of the player. While the exact songs and notes of the whistles may never be fully elucidated, we were able to propose some potential applications in ceremony, and entertainment.

Hinojosa-Balino, Israel (Durham University) and Gerardo Gutiérrez (University of Colorado Boulder)

[248] *Moving beyond Drone Technology: Comparing and Interpreting Architecture and Power at Chalcatzingo, Cuicuilco, and Teotihuacan through Volumetric Measurements Obtained with Unmanned Aerial Vehicles*

Drone technology has become widely available, easy to use, and relatively inexpensive over the last four years, and archaeologists have embraced it eagerly. Apart from the technological breakthroughs of the UAV platform and its assortment of sensors, we need to interpret these data beyond the beautiful models and topographic measurements. In this paper, we use the concept of monumentality and compare three iconic sites in Central Mexico to understand how their architectural expression correlates with the ways they organize their societies and display their power.

Hinthorne, James [89] see Skowronek, Russell

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Hiquet, Julien (Université de Paris 1 Panthéon-Sorbonne), Julien Sion (ArchAm-CEMCA) and Divina Perla-Barrera (USAC Guatemala)
[80] *Households, Growth, Contraction, and Mobility at the Classic Maya Center of Naachtun*

At Naachtun, extensive excavation programs carried out in monumental Group B, a compact set of three large elite clusters of residential compounds located in the site epicenter, and intensive test-pitting programs applied to the residential zones which surround the monumental core, have enabled us to understand the site occupation development during the Classic phases. We identify contraction, dispersal and expansion where and when most households units were occupied. We compare these space-time dynamics in epicentral Group B and surrounding urban residential zones, explore their articulation, and discuss possible intra-site population mobility. Although some of the dynamics resulted from royal-court elite attraction and urban planning, the permanence of a dense, post-dynastic occupation, and new housing practices in Group B indicate that people did not need rulers' coercion to organize and modify their settlement in accordance with what they perceived to be their socioeconomic interests.

Hiquet, Julien [80] see Nondédéo, Philippe

Hirshman, Amy (West Virginia University)

[169] *Petrographic Perspectives on the Ceramic Complexity in the Lake Pátzcuaro Basin*

Archaeologically known ceramic pastes from the Lake Pátzcuaro Basin, Michoacán, Mexico, involved long-lived paste recipes that have been identified both visually and via neutron activation. This paper focuses upon Late Postclassic Tarascan state-period ceramics (AD 1350–1525) and contextualizes new petrographic data within the regional geology and prior research in order to assess aspects of the longevity and complexity in potter's paste choices within the basin.

Hirth, Kenneth (Penn State University), Alejandro Figueroa (Southern Methodist University), Alejandra Domic (Penn State University), Heather Thakar (Texas A & M) and Harry Iceland (Smithsonian Institution)

[59] *The Esperanza to Middle Marcala Phase Subsistence Practices at El Gigante Rockshelter (11,000–7400 cal B.P.)*

The earliest human occupation of the El Gigante Rockshelter in the highlands of western Honduras dates to the Early Esperanza phase at 11,010 cal B.P. This paper examines the perishable and imperishable remains from the Early Esperanza through Middle Marcala phase occupation from 11,010–7,430 cal B.P. and what they inform about human adaptation and forager subsistence practices in the highlands during this early period of Honduran prehistory.

Hirth, Kenneth [184] see Buckley, Gina

Hitchens, Gail [329] see Spikins, Penny

Hlubik, Sarah (Rutgers University), Russell Cutts (University of Georgia, Athens), David R. Braun (The George Washington University), Francesco Berna (Simon Fraser University) and Craig Feibel (Rutgers University)

[41] *Fire in the Early Pleistocene: Evidence for the Use of Fire by Hominins at the 1.5 mya Site of FxJj20 AB, Koobi Fora, Kenya*

The Cooking Hypothesis contends that fire use became common in the Early Pleistocene and was part of a suite of characters that were associated with the appearance of *Homo erectus*. The morphological changes associated with *H. erectus* support this hypothesis. Archaeological evidence for the control of fire in this time period is generally sparse, and arguments for controlled fire at early sites have been controversial. Here we present evidence for fire use by early hominins at the open-air site of FxJj20 AB, Koobi Fora, Kenya. Bone and sediment exhibiting FTIR signatures consistent with burning at high temperatures have been recovered from a single horizon. A magnetic anomaly has been identified close to a cluster of artifacts. Micromorphological analyses indicate site formation processes with relatively little post-depositional modification. This is further supported by fabric analysis. The site is one of the earliest known sites, to date, with evidence for an association of fire and human activity. This validates a methodology for investigating early fire by highlighting the importance of using techniques geared toward identifying and verifying combustion features in open air contexts. This research was supported by the U.S. National Science Foundation, OISE awards 1358178 and 1358200.

Hockaday, William [182] see Roos, Christopher

Hockett, Bryan [47] see Goebel, Ted

Hocsman, Salomón [120] see Flegenheimer, Nora

Hodder, Ian (Stanford University)

[1] *Discussant*

Hodgkins, Jamie [99] see Simeonoff, Sarah

Hodza, Paddington [42] see Arksey, Marieka

Hoff, Aliya [66] see Fletcher, Brittany

Hoffecker, John (INSTAAR)

[182] *A North American Plains Perspective on the East European Paleolithic*

For historical reasons, the Middle and Upper Paleolithic record of Europe has been viewed largely through the prism of rockshelters in the southwestern corner of the continent. Europe is dominated geographically, however, by an immense plain that stretches from the Carpathians to the Ural Mountains, much of which is devoid of natural shelters. Vance Holliday has made a significant contribution to the study of soils, stratigraphy, and site-formation process in open-air Middle and Upper Paleolithic sites on the central East European Plain. More generally, he has enhanced our understanding of these sites by introducing a North American Plains perspective to their analysis and interpretation.

Hoffman, Christopher and Michael Black (University of California, Berkeley)

[172] *CollectionSpace at the Phoebe A. Hearst Museum of Anthropology: A Strategic Information Platform for Cultural Heritage Collections*

Museums use collection management systems to manage metadata about objects in their collection and track transactions such as loans and exhibitions. At UC Berkeley however, museums are turning the open source CollectionSpace system into a strategic platform for research, education, and public service. The Hearst Museum of Anthropology is in the midst of a major effort to improve the quality of the data documenting its collection of approximately 3.8 million objects. With this improved foundation, the Hearst Museum and its partners in Research IT have turned attention to the most important priorities for cultural heritage information preservation, sharing, research and education. This case study will describe how the Hearst

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Museum uses CollectionSpace and its partnerships with Research IT and the CollectionSpace community to accomplish these goals. Particular attention will be given to how the Hearst Museum and its community stakeholders have made decisions about when and how to share sensitive information such as field collection location and photos of sacred objects. The paper will conclude with the emerging challenges and opportunities that the Hearst Museum and its partners are considering, including building in support for managing and displaying 3D models and improving support for research, education, and public service.

Hoffman, Courtney [14] see Wright, Sterling

Hoffman, Sarah E. (University at Buffalo)

[282] *No Man Is an Island: Death and Burial on the Island of Haffjarðarey*

During the 13th century Iceland became a major hub of the North Atlantic fishing industry sparking international conflict over fishing rights between mercantile interests from Norway, Denmark, England, the Netherlands and Northern Germany. From ca. 1200—1563 the Catholic Church and cemetery on the island of Haffjarðarey served as the burial place for the large geographic region of Eyjahreppur in western Iceland. The church and cemetery were closed during the Lutheran Reformation and the island was subsequently abandoned. Folklore intended to support this abandonment appeared soon afterwards and generated a negative perception of the island as a place of death and danger. Early 20th century accounts considered Haffjarðarey an unlikely location for an important community gathering place due to difficulty of access and apparent isolation, however recent research has demonstrated quite the opposite. The medieval population of Eyjahreppur was engaged in the international fishing industry. Human remains exhibit pathological features suggesting they experienced the long-term impacts of unique local and global political, economic, and cultural influences. This paper discusses the human skeletal remains from the Haffjarðarey church cemetery and interpretations of community attachment (topophilia) and fear (topophobia) during a period of increasing global contact and conflict.

[282] *Chair*

Hofman, Corinne L. (University of Leiden), Roberto Valcárcel Rojas (University of Leiden) and Jorge Ulloa Hung (University of Leiden)

[275] *Colonization, Transformation and Continuities in the Indigenous Caribbean*

The indigenous peoples of the Caribbean were the first to have suffered European colonization of the Americas. From the arrival of Columbus in 1492 the insular territories were transformed in a massive slave raiding arena in which the knowledge of so-labelled 'indios' was used and manipulated by the Europeans and transferred across the Caribbean Sea. Indigenous peoples were put to work in the goldmines and farms of Hispaniola, Cuba and Puerto Rico or in the pearl fisheries in Cubagua. On the other hand, in the Greater Antilles the encomienda system generated an intensive exploitation that disarticulated the indigenous societies and transformed their sociocultural practices. The influence of a forced African diaspora, and the concomitant Amerindian-African-European inter-cultural dynamics at play changed the indigenous Caribbean landscape forever. The impact of these initial acts of colonialism and the role played by the Amerindian populations in the colonial process are often discounted for and remain up until today a far neglected chapter in global history. Despite the infamous genocide that took place, indigenous cultural and religious continuities are strongly represented in today's multi-ethnic and multi-cultural society of the Caribbean.

Hofman, Corinne L. [83] see Borck, Lewis

Hofman, Courtney (University of Oklahoma)

[143] *Chair*

Hofman, Jack (University of Kansas) and Barbara Crable (University of Kansas)

[90] *Cultural, Taphonomic, and Biogeographic Considerations of Black Footed Ferret at the Burntwood Creek Bison Kill Site, Central High Plains, USA*

Feature 15-1 at a 9,000 year old bison kill site in Rawlins County, northwest Kansas yielded remains of black footed ferret (BFF) and numerous other species. Here we summarize cultural and taphonomic factors related to the feature's formation and review BFF biogeography for the early Holocene period in the central Plains region. The diverse fauna from this feature and its varied modifications may reflect special cultural behavior associated with the bison kill at Burntwood Creek. Both natural and cultural processes contributed to formation of this distinctive feature, and some elements may represent part of a "medicine" bundle.

Hoggarth, Julie (Baylor University)

[147] *Using Bayesian Radiocarbon Chronologies in Conjunction with Artifact Inventories to Reconstruct the Timing and Formation of Peri-abandonment Deposits at Baking Pot, Belize*

A variety of functions have been proposed for 'problematic deposits' across the Maya lowlands. All of the explanations have archaeological and temporal implications that have rarely been operationalized together to gain better insights into the nature of these deposits. In this presentation, we describe these features as 'peri-abandonment deposits', as all proposed explanations imply that the events that led to the formation of the deposits occurred around the time (or after) ceremonial centers experienced political and/or demographic decline. We use evidence from the site of Baking Pot as a case study to test multiple hypotheses for the formation of these deposits and to illustrate the utility of the combined use of Bayesian radiocarbon chronologies, calendrical dates of hieroglyphic texts, and artifact proportions to better understand the timing and artifactual composition of each feature. Finally, we discuss the temporal and depositional differences between multiple peri-abandonment deposits at Baking Pot and contrast these data with radiocarbon evidence for political and demographic decline at the site and across the broader Belize River Valley.

[147] *Chair*

Hoggarth, Julie [14] see Harvey, Amanda

Holcomb, Justin [48] see Mark, Andrew

Holdaway, Simon [200] see Douglass, Matthew

Holland, Caitlin (Center for Mountain and Plains Archaeology, Colorado State University)

[267] *The Fremont Canyonlands: Granary Architecture in Northwestern Colorado*

With the introduction of horticultural practices in northwestern Colorado during the Formative era, the ruins of prehistoric masonry granaries represent a storage strategy utilized by the Fremont people to store equipment and maize near their communities. In northwestern Colorado, storage features such as granaries are primarily found in three geographic locations: Dinosaur National Monument, Skull Creek Basin, and the Canyon Pintado Historic District, all of which are located within a 1,200-square mile area. These high desert areas represent distinct ecological zones on the Colorado Plateau, with granary architecture reflecting the local environmental and social landscapes. This poster compares granary architectural data from several

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documented Formative era granaries to examine variability in construction style, material use, granary dimensions, and form between the three geographic clusters.

Hollenbach, Kandace (University of Tennessee)

[94] *The Volunteer Spirit: "Archaeology Volunteer Day" at the Archaeological Research Laboratory at UT-Knoxville*

In January 2015, we instituted a monthly "Volunteer Day" at the Archaeological Research Laboratory at the University of Tennessee. Originally conceived as a way to increase outreach to the general public as well as prepare a large number of artifacts for curation, this activity has developed into a "citizen science" opportunity, where participants help collect data. Here we reflect on the positives and negatives of the program as we have implemented it over the past two years, with feedback from our volunteers. We also explore ways to develop it into a community-based participatory research project, incorporating additional participant groups (including students and descendant communities) into our corps of volunteers.

Hollesen, Jørgen [135] see Harmsen, Hans

Holliday, Vance (University of Arizona)

[182] *Discussant*

Hollinger, Eric (Smithsonian Institution)

[337a] *Beyond Repatriation at the Smithsonian's National Museum of Natural History*

Congress intended federal repatriation legislation to go beyond removing collections from museums. They hoped that it would lead to new relationships between Native Americans and museums that would recognize the interests of all parties. The Anthropology Department of the Smithsonian's National Museum of Natural History has worked, through its Repatriation Office and other programs, to collaborate with tribes and Alaskan Natives on projects that go beyond repatriation to include initiatives with 3D replication, traditional care, language revitalization, and cooperative curation. Repatriation is about fostering new relationships for the long term not the short term rush to meet a deadline or check a bureaucratic box.

Hollingshead, Analise (Florida State University) and Morgan Smith (Texas A&M University)

[102] *A Fabric and Spatial Analyses of the Artifacts Recovered from the Ryan-Harley Paleoindian Site (8JE1004) in North Florida*

The Ryan-Harley site (8JE1004) is a Suwannee point site located in North Florida along the Wacissa River. Ryan-Harley is significant because it is the only archaeological site in the Southeast United States where diagnostic Suwannee material has been recovered in-situ within a discrete geological layer through extensive excavations. A broad faunal assemblage interpreted as dietary remains was also recovered from the same stratigraphic layer as the Suwannee material. Taxa identified include extinct Pleistocene species such as tapir, horse, giant tortoise, and muskrat. This association relatively dates Ryan-Harley to the terminal Pleistocene, most likely between 10,900 14C yr B.P. to ~10,500 14C yr B.P. The association of lithic and faunal material at the site is critical to the interpretation and proposed age of the site. We examine this association through fabric and spatial analyses of artifacts and faunal material recovered at the Ryan-Harley site to test the null hypothesis that the site represents an intact Suwannee campsite. We compare how cultural material accumulates due to post-depositional processes with how intact archaeological deposits are oriented in space to determine which case compares most favorably to the lithic and faunal material at Ryan-Harley.

Holloway, Caitlin (National Park Service; UA Museum of the North)

[250] *Hearth Features in High-Latitude Environments*

The depositional context of many high-latitude archaeological sites often inhibits preservation of hearth features and associated organic remains. When preserved, subsurface hearth features provide insight into the role of plant resources in prehistoric hunter-gatherer economies. This research addresses questions of taphonomy, paleoecology, and prehistoric plant use with archaeobotanical analysis of hearth features from sites located in Yukon-Charley Rivers National Preserve and Gates of the Arctic National Park and Preserve. The results inform on the deposition and preservation of archaeobotanical remains in high-latitude environments and contribute to our understanding of arctic and subarctic forager exploitation of plant resources.

Holloway, Richard (Dept. Biological Sciences NAU) and Karl Laumbach (Human Systems Research Inc.)

[290] *Macrobotanical and Pollen Analysis of the Canada Alamosa Project*

Analysis of macrobotanical materials from the Cañada Alamosa Project began with materials from the 1999 field season and continued to materials from the 2011 season. The samples were retrieved from four sites (LA 1125, LA 2292, LA 88891, and LA 88889). A total of 1,359 samples were analyzed for this project. In total, 223 individual specimens of corn cob fragments were examined via digital electronic photography (Table 2). A total of 3,052 individual cupules provided measurements for our database which was then used to compare types of remains. New methods were developed during this project, which allowed us to obtain large quantities of measurements on the charred cob fragments without harming the specimen. The improvement of digital electronic photography allows measurements to be taken off the digital pictures instead of directly on the specimen. All cobs examined were photographed and then measurements taken on the photos.

Holly, Donald [34] see Wolff, Christopher

Holmberg, Karen (New York University)

[136] *Acts of Nature and Culture: Caves, Performance, and Transformation*

The role of performance in disaster risk reduction provides the focus for evocative recent discussions of somatic experience, embodied knowledge, and climate change (e.g., Cosgrove and Kelman 2017). In this paper, I'd like to expand this perspective on the perception of dynamic environments through consideration of how material residues in caves link to large-scale transformations in the complexly entwined natural and cultural landscapes outside of the caves. I draw on four seemingly disparate cave contexts: a 7,400 year stratigraphic sequence in Banda Aceh, Indonesia that extends the record of tsunami events beyond what oral history provides; a preceramic rock shelter in western Panama with an unusual lithic cache interpreted as evidence for the earliest example of shamanistic practice in Central America; a coastal cave in northern Patagonia, Chile filled with prehistoric rock art and the bones of a child; and the paleolithic caves of Matera, Italy, which helped secure the city's designation as a European Capital of Culture for 2019. In each case, whether in prehistoric or contemporary contexts, I posit that acts and actions performed in caves link the performers literally to a scale that is geological in span and chthonic in association.

Holmes, Charles (University of Alaska Fairbanks)

[250] *Discussant*

Holmes, Charles [50] see Krasinski, Kathryn

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Holyoke, Kenneth (University of Toronto)

[199] *Persistent Places in the Prehistoric Wabanaki Homeland: Understanding the Role of Lithics in Interaction, Exchange, and Territoriality on the Maritime Peninsula*

This paper will present a method for addressing questions of prehistoric Wabanaki territories and territoriality, human movement and exchange, and how persistent places in the prehistoric landscape of the Lower Saint John River (LSJR) shaped ancient Wabanaki ontology, and so too, the archaeological record. Persistent places like bedrock lithic sources may shape human movement; however, patterning in the distribution of stone tools may provide more than just settlement and exchange information. The bedrock source for Washademoak multi-coloured chert (WMCC) lies nearby what has been historically viewed as a boundary between the traditional territories of the Mi'kmaq and Wolastoqiyik people (e.g., Ganong's 1899 "Map No. 12"). WMCC is a ubiquitous stone tool material found throughout the LSJR sub-region during the Maritime Woodland Period (ca. 3000–500 BP) and appears as a (presumably) traded material in assemblages outside of the LSJR. Thus, the location of the bedrock source may have facilitated social interaction between different ethnic groups. The material has a diverse range of colours and qualities for which preferences may have changed over time. Further, WMCC, at least within the LSJR, may have been distributed differentially over time into the late pre-Contact period, and potentially on into the protohistoric period.

Holzman, Cayt [241] see Hermitt, Elijah J.

Homsey-Messer, Lara [52] see Burgis, Harley

Hoobler, Ellen (Walters Art Museum)

[70] *Cultural Exchange in Times of Crisis: A Historical Perspective from Mexico of the 1930s and '40s*

During the depths of the Great Depression and prior to and after World War II, Mexico's Museo Nacional de Antropología undertook exchanges, or canjes, of archaeological pieces with a variety of museums, disseminating small portions of its collection across the nation and the world. Actual trades of archaeological works were completed in the early 1930s with museums in Yucatán, Mexico; Lima, Peru; and New York and Chicago in the United States. There were more limited exchanges of casts with museums in Berlin and Brussels. In 1948, a particularly large swap was completed with the Brooklyn Museum. Other interchanges were contemplated, but apparently not completed, with museums in Colombia, Madrid and Philadelphia. Many of these trades were linked by the involvement of Alfonso Caso, the most famous Mexican archaeologist of his generation, and an important figure in archaeological bureaucracy of Mexico of the 1930s and '40s.

What were the kinds of objects that Mexico's National Museum offered to and received from these other museums? What were the motivations for and circumstances of such exchanges? The incentives behind such exchanges seem to have transcended the needs of the Museo's collection, and were related closely to cultural diplomacy at the time.

Hood, Larkin (The Pennsylvania State University)

[313] *You Read It; Don't Forget It: Designing Activities That Help Students Learn*

Ideally, exercises and activities for an open textbook should encourage students to engage with and apply the information beyond a single course. This session provides a reflection on the process of designing resources that activate student motivation to engage with content, and provide checks on student understanding (for students and instructors). Activities are also a means for students to practice retrieving what they have learned so they can use it in other situations, and provide ways for students to use study approaches that work for learning archaeology, which can be different from approaches they have learned for other subjects.

Hoogland, Menno (Leiden University), Angus Martin (Leiden University) and Corinne L. Hofman (Leiden University)

[123] *Reimagining Creole. The Deep History of Mixed Identities in the Windward Islands, Lesser Antilles*

The Lesser Antilles are known as an arena of to- and froing of peoples from different areas of the insular Caribbean and coastal mainland areas of south America during its entire pre-colonial history. Migration, and intensive networks of human mobility and exchange of goods and ideas have created diverse ethnic/cultural communities across these small islands. These, coupled with constantly shifting alliances among the various peoples have resulted in what can only be described as Creole communities. This paper will examine the ideal of Creole in terms of the mixed identities that emerged among the Windward Islands of the Lesser Antilles in pre-colonial times and we will look into the historiographical and emerging archaeological information we have on formation of Kalinago and Garifuna identities during early colonial times.

Hoogland, Menno [323] see Pagan-Jimenez, Jaime R.

Hoopes, John (University of Kansas)

[291] *Fantastic Archaeologist: Stephen Williams and the Perennial Task of Debunking Pseudoarchaeology*

The history of archaeology is replete with assertions about lost tribes, sunken continents, and ancient aliens in the context of failed hypotheses, deliberate hoaxes, and intentional frauds. Williams chronicled these, in the process helping others hone skills in critical thinking. New technologies proliferate spurious explanations of the past that archaeologists must continually address. As the Talmud says, "It is not your responsibility to finish the work of perfecting the world, but you are not free to desist from it either". This paper offers strategies based on Williams' methodology, ones based in meticulous historiography and evaluations of the cultural and historical contexts of specific individuals, their possible motivations, and critical examination of the specific paradigms, theories, and evidence that conditioned their claims. Williams demonstrated that many myths promulgated today have deep roots in American history and that familiarity with this background is a valuable element of successful, ongoing, scholarly refutation of claims from the "wild side" on the fringes of science.

[260] *Discussant*

[260] *Chair*

Hoopes, John [263] see Carlson, John

Hoover, Corey (Pontificia Universidad Católica del Perú) and Patrick Mullins (University of Pittsburgh)

[68] *Exploring Classification Methods for Drone Based Imagery on the Peruvian North Coast*

With the growing availability of high-resolution aerial imagery, capabilities for spatial and land use analyses also become more of a possibility to researchers. Drones are becoming more affordable with sensors capable of capturing imagery at sub-meter resolutions. Ground cover classification allows further investigation into land use, disturbance and site integrity. This paper discusses the use of supervised and object based classification methods using image analysis software and high-resolution imagery obtained from unmanned aerial systems. It also discusses the use of multispectral imagery in drone-based survey applications and capabilities for classification based on varying image resolutions. Best practices for maintaining resolution and image integrity are discussed along with processing capabilities based on project goals. A training area located near Peru's North Coast is used to create classification parameters, which is then tested against similar areas on the North coast. Utilizing this method, we are able to classify land use, disturbances, and cultural sites with some limitations.

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[68] Chair

Hopkins, Maren (Anthropological Research, L.L.C.)**[131]** *Archaeology and Ethnohistory of the Western Papagueria: Let's Not Forget the People*

The O'odham and other tribes of southern Arizona and northern Sonora have occupied the Western Papagueria since time immemorial. This dry and desolate corner of the Sonoran Desert is home to rich histories and living traditions that have left their subtle marks on the land, and that archaeologists have continuously tried to identify, describe, and interpret. For too long, ethnographic and ethnohistoric records from this region have run in parallel to the archaeology; however several recent studies demonstrate the value in merging these accounts to construct a comprehensive picture of people on the land that includes perspectives about their own experiences and worldviews. Work on the Barry M. Goldwater Range, Organ Pipe Cactus National Monument, and in the proposed area of the Great Bend of the Gila National Monument, draws on ethnographic and ethnohistoric accounts to understand the archaeology, and on archaeology to make sense of the longevity and fortitude of living Native American traditional cultural practices. Following, and hopefully adding to, the legacies of Father Kino, Carl Lumholtz, Ruth Underhill, Julian Hayden, and countless others who devoted themselves to the Western Papagueria, this work reinforces the significance in working with the people who are behind the material record.

[72] Chair

Hopkins, Maren [72] see Price Steinbrecher, Barry

Hora-Cook, Elizabeth [105] see Finley, Judson

Horn, Sherman (Grand Valley State University) and Anabel Ford (University of California, Santa Barbara)**[302]** *Through a Scanner...Darkly? LiDAR, Survey, and Mapping at the Ancient Maya Center El Pilar*

Survey at the ancient Maya center El Pilar, along the border between Belize and Guatemala, has incorporated LiDAR imagery since 2013, allowing expansive—yet targeted—coverage of settlement beyond the monumental core. Successive field seasons have revealed a complex picture of landscape modification, resource extraction, and settlement concentration in different micro-environmental zones around the city center. Our fieldwork in 2017 had three foci: 1) explore and map the Amatal Supercluster, a grouping of domestic and monumental structures identified in LiDAR imagery west of the monumental core; 2) remap the minor ceremonial center K'um, where LiDAR signatures suggested a more complex site than was recorded in the 1990s; and 3) survey the area between these centers and validate settlement remains suggested by analysis of LiDAR imagery. We present our results and examine relationships between settlement, landscape modification, and resource use around El Pilar. We further explore the differences between what LiDAR returns indicate and what is discovered by putting survey boots on the ground. Our results suggest new survey protocols, such as those we present, are necessary to fully realize the power of LiDAR as a survey tool in the Maya Lowlands.

Horning, Audrey (College of William and Mary)**[327]** *Ethics, Positionality, and Pragmatism: Archaeological Approaches to Identity and the Role of Archaeological Practice in Conflict Transformation*

The 'ontological turn' in archaeology encourages the decentering of the human subject, and the longstanding focus upon identity, in favour of exploring material relationalities. While the discipline may congratulate itself for finally finding a way out of the twin traps of Enlightenment dualism and the humanism which underpins neoliberal geopolitics, it runs the risk of becoming even less relevant to society at large at a time when global conflicts are widely understood through the lens of competing and contested identities. Such identities are often framed as rooted in archaeological pasts as much mythical as material, but no less efficacious in the present. Drawing from experience in Northern Ireland, the discussion will focus upon the contribution of pragmatic philosophy in not only shaping ethical archaeological practice in conflict and post-conflict setting, but allowing for a significant and socially valuable role in conflict transformation.

[296] *Discussant***Horowitz, Mara (Purchase College SUNY)****[40]** *Performative Aspects of Early Monumental Architecture at Late Bronze I Phlamoudhi-Vounari, Cyprus*

The small (1 hectare) site of Phlamoudhi-Vounari was built in Late Cypriot IA:1 and abandoned early in Late Cypriot IIA, a lifespan of c. 200 years. This paper presents a 3D model and spatial analysis suggesting that the site functioned as a stage during community gatherings (and greeting visitors). Vounari's plan is unique on Cyprus: a likely man-made, eight-meter-high mound topped with a sequence of superimposed structures. Initially built with open access to the summit from the higher south side landscape, the monumental plastered north ramp, double gateway, 16 x 16m stone façade platform, and circuit wall added to Vounari in Phase IV restricted access to the hilltop as well as creating an imposing effect. Using a viewshed approach, this paper examines the monumental north façade and broad plaster ramp as seen from the seaward approach. As a comparanda to Vounari, the New World platform mound phenomenon is reviewed. These sites also arguably functioned as stages for ceremonial community activities that reinforced the corporate identity even as an elite class was beginning to emerge and increasingly circumscribe the space for themselves. This analysis is relevant to the ongoing debate about the first emergence of complex society in Cyprus.

Horowitz, Rachel (Tulane University)**[140]** *Chert Extraction and Production in Resource-Rich Regions: Chert Economies among the Late Classic Maya of Western Belize*

Global studies of raw material extraction permit us to examine the methods and involvement of different individuals in the extraction and production of lithic materials. One variable which can influence the organization of extraction and production is the abundance or scarcity of raw materials in a region. This paper addresses the extraction and production of chert materials among the Late Classic Maya (A.D. 600–900) in the lowland Maya region, specifically western Belize, a chert-rich area, to address the relative economic involvement of varying individuals in those processes and how these activities linked people throughout the region. Specifically, this paper compares the extraction mechanisms and reduction sequences from a chert quarry and production area, Callar Creek Quarry, and a nearby production area, Succotz Lithic Workshop, using detailed lithic attribute and aggregate analyses to examine regional trends in lithic production and the economic activities involved in these trends. This paper finds that householders living adjacent to chert source areas produced specialized lithic materials for exchange through a range of mechanisms, including reciprocal and market exchanges, thus creating regional connections. The density of chert sources in the region influenced both people's abilities to produce tools but also the mechanisms of their exchange.

Horowitz, Rachel [147] see Petrozza, Michael

Horton, Elizabeth [168] see Beahm, Emily

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Horton, Shannon (University of Nevada, Las Vegas)**[225]** *What the Ceramics Tell Us About the Inhabitants of the Steve Perkins Site*

The purpose of this research is to examine the ceramic assemblage present at the Steve Perkins site, located in the lower Moapa Valley of southern Nevada. A full analysis of the ceramic assemblage has never been undertaken. Thus the goal of this research is to fully analyze the assemblage. Thereby providing more information on the lifeways of the Virgin Branch Puebloan (VBP) people residing at the Steve Perkins site. In addition, the examination of possible trade wares will also help to better understand the VBP's extensive distribution network that began to increase considerably during the Pueblo II period.

Hoskins, Andrew J. [92] see Martin, Erik

Hosoya, Leo Aoi [24] see Owlett, Tricia

Houk, Brett A. (Texas Tech University)**[147]** *"Problematic Deposits" at Chan Chich, Belize*

The Chan Chich Archaeological Project has documented two types of terminal, above floor "problematic" artifact deposits in a number of different locations and contexts at the site of Chan Chich, Belize. The first type comprises light scatters of "exotic" ceramics and other artifacts on the steps to range buildings in epicentral courtyards. The second type is a dense artifact deposit in an ashy matrix at the base of a platform face in a hilltop, elite courtyard. Compositionally, the second type closely resembles a midden; however, the context—within an "elite" courtyard at the base of a masonry building—seems to warrant calling it something other than a midden. Compounding the categorical confusion are nearly identical features found in residential courtyards near the site center. Based on their association with domestic structures, excavators have classified these features as middens despite the fact they occur on courtyard floors, against buildings, rather than off the back of the structures. This paper describes the different types of terminal, above floor deposits at Chan Chich, focusing on composition and context. Comparisons are made to features at other sites in the region, including the archetypal Problematic Deposit 2 at Dos Hombres, to highlight regional trends.

Houk, Brett A. [173] see Booher, Ashley

Houk, Brett A. [30] see Gallareta Cervera, Tomás

Houle, Jean-Luc [3] see Parrish, Deborah

Housse, Romuald (Université Paris 1—Panthéon Sorbonne)**[75]** *Beyond the Wall: Defensive Arrangements, Conflicts and Coexistence Inside an Andean Oasis during the Late Intermediate Period (1100–1450 AD)*

Located on the western foothills of the Andes, in the region of Tacna, the study area seems to have been densely occupied during the Late Intermediate Period (1100–1450 AD) as the recent archaeological research carried out in the area has demonstrated it. The many agricultural terraces and irrigation canals, as well as the numerous residential settlements, some of which are fortified, seem to demonstrate a strong desire for control and management of resources among the different groups occupying the area. Indeed, this region is known to be one of the many archipelagos of the Andean verticality and, on the northern margins of the Atacama desert, it can be also considered as a real oasis where different groups of people lived to harness resources together.

During a period known as violent, like the LIP, the study of the hillforts named pucara can allow us to better understand the prehispanic occupation of this complex area and shed light on the modalities of coexistence within a multi-ethnic archipelago. Thus, many questions can be raised: How does resource sharing work? Is there a separation between the different groups? What are the role and functions of the defensive sites?

Houston, Stephen [248] see Alcover, Omar

Hovezak, Tim (National Park Service), Gary Ethridge (National Park Service) and Gay Ives (National Park Service)**[226]** *JW Fewkes, James "Al" Lancaster, and Beyond: A Century of Preservation Archeology at Mesa Verde National Park.*

Site preservation has been an essential function at Mesa Verde National Park for a full century as well as a major prerogative of the National Park Service since its very inception. Early archaeological investigations at the park and attendant preservation efforts were instrumental in the definition of Ancestral Pueblo culture history by players who themselves were instrumental in the development of the science of North American archaeology. This presentation chronicles some of the remarkable accomplishments of these efforts, the evolution of preservation theory and practice, and contributions of the key players.

Hovezak, Tim [226] see Ives, Gay

Howe, Ellen [139] see Thibodeau, Alyson

Howell, Cameron (ERM)**[81]** *Ritual Circuits and the Distribution of Exotic Sherds in Hopewell Contexts*

The exchange of exotic goods between disparate geographic and cultural groups across the Midwest and Southeast is a hallmark of the Hopewell Period. Ceramics are recognized by archaeologists as an important component of this interaction sphere. This exchange is usually conceptualized as whole vessels moving across the landscape. In this paper, it is posited that sherds could be the unit of exchange instead. Using ritual circuits as a theoretical framework, this preliminary paper seeks to lay a foundation for how sherds can be reinterpreted as imbued objects on their own, and representative of complex social interactions during the Hopewell Period

Howey, Meghan (University of New Hampshire)**[133]** *Mishipishu and Danger in the Inland Waterway Landscape of Northern Michigan*

The Inland Waterway is a series of lakes, rivers, and streams that creates an inland route between Lakes Michigan and Huron. During the 1970's, Lovis helped lead the NSF-funded Inland Waterway Project which involved survey and test excavations. The results of this research have been vital in advancing understandings of hunter-gatherer-horticulturalist social, economic, and ideological processes in the region and beyond. In a 2001 article, Lovis argued a set of clay products found at the Johnson site, a Late Woodland site from the Inland Waterway Project, were clay effigy representations of bear and Mishipishu. In this paper, inspired by this work, I examine a set of clay products recovered from other sites in the Inland Waterway region as similar possible Mishipishu effigies. Mishipishu is a complexly powerful, seductive, and dangerous underwater panther known as the head of all water spirits. Ethnohistoric accounts indicate this manitou was a malevolent figure in dreams of hunters as well as one that received special prayers for

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protection when ricing or fishing. I interpret these figurines as features connected to the need for accurate socioecological information among hunter-gatherers occupying physically and socially dangerous landscapes, another important concept reiterated by Bill throughout his career.

[235] *Discussant*

Howey, Meghan [239] see Mierswa, Emily

Howie, Linda (HD Analytical Solutions / The University of Western Ontario), Jillian Jordan (University of New Mexico, Albuquerque) and Heather McKillop (Louisiana State University, Baton Rouge)

[95] *Mineralogy without Minerals: A Proposed Methodology for Reconstructing the Original Compositions of Highly Altered Ceramic Bodies Using Thin Section Petrography*

The rock and mineral fragments present in archaeological pottery, whether naturally occurring in the clay component or intentionally added as a temper, often serve as the primary geologic basis for provenance ascription in petrographic analysis. In certain contexts, however, the original compositional characteristics of pottery have been highly altered through technological or postdepositional processes. In these situations, accurate characterization and sourcing of original raw material ingredients must be based on a wider range of microscopic attributes than the rock and mineral assemblage alone. This is especially the case when diagnostic aplastic components have been completely removed.

We present two case studies of Late Classic Maya pottery from archaeological sites in Belize in which the original mineralogy of the raw material ingredients and paste recipes were reconstructed in the complete absence of actual rock and mineral fragments. We discuss the factors contributing to the removal of these essential fabric components, which are different in each case, and their identification. We propose a methodology for the reconstruction and description of the original compositions of highly altered ceramic bodies using a descriptive systems approach that integrates an appropriately broad range of microstructural and textural criteria, which are oftentimes otherwise ignored.

Howie, Linda [95] see Ford, Anabel

Howland, Matthew (UCSD Anthropology Department) and Thomas E. Levy (UCSD Anthropology Department)

[238] *Digital Deforestation: DTM Generation with Agisoft Photoscan*

Image-based Modeling (IBM) is an increasingly-applied technique for field archaeologists for generation of high-resolution spatial data. IBM is effectively and easily applied for generation of Orthophotographs and Digital Surface Models (DSMs). Yet raw DSMs are not suitable for analysis or mapping purposes in vegetated environments due to the fact that they contain measurements of trees, bushes, and even architecture, ancient and modern. Archaeologists often instead require Digital Terrain Models (DTMs), showing only the surface of the underlying earth, for cartography or volumetric calculations. Fortunately, the popular IBM software package, Agisoft Photoscan, contains point cloud classification functionality, allowing researchers to categorize points according to their location or color. By doing so, users can classify and then disregard vegetation in generating elevation models, and in doing so produce a true DTM without the need for complex GIS manipulation. This poster displays an Agisoft-based DTM-generation workflow, using the Mycenaean site of Kastrouli, Greece, as a case study.

Howland, Matthew [68] see Liss, Brady

Howse, Lesley (McGill University), James Savelle (McGill University) and Arthur Dyke (McGill University)

[16] *Beach Level Chronology and Paleodemography at Alarniq, Northern Foxe Basin, Arctic Canada*

In this paper we discuss beach level chronology and settlement at Alarniq—the ‘type-site’ for Dorset culture history and one of the largest Dorset archaeological sites in the Eastern Arctic. The Dorset occupation at the site extends approximately 3 km along a succession of raised gravel beach ridges, ranging in elevation between 8 to 24 m asl, and is almost entirely comprised of semi-subterranean structures that would have been occupied during the cold season. The number of houses varies across the beach ridges suggesting populations fluctuated throughout the site’s use. However, new radiocarbon analyses indicate that all houses between 22–16.5 m asl are of the same general age, and that paleodemography at Alarniq is less straightforward than suggested by the number of features per beach ridge. Here we examine how settlement at the site was impacted by the season of occupation, and discuss how ideal house construction locations seem to be a stronger indicator of the placement of winter houses at the site versus proximity to the shoreline.

Hoxha, Timothy

[73] *An Archaeological Analysis of Identity as Presented in Southwestern Indigenous Rock Art*

Rock art panels in the American Southwest contain defining markers of Archaic, Hohokam, Anasazi, Fremont and Historic Ute social practices. This paper will employ archaeological social theory and various communication theories to decode tribal information, including identity, that indigenous people recorded on rock surfaces.

Through case study analysis of particular physical characteristics for several rock art panels, this paper will analyze their potential applications as ancient communication platforms. It will compare, as evidence, shared characteristics between modern and ancient aboriginal cultures, such as matriarchal social values; religious practices, including dance ceremonies and pilgrimage rituals; and political identity formation via the development of tribal states.

This paper will use linguistics and semiotics theories to illustrate ways in which indigenous rock art sites may have:

- 1) Showcased tribal council leadership through defined characterizations of political and social roles;
- 2) Instructed populations in visual communication literacy to publicize and interpret significant events;
- 3) Cultivated tribal thinking to encourage conformity through social and ceremonial participation; and
- 4) Displayed advancements in technological communication.

Assessing rock art through the lens of archaeological social theory and various communications theories can provide unique insights into the social practices that defined ancient indigenous life in the American Southwest.

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Hoyle, Alesia (University of Texas at San Antonio) and Sonia Alconini (University of Texas at San Antonio)**[207]** *Water Management, Pastoralism and Settlement Shifts in the Andean Apolobamba Region*

The qochas of the high-altitude Bolivian Apolobamba Puna region had a pivotal importance in the local agropastoral economies. Fed by snow melt and inner water sources, the qochas formed a complex hydrological system along the rich marshes. Although we do not know their origins, some of these qochas were modified during the Late Intermediate period, and a network of canals expanded in order to accommodate increasingly specialized pastoralism. Later the Inka arrival prompted specialized agriculture and pastoralism in the hands of increasingly diverse ethnic groups. We explore these changes by comparing the shifts in the size and settlement distribution around the qochas, and the symbiotic relations maintained between farming and pastoral communities along the ecological spectrum. This information will be useful to assess the different forms of social integration that such groups maintained, the archaeological evidence of ayllu-like organizations, and the importance of qocha systems in the reorganization of the landscape.

Hranicky, Jack [81] see Hranicky, William

Hranicky, William and Jack Hranicky (Virginia Rockart Survey)**[81]** *Paleoamerican Archaeology in Virginia*

This illustrated paper presents over ten years of early American research in Virginia and Maryland. It covers 12 pre-Clovis sites, a summary of hundreds of Pleistocene/Early Holocene artifacts, and relies on various professional papers on this topic. It discusses the change over from blade/core technology to biface/core technology around the Younger-Dryas geological event. The paper shows artifacts that have not been seen in the archaeological literature. Several ongoing site investigations are shown showing volunteers. A prehistoric calendar is suggested which argues for a 10,000 years Pleistocene occupation in Virginia which starts with the now famous Cinmar bipoint. There are six sites in the Middle Atlantic area with date around or older than 16,000 years.

Hreinsson, Viðar [167] see Hicks, Megan

Hren, Michael [177] see Brittingham, Alexander

Hritz, Carrie (National Socio-Environmental Synthesis Center, University of Maryland)**[247]** *Archaeology as Actionable Science on Climate Change: Lessons from Interdisciplinary Collaboration*

Within archaeology, it is widely assumed recognized that the field has much to offer present and future efforts to address climate change. From an archaeological perspective, this may be directly through data, improved models of human adaptation, building or preserving modern connections to place, to name a few. However, to date these have not been well-incorporated into federal efforts to address climate change, largely as a result of a lack of systematic engagement. To address this gap for archaeology and other social sciences, in 2016 the US Global Change Research Program (USGCRP) undertook an effort to engage four underrepresented social science disciplines to support preparation of the fourth US National Climate Assessment and other ongoing federal work. This paper presents the experiences of three archaeologists and one anthropologist involved in this project and an assessment of what worked, what was a challenge, and recommendations for improving the art of connecting study of the past to actionable government results for global climate change.

[247] *Chair***Hronec, Laura (Bureau of Land Management, Roswell Field Office)****[261]** *Chair*

Hronec, Laura [222] see Waggle, Tawnya

Hruby, Julie (Dartmouth College)**[298]** *Building a Statistical Model to Evaluate the Sexes of Ancient Greek Fingerprints*

While fingerprint impressions have been used archaeologically to approach a range of cultural questions, the methodologies developed to date tend to be labor intensive, statistically unsophisticated, or require large numbers of complete prints. Recently, numerous quantitative print attributes that correlate with sex in modern populations have been discovered, almost always from two-dimensional data. It is probable that there are additional, yet-unrecognized features that correlate with producer attributes, especially if we include three-dimensional data. This project is a collaboration between an archaeologist and two professional mathematicians, with the goal of building a mathematically rigorous model for sexing ancient prints. The reference sample upon which it is based is a set of high-resolution 3D scans of fingerprint impressions left by modern Greek potters of both sexes; they were chosen on the basis that they are the closest population group, both genetically and occupationally, to their ancient predecessors. A scan of a print provides a high-resolution representation, akin to a digital elevation map of the topography of the print, including ridge patterns, overall size, shape, and depression depth. We plan to use high dimensional multivariate statistical techniques to develop informative metrics that show high predictive power for the sex of the imprint maker.

Hruby, Zachary (Northern Kentucky University)**[330]** *Obsidian Trade at the Edge of the Maya World*

The position of Vista Alegre at the Northeastern edge of the Yucatan Peninsula, a gateway between the Caribbean and the Gulf of Mexico, made it a strategic location for circumpeninsular maritime trade in Pre-Colombian times. A robust sample of obsidian artifacts from the Terminal-Postclassic transition increases our understanding of trade relations between the eastern and western sides of the Maya world. Technological and source analyses of obsidian artifacts from the site are presented to fill in gaps in our knowledge, not only of Terminal and Postclassic trade, but also first evidence from Early Classic and Preclassic deposits.

Hrynck, Gabriel (University of New Brunswick)**[199]** *The Devil's Head Site in Maine: The Organization of the Protohistoric Wabanaki World*

Archaeological studies of the Protohistoric period in Maine and the Maritimes have emphasized cosmology implicitly through their focus on copper kettle burials. Archaeologically, copper kettle burials may be the only truly diagnostic archaeological manifestation of the Protohistoric period in this region. The Wabanaki ethnographic record reveals that seemingly mundane activities—the organization of space, the disposal of animal remains, for instance—were also central to Wabanaki relational ontology. The Devil's Head site, located on the St. Croix River, in the Passamaquoddy Bay region of Maine (the "Far Downeast"), has yielded features with Protohistoric radiocarbon dates, a rarity on the Maritime Peninsula, as well as Late Maritime Woodland features. In this paper, I employ the organization of space and the disposal of food remains at Devil's Head to consider changes and continuities in cosmology from the Late Maritime Woodland to the Protohistoric period.

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Hrynicky, Gabriel [84] see Betts, Matthew

Hsu, Teresa (Smithsonian Institution), Nawa Sugiyama (George Mason University), Leila Martinez-Bentley (George Mason University) and Mónica Gómez Peña (Escuela Nacional de Antropología e Historia, Mexico)

[293] *Zooarchaeology and Bioarchaeology: Ceremonial Feasts and Human Caches at Plaza of the Columns Complex, Teotihuacan*

Preliminary analyses of the zooarchaeological assemblage from the Plaza of the Columns Complex illustrate a snapshot into past human activities such as specialized ceremonial events and faunal acquisition strategies for food consumption. The fauna from this complex, located just northwest of the Sun Pyramid, add to the database of forty years of archaeofaunal exploration throughout Teotihuacan. Here, we focus upon animal species distributed among four areas to understand the economic and ritual activities that took place in this complex.

Results from our analyses revealed intra-site variation among the general debitage fills and areas used for human caching and burnt offerings. One front, in particular, located along the Avenue of the Dead, featured a high concentration of human remains. These remains exhibited cranial deformation and some also teeth modifications atypical for Teotihuacan. Even further, one mound excavation revealed a burnt offering site where the zooarchaeological assemblage was predominately lagomorph and avian remains, mainly that of cottontail rabbit and partridge. High volumes of these easily managed species suggest the offering was representative of a ceremonial function like a feasting event, and furthermore, provides evidence that the Teotihuacanos were provisioning and managing these animal species for larger purposes.

Hu, Lorraine (Washington University in Saint Louis), Fiona Marshall (Washington University in Saint Louis), Henry Saitabau (National Museums of Kenya), Angela Kabiru (National Museums of Kenya) and Stanley Ambrose (University of Illinois Urbana-Champaign)

[99] *Pastoral Neolithic Mortuary Site Sedimentology at Noomparrua Nkosesia, Kenya*

Mobile pastoralism was the earliest form of food production in eastern Africa. The spread of pastoralism in Kenya c. 5000–1200 BP involved peoples with diverse subsistence patterns and material culture repertoires. However, little is known about the social landscapes and mortuary practices in southern Kenya. The mosaic of Pastoral Neolithic burial traditions across Kenya is diverse, ranging from monumental pillar sites to the north to cairns and rockshelter cremations to the south. In 2016, members of a Maasai community in the Loita Hills discovered a unique Pastoral Neolithic mortuary site named Noomparrua Nkosesia (GxJg2). This rockshelter held the remains of five cremated individuals, approximately 90 ground stone bowls and 44 obsidian artifacts, but no grindstones. We report on the chronology, stratigraphic profile, and formation processes of this site. Particle size, magnetic susceptibility and FTIR analyses demonstrate the presence of distinct layers of ash and red ochre at the site. Our analyses provide insight into mortuary practices clearly distinct from those at Elmenteitan cremation sites such as Njoro River Cave.

Hua, Quan [175] see Hendrickson, Mitch

Huaman Oros, Oliver [224] see Whitlock, Bethany

Huang, Cindy Hsin-ye (University of Victoria), April Nowell (University of Victoria) and Leslie Van Gelder (Walden University)

[118] *Tracing Ice Age Artistic Communities: 3D Digital Modeling Finger Flutings*

Finger flutings are lines and markings drawn with the human hand in soft cave sediment in caves and rock shelters throughout southern Australia, New Guinea and southwestern Europe, dating back to the Late Pleistocene. Two decades ago, Kevin Sharpe and Leslie Van Gelder developed a rigorous methodological framework for the measurement and analysis of finger flutings that allows researchers to identify characteristics of the creators, such as age, sex and group sizes. However, despite a comprehensive framework of study, data collection is still reliant on in-field measurements and is often constrained by physical challenges within the caves. With advances in technology, new methods of digital documentation are emerging. Creating three-dimensional models of finger fluting panels would allow for off-site measurements and other forms of analysis. This paper presents the results of an experimental archaeology project that tests three different 3D scanning techniques to determine the most appropriate method for the documentation of finger flutings based on factors such as portability, cost, efficiency, accuracy, as well as other challenges present in cave and rock shelter settings. A consistent method of 3D documentation for finger flutings will allow researchers to document sites globally and give rise to new perspectives and questions.

Huang, Jiawei (Pennsylvania State University, Department of Geography), Claire Ebert (University of Pittsburgh, Center for Comparative A), Jan Oliver Wallgrün (Pennsylvania State University, Department of Geogr), Jaime Awe (Northern Arizona University, Department of Anthropol) and Alexander Klippel (Pennsylvania State University, Department of Geogr)

[101] *Immersive Augmented and Virtual Reality for Archeological Sites Exploration and Analysis*

Immersive technologies such as virtual reality (VR) and augmented reality (AR), in combination with low cost yet high quality photogrammetry techniques, are beginning to change the way that archaeologists understand space and place. The availability of affordable immersive technologies is dissolving natural boundaries of space and time, and offering new ways of communications. The maturity of existing software environments such as Unity additionally allows for integrating spatial analysis tools into immersive environments, boosting archaeological research. We present the results of recent field work at the ancient Maya site of Cahal Pech, located in the Belize Valley of west-central Belize. We used a range of environmental sensing technologies, 3D modeling (e.g., structure from motion mapping and hands-on modeling) and 360° photography/videography of architecture to create an immersive experience for Cahal Pech (for an overview see: <http://sites.psu.edu/archaeology/>). Importantly, we developed a field protocol that could be implemented at other archaeological sites to allow researchers to view, interact with, and analyze data both on and off-site immersively. Our goal is to create a comprehensive suite of immersive applications for important Maya sites across Belize to enhance site visits, enable immersive tours and virtual time travel (VTT), and create immersive archaeology workbenches for researchers.

Hubert, Erell (Montreal Museum of Fine Arts)

[216] *Moche Women: Multiple Realities and Alternative Powers*

The growing breadth of data coming from scientific excavations of Moche sites in different valleys along the north coast of Peru has led to major advances in our understanding of the diverse ways of being Moche as well as the complex relationship between religious and political powers. How gender relations played into these Moche experiences however remains relatively understudied. Here, I specifically focus on the place of women in Moche society through time and space. Some women have now been shown to have played leading roles in practices linked to the dominant Moche ideology. However, these women appear to have lived mostly in the northern part of the Moche sphere and were exceptional in the way their status and gender identity intersected. Furthermore, beyond the positions of various women within the dominant hierarchical structure, the combination of multiple lines of evidence reveal alternative spaces where and ways in which the power of women may have been enacted.

Huckell, Bruce (University of New Mexico)

[182] *Black and Blue, Red and Yellow: Clovis Exploitation of a Central New Mexico Lithic Source*

Along the western edge of the Rio Grande Valley in Central New Mexico is a huge expanse of late Cenozoic volcanics, including a high-quality hydrothermally altered rhyolite. Colloquially known as Socorro jasper, at least one source of this material was exploited frequently by Clovis groups.

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This paper describes this source—the Black Canyon quarry—and the physical and geochemical properties of the “jasper” from it. Recent and continuing studies of its use by Clovis groups are reviewed, and its role in technological organization in central New Mexico is considered. The Mockingbird Gap site and the newly discovered Blue Canyon site reveal that Clovis groups practiced flexible strategies for procurement, reduction, transport, and consumption of this material. It is hypothesized that biotic and abiotic resource distribution and mobility strategies, in relation to the source location, appear to underlie this flexibility. The hypothesis is evaluated using these two sites, examining the composition of artifact assemblages of transported versus locally consumed Socorro jasper. Finally, comparisons are made with similar patterns of lithic source exploitation by Clovis foragers elsewhere in North America.

Huckell, Bruce [186] see Birkmann, Joseph

Huckert, Chantal (Universidad Veracruzana)

[33] *Una iconografía estelar en figurillas y esculturas de las culturas del Clásico del Centro de Veracruz*

La presentación se centra sobre figuras estelares de ojos emplumados, cruces, estrellas de tres o cinco puntas, y máscaras. Están pintadas y moldeadas en bajo relieve en la vestimenta y el cuerpo de representaciones humanas en barro que pertenecen a los tipos, rojo sobre crema, mayoide, sonriente y escultórico.

Se identifican las variantes, procedentes de las culturas del centro de Veracruz, a la luz de formas análogas en las artes y los registros gráficos de Mesoamérica, referidos por los especialistas como glifos de Venus o “estrella”, conjunto signico al que estudian en sus aspectos divinizados, y en sus funciones calendáricas asociadas a prácticas sacrificiales, entre otras.

Efectivamente, las figurillas y las esculturas del centro de Veracruz son investidas por un discurso signico estelar o venusiano que se sedimenta en raíces mesoamericanas. Las tratamos como los instrumentos y los testigos de la relación entre los poderes divinos y los hombres, que dan cuenta de la manera en que estos últimos concebían el cielo.

Proponemos una lectura interpretativa sobre los espacios simbólicos estelares, articulada en torno a los sistemas de significados que son los elementos formales de las tipologías, los temas figurativos y la iconografía estelar que se contextualizan mutuamente.

Huddart, David [59] see Gonzalez, Silvia

Hudson, Jean (U Wisconsin- Milwaukee)

[165] *Bones Left Behind: Living Spaces at a Residential Compound at Cerro la Virgen, a Rural Chimu LIP Settlement*

Cerro la Virgen (CLV) is a town-sized LIP site located in the Moche Valley a few kilometers from Chan Chan, the administrative and political center of the Andean polity of Chimú. Previous studies have focused on ceramics and regional politics (Keatinge 1974, 1975), the kinds of plant and animal remains found in residential dumps (Pozorski 1976, 1979; Billman et al in press), and multiple lines of evidence for the nature of the political relationship between the residents of CLV and the leadership and residential population at Chan Chan. What was life like at home for households at CLV? This study looks at the remnants of a single residential compound, originally one among hundreds, and asks how room sizes and spatial relationships, in conjunction with a detailed look at vertebrate remains left behind, both near the floors and in the fill above them, can contribute to a fuller understanding of the use and reuse of space within a residential context.

[165] *Chair*

Hudson, Kathryn [299] see Henderson, John

Huebert, Jennifer (International Archaeological Research Institute) and Melinda S. Allen (University of Auckland)

[85] *Arboriculture, Translocated Flora, and Ecological Inheritance in the Marquesas Islands, East Polynesia*

Contact-period accounts point to considerable variability in Polynesian agronomic production systems. In the Marquesas Islands, a mountainous island group in the eastern Pacific, food production in the proto-historic period was narrowly focused on tree cropping and breadfruit cultivation in particular. Early western visitors remarked on the archipelago's large and thriving island populations, and their stable and productive arboricultural systems. In this paper, we present the results of a multi-valley archaeobotanical study that documents the timing and character of native forest transformations and the creation of anthropogenic ones on Nuku Hiva, the largest island in the archipelago. The evidence suggests that early niche construction activities (forest clearance, species replacement, erosion management, and the creation of extensive tree plantations) gave rise to an ecological inheritance that was beneficial to the long-term fitness of Marquesan populations. We consider the co-evolution of local landscapes, translocated arboreal flora, and Marquesan societies.

Huebert, Jennifer [171] see Quintus, Seth

Huerta, Danielle (University of California, Santa Cruz), Heather Trigg (University of Massachusetts, Boston) and Judith Habicht-Mauche (University of California, Santa Cruz)

[104] *Analysis of Rio Grande Glaze Ware Glaze F Pottery from LA 20,000 Using Petrographic and Chemical Composition Techniques*

The pre-Revolt period (1598–1680) in New Mexico was a tumultuous time characterized by the forced making and breaking of ties between Spanish and Indigenous peoples on the Spanish Colonial settlement landscape that resulted in the circulation of cultural and economic resources. For Pueblo communities, colonial incursions significantly affected daily life through the ravages of war and disease, the privations of taxation and religious persecution, and the disruption of traditional economic and resource allocation practices that accompanied the introduction of Spanish goods and new domestic plants and animals. This poster presents combined petrographic and chemical composition data from the analysis of 28 Rio Grande Glaze F ceramic sherds from the site of LA 20,000, a seventeenth-century rural Spanish ranch just outside of Santa Fe, New Mexico. This analysis was carried out to investigate the procurement, production, and movement of late glaze wares and their raw material constituents in order to examine the structure and scope of social networks connecting Spanish and Pueblo households and communities.

Huerta, Edgar [285] see Wendt, Carl

Huertas Sánchez, Geraldine (Proyecto Qhapaq Ñan-Ministerio de Cultura)

[273] *El caso Huarco y la hegemonía Inca en el valle bajo de Cañete*

En el valle bajo de Cañete, la élite Huarco compartía una tradición cultural similar con las élites vecinas a lo largo de la costa centro-sur; a la llegada de los incas, esta tradición se mantuvo pero reconfiguraron sus estrategias políticas y económicas. De esta manera lograron proteger sus relaciones interregionales en este territorio, con el fin de aprovechar los beneficios de la presencia inca en el valle.

El Huarco, de acuerdo a los relatos etnohistóricos fue un señorío fuerte e independiente, también es señalado como un señorío que formó parte de una confederación política conquistada por los incas. Las investigaciones arqueológicas priorizaron el análisis estilístico; como consecuencia, su

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organización política, económica y cultural se redujo estrictamente a un espacio geográfico determinado.

Por ello, actualmente nos replanteamos la idea de cómo la costa centro-sur fue ocupada por uno o más grupos sociales en tiempos pre-incas y su posterior desarrollo bajo la dominación inca.

El presente trabajo analiza los materiales cerámicos recuperados durante dos temporadas de excavaciones en el sitio arqueológico El Huarco-Cerro Azul (Proyecto Qhapap Nan-Ministerio de Cultura) con el fin de caracterizar la ocupación del sitio y comprender la adaptación o transformación de sus instituciones bajo la conquista inca.

Huffer, Damien (Postdoctoral Fellow, Stockholm University) and Shawn Graham (Dept. of History, Carleton University)

[88] *Bioarchaeological Approaches to Investigating Supply, Demand and Authenticity in the Colonial-era Human Remains Trade*

During the Colonial era, numerous “trophy skulls” from various Indo-Pacific cultures entered Western museum and private collections, and continue to be sought as “authentic” collector’s items. However, very little bioarchaeological research exists investigating their provenience, intra-cultural variation in decoration and manufacture, and how examples created for Indigenous ritual use differed from those created for sale to Colonial explorers at the beginning of ‘curio’ trade, let alone what characterizes a modern forgery. Using c. late 1800s-early 1900s Dayak and Asmat “trophy skulls” as a case study of the global trade in the “exotic” dead, this presentation will discuss preliminary results from in-progress research on numerous museum collections. The systematic database created will allow for a much more detailed examination of variation in source, manufacture and use. Combining morphological, biodistance (metric and non-metric), and biogeochemical (strontium and lead isotope ratio) data analysed at the individual and population level, key findings to date will be discussed in the context of how a multi-faceted bioarchaeological approach can improve our ability to understand the Colonial-era roots of modern markets.

Huffer, Damien [118] see Graham, Shawn

Huffman, Thomas (University of the Witwatersrand)

[32] *Excavations at Great Zimbabwe: Commoner Housing versus Elite Enclosures*

Salvage excavations in the 1970s at the famous capital of Great Zimbabwe, southern Africa, uncovered several residential complexes dating to Periods IVb (AD 1300–1450) and IVc (AD 1450–1550). Overall, granaries and middens surrounded closely-spaced houses of commoner families living between the Outer and Inner Perimeter Walls. These high-density concentrations stood in marked contrast to the open spaces typical of elite enclosures. One midden against the Outer Perimeter Wall yielded a copper coin minted in Kilwa in honour of al Hasan bin Sulaiman (AD 1330 and 1333). Within the compounds, most structures had undergone several renovation stages. In addition, separate kitchens and sleeping houses—together with split fireplaces—show a change in attitudes about male and female roles. Among other things, the excavations showed that Great Zimbabwe was a dynamic town rather than a vacant ceremonial centre.

Huggins, Kathleen (University of California, Berkeley)

[141] *It's (Not) Just a Phase: Characterizing Surfacing Techniques in the Ancient Andes*

This presentation introduces a technique for quantitative analysis of ceramic surface topography, using false-color images generated through reflectance transformation imaging and automated quantitative analysis using cell-counting software. A preliminary study of surface topography variation in Early Formative and Middle Formative ceramics from Chiripa, Bolivia, will be presented, along with an outline of a reference database, Ceramic-Surface Topography of the Andes. The purpose of this study has been to expand the documentation and analysis of surfacing techniques. Alongside extensive attributional analysis, expedient quantitative analysis of various surface-topographies can enrich operational sequence studies and illuminate the creative environment in the past. The time spent burnishing a ceramic is a compressed time of repetitive and monotonous actions, when gestures blur into the next as easily as the former, and the non-linearity of productive labor can be seen and heard. Burnished ceramics, like quilts in a knitting circle, were audience to the kinds of social interactions which reinforce ties, circulate gossip, and hash out political grievance and agreement. Bringing surface-topography into the larger project of attribute analysis and archaeometry may help in understanding the relationship between the production of objects and political objectives.

Hughes, Lauren [202] see Button Kambic, Emily

Huiyuan, Gan [45] see Lina, Zhuang

Hull, Emily (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College) and Colin Quinn (Hamilton College)

[186] *Lithic Raw Materials and Social Landscapes: Mica-Lamented Quartzite Tools from Slocan Narrows, Upper Columbia River Area*

Utilitarian stone tools produced from raw materials that are linked to a place or landscape of significant social, ritual, and economic importance likely still carry that importance when tools are transported away from their source. Such objects can serve as indices of social relationships, economic priorities, and ritual practices. By transporting and using these objects, communities would have daily reminders of their connections to important places and activities that take place there. Ethnographically, the Sinixt People of the Upper Columbia seasonally migrated within their territorial range from Kettle Falls, WA north to Revelstoke, BC. Slocan Narrows is a pithouse village located in the center of that traditional territory. Excavations at Slocan Narrows recovered an assemblage of mica-lamented quartzite tools from a geological formation at Kettle Falls, nearly 200km away. We demonstrate the utilitarian use of these quartzite tools through microwear and experimental analysis in conjunction with archaeological and ethnographic contexts. We suggest the daily practice of using these tools at Slocan Narrows linked inhabitants at the site to prominent fishing grounds at Kettle Falls that had social, economic, and ritual significance. This highlights the importance lithic raw materials can have in conveying social information and connecting people to landscapes.

Hull, Kathleen (University of California, Merced)

[191] *Discussant*

Hulme-Beaman, Ardern (University of Liverpool & Liverpool John Moores University), Thomas Cucchi (Muséum national d'Histoire naturelle), Jeremy Searle (Cornell University) and Keith Dobney (University of Liverpool)

[125] *Competition for Resources: How Commensal Competition Informs Us of Past Human Activity*

Humans have a dramatic impact on environments around them. They augment, manipulate and engineer local environments to their own benefit, often resulting in a concentration of easily available food and nest sites. These anthropogenic resources and environments are readily exploited by a myriad of other organisms. These organisms, in local and neighbouring environments, engage in a range of different relationships with humans, reflecting the level of interaction and dependence. Due to the ubiquitous nature of some of these organisms and their sheer numbers, it is often assumed that humans provide a predictable and buffered environment, free from the normal annual cycles of resource availability and climate. However, this is a serious misconception, which can lead to a misunderstanding of the dynamics and intense competition experienced by organisms living within anthropogenic environments. A re-examination of human constructed environments illustrates why and how certain species survive, providing greater

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insights into how we impact organisms around us. Here we examine the evidence for (un)predictability in anthropogenic environments and competition in modern and ancient commensal species to identify the true nature of this relationship and what it reveals about the human past.

Hulme-Beaman, Ardern [212] see Dobney, Keith

Hummel, Rebecca (University of Kentucky), Katharine Alexander (University of Kentucky) and George Crothers (University of Kentucky)
[52] *Initial Timing and Spread of the Eastern Agricultural Complex: Need for a Comprehensive Database*

Extensive research has illuminated many aspects of the emergence of the Eastern Agricultural Complex, yet gaps remain surrounding the origin and spread of these early domesticated plants. The long-term goal of our research is to create a comprehensive, online database of accurately dated EAC plant samples similar to the Ancient Maize Map project (Laboratory of Archaeology, University of British Columbia). Compiling this chronology will contribute to our understanding of the social, economic, and ecological consequences of plant domestication in this region and highlight where additional research is needed. We have begun by compiling all known instances of four early domesticates (goosefoot, maygrass, marsh elder, and sunflower) in Kentucky and surrounding states. We describe our database project, provide summary information for the Kentucky region, and discuss future plans to increase the regional scope.

Hundman, Brittany (East Tennessee State) and Jay Franklin (East Tennessee State University)

[241] *Crocks and Canning: Economics of Homesteading on Boone Lake*

Situated at the confluence of the industrial North and the agricultural South, the rural Appalachian Mountains of east Tennessee had unique access to a variety of material and agricultural goods. These resources were key to the practice of homesteading; a type of small-scale subsistence living that was a mechanism not only for survival but of familial and communal pride that continues to this day. Boone Lake, formed from the damming of the Holston and Watauga Rivers, has covered many early occupation sites from this region. Surface survey along the lake periphery and riverbanks indicates historical occupations beginning as early as the late 1700s, continuing until the mid-1900s. Examining the distribution of artifacts from these disturbed sites by material type proportions and temporal spans will shed light on occupational patterns and social dynamics for this underinvestigated region. The composition of the glass and ceramic assemblages will investigate food preservation patterns, availability of consumable resources, and household economics. Self-reliance and sustainability are continued cultural traditions in this mountainous region and would have played a major role in the maintenance of an autonomous homesteading household.

Hunt, Chris (Liverpool John Moores University), Evan Hill (14Chrono Centre, School of Natural & Built Environ), Paula Reimer (14Chrono Centre, School of Natural & Built Environ) and Graeme Barker (McDonald Institute for Archaeological Research, Un)

[137] *Radiocarbon Dating of Land Snail Shell and the Chronology of MSA-Neolithic Human Activity in the Haua Fteah, Libya*

Land snails have a radiocarbon ecology which leads to offsets in shell radiocarbon age, relative to contemporary biogenic carbon. We describe new methods for evaluating and calculating this offset. We radiocarbon date and apply the new methods to land snail food debris, from the deep MSA to Neolithic sequence in the Haua Fteah cave, NE Libya. Oxcal modelling of the resulting 136 dates over ~45000 years shows the site was used for short episodes separated by long periods of abandonment. The archaeological record had suggested continuous activity. The record in this, and similar sites, needs reassessment in this light.

Hunt, Katie [5] see Herrmann, Edward

Hunt, Rebecca (Binghamton University), Tiffany Raymond (Binghamton University), Anna Patchen (Binghamton University), Sarah Gilleland (Binghamton University) and Matthew Sanger (Binghamton University)

[156] *Prepared Floors on Mound A Revealed through Near-Surface Geophysics*

Mound A is the largest earthen construction at Poverty Point and the second largest mound in North America. Limited excavations on the mound have documented the construction history of the deposit, but have failed to find evidence of how the mound was used. Recent geophysical surveys (including resistivity, ground penetrating radar, and magnetometry) reveal specialized use areas—including prepared floors that we interpret as dance and presentation platforms. The discovery of these platforms suggests that the mound was not simply an earthen pile, but rather a focal point for ritual gatherings whose height allowed greater visibility of activities taking place on it. The successful application of geophysics on Mound A also highlights the applicability of near-surface geophysics as a technique for better understanding other earthen construction at Poverty Point and elsewhere.

Hunter, Carly

[241] *The Last Ones Out: The Impacts of the National Park Service on the Inhabitants of Cataloochee Valley, NC*

This poster will highlight the benefits and drawbacks associated with the establishment of the National Park Service in western North Carolina. Specifically focusing on the Cataloochee Valley of the Great Smoky Mountains National Park, the implementation of government regulations both culturally and geographically affected the region in ways that did not always align. Some of these programs actually disenfranchised the local population, but simultaneously supplied the federal protection that has provided a means by which the public can enjoy the land for years to come.

Hunter, Carly [241] see Hermit, Elijah J.

Hunter, Raymond (University of Chicago)

[297] *Cultivating Ideology: Food Production in Colonial Cusco, Peru*

Historical and archaeological research on the Colonial Andes and Spanish colonialism more broadly has drawn parallels between the conversion of indigenous populations to Catholicism and the conversion of agricultural land to 'Christian' food production. This scholarship contends that for colonizers, religious conversion was irrevocably connected to agricultural practice—a particular concern to Spaniards in the Andes given the strong links between agrarian production and Inka ritual practices.

Evidence from the site of Markaqocha, in the Cusco region of Peru, both corroborates and complicates arguments that link religious and ecological conversion. At Markaqocha, archaeological, historical, and paleo-environmental data provide a lens on Inka and Colonial ritual economies. These data suggest that while the intervention of religious organizations was critical to initial attempts to convert from an Inka to Spanish political ecology, the connections this process affirmed between ritual spaces and agricultural production later prompted conflict between secular and religious institutions. Further, data from Markaqocha suggest that attempts at such a conversion were not entirely successful. The data demonstrate that pre-Colonial and Catholic ritual practices have together influenced food production in the vicinity of the site through the five centuries since the arrival of colonizers in the region.

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Huntley, Ashley, Jon-Paul McCool (University of Cincinnati, Valparaiso University), Nicholas Dunning (University of Cincinnati), Samantha Fladd (University of Arizona, University of Cincinnati) and Vernon Scarborough (University of Cincinnati)

[91] *Reassessing Agricultural Potential in Chaco Canyon: Exploring the Link between Soil Salinity and Soil Texture*

Determining the soil salinity of a site can aid in the assessment of the agricultural potential of a particular area, thus enabling researchers to draw conclusions about the potential for cultivation and subsistence intensification. Studies pertaining to soil salinity in Chaco Canyon often argue that the electrical conductivity (EC) levels within the area—a standard proxy measure of soil salinity—were too high for maize farming in many areas of the canyon, drastically limiting the potential agricultural yields within the canyon. These findings influence interpretations of the canyon's social and economic structure, as well as reconstructions of population size. A recent reanalysis of salinity counters earlier studies, suggesting maize agriculture was possible in large portions of the canyon. We reexamine the implications of soil salinity research through an assessment of the relationship between texture and salinity within the "dune dam" area located just below the great house of Peñasco Blanco. Two cores from this portion of Chaco Canyon will be compared with previously published data from the well-studied Gila Basin pertaining to salinity and agricultural potential. Through this comparison, we will explore the interconnection between soil texture and salinity and its implications for broader agricultural patterns within the Southwest.

Huntley, Deborah (Tetra Tech, Inc.) and Suzanne Eckert (Arizona State Museum)

[287] *The Reshaped Sherd: A Comparative Study of Ancestral Pueblo Worked Sherd Assemblages*

Every site has at least one: the worked sherd. Game piece? Scraper? Spindle whorl? Miscellaneous ceramic object? Different analysts categorize these easily recognized but not always easily interpreted artifacts in different ways. In this presentation, we examine worked sherd assemblages from three 13th-15th century Ancestral Puebloan villages. Differences among these assemblages attest to variable contexts of use and meaning for worked sherds. We argue that individual worked sherds should be understood within a larger framework of worked sherd assemblages, and suggest some key attributes to consider when such objects are present in a collection.

Huntley, Deborah [95] see Eckert, Suzanne

Huo, Wei

[336] *Recent Archaeological Discoveries in Tibet and the 'Plateau Silk Road'*

In the past, the Qinghai-Tibet Plateau region has been vacant in Silk Road route studies. The northern part of the Qinghai-Tibet Plateau can be directly connected to the western region, with the Tarim Basin, Hexi Corridor, and the Loess Plateau together forming a very smooth ring. There are a number of oases connecting the desert and the Gobi, which has been considered by some as a direct connection of a Silk Road branch to the northern region of Qinghai-Tibet Plateau. The southern part of the Qinghai-Tibet Plateau is a portion of the Himalayas. It has many mountain passages, which cross-cut the northeastern region and the mountains of the Six Rivers Basin as a whole. These north-south alpine valleys have since the prehistoric period become important channels for human beings. Geographically speaking, although the Qinghai-Tibet Plateau is cold, dry and exhibits a number of conditions not suitable for human survival, it is not a restricted area. The history of the Qinghai-Tibet Plateau is very late, basically from the beginning of the Tang Dynasty, so the archaeology of the area is a good entry point toward understanding the regional civilization and cultural exchange dynamics.

Hurst, Stance (Museum of Texas Tech University), Ricardo Chacon (Museum of Texas Tech University), Eileen Johnson (Museum of Texas Tech University) and Doug Cunningham (Museum of Texas Tech University)

[140] *Lithic Technology of Manufacturing Stone Tools at Gravel Quarry Source Locations Using Heat-Treatment*

Prehistoric flintknappers world-wide typically used heat-treatment to improve the flakeability of lithic materials after initial reduction into smaller-sized packages. In contrast, along the eastern escarpment of the Southern High Plains of Northwest Texas, Late Archaic-age (4,500–2,000 rcyBP) flintknappers used heat-treatment to improve large quartzarenite clasts prior to initial clast reduction. Heat-treatment in this case was used as part of procurement at quarry gravel source locations. These quartzarenite clasts along with other knappable lithic material occurred within large secondary gravel deposits eroded from the nearby Southern High Plains basal section of the Ogallala Formation. The Potter member quartzarenite clasts were the largest sized clasts within these gravel deposits. A surface survey at Macy Locality 313 (41GR911), a Late Archaic hunter-gatherer campsite and Potter member quartzarenite quarry workshop, documented a lithic assemblage consisting of over 3,500 pieces of lithic tools and debitage, along with hearthstones. A technological study of this assemblage examined the role of heat-treatment in the initial reduction of Potter member quartzarenite clasts. Results indicated the process of heat-treatment improved the unmodified clasts for primary reduction and produced heat fractured debitage that also was used to fashion stone tools.

Hurst, Stance [182] see Johnson, Eileen

Hurt, John Duncan (University of Texas at Austin)

[229] *The Cividade de Bagunte and the Problems of Castro Architecture*

It is generally accepted that the Castro Culture in northwestern Portugal exhibits a fairly consistent architectural tradition, characterized by the presence of certain construction techniques, structural forms, and organizational schemes. Despite this consensus, there is a pressing need for further research on the topic. Publications dedicated to the study of castro architecture are few, and they have mostly taken a broad approach that focuses on apparent commonalities between sites from across Galicia and northern Portugal. Authors have placed undue emphasis on singular features of the evidence from each site, overlooking the more complex and problematic questions that arise when a structure is viewed in the context of its own settlement. While these works have been effective in establishing some distinct architectural trends, their interpretive components are often oversimplified or unnecessarily speculative. Such an approach encourages tentative generalizations and contributes little toward an in-depth understanding of castro communities. This paper considers architectural evidence from the Cividade de Bagunte and a few nearby sites to demonstrate the complexity inherent in any comparative assessment of castro architecture. In short, this study seeks to raise meaningful questions while skeptically evaluating the evidence in a way that responds to the current state of architectural research.

Hurte, Sr., Guilliam (VCP Alexandria) and Gabriel Brown (VCP Alexandria)

[326] *Forensic Photography and the VCP—Teaching Veterans and Capturing History*

One of the unique opportunities given veterans within the Veterans Curation Program (VCP) is professional training in high quality digital artifact photography that far exceeds the quality of photography practiced by most Cultural Resource Management firms. A representative sample consisting of 10% of every collection processed by VCP is photographed by the veteran technicians and subsequently combined with the finalized collection. These digital images are reviewed and a selection is eventually uploaded to the Digital Archaeological Record (tDAR), an international digital repository for the records of archaeological investigations. The process of training veterans with little or no background in photography relies primarily on well-established step-by-step methods, ongoing personalized training and mentoring, and an accessible reference guide designed specifically for the VCP. With the skills and experience acquired through the VCP, many veterans have discovered the value of photography not only as a therapeutic and satisfying hobby, but also as a possible career choice.

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Hurte, Sr., Guiliam [326] see Brown, Gabriel

Hurtubise, Jenna (University of Alabama)

[117] *Preliminary Understandings of the Casma's Response to Chimú Conquest in the Nepeña Valley, Peru: Findings from the 2017 Pan de Azúcar Excavations*

Around A.D. 1300, the Chimú conducted a series of expansions south of the Moche Valley conquering the Casma, a regional group whose territory spanned from the Chao to the Huarmey Valleys. While past research has examined this event in the northern and southern extent of the Casma's territory, there exists a void in our knowledge on the Casma's experience during the Chimú conquest in the central Santa and Nepeña Valleys. In 2017 the Proyecto Investigación de Arqueología de Pan de Azúcar (PIAPAN) conducted the first season of excavations at the principle Casma site of Pan de Azúcar. The project's goals are to understand the Casma's response during the Chimú conquest in whether they conformed, resisted, or hybridized their daily practices through taking a multi-component analysis of cultural and biological data. Based on findings from the first season of excavations at Pan de Azúcar, this paper discusses the data discovered and presents preliminary hypotheses on how the Casma reacted to Chimú conquest in the Nepeña Valley.

[117] *Chair*

Hurtubise, Jenna [65] see Shimada, Izumi

Huster, Angela (Arizona State University)

[257] *Being Matlatzinca: Ethnicity and Household Activity at Aztec Calixtlahuaca*

In written sources, the Mexica provide stereotyped descriptions of other groups, many of whom had been conquered and incorporated into the Aztec Empire. I use data from the site of Calixtlahuaca to evaluate the archaeological validity of such stereotypical practices for one group, the Matlatzinca. In particular, I focus on the heavy reliance on maguey, and locally distinctive foodways relating to maize. I then consider whether these practices became more or less pronounced once the area came under Triple Alliance rule. I find that there is a modest shift toward more characteristically Aztec practices in both activities over time, but that these changes are highly unevenly distributed among households. Given that both of the activities under consideration are relatively low-visibility, household-level practices, it is unlikely that they were specifically targeted by Aztec imperial policies. This suggests that shifts toward more Aztec practices were largely voluntary actions by particular subgroups of the local population.

Hutson, Jarod (Department of Paleobiology, Smithsonian Institution), Anna K. Behrensmeyer (Department of Paleobiology, Smithsonian Institution), Diane Gifford-Gonzalez (Department of Anthropology, University of California), Gary Haynes (Department of Anthropology, University of Nevada), and Amanda Millhouse (Department of Paleobiology, Smithsonian Institution)

[189] *Zooarcheological Contributions to the Smithsonian's National Taphonomic Reference Collection*

Taphonomy, the study of how organisms fossilize and information that is lost and gained along the way, has emerged as pivotal to reconstructing the paleoecology of animal communities and ancient human lifeways. Through taphonomic analysis, we can decipher the sources of bone accumulations at paleontological and archaeological sites and the processes involved in bone modification and preservation. Such inquiries rely upon well-documented reference collections that link certain bone modifications to specific taphonomic agents, processes, and ecological contexts. Here we introduce two major additions to the Smithsonian's National Taphonomic Reference Collection (NTRC), consisting of roughly 5,000 taphonomic specimens assembled by two of us (Gifford-Gonzalez and Haynes), during many decades of experimental, ethno-archaeological, and landscape-scale taphonomic research in North America and Africa. The taphonomic significance of each specimen has been meticulously documented using original field notes, photographs, and inventories, in a searchable online database. The NTRC is the first global taphonomy repository and is designed to grow with future additions of modern and fossil bones that document known or inferred taphonomic processes. The collection can be accessed digitally and/or through examination of the actual specimens at the museum. We encourage archeologists, paleoanthropologists and paleontologists to utilize this valuable comparative resource.

Hutson, Scott (University of Kentucky)

[109] *Creations of the Lord: New World Slavery and Sacrifice*

In the ancient cities of Ur and Chan Chan, excavations revealed that when a lord died, dozens of servants were sometimes put to death and buried with the lord. Such examples of retainer sacrifice, also mentioned for Aztec kings and documented in Maya tombs, raise questions about slavery, violence, and subjectivity. David Graeber has argued that slavery played a key role in the origin of commercial systems. The transition at issue concerns the melding of human economies (which make and remake relations between people) with commercial economies (which concern the acquisition of goods and wealth). Social currencies power human economies, but such money can never substitute for a person because each person and their relations are unique. Sufficient violence, however, can reduce a person to mere property, a slave. In a well-known passage from Phenomenology of Spirit, Hegel states that the bondsman (the slave) has no consciousness of own: his/her essential nature is to live for the lord. Some aspects of captives and human sacrifice in the New World accord well with Graeber's and Hegel's position, yet there are salient differences. This paper explores these discrepancies and considers their consequences to a relational approach.

[82] *Discussant*

[109] *Chair*

Hutson, Scott [37] see Plank, Shannon

Hyche, John (University of Maryland, College Park)

[296] *Shanties on the Mountainside: A Look at Labor on the Blue Ridge Railroad*

From 1850 to 1860, the Blue Ridge Mountains were home to roughly 1,900 Irish laborers as they worked on the construction of the Virginia Central Railroad. Upon its completion, the railroad stretched from Norfolk, Virginia, to the Ohio River. Along the Blue Ridge Mountains, the Irish immigrants constructed several cuts and tunnels, including the Blue Ridge Tunnel. At its completion, the tunnel measured 4,263ft long and bridged two Virginia counties. This project proved to be an especially daunting task that took ten years to complete and cost many lives. Workers and their families nearby were forced to live in groups of shanty homes, prone to regular outbreaks of disease throughout construction. In 2011, a local non-profit organization, focused on pinpointing the remains of these Irish shanty homes, contacted the University of Maryland to see if an archaeological survey could aid their search. Over the course of two years, archaeological research shed light on the material culture of transient labor and reinforced strong community ties related to the surrounding cultural landscape. The aim of this paper is to evaluate the archaeological evidence collected and determine if the data conclusively points to the existence of shanty settlements at the two sites investigated.

Hyde, David (Western State Colorado University)

[142] *Elite Maya Social Identity at a Hinterland Community: The View from Medicinal Trail, NW Belize*

Social identification is the perception of oneness with, or belongingness to, some human aggregate. The definition of others and self is largely relational and comparative. Archaeologists demonstrate Maya elite identity by comparing them to non-elites in terms of energy expenditure in burial preparation,

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house and platform construction, access to luxury items, and cranial and dental modifications. Although non-elites include some urban residents and all hinterland residents, this study proposes that some hinterland residents also identified as elites. The Medicinal Trail Community is a hinterland settlement with considerable variation in household complexity, ranging from simple perishable structures informally arranged, to households on elevated platforms formally arranged around a courtyard. The latter residents attempted to adopt the social identity of the urban elites by using the symbols and material culture of the "Urban Elites," therefore becoming "Hinterland Elites." As a result, these "Hinterland Elites" economic and socio-political status was elevated above most of the community's inhabitants, providing them with limited social power. Although their elite identity was probably not acknowledged by the urban centers, by distinguishing themselves from those in their immediate community, they used this identity to gain and maintain power within the community.

Hyde, David [243] see Sullivan, Lauren

Iannone, Gyles (Trent University), Pyiet Phyo Kyaw (University of Yangon), Nyien Chan Soe (Yadanabon University), Saw Tun Lynn (University of Yangon) and Scott Macrae (Trent University)

[56] *Water, Ritual, and Prosperity at the Medieval Capital of Bagan, Myanmar (11th to 14th Centuries CE): Preliminary Exploration of the Tuyin-Thetso "Water Mountain" and the Nat Yekan Sacred Water Tank*

The IRAW@Bagan project is aimed at developing an integrated socio-ecological history for residential patterning, agricultural practices, and water management at the Medieval Burmese (Bama) capital of Bagan, Myanmar (11th to 14th century CE). As part of this long-term research program investigations have been initiated on the Tuyin-Thetso mountain range, located 11.25 km southeast of Bagan's walled and moated epicenter. This upland area figures prominently in the chronicles of early Bagan, and numerous 13th century religious monuments were erected there. Recent explorations on Tuyin-Thetso have drawn attention to an additional feature of historical significance, a rock-cut tank located along the eastern edge of the Thetso-Taung ridge. Referred to by local villagers as Nat Yekan (Spirit Lake), this reservoir appears to have been integral not only to the initial collection and subsequent redistribution of water via a series of interconnected canals and reservoirs spread across the Bagan plain, but also, through its associated iconographic imagery, it may have been intended to purify this water, symbolically enhancing its fertility. This presentation will provide a preliminary assessment of Nat Yekan's potential economic, political, religious, and ideological significance during Bagan's classical era.

Iannone, Gyles [142] see Demarte, Pete

Ibarra, Eugenia (Universidad de Costa Rica)

[260] *What Archaeologists Can't See: Contrasting Ethnohistorical and Archaeological Data in Talamanca, Costa Rica in the 16th Century*
Archaeologist Francisco Corrales and myself recently undertook the study of the exploitation of natural resources and their exchange in the areas close to Juan Vázquez de Coronado's route in 1564, traced from the Pacific coast to the Caribbean in Southeastern and Southwestern Costa Rica. This presentation aims to underline how resources of the different altitudes on both slopes formed an important part of the various activities carried out by the inhabitants during the 16th. century and immediately before. I will detail the paraphernalia used by usékares and sukias as it becomes important to understand the nature, presence and movement of distinct objects. I will also discuss how, on the area, ethnohistorical, ethnographical, linguistic and mythological data are able to depict clues to the presence or absence of material culture. The Museo Nacional de Costa Rica holds materials coming from that precise area, with no context. A sharper look at written sources can help reconstruct the sociocultural dynamics which can aid archaeologists to interpret and orient their specific work objectives.

Ibarra, Julio (INAH OAXACA)

[158] *Trabajos de Conservación Arquitectónica en el Sitio Arqueológico de San Pedro Nexicho, Colaboración INAH-FAHHO-Comunidad*
La conservación del patrimonio arqueológico en la región de la Sierra Norte del estado de Oaxaca, representa un gran reto debido entre otros aspectos a su entorno geográfico, a cuestiones del ámbito social que se relacionan con el arraigo a sus costumbres y tradiciones; y más aún, a la falta total de antecedentes sobre trabajos previos de conservación sobre el patrimonio cultural local.
En esta ponencia se presentarán los trabajos de intervención para la conservación y restauración de los vestigios arqueológicos efectuados durante el desarrollo del proyecto de intervención en el Sitio Arqueológico San Pedro Nexicho, avalado por el INAH y con fondos de la Fundación Alfredo Harp Helú de Oaxaca, han dado como resultado primeramente frenar el proceso de deterioro al cual fueron sometidos a partir su localización, saqueo y desatención; logrando mediante la aplicación de los criterios de restauración, sentar las bases para garantizar su conservación, partiendo de la concientización de la comunidad a raíz de su participación en dicho trabajos.

Ibarra, Thania (Proyecto Arqueológico Tepeticpac—Centro INAH Tlaxcala) and Aurelio López Corral (Instituto Nacional de Antropología e Historia)

[31] *A Technological Approach of Textile Production in Late Postclassic Tlaxcallan*
Textile production had a pivotal role among Late Postclassic societies including ancient Tlaxcallan, a prominent altepetl of the Puebla-Tlaxcala region. Several scholars have studied prehispanic cloth and garments production based on 16th century historical sources, but using little archaeological evidence. In particular, poor attention has been paid on the technology of textile production based on archaeological artifacts, especially in relation to spinning techniques and the different fibers exploited. In order to assess the technological characteristics of thread production in Tlaxcallan, here we analyze a sample of 364 archaeological spindle whorls recovered at the site of Tepeticpac, one of the main members of this political entity. By evaluating their mechanical performance, in association to different fiber processing techniques and thread qualities, we establish the existence of two large groups of archaeological whorls that are correlated with two spinning techniques. In addition, experimental analysis using replicas shows that it is possible to process a variety of short or long staple fibers with each spinning technique, and that artisans can choose the type of spindle whorl to use according to personal experience and skills.

Iceland, Harry [59] see Hirth, Kenneth

Ichikawa, Akira

[18] *Intraregional Interaction in the Zapotitan Valley, El Salvador: The San Andres Regional Center and Joya de Ceren Village*
This paper provides new insights to better understand the intraregional interaction, especially San Andres and Joya de Ceren in the Zapotitan Valley of El Salvador. Joya de Ceren is a village of commoners that was buried by the Loma Caldera eruption, which occurred around AD 650; it is one of the most studied ancient villages in Mesoamerica. Moreover, the previous study indicate that this village might have been closely connected to San Andres, which is the religious, political, and economic center in the region. However, due to limited research, the extent of control of the elite of San Andres over the commoners of Joya de Ceren remains unclear. Therefore, the author recently conducted an archaeological investigation at San Andres. The results revealed that in San Andreas, the major occupation and construction of public architecture developed after the Loma Caldera eruption. In other words, San Andres might not have been a regional center at the time of Joya de Ceren. In addition, based on these findings, the

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interpretation of the Joya de Ceren commoners and the nature of interaction between regional centers of the elite and villages of commoners can be reconsidered.

Iglesias, Christina (California State University, Los Angeles), Samantha Lorenz (Contested Caves Archaeological Project) and Toni Gonzalez (University of California, Santa Barbara)

[157] *Redefining the Relationship between the Surface and the Subterranean at Mul Ch'en Witz, La Milpa, Belize*

One of the many unsettled issues in chultun research is the relationship of chultunes to surface architecture. At Mul Ch'en Witz, located within the large Maya site of La Milpa in northwestern Belize, the chultunes are covered by low, rectangular rubble core platforms so that each is an architectural complex with both a surface and a subterranean component. This degree of formalization of the surface space had not been previously reported until recently at RB-25-A5, a collapsed chultun also located at La Milpa. Data on the surface construction of chultunes at Mul Ch'en Witz along with speculation on its significance will be presented here.

Iizuka, Fumie (University of California, Merced), Masami Izuho (Tokyo Metropolitan University) and Mark Aldenderfer (University of California, Merced)

[155] *Evaluating the Advent of Neolithic in Southern Kyushu, Japan, through Systematic Ceramic, Lithic, and Paleoenvironmental Studies*

Archaeologists suggest that during the transitions between the Pleistocene and the Holocene, drastic changes occurred in the lifeways of humanity. They are termed the "Neolithization processes." Changes include the advent of food production and sedentism, and the adoption of pottery and ground stones. However, case studies around the world suggest that the timings, order, and nature of the occurrence vary. More case studies are required to better understand the "Neolithization." In this study, we focus on the transitions from the Upper Paleolithic to Initial Jomon periods of southern Kyushu, Japan. The earliest signatures of sedentism are found there. Pottery was adopted at least by 14,000/13,500 years ago by hunter-gatherers. Our previous study suggested that the advent of ceramics is associated with sea level changes but the change in climate and biomes may correspond with the increase in the occupational intensity, the proportion of decorative vessels, and lithic type variability. In this study, we conducted (1) a systematic literature-based investigation of ceramics, stone tools, features, and paleoenvironment, (2) a visual analysis of pottery and stone tools, and (3) map-based research of landscapes. Our results add new understanding to our previous results on the timings of technological, behavioral, and paleoenvironmental changes.

Ikehara Tsukayama, Hugo (Pontificia Universidad Católica de Chile)

[75] *Scars of Warfare: Early Fortifications and Politics in Coastal Ancash (Peru)*

Between 500 BC and AD 500 communities of the coastal valleys of Ancash (Peru) lived in a period of increased conflict and violence. People moved to defensive locations and invested in the construction of defensive infrastructure such as: walls, moats and fortifications. These features are still visible today as scars in the landscape. Two moments have been defined in this period and are related to the Salinar and Gallinazo archaeological cultures, each characterized by different settlement patterns and defensive strategies. These differences suggest the nature of warfare changed through time. This paper presents a study of how defensive infrastructure in the Nepeña middle valley is related to changes in local and regional politics, more specifically to the transition from a balkanized landscape to the possible emergence of a unified chiefdom.

[75] *Chair*

Ikehara-Quebral, Rona (Int'l Archaeological Research Institute, Inc.), Michael Pietrusewsky (University of Hawai'i at Manoa, Department of Anth) and Michele Toomay Douglas (University of Hawai'i at Manoa, Department of Anth)

[20] *Cranial Vault Modification in the Mariana Islands*

Cultural flattening of the posterior skull, rare in the Mariana Islands, was recently observed in multiple human skeletons from a Latte Period site in Guam. Prior to this study, only one case of possible artificial cranial modification was reported for this region. The cranium of a young adult female from Songsong Village, Rota, was described as having "asymmetrical deformation in the occipital region consistent with artificial shaping practices." In a review of the ethnohistoric literature, journal articles, available historic preservation compliance reports, and unpublished photographs, we evaluate the extent of cranial modification in the Mariana Islands. Using these resources, we identified crania from five burial assemblages in Guam, Tinian, and Rota that appear to have been culturally modified. Since these Latte Period sites each contain an early Spanish Historical Period component, it is possible a cultural practice that unintentionally (e.g., cradle boarding) or intentionally caused cranial modification was introduced shortly after European contact in 1521. Alternatively, this may have been a long-standing Chamorro practice that has been largely overlooked in pre-Contact burial assemblages. Results of this evaluation suggest modified crania are being under-reported in the region.

Ikeshoji-Orlati, Veronica [86] see Zori, Davide

Ikram, Salima [34] see Cakirlar, Canan

Inga, Josh [95] see Ford, Anabel

Ingalls, Victoria (The University of Texas at San Antonio) and Jason Yaeger (The University of Texas at San Antonio)

[142] *Public Spaces and Polity Making in Maya Hinterland Communities: A Case Study from San Lorenzo, Belize*

Public structures in the Maya region materialize ideologies and define centers of power as they create politically charged sacred landscapes. These locations are nexus points for community and polity making processes, embedding social hierarchies, ideologies, and social memories into the physical landscape. However, archaeologists have historically focused attention on monumental public spaces within large civic-ceremonial centers, and relatively little attention has been given to public spaces within rural communities. Yet it is at these public structures and spaces that entanglements of both top-down and bottom-up processes are visible to archaeologists. To explore the ways in which hinterland or 'rural' communities may integrate and articulate with larger 'heartland' seats of power, this paper will examine one such public group at the hinterland site of San Lorenzo, Belize. Data demonstrates that this group was used and modified by the local community from the Preclassic to the Terminal Classic periods. Its proximity to the large center of Xunantunich and the continual use of this space over centuries suggests that this group played an enduring role in the socio-political integration of the San Lorenzo community and Xunantunich polity.

Ingraham, Robert, Sky Heller (University of Maine, Orono), Brian Robinson (University of Maine, Orono) and Kristin Sobolik (Wright State University)

[294] *"Left for the Tide to Take Back": Specialized Taphonomic Mechanisms at Play in a Coastal Maine Seal Hunting Camp*

Archaeological investigations at Holmes Point West (Maine site 62-8) on the eastern Maine coast have yielded potential indicators of cultural treatment of seal remains that vary between two primary species: harbor seal (*Phoca vitulina*) and gray seal (*Halichoerus grypus*). Analyses of these patterns required development of element-specific speciation factors for best represented elements for each species, the temporal bone of the skull, including the auditory bulla and mastoid process. Holmes Point West is situated in the midst of a high density of petroglyph sites on Machias Bay, and in the

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context of abundant Algonquin oral traditions emphasizing cultural practices that reflect respect for the spirit of hunted animals. This presentation hypothesizes cultural practices associated with bone disposal patterns within the assemblage, and trajectories for ongoing research at Machias Bay.

Ingram, Scott (Colorado College)

[247] *Engaging the Past for a Warming World*

Increasing the public benefits of archaeology involves more than increasing our assertions of relevance. Relevance is a vague term that is easy to assert because it is difficult to disprove. Likewise, archaeology is not a predictive science and promoting “lessons from the past” creates unrealistic expectations of archaeologists and our work. If we are to connect the past to efforts to address climate change, we need to provide specific, archaeologically-informed examples that demonstrate how the past can inform human actions to address climate change. This presentation will offer specific examples of how a long-term perspective and some knowledge of the past can (should?) influence public actions and policy decision-making. It is hoped that these examples will be shared and stimulate similar efforts that demonstrate, but do not assert, the need to engage the past for a warming world.

Inomata, Takeshi (University of Arizona)

[147] *Termination Deposits at Aguateca and Ceibal, Guatemala*

Excavations at Aguateca and Ceibal revealed a series of dense deposits associated with the ritual destruction of buildings. At Aguateca, such deposits were found in and around Structures M7–22 and M7–32 of the Palace Group, probable royal administrative-residential buildings. Excavators also unearthed similar deposits around Structures L8–6 and L8–7, temple pyramids in the Main Plaza. These deposits date to c. AD 810 when enemies attacked Aguateca. At Ceibal, dense deposits of broken objects were found in and around structures surrounding the West Plaza of Group D, the probable royal palace complex of the illegitimate ruler, Ajaw Bot. This complex appears to have been destroyed at the end of Ajaw Bot’s reign around AD 800 or 810. Another set of deposits were revealed in and around Structure A-14 and A-16 of the East Court, Group A, the likely palace complex of Wat’ul K’at’el and his successors during the Terminal Classic period. These deposits were most likely made around AD 900 when the Ceibal dynasty collapsed. These examples show certain variability in types and contents of deposits, but they are all tied to the ritual destruction of royal buildings at the time of dynastic disruption or collapse.

[136] *Discussant*

Inomata, Takeshi [80] see Triadan, Daniela

Inskip, Sarah (University of Cambridge) and John Robb (University of Cambridge)

[171] *Acts of God? Causation and Agency in Disease History*

Epidemics are often understood both by historians and by ancient people as “acts of God” which structure human lives but originate outside systemic causation, and are simply caused by the advent of pathogens. But no simple model of unidirectional causation, whether by natural agents or humans, really does justice to the situation. Disease responds to social and biological environments (for instance, settlement distributions affecting contagion, and poverty and malnutrition compromising the immune system), and it has complex effects on society. The result is a model of causation in which agency resides in systemic relations rather than single entities. This argument is illustrated by considering the Black Death in Britain (1348–50) and other diseases affecting medieval English people.

Ionic, Daniel (McMaster University)

[95] *The Recipes of Disaster in Northern Iroquoia: Integrating Digital Image Analysis into Petrographic Practice*

European contact with Northern Iroquoian communities brought about a series of direct and indirect consequences. These involved European-disease epidemics and a series of migrations that moved people across the landscape as refugees, captives, or conquerors. Ceramic petrography offers a way for archaeologists to understand the impacts such demographic upheavals can have on technological systems. Iroquoian potters often use a recurrent set of rock and sand types that homogenize the paste-type assemblage, yet textural data (inclusion sizes, density, sorting, roundness, and sphericity) from thin sections can be used to explore micro-style changes in pottery production. However, constraints on time and levels of experience are often at odds with point counting procedures and recommended sample sizes for statistically significant studies. In this study, I couple qualitative and semi-quantitative assessments of petrographic samples with a digital textural analysis using the free open accessed program ImageJ (v. 1.51k) and Adobe Photoshop CC 2017. With this collection of techniques, I analyzed samples from two villages in the Neutral Iroquoian Confederacy that represent before and after chronologies for a series of demographic shifts to consider how these experiences altered paste preparation practices.

Iovino, Maria Rosa, Salvatore Chilardi (Istituto Italiano di Paleontologia Umana), Güner Coskunsu (Centro Internazionale di Sperimentazione, di Docum), Anita Crispino (Museo Paolo Orsi Siracusa) and Giuseppe Sabatino (Università di Messina)

[85] *Lithic Raw Material Procurement and Mobility in a Geological Diversed Environmental Setting in Prehistoric Eastern Sicily*

The geological constitution of Sicily is enough complex as the characteristics of the geological units are consequences of the tectonic compression that happened between the beginning of Miocene and the beginning of the Pliocene. Three structural units are basically distinguished:

1. To the north, in the western side (towards Palermo) there is prevalence of carbonatic reliefs while in the oriental side (Nebrodi Mounts and Peloritani Mounts) there are metamorphic and terrigenous deposits
2. the central part and western center, is mainly occupied from a graben terrigenous sediment
3. the Hyblean plateau, constituted by carbonate cliffs. Three distinguishable ecological and orographic units characterize the south eastern Sicily: The Aetna volcano, the plain of Catania and the Hyblean Mounts. During Prehistoric time, thanks to this geological diversity, the sourcing of efficient lithic raw material was flourishing. Volcanic glass is virtually absent.

This paper focus on the peculiar contexts of early Neolithic Sicilian sites from eastern Sicily to discuss their strategy for lithic raw material procurement, local and exotic, and their potential involvement into the development of new mobility systems.

Iovita, Radu (New York University)

[329] *Behavioral Modernity (or Lack Thereof) and Its Reflection in Lithic Assemblages*

One of the most important methodological issues facing modern paleoanthropology is the so far failed matching of archaeological material with specific hominins, at least at the metapopulation level. Due largely to the plethora of scenarios produced by genetic and genomic data in the last few years, the demand for archaeological confirmation or refutation of diverse dispersal scenarios has increased. Yet our understanding of lithic assemblages is not sufficiently nuanced to answer these questions. This is compounded by research bias in some of the places of likely contact between multiple species/metapopulations, such as Eastern Europe, Central Asia, and Southeast Asia. We review the history of key definitional concepts, such as Levallois and prepared-core technology, blades and bladelets, as well as retouch intensity and tool diversity in the context of shifting fossil identities of their makers. We ponder the effect of ecology, taphonomy, and function in determining our studiable units, and propose that the answer to separating populations probably depends on multiple lines of evidence that preserve different life ways rather than individual strands of material culture. We abstract from examples of contact situations from the historical record (albeit between members of our own species) and discuss their potential outcomes.

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Iriarte, Jose, Mark Robinson (University of Exeter), S. Maezumi (University of Exeter), Daiana Travassos (University of Exeter) and Denise Schaan (Universidade Federal do Para)

[213] *Climate Change and Polyculture Agroforestry Systems: Examples from Amazonian Dark Earths*

In this presentation, we discuss pre-Columbian Amazonian Dark Earth (ADE) polyculture agroforestry systems and its implications for management and conservation efforts on Amazonian sustainable futures under current threat from climate change and development. We present and compare new multi-proxy paleoclimate, palaeoecological and archaeobotanical data from two mid to late Holocene records of land use history of ADE in Santarem (Lower Amazon) and the Itenez Forest Reserve (SW Amazonia). Our data complement the previous understanding pre-Columbian land use of Amazonian Dark Earths based on soil science and geoarchaeology by offering new palaeoecological insights into ADE in relation to resilience to climate change, crop and fruit-tree cultivation, as well as fire and forest management. Our results provide a long-term example of sustainable anthropogenic landscapes in the Amazon which can inform sustainability and climate change in tropical social systems.

Iriarte, Jose [116] see Maezumi, S.

Isaac, Gwyneira (National Museum of Natural History)

[321] *Discussant*

Isaza, Ilean (IFAR) and Eric Vrba (EDC)

[260] *The Greater Chiriquí Fringes: A Perspective from the Coiba National Park Islands on the Pacific Coast of Panama*

The islands of the Coiba National Park (CNP) are located on the continental platform of Panama and the southeastern fringes of the Greater Chiriquí cultural region. During the period of the earliest human migrations to the isthmus (ca. 13,000—10,000 a.P.) these islands were connected to the mainland, although the current state of research cannot provide evidence of being inhabited earlier than ca. 1800 B.P. Multidisciplinary research aimed to study the long-term impacts of human on the insular forest of Coiba and its neighboring islands revealed, however, that the groups that colonized them had simultaneous affiliations with their closest neighbors from the Greater Chiriquí and Greater Coclé coastal zones. This presentation will focus on the results of survey and *décapage* excavation data from three of the CNP islands revealing evidence of domestic and ritual deposits from ca. A.P. 1500—950. I will address the issue of island colonization on a critical period when the local societies began to define themselves politically and economically, as well as the fluctuations in cultural affiliations as depicted on the material culture.

Isbell, William (SUNY—Binghamton)

[300] *Huari Urban Prehistory: An Introduction to the Excavations of 2017*

From June through mid-August archaeological excavations were conducted at the Patipampa section of Huari, Ayacucho, Peru, where prehistoric constructions are not preserved on the surface. The goal of this first season of excavation was to detect and expose outlines of the built environment in approximately a hectare of space believed to contain primarily residential remains. As spatial organization becomes clear, individual architectural spaces were excavated to learn about everyday life in the capital city of Huari. This presentation provides an overview of project and its first-year results, while also contextualizing most of the other papers constituting the symposium.

[211] *Discussant*

Isendahl, Christian [213] see Scarborough, Vernon

Ishiki, Naho [24] see Sweeney, Alex

Isla, Johny [141] see Mader, Christian

Islam, Saiful [143] see Kistler, Logan

Islebe, Gerald [76] see Fedick, Scott

Israde Alcantara, Isabel [59] see Gonzalez, Silvia

Israel, Stephen

[251] *A Brief History of Archaeology Studies in Maryland with Biographical Sketches of Notable Maryland Archaeologists and Avocational Archaeologists, 1870 to 2018*

I began the "Maryland Archaeology: Past Portrait Project" because I came across many undocumented terrestrial, underwater, and avocational archaeologists in Maryland, and realized they provided a large range of information on Maryland's forgotten and unacknowledged archaeological activities and accomplishments. My goals for this paper were to document, to the extent possible, many of the forgotten contributors of the late 19th, 20th, and early 21st century archaeological surveys and investigations, personal artifact collections, memories, and records (1) before they are lost to memory, (2) acknowledging their contributions to the understanding of Maryland Archaeology, and (3) for compiling an early 21st century comprehensive database for future syntheses on Maryland Archaeology. Compiling the early and current archaeological surveys and investigations, and documented artifact collections, personal memories and their written records is an important first step before their memories, their records, and their artifacts disappear altogether. A cross section of biographical sketches will illustrate what surprises I found while compiling these profiles.

Itahashi, Yu [24] see Owlett, Tricia

Ivanova, Ivana

[104] *New Mexican Cuisine as Ethnogenesis*

Food is a major vehicle through which cultural identity is both formed and expressed. While foodstuffs are often consumed based on cultural practices, they are also utilized based on availability. The colonial situation in New Mexico provided a particular environment in which a new cuisine was developed, and persists to this day. The Spanish colonists brought with them both food traditions from Europe, and from Mexico, where they had been inhabitants for generations. In New Mexico, the food traditions that the colonists brought with them blended with native food traditions, thus producing the "New Mexican cuisine." By analyzing the macrobotanical remains from LA 20,000, I will attempt to understand how the identity of the site's inhabitants developed through food. The first step will be to attempt to reconstruct the cuisine at LA 20,000 by using a combination of macrobotanical archaeological data and historical data. Macrobotanical data indicates a mix of indigenous foods and foods introduced by Spanish colonizers at the site. After gaining an understanding of the diet at LA 20,000, it will be possible to observe changes in frequencies of crops over time, supplementing with data from later New Mexican sites.

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Ives, Gay (National Park Service), Sheldon Baker (National Park Service), Christine McAllister (National Park Service) and Tim Hovezak (National Park Service)

[226] *Roads, Canals, and Agricultural Fields: Widespread Landscape Development across Chapin Mesa, Mesa Verde National Park*
Constructed roads affiliated with Ancestral Pueblo great house architecture are well documented in the cultural landscape of Chaco Canyon and elsewhere across the Colorado Plateau, but the potential for such features has received little attention on the Mesa Verde cuesta. This project examines the archaeological background and provides new insight into one such feature in Mesa Verde National Park. This feature, variously interpreted as a trail, road, and a canal, has been enshrouded in controversy since first recognized by Dr. J.W. Fewkes during his investigations in the Far View area during the early decades of the 20th century. Project investigations are expected to document widespread landscape development across northern Chapin Mesa.

Ives, John W. (University of Alberta), Gabriel Yanicki (University of Alberta), Courtney Lakevold (Archaeological Survey of Alberta) and Kisha Supernant (University of Alberta)

[120] *Confluences: Fluted Points in the Ice-Free Corridor*
Widely assumed to be younger than Clovis forms, Corridor fluted points have been dated just once, at Tse'K'wa (Charlie Lake Cave). Given clear evidence of biotic habitability along the entire Corridor before 13,000 years ago, along with early hunting in its southern funnel, moderately dense fluted point clusters likely reflect both Clovis contemporaneous and later fluted point instances. These points were overwhelmingly fashioned on local toolstones, featuring a bimodal length distribution of some larger, relatively unaltered fluted points, plus many reworked, smaller fluted points at the end of their use life. Corridor fluted points are generally found in tertiary landscape settings rather than major kills or campsites. Consistently wide point bases (on average, greater than 26 mm) imply that shaft morphology remained little changed in the hunting of game animals including horses, bison, camels, sheep and caribou. Fluted point makers traversing the Corridor eventually met populations bearing eastern Beringian traditions; determining the degree to which diffusion or demic expansion mediated north-south interactions is a research priority. A template featuring deeper U- and V-shaped bases with multiple flutes was at play, creating geographically intermediate forms decidedly similar to Younger Dryas-aged Alaskan fluted points.

Ives, Timothy (Rhode Island Historical Preservation and Heritage Commission)

[159] *Window of Opportunity: Administering Hurricane Sandy Archaeology in Rhode Island*
Supported by the U.S. National Park Service's Historic Preservation Fund Program, the Rhode Island Historical Preservation and Heritage Commission administered surveys of coastal archaeological sites damaged by Hurricane Sandy in Rhode Island. This paper considers, from a management perspective, some of the unique constraints and challenges of this work, including incomplete property access, bureaucratic delays, and a Tribal collaboration that fell short. The insights provided by this retrospective may prove useful to anyone faced with responding to catastrophic erosion of archaeological sensitive coastlines in the future, which we coastal archaeologists collectively anticipate.

[159] *Chair*

Ives, Timothy [159] see McCabe, Chris

Ivester, Andrew [90] see Ferguson, Terry

Ivory, Sarah [283] see McCriston, Joy

Izeta, Andres (IDACOR-CONICET, Universidad Nacional de Córdoba, Argentina)

[316] *Discussant*

Izeta, Andres [154] see Cattaneo, Roxana

Izuho, Masami [41] see Gillam, J. Christopher

Izzo, Victoria, Jennifer Marla Toyne, Michael Callaghan and Brigitte Kovacevich

[302] *An Osteobiography of Skeletal Remains from Holtun, Guatemala*
Excavations at the site of Holtun, Guatemala during the 2014–2017 field seasons yielded eighteen human burials from various temporal periods and site locations. Holtun was inhabited by the ancient Maya from the Middle Preclassic (1000–300 BCE) to the Terminal Classic Period (600–900 CE). Recent archaeological investigations have identified the Preclassic period at Holtun as a time characterized by increasing social inequality, but few burials have been recovered to infer the impact of social change on individual health. This poster describes skeletal observations and analysis of the burials excavated from Holtun. Individual osteobiographies are created for each due to variation in preservation, mortuary features, and chronology. Specifically, this research will examine patterns in age-at-death, sex, presence of pathology, and cultural modification, in conjunction with mortuary data to begin the exploration of social identity as reflected in burial remains. Unique features, including dental modification, suggest some individuals exhibited elevated social status exemplified with burial in the site core. The results of this study contribute to research regarding the nuances of increasing social complexity at Holtun, and broadly contribute to our knowledge of ancient Maya life and the intersection of skeletal health and inferred social status.

Jablonski, James [52] see Casson, Aksel

Jackson, Katherine (University of Montana) and Genevieve Mielke (University of Montana)

[88] *A Comparison of Mock Excavations and Active Case Excavations*
Performing mock excavations of human skeletal material is a common practice throughout undergraduate and graduate studies in Forensic and Bioarchaeological programs. These class sessions include instruction on correct excavation methods, mapping techniques, documentation methods, and chain of custody. Inevitably however, there are differences between mock excavations within a class setting and active homicide excavations where no professor is present and the real-life ramifications of the students' actions are dramatic. Instead of practicing for a grade, the student must aid in the deliverance of justice for the victim and work well with law enforcement while professionally executing what they've practiced in school. The goal of this presentation is to discuss real-life experiences of an active homicide excavation in comparison to how mock excavations are traditionally taught. We hope to offer insight from a student perspective to help current and future educators develop effective methods of teaching mock excavations and to prepare students for what a real excavation may entail.

Jackson, Kendal [84] see Pluckhahn, Thomas

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Jackson, Sarah (University of Cincinnati), Joshua Wright (University of Aberdeen) and Linda A. Brown (George Washington University)

[40] *Contrasting Cartographies: Mapping a Maya Site Using Multiple Perspectives*

Archaeologists routinely engage with concepts of space and materiality as we inscribe meanings onto the architecture and objects left behind by past peoples. However, in doing so, we bring explicitly modern sensibilities to our interpretations. In this paper, we consider alternative interpretations of space and materiality as described by Classic Maya people (250–900 CE). We ask: In what ways do categorizations and interpretations of space at Maya archaeological sites change when traditional archaeological spatial analyses are augmented by ones based on Classic Maya characterizations? What can be learned from identifying places of convergence and divergence between these two datasets? As part of our excavations of the site of Say Kah, Belize we have developed and used a recording system that allows us to document excavated artifacts and features simultaneously within conventional archaeological frameworks and also using Classic Maya categories. These parallel classifications, when visualized as distributions of artifacts and features within GIS, allow us to compare and contrast two sets of spatial documentation at a detailed and site wide level and explore the cultural meanings in spaces that would not otherwise appear in studies of the site created using solely modern, Western spatial and artifactual classifications.

Jacobs, Jordan

[322] *Discussant*

Jacobson, Jodi (TRC Environmental)

[90] *Broken Bones: Taphonomy vs Cultural Modification in North and Central Texas*

Until recently, highly fragmented bone assemblages in Texas were almost all attributed to poor preservation. A review of assemblages, however, indicates that while there are a high percentage of heavily fragmented medium-sized and larger mammal bone at many of these sites, bones associated with small mammals, reptiles, avian, and fish have only minimal fragmentation. A review of bone from a variety of sites with deep temporal and well-stratified context and of varying degree of preservation and fragmentation from Central and North Texas including 41DL436 (Fish Creek Slough Site), 41TR203 (Mercado Site), 41HM51, and 41WM1126 (Siren Site) are examined and contrasted. Differences in taphonomic versus human imposed bone breakage for each site are presented. Patterns in temporal variations and overall frequencies of fragmentation combined with evidence for intentional fracturing are identified to examine trends and shifts in, and methods for, marrow and bone grease extraction in Central and North Texas through time. These trends are placed within a greater context of environmental changes and reviewed as potential indicators of dietary stress and shifts in subsistence resource availability.

Jadhav, Nilesh [56] see Kim, Yong Jun

Jadot, Elsa [169] see Forest, Marion

Jaffe, Yitzchak [221] see Castellano, Lorenzo

Jaffke, Denise [130] see Lercari, Nicola

Jajjel, Roy (University of Haifa)

[330] *The Geoarchaeology of Vista Alegre*

The maritime Maya site of Vista Alegre, located in the northeastern part of the Yucatan Peninsula is being investigated with the aim to achieve a comprehensive understanding of the daily life of the past inhabitants, and their interaction with their surrounding environment. Results from a sediment core campaign resolved the character, environmental associations, and ages of underlying sediments. To achieve a continuous lateral understanding of the underlying sediments, a seismic survey was conducted. The survey area covered the immediate flooded area of Vista Alegre, focusing on zones that have morphologically changed throughout time, flooded during sea level rise, and which showed promise as likely locations for use during maritime activity by the past inhabitants. The seismic survey results provided evidence for sea-level rise, and revealed a ridge-basin structure that was congruous with natural trends observed terrestrially. This uniqueness could be attributed to significant differences in the submerged landscape, and possibly the presence of anthropologically-altered offshore features. The seismic interpreted data is useful both for a site scale spatial understanding of the flooded landscape history, as for aiming for potential location of marine archaeological excavations.

Jaillet-Wentling, Angela (PENNDOT) and Samantha Taylor (Indiana University of Pennsylvania)

[53] *Building a Public Archaeology Effort Finding the Best Foundation Somewhere between Bedrock and Shifting Sands: Public Archaeology Efforts at Pandenarium (36ME253)*

Small-scale and volunteer-driven public archaeology efforts undertaken at the site of Pandenarium (36ME253) aim to bring the results and practice of archaeology to many publics with recent outreach efforts including partnerships between state agency personnel and university archaeology programs, fieldwork opportunities for volunteers, interviews with local media, and presentations at local, regional, and national conferences. With changing methods and times, our definition of hybrid professionals (Jeppson, 2005) can be characterized as in flux when they move beyond the formal definitions of applied, theoretical, academic, or even compliance-driven public archaeological efforts to informal volunteer-based programs. While not necessarily a novel approach, an effective partnering of research and socio-political interests paired with the experience and willingness of off-duty professionals can provide a foundation for future research and volunteer organizations. Not everybody needs to build on the bedrock of fully-funded formal programs, but shifting sands of one or two individuals will not do either. The flexibility in building informal partnerships out of professional and formal relationships allows us to move beyond concerns with who is telling the story to telling the story for those who would listen.

Jamaldin, Sophia (University of Nevada, Reno)

[92] *Paleoindian Cave and Rockshelter Use in the Fort Rock Basin, Oregon*

The Fort Rock Basin's (FRB) caves and rock shelters hold an important place in the history of Great Basin archaeology. Excavations at Fort Rock Cave by Luther Cressman in the late 1930's led him to argue for a long-standing presence of humans in the region. The subsequent development of radiocarbon dating confirmed his ideas, providing firm evidence for a considerable human population in the FRB during the Terminal Pleistocene/Early Holocene (TP/EH). Although most caves and rock shelters probably served as logistical and/or cache locations throughout prehistory, the substantial TP/EH archaeological deposits recovered from Fort Rock Cave, Cougar Mountain Cave, and the Connley Caves suggest residential occupations. Using a central place foraging model, I test the hypothesis that those caves served as longer-term residential camps from which peoples came and went (i.e., central places). I present an analysis of source provenance data generated on extant collections of obsidian projectile points, evaluating patterns of Paleoindian toolstone use as a baseline for interpreting the occupation spans at the FRB caves and settlement-subsistence strategies of early groups in the region.

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Jamison, Thomas and David Mixter (Binghamton University)**[129]** *Public Architecture and Space at Actuncan*

Monumental architecture and public spaces provide primary contexts for community ritual and social action. The process of construction of public architecture involves community cooperation and collective action, with the latter contributing to significant changes in the form and use of structures through time. The public architecture of Actuncan developed from the Preclassic period to constitute a nearly complete set of architectural forms devoted to ritual, administrative and community functions. The excavations at Actuncan over nine seasons have documented much of the development of the center and history of individual structures. This paper traces the development of the public architecture, public spaces and the changes to individual structures and associated deposits that inform an interpretation of the social context in which they were constructed, utilized, modified and abandoned.

Janesko, Sarah (VCP, Alexandria Laboratory), Alison Shepherd (VCP, Augusta Laboratory), Grace Gronniger (VCP, St. Louis Laboratory) and Kevin Bradley (Alexandria VCP)**[326]** *To Be of Use: Re-examining Army Corps of Engineer's Collections*

The Veterans Curation Program has been rehabilitating U.S. Army Corps of Engineers (USACE) collections for long-term preservation since 2009. With the dual goal of training and assisting veterans with their professional goals while also archiving and curating USACE collections, this program ultimately produces high quality digital records and photographs of cultural materials from across the U.S. This paper delves into the value of USACE's digital collections for continued research, education, and public engagement. These digital records, once finalized, are uploaded to the Digital Archaeological Record (tDAR) and provide greater access of the archaeological and archival collections for researchers, teachers, and other stake holders. This paper features finalized collections that were processed at each of the three VCP labs in Alexandria, VA, Augusta, GA, and St. Louis, MO. The materials span a range of cultural materials from the Mid-Atlantic, Mid-west, and Southeastern U.S., and embrace the direction in the field toward digital preservation of material culture.

Jansson, Anna [153] see Zedeño, Maria Nieves

Jantz, Lee [90] see Devlin, Joanne

Janusek, John (Vanderbilt University)**[333]** *Adolph Bandelier's Legacy in the Lake Titicaca Basin: Tiwanaku and Qeya Ceramic Style*

While Swiss-born anthropologist Adolph Bandelier is perhaps best known for his research in the U.S. southwest, for which the Bandelier National Forest bears his name, his research in the Bolivian Lake Titicaca region during the late nineteenth century has left an indelible legacy. Based on a brief visit of scarcely three weeks to the site of Tiahuanaco in 1894, he produced an informative document that remains vital to understanding its monuments to this day. In this paper we focus on his excavations on the Island of the Sun in Lake Titicaca, where at the site of Qeya Qolla Chico he recovered 'over 100' ceramic vessels pertaining to an enigmatic, transitional material assemblage Dwight Wallace later christened 'Qeya.' We synthesize the significance of this research and our comprehensive analysis of this collection, housed at the American Museum of Natural History, New York, in relation to other Qeya finds and collections to assess the impact of Bandelier's research on knowledge of Titicaca's pre-Columbian past.

[300] *Discussant*

Janusek, John [181] see Williams, Patrick Ryan

Janzen, Anneke (Max Planck Institute for the Science of Human History), Mary Prendergast (St. Louis University—Madrid) and Katherine Grillo (University of Wisconsin—La Crosse)**[310]** *Early Pastoralists in Tanzania: Mobility and the Seasonal Round*

First developing around 8,000 years ago, pastoralism in Africa has continued as a flexible and dynamic mode of subsistence. One key feature of this dynamism is mobility, which is crucial for many East African pastoralists today to access seasonally available pasture and water. In areas of unpredictable rainfall, mobile pastoralism permits more people to live in dry lands than do other subsistence strategies. How the earliest herders in Tanzania used the landscape is still relatively unknown. Recent excavations at Luxmanda provide detailed information about early pastoral lifeways in Tanzania. Situated at the southern edge of Tanzania's Mbulu Plateau, Luxmanda is the earliest and most southern known Pastoral Neolithic site, thus providing an intriguing example of pastoral mobility strategies as herding initially took hold in Tanzania. We present the first isotopic analyses of ancient livestock in Tanzania. Carbon and oxygen stable isotope data from sequentially sampled cattle and caprine teeth provide a record of seasonal herding practices. Strontium isotopes clarify movements across distinct geologies, providing a nuanced picture of both herding over the seasonal round and possible livestock exchange among pastoral groups. Finally, these analyses throw more light on the nature of the spread of pastoralism in Africa.

Janzen, Anneke [297] see Hildebrand, Elisabeth

Jara, Kevin [154] see Zimmer-Dauphinee, James

Jarvenpa, Robert [220] see Brumbach, Hetty Jo

Jasim, Sabah [145] see Dunning Thierstein, Cynthia

Jazwa, Christopher (University of Nevada, Reno), Chloe McGuire (Pennsylvania State University), David Zeanah (Sacramento State University) and Douglas Bird (Pennsylvania State University)**[155]** *Pre-contact Settlement Patterns in a Clay Pan and Wetland Environment in Australia's Sandy Deserts*

Much of the archaeological research done in the interior deserts of Australia has focused on rockshelter sites, primarily because of intact stratigraphy and better preservation than in open air contexts. However, ethnographic studies of local Martu populations have demonstrated that people rarely lived in rockshelters or caves, particularly during the wet season when populations focused around reliable soaks and clay pans. Therefore, it is necessary to study the distribution of archaeological sites and cultural materials in open air contexts to fully understand settlement patterns. During the 2017 field season, we conducted a systematic survey of the Wuukurta Clay Pan region in Karlamilyi National Park, less than a day's walk west of the present-day Parnngurr aboriginal community. The cultural landscape surrounding the main soak contains extensive groundstone and lithics, with the highest densities of cultural materials at the edge of the soak and two clay pans. Seasonally available water and subsistence resources attracted people to the region and provided the potential to support wet season population aggregation. This poster shows the distribution of cultural materials in Wuukurta and demonstrates the archaeological research potential of open air contexts in understudied desert environments.

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Jean, Joseph**[123]** *Long-Term Survival of Indigenous Cultures in Haiti*

The Espanola island was disrupted by the Spanish colonial power by massively forcing Indigenous people to work in the gold mines and to cultivate fields for producing foods for the Spaniards following the Encomienda system. The rise of European imperialism conducted to share the New World where the island of Espanola was officially occupied by the Spanish and French. Massive French investments into an agricultural industry lead to a large number of enslaved Africans being transported into the colony. Long before the division of the island into two possessions, Haiti experienced significant installations of French Buccaneers operating mainly along the North coast and Tortuga Island. It is from these interactions that developed the first perceptions of the French encounter in the cultural landscape. Behind the traditional discourse, there were exclusive social categories for African, Mulatos, and White people of the colony, by using primary archives as sources, as well as historical and ethnographic perspectives, this presentation proposes to examine contributions of free and enslaved Indigenous people in the colony of Saint-Domingue and their legacies of their cultural survival in the Haitian present-day society. In addition, it will address questions of future directions for cultural landscape studies related to *longue-durée* transformations

Jefferies, Richard and Christopher Moore (University of Indianapolis)**[241]** *Baubles, Bangles and Beads: The Role of Personal Adornments in a 17th Century Spanish Mission Period Community*

More than a decade of archaeological investigations at Mission San Joseph de Sapala and its associated Guale village of Sapala on Sapelo Island, Georgia have provided significant new insights into the nature of Spanish-Guale interaction and negotiation. Some of these cultural transactions are reflected by items of clothing or personal adornment that were worn by the Spanish and/or Native Americans who lived in that 17th century Spanish Mission community. This poster explores the nature of personal items, such as buttons, earrings and beads, worn by the mission community's Guale and Spanish residents to express their evolving personal identities and cultural affiliations in a world characterized by social, economic, and political upheavals brought on by massive population loss, demographic displacement, and the destruction of traditional Guale society.

Jeger, Rujana (None) and Darcy Morey (Radford University)**[212]** *When Dogs and People Were Buried Together*

Throughout prehistory, dogs and humans have sometimes been interred together in the same grave, in different locations in the world. This practice raises the question of why this practice was so prevalent. Circumstances leading to this practice were variable, but its consistency suggests an underlying factor in common. Using one of the earliest known cases as a point of departure, Bonn-Oberkassel from Germany, we suggest that this underlying factor in common is that dogs and people were regarded similarly. Further, as part of developing that framework, we suggest that in certain cases, simultaneous human-dog interments may not so much have reflected one or more dogs being buried with people, but rather one or more people being buried with dogs.

Jelinek, Lauren E. [72] see Slaughter, Mark

Jenkins, Emma (Bournemouth University), Samantha Allcock (Plymouth University), Sarah Elliott (University of Exeter), Carol Palmer (Council for British Research in the Levant) and John Grattan (Aberystwyth University)**[4]** *Phytoliths, Geochemistry and Ethnography: A Multi-method Approach for Interpreting the Neolithic Sites of WF16 and 'Ain Ghazal*

Understanding Neolithic sites in southwest Asia is often difficult because of the lack of preservation of organic remains and the effects of various taphonomic processes that alter the original record. It is, therefore, critical that we maximise the information that can be acquired from these sites. Here, we use an ethnographic approach to test the potential of using plant phytoliths and geochemistry to aid our interpretation of southwest Asian Neolithic sites. We sampled two Neolithic sites-WF16 and Ain Ghazal-and one ethnographic site-Ai Ma'tan-a recently abandoned stone and mud constructed village. Here sampling could be supplemented by information gained from informal interviews with former residents, which furthered our understanding of how the phytolith and elemental concentrations formed. We sampled distinct context categories such as 'middens', 'storage features', and 'roofs and roofing material'. Our results found that certain categories from all three sites showed similar patterns in their phytolith and elemental signatures such as 'storage features', 'floors and surfaces' and 'fire installations' whereas others were quite distinct for example 'pisé walls'. These results demonstrate that phytolith and geochemical analysis can greatly improve our understanding of southwest Asian Neolithic sites.

Jenkins, Dennis [126] see Blong, John

Jenkins, Dennis [47] see Shpall, Cahill

Jenkinson, Clay [36] see O'Briant, Kevin M.

Jenks, Kelly (New Mexico State University)**[39]** *On the Road Again: Archaeology on El Camino Real*

In 2017, graduate students enrolled in a cultural resource management class conducted a week-long documentation and surface collection project at Paraje San Diego, a popular historic campsite on El Camino Real de Tierra Adentro National Historic Trail. The Camino Real once connected the Spanish colony of New Mexico, founded in 1598, to the markets and governing authorities in central Mexico. After Mexico won independence from Spain it served as a commercial corridor between Mexico and the United States. Following the Mexican-American War, it hosted American soldiers as they battled Apache raiders, and later each other, in the Civil War. In all of these periods, and in the decades that followed, travelers stopped at Paraje San Diego to rest and fill up on water. Preliminary analysis of the types and locations of historical-period artifacts recovered from the site provides some insight into the dates and nature of these different encampments.

Jennings, Justin (Royal Ontario Museum), Patricia Knobloch (Institute of Andean Studies) and Elizabeth Gibbon (University of Toronto)**[211]** *Who Founded Quilcapampa? Wari Agents, Social Network Analysis, and the Unfurling of a Middle Horizon State*

At the beginning of the ninth century AD, a Wari-affiliated settlement was founded in the Sihuas Valley of southern Peru. Celebrants ritually smashed face-necked jars when they abandoned the site less than a century later. These vessels likely represent elites or ethnic groups in the Wari sphere—agents whose associations in conflict or cooperation can be used to tell a more dynamic story of the founding of Quilcapampa during this turbulent era of Wari state expansion. This paper uses social network analysis (SNA) to explore the relationship between Middle Horizon agents throughout Peru based on site provenance and artifact co-occurrence. We suggest that SNA hints at a series of changing relationships between agents that speaks both to the complexities of Wari governance and the reasons behind the creation of sites like Quilcapampa.

[300] *Discussant*

Jennings, Thomas [81] see Jones, Katherine

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Jensen, Anne (Bryn Mawr College)**[135]** *Salvaging Heritage and Data from Walakpa: A Case Study of the Walakpa Archaeological Salvage Project (WASP)*

Walakpa is an iconic Arctic site with spectacular preservation. Sadly, the once stable site began eroding rapidly in 2013, with ongoing erosion outpacing attempts to obtain traditional funding for excavation. The loss of cultural heritage led to growing international volunteer efforts, starting in 2015, with support from the landowner (an Alaska Native village corporation) and many individuals. I will discuss both the success and challenges of this type of project. Walakpa is only one of many significant sites threatened by various aspects of climate change. I will discuss the implications for our future ability to contribute to the expansion of scientific knowledge of the past and thereby to sustainable and resilient communities for the future.

[247] *Discussant***Jenz, Trisha (University of Wisconsin Oshkosh), Sarah Ledogar (University of New England) and Jordan Karsten (University of Wisconsin Oshkosh)****[304]** *Dogs of Death: An Evaluation of Canid Remains from a Mortuary Eneolithic Cave Site in Ukraine*

Burials of dog skulls and full dog skeletons have been uncovered at several Eneolithic Tripolye (5100–2900 cal BC) sites suggesting that dogs held a special symbolic role for the Tripolye compared to other domestic fauna. To evaluate human-dog relationships in Tripolye culture and funerary context, we examined dogs from a single mortuary site (Site 17) located in Verbeba Cave (3951–2620 cal BC), Ternopil Oblast, Western Ukraine. Symbolic representations of canids have been observed on some pottery sherds found at the site. The faunal sample (n=7560) from Site 17 contains mainly domestic mammals (n=1389, 18%) and shell (n=577, 8%). Canids (n=122) are rare and comprise around 2% of the faunal sample and only 9% of the domestic fauna. The dog remains are from at least six individuals—three adults and three subadults. Individual teeth were the most common dog elements recovered, including two perforated canines and one perforated lower first molar. These teeth may have been a component of body ornamentation that was incorporated into the Tripolye burial practices or deposits. The other dog elements found in context with other feasting deposits suggest that they were consumed as a part of Tripolye mortuary ritual.

Jeremiah, Kristen (Public Archaeology Laboratory, Inc. (PAL)) and Dianna Doucette (Public Archaeology Laboratory, Inc.)**[294]** *Written in Stone: 10,000 Years of Activity at the Acushnet LNG Site*

The Acushnet LNG Site is a multicomponent Native American campsite located along the Brayton Point peninsula in southeastern Massachusetts. Brayton Point extends into the Mount Hope Bay, at the confluence of two major rivers—the Lee and Taunton rivers—an area with numerous documented Native American campsites and ceremonial sites. Cultural resource management investigations identified an extensive archaeological site, measuring a minimum of 71,000 square meters, that was occupied from the Early Archaic through Middle Woodland Periods based on diagnostic artifacts and radiocarbon dates. Stone piles and configurations were identified within the site by representatives of the Wampanoag Tribe of Gay Head Aquinnah and Mashpee Wampanoag tribes, who defined the stone features as components of a ceremonial stone landscape (CSL). The CSL, combined with the recovered artifact assemblage and archaeological features (fire pits and lithic workshops), indicates the Acushnet LNG Site was a significant Native American meeting place during the pre-contact period, and a valuable resource with the potential to provide new information about Native American settlement patterns along the Mount Hope Bay.

Jerrems, William**[38]** *Pre-Clovis Evidence at Guano Mountain, Nevada*

The Winnemucca Lake basin, one of many branches of Pleistocene Lake Lahontan in northwest Nevada, is again in the headline news for early human occupation of the Great Basin. Possible horse butchering at the end of the Pleistocene, fuel storage, grasshopper caching (14,195 cal. BP) and ancient rock art add to the intrigue of an ever developing mystery behind North America's earliest ancestry. Most familiar are Fishbone and Crypt caves, a part of the Guano Mountain cave complex, where a reevaluation of storage facilities has added a new dimension to the great antiquity of the Lahontan Basin. A synthesis of the evidence found throughout the Winnemucca Lake basin is the purpose of this presentation; an analysis of that evidence is the goal.

Jeske, Robert (University of Wisconsin Milwaukee) and Katherine Sterner (University of Wisconsin-Milwaukee)**[26]** *Early Oneota Longhouses in Southeastern Wisconsin*

Since 1998, archaeologists from UW-Milwaukee have conducted long-term, systematic excavations at the 12th-15th century Crescent Bay Hunt Club site (47JE0904). The Crescent Bay Hunt Club site is unique among early Oneota sites because of the three distinct forms of structures discovered there. This paper focuses on longhouses: portions of at least three longhouses have been recovered from the site. Evidence suggests that these longhouses are at least two hundred years older than previously dated longhouse structures in Wisconsin. Analysis of the pit features, artifacts, and burials associated with these structures provides insights into overall site organization and function. Comparison of these early longhouses with those typical of later sites illustrates the breadth of temporal and geographic variation exhibited at Oneota sites.

Jeske, Robert [26] see Edwards, Richard

Jiang, Jianxin [177] see Zeng, Lingyi

Jiang, Leping (Zhejiang Provincial Institute of Archaeology, China)**[284]** *The Sites and Dating of the Shangshan Culture*

The Shangshan Culture is named after the site of Shangshan in Pujiang County, Zhejiang Province, China. Multiple kinds of materials from multiple sites have been dated by several radiocarbon dating labs, indicating that the Shangshan Culture spans 10,000–8,400 BP. It can be divided into three phases: a 10,000–9,500 BP early phase, a 9,300–8,800 BP middle phase, and a 8,600–8,400 BP late phase. There are 18 sites belonging to Shangshan culture that have been uncovered so far. They are distributed in the upper reaches of the Qiantang River, including 4 sites attributed to the early phase, 8 middle-phase sites, and 4 late-phase sites. The other 5 sites have been identified by preliminary survey and their precise attribution remains unclear. The pottery and stone artifacts from these sites show similarities in typology, and rice remains are commonly recovered. As a result, this area has attracted scholarly attention concerning the agricultural origins of rice.

Jimenez Alvarez, Socorro [163] see Schroder, Whittaker

Jin, Zhengyao [45] see Wu, Xiaotong

Jodry, Margaret**[79]** *Listening to One Another: Contributions of Indigenous People to the Life and Research of Dennis Stanford*

A wealth of mentors, colleagues, and friends influence the evolution of one's approach to archaeological research. This paper reflects on Dennis Stanford's associations with native people beginning with his graduate student days involved in audio recording American Indian Oral Histories for the Doris Duke Foundation, including learning from Santa Ana Pueblo Cacique Porfirio Montoya and his wife Eudora Montoya, assisting with land claims

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for the return of Sacred Blue Lake to the people of Taos Pueblo, and traveling to Alcatraz during its occupation in 1970 to interview John Trudell and others. Dissertation research in Barrow, Alaska involved generous sharing by Inuit neighbors regarding traditional hunting methods and technology. Later, indigenous archaeologists joined his excavations in Colorado. Stanford served as chairman of Smithsonian's Department of Anthropology during the initial decade of the implementation of the NMAI Act and NAGPRA. He was involved with the Kennewick law suit against the Army Corps of Engineers for NAGPRA violation. Recently, Snoqualmie individuals reached out to share their knowledge and interpretation of the East Wenatchee Clovis Cache and Northern Cheyenne Elder, Ralph Red Fox, initiated a discussion of an ancient Algonquian oral history regarding ancestors who arrived in North America across the Atlantic Ocean.

Johansen, Peter (McGill University)

[230] *Assembling Infrastructure, Detotalizing Communities: Provincial Infrastructure as Situated History and Landscape in British Columbia*
Investigation of the material, spatial and temporal distributedness of large-scale, infrastructure projects holds significant potential to lay bare histories of underlying political rationales and practices that challenge overtly utilitarian narratives of public welfare and economic good. This paper investigates the differential experience and perception of a sample of state-initiated or sanctioned infrastructure projects (e.g., Hydro power lines and substations, pipelines, highways and railroads) on First Nations and non-First Nations communities in southern interior region of British Columbia. I examine 19th through 21st century intersections of settlement and other places with those of state-imposed or sponsored infrastructure as situated histories. The detotalizing effects of large-scale infrastructural projects and their conscious and unconscious rendering of ethno-centric political rationales on First Nation's settlement communities is ongoing in the face of multi-sited resistance, including community-initiated heritage management. Ironically, today, archaeological practices, situated in late 20th Century normative systematics and the constraining objectives of compliance-initiated archaeological field projects (often undertaken in the interests of furthering large-scale infrastructure), unwittingly contribute to both reductive understandings of the region's rich pre-colonial past and an overly biased sample of the archaeological record, one in which in which past cultural landscapes are analytically difficult to conceive.

John, Christian [101] see Mejía Ramón, Andrés

Johnen, Connor

[38] *A View from the Mountains: A Test of a Predictive Model in the Southern Wind River Range, Wyoming*

This paper details the results of archaeological survey in the Wind River Range, Wyoming between elevations of 9,000 and 11,000 ft. The purpose of this survey was to test a predictive model of a specific site type (sites referred to as villages) created by Stirn (2014) and tested by Stirn in a different region of the same mountain range. Although the methods of creating the predictive model were not altered, the survey methods were significantly altered. Random survey blocks were created within the project area to better sample the landscape for archaeological sites. The use of GPS track logs allowed for quantification of survey intensity and highlighted areas that were not intensely surveyed. The distribution of sites and the quantified surveyed area were compared in order to rule out survey bias as a factor influencing the discovered distribution of sites. The model was not successful in discovering alpine village sites and the distribution of the newly discovered sites can be explained by survey bias. Comparison of lithic assemblages including tools and debitage indicate that the newly discovered sites and previously discovered village locations have differences in tool diversity and debitage:tool ratios, but contain similar attributes of debitage assemblages.

Johns, Mischa (Putnam County Florida Historical Society)

[53] *Resuscitating a Dying City: Instilling Pride Through Public History and Archaeology*

Palatka is dying. This is not a metaphor or an over-dramatic attempt to garner pity: Census reports show that more people are moving out of the city or dying than are moving in or being born. In August of 2017 the Washington Post came down to write an obituary on the quiet river town that was once

known as the Gem of the St. Johns River. Buried in the ground and in dusty books in the historic society's museum are testaments to the city's rich historic and prehistoric past, yet few if any residents know to look...or know there is anything to look for. In a sleepy, disenfranchised river town where public schools barely mention its own history at all, efforts are under way to use history and archaeology as the backdrop to revive the Gem City's sense of pride by renovating the local historic society's museum and hosting a festival dedicated to Bartram's travels. Join us as we take a trip to a city that once bustled with life as one of the largest in Florida, and revive it by invoking a sense of pride using public history and archaeology to power our efforts.

Johnson, Amber (Truman State University), Rudolf Cesaretti (Arizona State University), Christina Collins (University of Exeter) and Peter Turchin (University of Connecticut)

[105] *Global and Regional Frameworks for Comparing Agricultural Intensification and Productivity across Cases*

Understanding variation in the stability and productivity of subsistence strategies is fundamental to explaining patterns of variation in long-term human demography. This poster addresses under what conditions societies intensify food production at both global and regional scales using frameworks ranging from relatively abstract environmental measures to models based on detailed historical and archaeological data relating to agricultural productivity. At a global scale, the combination of effective temperature zones and aquatic resource availability is shown to condition broad patterns in the pace of intensification in a comparison of 14 archaeological sequences. Crop yield models using climatic, historical and archaeological data as inputs provide a framework for comparing changes in carrying capacity over time among archaeological cases from Latium (Italy), Kansai (Japan), and Oaxaca (Mexico). At a regional scale, a model of alternative agricultural strategies in the Maya Lowlands is used to predict which environmental variables explain regional variability in the rate and demographic thresholds of agricultural intensification. Together, we demonstrate the value of using frameworks at different levels of precision to compare archaeological cases at different spatial scales.

Johnson, Eileen (Museum of Texas Tech University), Stance Hurst (Museum of Texas Tech University) and John Moretti (Museum of Texas Tech University)

[182] *Spring Creek Drainage—Geoarchaeological Explorations along the Southern High Plains Eastern Escarpment, Northwest Texas*

The Spring Creek drainage, part of the upper Brazos River system, is located along the Southern High Plains eastern escarpment breaks near Post, Texas. Steep and confined vertical channel incision typifies the breaks and the drainage is and was fed by numerous springs emanating from the Ogallala Formation. Geoarchaeological research along a 774m transect from Macy Fork to 222m below its confluence with Spring Creek proper has documented a continual depositional record spanning the latest Pleistocene to early Holocene (~12,000–8,000 rcy BP). The stratigraphy records the shifting form and capacity of the drainage. The sedimentary record indicates a change from fluvial sands and gravels to spring fed pond and marsh deposits. The distribution of diatomaceous sediments suggests an ~200m-diameter pond formed during the early Holocene at the confluence of Spring Creek and Macy Fork. Slopewash colluvial deposits cap the sequence in upper Macy Fork. Fieldwork documents a diverse late Pleistocene biota and the presence of Clovis to late Paleoindians. The Spring Creek drainage provides the setting for a robust exploration of multiple facets of the Pleistocene-Holocene transition as well as comparison with the Southern High Plains regional record.

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Johnson, James (University of Copenhagen)

[196] *Beyond the Final Frontier: Time and Materiality in the Peripheralization of Bronze Age Eurasian Steppe Pastoral Societies*

Archaeologists studying prehistoric Eurasian steppe pastoral lifeways often seek inclusion into comparative research of urbanism, craft production, and complexity. Even as these studies contribute valuable information, they also reify their place in the intellectual periphery of archaeological inquiry. This peripheralization is due to several factors. First, the Eurasian steppe is perhaps unwittingly conceptualized as a relatively timeless socio-geographical periphery to “state-level” social entities located to the adjacent south—western Asia, south-central Asia, and east Asia. Second, this peripheralization is ultimately a spatially-derived frame of mind, one that essentializes and promotes geographic and cultural space over equally important considerations of time and materiality. In the following paper, I interrogate the spatio-centric mindsets that permeate current studies of Eurasian steppe pastoral social groups; a mindset that contributes to the further marginalization of pastoral-based case studies in anthropological archaeology. To break out of this exclusionary mindset, I explore the ways in which meaning was made in Bronze Age pastoral groups through a more inclusive inquiry drawing upon ethnographic and archaeological case studies to illustrate how pastoralists engaged with time and materials (as well as space) as they undergo periods of social change and continuity.

Johnson, Janet (The State Museum of Pennsylvania)

[148] *Discussant*

Johnson, John (Santa Barbara Museum of Natural History)

[136] *Cave Rituals in South Central California: Ethnographic and Archaeological Interpretations*

Two different versions of a myth, one Kitanemuk and one Kawaiisu, recount the tradition of a man taken into a cave where he was instructed in sacred knowledge by animal spirits. Neighboring Chumash and Yokuts elders passed along accounts of caves being used for shamanistic purposes, in part associated with rock paintings. These ethnographic accounts imply the private use of caves for special rituals by individuals. Nonetheless, there are particular Chumash pictograph sites that appear to have been decorated for public viewing. Many researchers have argued that some were locations where sunrises or sunsets were observed during the winter or summer solstices. A survey of these sites and associated sunlight phenomena test the hypothesis that these exhibit a consistent pattern of purposeful use.

Johnson, Kent (SHESC / Arizona State University)

[282] *Regional Solidarity, Ethnic Diversity, and Family Networks: The Bioarchaeology of Belonging and Exclusion in the Tiwanaku Colonial Enclave in the Moquegua Valley, Peru*

During the Middle Horizon, disparate communities in the south central Andes embraced Tiwanaku corporate culture to signal their affiliation with the Tiwanaku state, yet these communities also maintained separate regional and ethnic identities through distinct cultural practices. The archaeological record of the Moquegua Valley, Peru, provides an important opportunity to evaluate processes of belonging and exclusion within Tiwanaku society. Previous research indicates members of two Tiwanaku-affiliated communities in Moquegua, Omo-style agropastoralists and Chen Chen-style agriculturalists, maintained distinct cultural identities despite living in adjacent settlements for several hundred years. However, recent biodistance research indicates that cultural boundaries did not prohibit gene flow between ethnic communities, and archaeological data from several sites are suggestive of co-residence and cultural hybridity.

This study uses bioarchaeological data from samples of human skeletal remains from five archaeological sites in the middle Moquegua Valley to develop a multiscale approach to Tiwanaku social organization. Dental anomalies and basicranial and temporal bone landmarks are analyzed to assess postmarital residence practices and evaluate how family networks traversed ethnic boundaries. Results are contextualized using mortuary and body modification data to consider how processes of exclusion and belonging evident in material culture and social practice structured sociality within Moquegua Tiwanaku communities.

Johnson, Nadia (Penn State)

[31] *Obsidian Exchange and Use in Early Formative Chalcatzingo*

In the Middle Formative, Chalcatzingo was one of Highland Mexico’s dominant settlements. At its peak, Chalcatzingo had a well-developed obsidian blade technology and established lines of trade with the Gulf Coast. Chalcatzingo’s role in the exchange of obsidian in earlier periods is less well understood. This paper combines geochemical sourcing and technological analysis of an Early Formative obsidian assemblage from Chalcatzingo in order to elucidate this role. Geochemical sourcing enables a better understanding of the exchange routes maintained by the emerging site, prior to its florescence, while analysis of lithic technology may reveal how blade technology arrived in Chalcatzingo, and the form in which obsidian was transported.

[31] *Chair*

Johnson, Patrick

[255] *Authority via Mobility: Interpreting Yamasee Ceramics*

Yamasees worked as non-missionized laborers in Spanish Florida, raided for Charleston traders, fought to expand Georgia, lived with Creek Indians, and worked as diplomats and traders in Pensacola. Letters, speeches, and testimony demonstrate that this mobility—often leading them to outnumber local occupants—allowed Yamasees to dictate terms to and take vengeance against other Native Americans as well as Europeans. Despite such authority, pottery assemblages demonstrate the frequent adoption of local practices. In so doing, Yamasees demonstrate that assemblages do not necessarily identify communities and that communities may gain local cohesion and regional authority by adopting new practices.

[255] *Chair*

Johnson, Rachel (Tulane University)

[249] *Animism and Agency in the Amazonian Landscape: A Consideration of the Ontological Turn Utilizing Perspectives from Modern Runa Communities*

Modern Kichwa-speaking Runa peoples inhabit much of Ecuador’s Upper Amazon. Ethnographic study focusing on Runa communities of both the Pastaza and Napo Rivers indicate these groups share many of the views, collectively known as Amazonian Perspectivism, that characterize numerous lowland cultural groups. This paper will detail some of the ways in which Runa persons perceive and interact with their environment, focusing on relations with socially salient plants and animals thought to be persons, or rather, former persons who became distanced from human society through quilla, or “laziness.” I will argue that these interactions are an important form of social and economic adaptation within a broader ontological framework in which human–nature relations take on a highly social quality. This paper will also link modern perspectival views to the archaeological past through the consideration of the ontological turn, which posits that the ancient past may be best understood through the use of modern non-western ontologies. I argue that, at present, the application of non-western ontologies is complicated by the problematic creation of theoretical abstractions grounded in such ethnographic analogy.

Johnson, Rachel [6] see Schroll, Andrew

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Johnson, Susannah (Utah Valley University) and Karen Schollmeyer (Archaeology Southwest)**[91]** *Gaming Pieces in the US Southwest*

Tabular pieces of worked bone, commonly referred to as gaming pieces, have been found in archaeological sites throughout North America and the US Southwest. This project focuses on gaming pieces in Southwestern archaeological sites, with an emphasis on the Gila River basin. Data on gaming pieces in this area are compared to the Great Basin and surrounding regions, where much of the current research on these items has been focused. The analysis and comparison of context and other characteristics of known occurrences of gaming pieces in the Southwest informs a larger picture of how these gaming pieces may have been used in the past.

Johnston, Kevin [18] see Paine, Richard

Johnston, Susan (George Washington University)**[144]** *Ireland in the Iron Age: Interaction, Identity, and Ritual*

The relationship between Ireland and both Britain and continental Europe has often, both explicitly and implicitly, cast Ireland as either subsumed under the "British Isles" or as being "peripheral" to cultural life there and on the Continent. This terminology simultaneously ignores the unique aspects of Irish social and cultural life while suggesting that any study of culture there is not relevant to a broader understanding of the human experience. However, the archaeological record suggests a situation which is more nuanced and so more complex than this terminology would imply. Ireland clearly participated in a wider cultural world while also expressing its own unique identity. These issues will be explored specifically in the context of Iron Age ritual in Ireland, where evidence suggests that cultural and social identity were being actively fashioned. Using data from excavation at the Iron Age ceremonial center of Dún Ailinne, Co. Kildare, it will be argued that ritual in this period both tied Ireland to a larger Iron Age world while providing a medium in which to create a new context for political and ritual life that differed from that emerging in Britain and beyond while still being situated in international social trends.

[197] *Discussant***Jolie, Edward (Mercyhurst University)****[139]** *Threads from the Present and the Past Come Together in Smithsonian Collections*

In North America, some of the largest and most well preserved archaeological collections of perishable artifacts, including objects such as string, nets, baskets, textiles, mats, and sandals, are curated by the Smithsonian's National Museum of the American Indian and National Museum of Natural History. Generally poor preservation of these items has challenged interested researchers to recover as much information as possible from them, meaning that even some of the very early, minimally documented assemblages can make important contributions. At the Smithsonian's NMNH and NMAI, the availability of such material, combined with extensive collections of ethnographic weavings, facilitates engagement with both ancient and contemporary weaving traditions in ways that helps maximize what we can learn from the limited archaeological record. Drawing on long-term work with Smithsonian collections, this presentation considers first the insights obtained from a study of little-known historic Plains coiled gambling baskets with implications for understanding the precontact origins of that complex. Second, I review results of research on prehispanic Chacoan (ca. A.D. 850–1150) perishables from New Mexico that has yielded new data about these crafts in Chaco Canyon and beyond, and which also raises interesting new questions about recent Pueblo peoples' weaving traditions.

Jolie, Edward [48] see Lee, Craig

Jones, Alexandra (Archaeology in the Community)**[148]** *Discussant***Jones, Catherine (University of Wisconsin-Milwaukee)****[107]** *The Problem of Enacting Ethical Practice in Historic Cemetery Excavation*

The excavation, reburial, and permanent curation of human remains from historic cemeteries is inherently linked to complexities of Western paternalism, medical consent, nationality, traditional cultural practice, and a too-common absence of stakeholder engagement, among other pressing concerns. These important and fundamental considerations are often ignored or glossed over in both archaeological project planning and in publications utilizing these remains. The ideal of scientific objectivity inherently separates the researcher from the material, a suitable principle for particle physics but not for human remains. In order to ensure that active engagement in ethical discussion is a continual practice and not a cyclical concern-of-the-moment, we as researchers must consciously embrace the full range of our position as social actors as we seek to embrace a multiple consciousness at the intersection of divergent modern communities and judicious excavation.

[107] *Chair*

Jones, Douglas [68] see Caporaso, Alicia

Jones, Emily Lena (University of New Mexico), Cyler N. Conrad (University of New Mexico), Caitlin Ainsworth (University of New Mexico) and Stephanie Franklin (Santa Fe National Forest)**[115]** *Turkey Husbandry at Pueblo Bonito and Its Relationship to Turkey-Human Interactions in Chaco Canyon*

Domestic turkey (*Meleagris gallopavo*) husbandry at Chaco Canyon has been the subject of considerable debate. Previous research has argued, among other things, that turkeys were rare in the Canyon (Akins 1985); that turkeys first were a source of feathers for ritual and ceremonial activities, and only later treated as food (Akins 1985; Badenhorst et al. 2016; Windes 1977); that local wild turkeys were not present in Chaco Canyon and domestic turkeys were imported from the Four Corners region (Vivian et al. 2006); and that local domesticated and/or wild turkeys were husbanded within the canyon (Grimstead et al. 2016; Speller 2009; Speller et al. 2010). In this paper, we use turkey bone and turkey eggshell remains recovered during the 2013 re-excavation of Room 28 at Pueblo Bonito to address some of these controversies. Our results suggest that turkeys were likely husbanded at Pueblo Bonito (and possibly elsewhere at Chaco as well), and that site excavation histories may be biasing our interpretation of the turkey-human story at Chaco Canyon.

Jones, Eric (Wake Forest University)**[119]** *A Multiscalar Analysis of Piedmont Village Tradition Settlement and Demography, 1200–1600 CE*

This research uses settlement area of Piedmont Village Tradition (PVT) sites from the four major river valleys in the North Carolina Piedmont to describe demographic trends on multiple scales during 1200–1600 CE. It uses surface survey results and artifact styles to establish sizes and dates. Spatial data and radiometric dates from excavated sites in each valley are used to refine these data. Given the limitations of using surface survey data for estimating demographic characteristics, this work aims to establish an initial model for population sizes and changes in the Piedmont on several scales that can be tested and improved upon in the future. Previous work suggests population growth occurred across the valleys from 800–1200 CE. Findings in this research suggest that populations in different valleys experienced different trajectories during the subsequent 400-year-period. Intra-

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valley migrations and eventual abandonment marked the Yadkin; population growth, settlement coalescence, and eventual abandonment in the Dan; and population stability and settlement coalescence in the Eno and Haw. Contextualizing PVT demography in the larger Southeast will help us understand how small-scale societies compared to neighboring chiefdoms, chieftaincies, and confederacies and what that means for the relationship between sociopolitical form and different demographic trends during this period.

[119] *Chair*

Jones, Garrett (Morehead State University / The Craft Academy), Timothy Hare (Morehead State University) and Mike Dowell (Mobile Recon Systems LLC)

[190] *An Integrated Heavy-Lift Unmanned Aerial Vehicle (UAV) and Remote Sensing Platform*

We describe an integrated heavy-lift unmanned aerial vehicle (UAV) and remote sensing platform used to map archaeological features under the forest canopy in the northern Yucatán. We collaborated with Mobile Recon Systems Inc. to construct a UAV-based aerial mapping system that can be used to create high-resolution maps and 3D models of archaeological ruins, excavations, caves, and cenotes for small to medium-sized areas of the forested environment. The system integrates Light Detection and Ranging (LiDAR) and multispectral sensors with RGB light cameras into a large UAV for simultaneous recording of visible light, near-infrared, and topographical data. The major components include the UAV, sensors, inertial measurement unit, dual channel GNSS receiver and base station, radio transmitters, control points, and mission control equipment and software. Our goal is to create a practical and cost-effective system to facilitate rapid and accurate mapping of archaeological remains and associated environmental features.

Jones, J. Scott (University of Kentucky)

[127] *Paleoindian Site Formation in the Tennessee River Valley*

The Paleoindian occupation of the unglaciated eastern woodlands has generally been characterized by distributions of projectile points and few true sites. While this perception has begun to change in recent history, the Late Pleistocene archaeological record beyond projectile points including sites and settlement patterns remain poorly studied and reported. This paper provides an evaluation of the natural and cultural formation processes associated with Paleoindian occupation in the Tennessee River Valley. Natural process emphasize dynamic environmental conditions, coupled with resource availability, primarily including changes in riverine drainage dictating Paleoindian site location. The cultural processes involved in site formation have often been juxtaposed as aggregations of small bands of highly mobile hunter-gatherers vs. re-occupation by single bands of hunter-gatherers. Evaluation of the data derived from the Late Pleistocene Carson-Conn-Short site (40Bn190) in the Lower Tennessee River Valley suggests other factors beyond the traditional aggregation/re-occupation models are important in site formation. The data presented here also raises important implications for modeling the development of sedentism and horticulture in the Midsouth.

[127] *Chair*

Jones, John G. (Archaeological Consulting Services)

[274] *Early Settlement on the Island of Grenada: Ecological Evidence for the Extinction of Rodents and Palms*

Evidence of Archaic age settlement with possible rodent harvesting is apparent in two well-dated sediment cores collected in northeastern Grenada. At around 3600 BC, large scale burning on the island coincides with severe forest modification including the total elimination of at least two species of palms. The selective, though possibly unintentional, removal of economically valuable palms suggests the influence of a non-human variable into the equation. I propose that the removal of a seed-dispersal agent, possibly an agouti or a hutia, might play into the removal of these palms, already in a weakened state due to large scale human-caused fires.

Jones, Katherine (University of Georgia), Ashley Smallwood (University of West Georgia), Thomas Jennings (University of West Georgia), Jerald Ledbetter (Southeastern Archeological Services, Inc.) and Charlotte Pevny (SEARCH, Inc.)

[81] *Paleoindian and Early Archaic Southeast: Twenty Years of Georgia Archaeology*

In the twenty years since the O'Steen and Ledbetter et. al chapters in *The Paleoindian and Early Archaic Southeast*, a great deal of work on the earliest occupations of Georgia has occurred. In this paper, we review recent fieldwork and collections research that have contributed to our understanding of Georgia's early record, update distributional data of Paleoindian and Early Archaic diagnostics across the state, and compare this diagnostic distributional data with raw material distributions across the state. We then use this data to consider models for the Pleistocene and Early Holocene occupations of Georgia, paying close attention to raw material distributions and possible implications for shifting group interaction patterns over time.

Jones, Kelly (Florida Gulf Coast University) and William Locascio (Florida Gulf Coast University)

[52] *A Typology of Late Archaic Ceramic Evidence from Okeechobee Basin to Determine Regional Interactions*

Analysis of ceramic sherds collected during excavations at the Wedgworth Midden (8PB16175) permits insight into regional interactions during the Late Archaic period. Saint John's Plain, a chalky ware associated with people to the north of the Okeechobee Basin, constitutes a significant proportion of the assemblage and suggests that Late Archaic communities in the Northern Everglades maintained social interactions with people living in the St. Johns River Valley. While preliminary, these patterns offer evidence that south Florida cultures were involved in local and non-local activities that might have included exchange of resources and ideas during the Late Archaic period.

Jones, Lila (Museum of Texas Tech University) and Eileen Johnson (Museum of Texas Tech University)

[241] *3D Geometric Morphometrics Applied in the Identification of Canis spp. Specimen from a Historic Site in Western Texas*

Whiskey Flats, an archaeological site on the Llano Estacado (western Texas), is dated to the mid-18th century and represents Comanche occupation. Ongoing fieldwork has produced a vertebrate assemblage that includes coyote (*Canis latrans*) and a larger canid (*Canis* spp.) of a species that remains undetermined. The species of canids that may have been present at the time of deposition are grey wolf (*C. lupus*), coyote, domestic dog (*C. lupus familiaris*), and possibly red wolf (*C. rufus*). The *Canis* spp. is represented by a small, non-diagnostic sample (n=15). In the absence of diagnostic elements such as a skull or mandible, three-dimensional landmark-based morphometric analysis is applied to the right astragalus to determine the viability of the specimen as an indicator of species. Principal component analysis (PCA) is performed using astragali from modern comparative samples of grey wolf, coyote, dog, and red wolf in an attempt to characterize quantitative variation and ultimately, determine if species identification is possible. The methodology has proven useful in exploring the range of variation among the canid species and results indicate that *C. latrans* is the least likely candidate. Dog or red wolf would prove significant, the former culturally and the latter in range and habitat.

Jones, Makensie (Dickinson College), Isabel Figueroa (Dickinson College), Katherine Knothe (Dickinson College) and Maria C. Bruno (Dickinson College)

[334] *Archaeology at Camp Michaux: A Productive Collaboration between Dickinson College, Cumberland County Historical Society, and Governmental Agencies in Cumberland County, Pennsylvania*

Since 2013, the Dickinson College Archaeology program has partnered with the Cumberland County Historical Society, the Pennsylvania Historical and Museum Commission, and PennDOT to conduct research in the Camp Michaux area of Michaux State Forest (Cumberland County, Pennsylvania). This partnership functions through the Archaeological Methods course offered by the college each spring, which teaches students how to plan and

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execute their own small research projects involving remote sensing, pedestrian survey, feature mapping, and test pit excavation. Students design their investigations around questions about one of the multiple phases of occupations at the site: Prehistoric/Indigenous, Farm/Iron Furnace, Civilian Conservation Corp Camp, and WWII Prisoner of War Camp. Despite time constraints and other limitations inherent in the nature of a semester-long class, yearly public presentations that involve the local community disseminate new information about what was learned and improve public understanding of the site. The partnership between Dickinson College and local heritage and government agencies has proved successful in working towards the preservation of regional archaeological and cultural heritage resources, while continuing to look toward the future of the project.

Jones, Mica (Washington University in St. Louis) and Ruth Tibesasa (University of Pretoria)

[198] *Bridging the "Kansyore gap": Continuous Occupation and Changing Subsistence Strategies at Namundiri A, Eastern Uganda*
Environmental heterogeneity and climatic instability in the mid-Holocene (~8,000–3,000 BP) are linked to increased socioeconomic diversity in East Africa. Increasing aridity ca. 6,000–5,000 BP encouraged early herders to migrate south into the region, while local hunter-gatherers intensified their reliance on ecologically-rich environments. Kansyore hunter-gatherers of the Lake Victoria basin established specialized subsistence systems that incorporated heavy pottery-use and seasonal site occupation at this time, possibly in response to decreasing rainfall. A gap in the archaeological record, however, limits understandings of Kansyore strategies in relation to environmental reorganization. Evidence from western Kenya suggests Early (~8,000–6,000 BP) and Late phase occupations (~3,500–1,500 BP) associated with changes in the frequency of pottery production/use, ceramic style, and fishing strategies, yet no evidence exists for Kansyore activities between these periods. Recent excavations at Namundiri A in eastern Uganda reveal a long archaeological sequence without breaks in the stratigraphic or material record. Faunal and ceramic data shows clear patterns of subsistence change similar to those observed between the Early and Late Kansyore, suggesting that this Kansyore "gap" is the result of incomplete radiometric data and a dearth of targeted research in the region, rather than a break in occupation during the mid-Holocene.

Jones-Cervantes, Shelby A. [74] see Cox, J. Royce

Jordan, Keith (California State University, Fresno)

[209] *Possible Maya Analogs and Antecedents for the Pyramid B Atlantid Columns, Tula*
Classic Maya stelae have been proposed as precursors for the Early Postclassic stelae at Tula and the relief pillars of Pyramid B at the site in previous scholarship. While suggested Maya connections for the Tula stelae are often overstated, and local central Mexican stela traditions as well as ideas from Oaxaca and Guerrero also probably contributed to the genesis of these monuments, the role of Maya contacts remains plausible. Here I explore possible Maya analogs, including stelae, for the famed atlantid columns of Pyramid B. While in style and construction these sculptures reflect the legacy of Teotihuacan, their use of elite or royal images as literal pillars has conceptual parallels in Classic Maya stelae equating kings with trees, pillars of the sky and the axis mundi. I also critically assess the possible connection, first proposed by Kubler, between the Tula atlantids and the Terminal Classic figure columns of the Puuk area. While these similarities may reflect a common Mesoamerican background rather than direct contact, recent dating of the Tula sculptural style to 650–850 CE at Tula Chico increases the probability of interaction.

Jordan, Peter [50] see Admiraal, Marjolein

Jorgensen, Alex [20] see Ladefoged, Thegn

Jorgenson, Matthew [184] see Cassedy, Daniel

Jorgeson, Ian [103] see Burger, Rachel

Joseph, J. (New South Associates)

[236] *Discussant*

[326] *Chair*

Joshel, Sandra (University of Washington)

[308] *Roman Slavery*

In the last 20 years, Roman archaeologists have analyzed the remains of Roman streets, counted graffiti, benches, and doorways in Pompeii and Herculaneum, and mapped the spaces of houses, workshops, and villas, and examined as well as the location of objects. Archaeologists have turned the material remains into facts and assembled an archive of the traces of human activities—traffic, movement, work, rituals, etc. How this scholarship has furthered our understanding of a heterogeneous population of men and women, rich and poor, free and slaves, Romans and foreigners is another matter. In *The Material Life of Roman Slaves*, Lauren Petersen and I sought to retrieve and represent the physical environment and lives of Roman slaves by setting in dialogue the textual record of Roman law and literature on slaves and the archaeological remains and by drawing on the work of archaeologists and historians of slavery in other periods and places. I want to focus on the Haitian historian and theorist Michel-Rolph Trouillot to Roman archaeology. The goal is to think about what counts as facts, the interpretation of those facts, and how some interpretations are regarded as factual history while others are seen as works of fiction.

Joy, Shawn (Florida State University)

[244] *The Trouble with the Curve: Reassessing the Gulf of Mexico Sea-Level Rise Model*

During last glacial episode, a massive amount of water was locked within ice sheets, resulting in a reduction in global sea-levels by 134 meters. The reintroduction of freshwater into the oceans radically changed global sea-levels and littoral landscapes. Over the last 20,000 years, approximately 15–20 million km² of landscape has been submerged worldwide. Sea-level rise explains the rarity of glacial period coastal archaeological sites. Understanding Florida's Paleoindians' interactions with the coastal environment requires an accurate sea-level curve for the Gulf of Mexico. Balsillie and Donoghue (2004) sea-level curve has been the standard model for oceanic transgression in the Gulf for over a decade. Yet, when compared to global sea-level curves, there are discontinuities within their model. This paper will address the issues with Balsillie and Donoghue (2004) curve, introduce new data and methodologies to enhance the Gulf of Mexico sea-level curve, and improve distribution modeling for submerged archaeological sites.

Joyce, Arthur (University of Colorado at Boulder), Aleksander Borejsza (Universidad Autónoma de San Luis Potosí), Jon Lohse (University of Texas at San Antonio), Luis Morett Alatorre (Universidad Autónoma Chapingo) and Brendan Nash (University of Michigan)

[59] *Sourcing Pre-ceramic obsidian from Las Estacas, Morelos, and Yuzanu 36, Oaxaca*

Understanding of long-distance exchange during the Mesoamerican Pre-ceramic suffers from a limited range of materials whose source locations can be determined relative to later periods. Obsidian is one of the few materials that can provide evidence for long-distance exchange through geochemical analysis, although relatively few sourcing studies have been carried out on Pre-ceramic obsidian. In this paper, we report recent pXRF results from

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obsidian recovered at two Preceramic sites: Las Estacas, an Early Archaic period site in the Yautepec Valley of Morelos, and Yuzanu 36, a Late Archaic site from the Nochixtlán Valley, Oaxaca. Our results show that in each case a single obsidian source predominates, with at least 94% of the Las Estacas sample (n=100) from Otumba and 100% of the Yuzanu 36 sample (n=31) sourced to Guadalupe Victoria. We compare the results from Las Estacas and Yuzanu 36 to Preceramic and Early Formative period obsidian sourcing data from elsewhere in Mesoamerica. Data for the Preceramic and initial Early Formative indicate that in most cases obsidian procurement was focused on a small number of sources with procurement diversifying by the later Early Formative. We discuss the implications of the evidence for means and patterns of obsidian exchange.

[192] *Discussant*

Joyce, Arthur [9] see Wedemeyer, Rachael

Joyce, Rosemary (University California Berkeley)

[139] *Archaeology in and with Museums: A Case Study from Honduras*

Archaeology in the US is undergoing a series of transformations, emphasizing community engaged scholarship, new research questions of contemporary relevance dealing with such things as resilience, social memory, and production of historical identity, and a shift towards non-invasive methods and intensive analyses of smaller samples from more limited excavations. Yet the normative vision of archaeological research still is original excavation of a site selected purposively to answer a question, sampled by predetermined strategies. Research with previously collected materials, especially in older museum collections, is not often presented as potentially a normative option for theses and dissertations. My own research encompasses settlement survey, excavation, and materials analyses under the normative model of archaeological research, as well as use of curated collections. In this presentation, I will describe highly productive research on Honduran archaeology that the collections of the National Museum of the American Indian at the Smithsonian have made possible, emphasizing the kinds of questions that the museum collection allows me to address that were not feasible without its holdings. I explain several strategies used in this research to provide contexts for interpretation, emphasizing the interplay between smaller, tightly controlled excavated samples and the larger collections in the museum.

[278] *Moderator*

[263] *Discussant*

Juarez, Santiago (Colgate University)

[18] *The Creation of Late Preclassic Urban Landscapes at the site of Noh K'uh in Chiapas, Mexico*

The site of Noh K'uh in Chiapas, Mexico is a mid-sized ceremonial center that is found near the boundary between the Southern Lowlands and the highlands of Chiapas. Abandoned during the Late Preclassic (400 B.C.- A.D. 200), the site of Noh K'uh has provided an opportunity to study the Late Preclassic settlement patterns without the overburden of later period remains. Recent investigations in 2016 and 2017 have provided new evidence that allows me to compare the construction techniques utilized in different areas of the site, ranging from the ceremonial core to the humblest occupations. Combined with previous data, the city of Noh K'uh reveals a construction program that was responsible for forever altering the landscape

that supported the site. Survey and excavations over commoner contexts provide evidence that such activities were guided by cosmological rituals, especially the common practice of centering.

Juengst, Sara L. (UNC Charlotte), David Hansen, Sergio Chavez (Central Michigan University) and Stanislava Chavez (Wayne State University)

[335] *Across the Lake: Interregional Connections with the Tiwanaku Occupation of Copacabana*

Tiwanaku, the first expansive state in the southern Andes, established colonies in many parts of the Andes (Moquegua, the Atacama Desert, Cochabamba) and exerted influence over the southern Titicaca basin. Archaeologists have recreated daily life for people living in these places, producing many insightful studies of Tiwanaku diet, cultural bodily modifications, disease, and occasional incidents of trauma. Many colonists living far from the Tiwanaku heartland developed hybrid lifestyles, adopting some local practices while preserving other Tiwanaku traditions. The site Cundisa is located in modern-day Copacabana, approximately 60km across Lake Wiñaymarka and 90km over land from Tiwanaku. Cundisa includes a cemetery with Middle Horizon burials of 100+ individuals. While the majority of individuals were buried with Tiwanaku ceramics, isotopic and skeletal evidence suggests variation in geographic origin and lifestyles for the people buried here. In this paper, we present the results of preliminary skeletal analyses of diet, disease, trauma, and identity for these individuals and suggest the variation present in the sample indicates interregional connections between Copacabana, Tiwanaku, and the coast. This interaction is likely part of the larger processes of the Middle Horizon, when long-distance trade and movement of peoples stimulated social complexity across the Andes.

Juliusson, Árni Daniél [167] see Hicks, Megan

Junco, Roberto [69] see Castillo, Karime

Jung, Taesoo [217] see Hadden, Carla

Junker, Laura (University of Illinois Chicago)

[317] *Moderator*

Jurgens, Christopher [187] see Koenig, Charles

Justinvil, Delande (Brandeis University), Jessica Leonard (Brandeis University), Hannah Plumer (Maya Research Program), Thomas Guderjan (Maya Research Program) and Colleen Hanratty (Maya Research Program)

[302] *The Teeth Tell All: Dentition, Demography, and Paleopathology at Early Classical Mayan Site of Tulix Muul, Belize*

In 2013 a rescue mission to salvage and preserve details of the shrine complex at Tulix Muul, a Classic Maya site in northwestern Belize, yielded a Maya mural. While the arrangement of the mural at the shrine echoes notions of nobility, this rare landmark discovery lies in contrast to what we can infer about the social status of exhumed remains from the Tulix Muul archaeological site. This poster will address the multifaceted insights we can glean from certain aspects of the past life histories and social identities of the residents of Tulix Muul. An analysis of the dentition from thirteen burials illustrates how non-specific indicators of health (NSIH) relate to the varying tiers of class among Early Classic Maya communities in northwestern Belize. Subsequently, comparing these results alongside contemporaneous finds from the neighboring site of Blue Creek will emphasize the biocultural impact of class-based dietary disparities reflected in the bioarchaeological record of two communities a mere 30 kilometers apart.

Kabata, Shigeru [262] see Murakami, Tatsuya

Kabiru, Angela [99] see Hu, Lorraine

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Kahn, Jennifer (The College of William and Mary)

[171] *The Role of Short-Term and Catastrophic Climatic Events and Human-Induced Landscape Change in Society Island Cultural Transformations*

As studies of sustainability and resilience in pre-contact Polynesian societies proliferate, records of small-scale and large-scale environmental change are being refined. Yet the question of what drives social change, human actions or climatic factors, is still quite hard to discern. My case study focuses on non-human agency, particularly eroding landforms and climatic conditions, as forces of change in pre-contact East Polynesia. A Society Island case study outlines varied human responses to expected events, such as soil creep onto agricultural terraces, and cataclysmic ones, such as major landslides, tropical cyclones, and flooding. Some cataclysmic events had remarkably deleterious short-term effects, but in the long-term created more advantageous residential and agricultural conditions for the indigenous Ma'ohi. Other short-term cataclysmic events were successfully buffered with new adaptations, spurring cultural innovation. Ma'ohi efforts to combat soil erosion, due to both natural and human causes, led to remarkably labor-intensive inputs into the pre-contact socio-economic system. From a behavioral ecological perspective, both nature and culture shaped Ma'ohi habitats. East Polynesian case studies support that decision makers often lacked information about the long-term consequences of their actions, yet could sometimes rapidly adapt and integrate new forms of traditional ecological knowledge into their socioecosystems.

Kahn, Jennifer [189] see Ohman, Alexis

Kaijankoski, Philip (Far Western Anthropological Research Group), Brian Byrd (Far Western Anthropological Research Group), Michelle Goman (Sonoma State University), Jack Meyer (Far Western Anthropological Research Group) and Manuel Palacios-Fest (Terra Nostra Earth Sciences Research)

[84] *Sea Level Rise and Shell Mound Inundation within the Islais Creek Estuary, San Francisco, California*

Situated on the southeast edge of San Francisco, the Islais Creek estuary was infilled during early development of the city. Recent geoarchaeological coring searching for prehistoric sites underlying this urban landscape has documented a complex sequence of Holocene landforms deposited as sea level rise transformed the ancestral Islais Creek valley. This exploratory work also identified, in a variety of stratigraphic contexts, an extensive ancestral Native American shell mound that was occupied throughout most, if not all, of the Late Holocene. Sea level reconstruction indicates that the oldest site component was formed just above the tidal range at the time of occupation, was subsequently submerged, and is now situated over 6 meters below surface and overlain by estuarine mud. In response to progressively rising sea levels, later temporal components of this shell mound were formed at increasingly higher elevations. Paleoenvironmental analysis of diatoms and pollen reveal that during the Middle Holocene this estuary was largely freshwater, and transitioned to brackish conditions beginning around 5000 years ago. The timing of this transition raises several new questions regarding the nature of earlier adaptive strategies around the estuary and appropriate techniques for identifying older sites within this deeply submerged and buried landscape.

Kaiser, Bruce [154] see Martindale Johnson, Lucas

Kallio-Seppä, Titta [9] see Lipkin, Sanna

Kalra, Kanika (JD School of Liberal Arts)

[171] *The Agency of Monsoons in South Asia*

Every June through September, the inhabitants of South Asia welcome and celebrate the southwest monsoons. The monsoon winds are the lifeline of this region but also a major threat, inspiring societies to devise mechanisms to both harness their potential and subvert the damage they may cause. This paper analyzes prehistoric and historical responses to monsoons in South Asia in terms of their unpredictable nature, and examines how the monsoons both facilitate and constrict people's actions. In doing so, the paper compares societal responses to monsoons in the different contexts of rurality and urbanity, which each exert specific exigencies over individual and collective actions. In both situations, conserving seasonal rainwater is crucial to the sustenance of societies but an excess of that water can cause significant destruction. Poets of the past and the present allude to the vagaries of the monsoons, reflecting a society conscious of monsoons' deceits, but even today, it is nearly impossible to predict how much it might rain, when, and where. The paper thus urges archaeological studies of water infrastructure to take into consideration both human agency and the agency of the monsoons.

Kamenov, George [9] see Wallis, Neill

Kamp, Kathryn (Grinnell College)

[87] *Parents, Infants and Material Culture*

A study of over 50 U.S. parents of infants that included interviews and the recording of toys and living spaces shows that material culture does provide clues to both parental beliefs and behaviors, but, not surprisingly, the reflection is imperfect. The material presence of infants is considerable, but even in relatively affluent households much of it is often second hand and gifted, so may not directly reflect the espoused beliefs of parents. This is especially true of objects reflecting gender stereotypes. In addition, even infants interact significantly with objects that are designed for adults and adult activities rather than designated as specifically for infants or children.

Kang, Bong (Gyeongju University)

[45] *The Rock Art of Bangudae in Southern Korea: Focused on the Problems of Whale Hunting*

Many aquatic animals, such as whales, sea lions and turtles, and terrestrial animals, such as tigers, wild cats, deer, boars, and weasels, were identified on the rock art of Bangudae, located in the southeastern part of Korean peninsula. Scenes of human figures, whale hunting, boats, and net and fence hunting are also present. Some western archaeologists are suspicious about whale hunting conducted by prehistoric Korean people. They argue that there are not clear depictions at Bangudae of the actual hunting of whales. In contrast, I will put forward some indisputable images and relevant archaeological materials related to whale hunting in the region.

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[45] *Chair*

Kangas, Rachael (Florida Public Archaeology Network) and Sarah Miller (Florida Public Archaeology Network)

[135] *Heritage Monitoring Scouts (HMS) Florida: Pragmatic Responses to Heritage at Risk*

Heritage Monitoring Scouts (HMS) Florida, a program created by the Florida Public Archaeology Network, is designed to teach the science of climate change and pragmatic problems it poses for cultural resources. Beyond just learning about climate change science, projections, and increasing impact

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we can expect to see over the next 50–100 years, HMS Florida is specifically designed to give individuals a way to make a difference. Responding to threats posed by climate change, weather, and other sources, HMS Florida Scouts are individuals from a variety of backgrounds, professions, and skillsets that come together to monitor Florida's cultural heritage. This discussion will identify ways HMS Florida trains and mobilizes citizens, while working with state, national, and international partners to coordinate the effort and disseminate best practices and lessons learned.

Kangas, Rachael [53] see Ayers-Rigsby, Sara

Kansa, Eric (Open Context / UC Berkeley) and Sarah Whitcher Kansa (Alexandria Archive Institute)

[172] *Beyond Solutionism? Digital Data and Threatened Cultural Heritage*

In his influential book "To Save Everything, Click Here" (2014), Evgeny Morozov coined the term "solutionism" to describe a utopian vision that innovation in digital technologies can solve complex social problems. Fueled by Silicon Valley wealth, digital technologies have an obvious glamor. The high-profile reconstruction of the Palmyra Arch by the Institute for Digital Archaeology exemplifies how governments, universities, corporate sponsors, and granting foundations use media attention on threatened world heritage to showcase technological prowess. Do such efforts meaningfully preserve threatened heritage? Do they overshadow often tragic social realities that fuel war and other causes of heritage destruction? How likely are the data to be available, discoverable, and of any future use?

To move beyond solutionism, this paper highlights how digital data need better contextualization. Context is multi-dimensional—simultaneously physical, social, and intellectual. Contextualization requires developing "human capital" through community archaeology and public education, and sustained institutional commitments for digital curation. Such efforts cannot be siloed institutionally, intellectually, or technologically. Open Context (<http://opencontext.org>) illustrates approaches to link and integrate heritage data across institutional and community boundaries in ways that can encourage continued development of the human capital needed to make digital cultural heritage a meaningful aspect of preservation.

[316] *Discussant*

Kansa, Eric [130] see DeMuth, Robert

Kansa, Sarah Whitcher (AAI / Open Context), Anne Austin (University of Missouri, St. Louis), Ixchel Faniel (OCLC), Eric Kansa (AAI / Open Context) and Ran Boytner (Institute for Field Research)

[130] *Considering Communities of Practice throughout the Data Lifecycle*

The use of digital tools for data creation and presentation is pervasive in archaeology, and data preservation and dissemination is becoming common practice. Still, few archaeologists consider the life of their data beyond their own research purposes. This lack of broader consideration of the future uses of a dataset means that many researchers do not sufficiently describe their data to make it intelligible or useful to others, which risks filling repositories with data of very limited use. We present findings from the Secret Life of Data (SLO-data) project, which aims to better understand opportunities and challenges in data interpretation, publication and preservation by following the lifecycle of data from the field to the digital repository. The project's "slow data" approach emphasizes the need for thoughtful consideration of archaeological data, taking into account its curation, contextualization, and dissemination, as well as how it can contribute to broader understanding now and in the future. We share results from interviews, field observations, and excavation data assessments that our team has conducted at four field sites in three continents. We recommended technical and organizational changes to streamline data collection and management during excavations that will help improve its potential for future use.

[316] *Moderator*

Kansa, Sarah Whitcher [53] see Noack Myers, Kelsey

Kanungo, Alok [137] see Dussubieux, Laure

Kaplan, Emily

[139] *Materials Characterization at the National Museum of the American Indian: (Mostly) Non-destructive Analysis*

The use of portable X-Ray Fluorescence (pXRF) for in-situ elemental analysis is becoming widespread in archaeology and cultural heritage studies. Archaeologists and conservators routinely use pXRF instruments in the field and many museums use them in-house for identification of pigments, metals, and inorganic pesticide residues, characterization of minerals and determination of alloy composition. The NMAI Conservation Department has been using pXRF for over fifteen years for a variety of materials and projects. Focusing on results of a long-running technical study of polychromed Inka and Colonial Andean ritual drinking vessels called qeros, I present an overview of the utility of pXRF in the museum context. Identification of the palette of mineral pigments and metal decoration and repairs used for the qeros has contributed substantially to our understanding of chronology and production. I include examples of studies carried out at NMAI of modern, historic and archaeological collections items and discuss the value and limitations of pXRF when used alone or in combination with other analytical techniques.

Kaplan, Emily [139] see Harrison, Ainslie

Kaplan, Jed (Max Planck Institute for the Science of Human History)

[219] *Numerical Modeling of Hunter-Gatherer Population, Dispersal, and Influence on the Environment in the Late Pleistocene*

The expansion and dispersal of modern humans across Eurasia and into the Americas during the Late Pleistocene is remarkable for the application of niche construction, contemporaneous with megafauna extinctions and rapid climate change. Despite the importance of this period, the rate, pathways, and environmental impacts of the late Pleistocene human dispersals are poorly understood. To quantify the effects of these dispersals on the environment, and to better understand demographic development over the period, I implemented a new, computationally efficient numerical representation of human population dynamics and dispersal and incorporated this into a dynamic global vegetation model. This coupled model of human and natural systems simulates the way in which climate and other properties of the physical environment affected suitability for hunter-gatherer populations, while at the same time allowing humans to modify their local environment, i.e., niche construction, through the controlled application of wildland fire. Our model simulations show that humans could substantially influenced their environment even during the Last Glacial Maximum, selectively using fire to promote more open and heterogeneous landscapes. This anthropogenic modification of the land surface facilitated further dispersal and increases in population, a positive feedback that ultimately accelerates the growth and spread of humans across the planet.

Kaplan, Jessica (University of California Santa Barbara)

[17] *Political Economies of the Wari Empire: Resource Use in the Middle Horizon, Peru*

Political economies, or the "material foundations" for the institutionalization of power and control are complex and variable, within and across resources, political systems and incorporated communities (Earle 1994). During the Middle Horizon, Peru (AD 600–1000) the Wari Empire expanded from its capital in the Ayacucho highlands to cover a region of the Andes spanning over 1000km within present-day Peru. The empire embarked on large-scale infrastructural projects (roadways, agricultural terracing and irrigation works, political and administrative systems, etc.) and had a political

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economy built on a combination of strategies, including resource control and the specialized production and distribution of both utilitarian and special-purpose goods. The empire relied on the vertical ecology of the Andes to capitalize on regional resources, and to draw those regions into the Wari interaction sphere. This research seeks to understand the intersecting relationships between regions, resources and Wari power as enacted through the production, distribution and consumption of obsidian and other resources within the Wari capital and hinterland territories.

Kara, Alex (Boston University)**[28]** *Scrutinizing Theories of Maya Collapse with the CHAAHK Spatial Simulation Model*

The Classic Maya collapse remains as both relevant and controversial a topic as ever. For over a century, dozens of researchers have proposed different causes that may have driven this complex process. The last few decades have witnessed the academic community's opinion converge on the notion that many different social and environmental factors, operating at likewise diverse scales, somehow contributed to a temporally gradual and spatially heterogeneous disruption of the demographic, political, and cultural patterns known to have characterized the Classic Maya. This paper builds on this progress by attempting to quantify the relative influence of certain factors on the Maya region's long-term trajectory. It presents an abstract spatial simulation model of Maya demography, subsistence, and trade over a 3000 year period. It implements relatively generic manifestations of what processes were relevant to the growth, collapse, and regeneration of the Maya system. This abstraction permits quicker model execution times, which then facilitates using data mining and sensitivity analysis methodology to quantify how certain stressor categories contribute to the presence or absence of long term societal collapse. The relative importance of these stressors according to the simulation is then compared to the amount of research attention they tend to receive.

Karam, Carlos [55] see Campos, Cinthia M.

Karapandzich, Alina (The College of Wooster) and Paul Nick Kardulias (The College of Wooster)**[185]** *Zero to Hero: Elite Burials and Hero Cults in Early Iron Age Greece and Cyprus*

Adulation of heroes, including the flawed, militaristic, authoritative men of Homeric epic was an important feature of ancient Hellenic culture. This phenomenon is reflected in cults and shrines built in the Archaic period. How did these so-called "hero cults" form, and can Early Iron Age (EIA) elite burials form a connection between the tomb cults of the Late Bronze Age (LBA) and the hero cults of the Archaic and later Classical periods? The purpose of this study is to examine EIA burials whose elite goods and archaeologically visible tombs reflect the burial of a "heroic" person. In doing so, we draw connections between the elaborate LBA burials and the less ornate EIA interments of Greece and Cyprus that contain references to the LBA past. To examine this phenomenon, we consult theories of state formation, the cyclical nature of changing levels of social complexity, and cultural memory. In order to draw connections between Archaic hero cults and earlier EIA tombs, we examine burials at the following sites in Greece and Cyprus: Pylos, Tiryns, Mycenae, Athens, Lefkandi, Grotta, Phylakopi, Knossos, Mesa Moulana, Amathus, and Salamis. Additionally, Homer's Iliad and Odysseus and Hesiod's Theogony provide documentary evidence to accompany the archaeological material.

Karapandzich, Alina [274] see Kardulias, Paul Nick

Karavanic, Ivor and Antonela Barbir (Croatian Conservation Institute)**[304]** *An Integrative Approach to Cave, Open-Air and Underwater Mousterian Sites of Dalmatia (Croatia)*

Paleolithic sites situated in the Hrvatsko zagorje region of north-western Croatia (Krapina, Vindija) are well known because they contain important finds of fossil human remains associated with both faunal remains and lithic industry. However, in recent years, work on Mousterian sites in Dalmatia (south Croatia) has intensified. It focuses on three types of sites, (caves, open-air, and an underwater site) as well as on a systematic survey of the region. This poster briefly presents one of each type of the site in the light of new research and compares evidences from these sites. While the cave site of Mujina pećina has yielded both lithics and faunal remains in a stratigraphic context, lithics from the Karanušići open-air site and the Kaštel Štafilić—Resnik underwater site were mainly collected from the surface. Although surface finds lack stratigraphic information, they contain some general technological and typological data, damage patterns, as well as information on sphericity and roundness of finds. This integrative approach to mentioned sites allows a comparison between land sites and those now under water, providing better insight into formation processes, a more complete picture of the area occupied by the Mousterian people and a clearer insight into their mobility patterns.

Kardulias, Paul Nick (College of Wooster)**[274]** *Multi-faceted Anthropology: Recent Work of the Athienou Archaeological Project in Central Cyprus*

The Athienou Archaeological Project (AAP) has conducted multi-pronged investigations in central Cyprus over the past 27 years. The research has included excavation, survey, geophysical prospection, ethnoarchaeology, bioarchaeology, and cultural studies. The unifying thread in these endeavors has been a theoretical perspective that draws on Braudel's concern with the central role of the environment in the Mediterranean's historical development, world-systems analysis, and landscape archaeology. Field research has examined an Archaic to Early Roman rural sanctuary, a Roman to Venetian era village, and a funerary landscape with tombs (Archaic to Venetian) scattered throughout the valley. Ethnoarchaeological research has focused on a recent Turkish village, traditional agricultural practices and tools, current herding practices, local water systems, and ephemeral sites for the production of charcoal and bee-keeping. Our team has also examined the role of historic preservation in consolidating a local identity linked to restored buildings, and efforts to maintain traditional crafts, such as the manufacture of lace and production of cheese. As John White emphasized throughout his career, the holistic scope of anthropology is necessary to understand the multiple dimensions of life in the past and present. That approach has been a guiding principle for the work of the AAP.

[274] *Chair*

Kardulias, Paul Nick [185] see Karapandzich, Alina

Karkanas, Panagiotis (The Malcolm H. Weiner Laboratory for Archaeological Science, ASCSA), Sharon Stocker (Department of Classics, University of Cincinnati) and Jack Davis (Department of Classics, University of Cincinnati)**[298]** *Microstratigraphic and Geochemical Contributions to the Study of the Burial Practices and Taphonomy of the Mycenaean Shaft Grave of the 'Griffin Warrior', Pylos, Greece*

Results of a microstratigraphic and geochemical approach are presented here in reference to study of the Mycenaean 'Griffin Warrior' shaft grave at ancient Pylos. Soil and sediment micromorphology are used to address questions concerning the preparation of the tomb, the mode of corpse deposition, and taphonomy of the burial. Processes and activities such as the preparation and configuration of the floor and other earthen constructions inside the tomb are considered, as well as the rapidity of episodes of backfilling both through human and natural agency. Overall, a microcontextual approach has revealed a more complicated burial history than recognized by field observations alone. Furthermore, the identification of neoformed minerals and their chemistry has enabled the detection of degradation products of human body tissue and probably also that of some of the associated cultural objects. The genesis of these minerals reflects the sequence of the opening and filling of the tomb and their identification, therefore, contributes to a more informed reconstruction of the history of the burial. The discovery of such chemical traces has important implications for their future identification in graves and our ability to distinguish between primary and secondary burials.

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Karsten, Jordan [304] see Jenz, Trisha

Kasper, Kimberly [153] see Lane, Amanda

Kassabaum, Megan (University of Pennsylvania)

[295] *Mounds at the Margins: The Effect of Temporal Frontiers on Archaeological Interpretation*

The practice of building earthen mounds has tremendous time depth in the American South, and the variation in these monuments across time and space continues to spark debates regarding their functions and social significance. A great deal of attention has been focused on the shifting functions of mounds during Terminal Woodland / Emergent Mississippian times, when platform mound-and-plaza complexes become commonplace, corn agriculture becomes the norm, and higher levels of institutionalized status differentiation develop. In this paper, I define this transition as a “temporal frontier” and interrogate the effects of the period’s marginal position on its archaeological interpretation. In particular, I draw attention to the distorting effect of archaeology’s backward gaze in examining the changes that take place at temporal frontiers and advocate for a more forward-looking approach to the interpretation of these pivotal moments. My primary case study focuses on the Late Woodland Coles Creek culture (AD 700–1200) of the Lower Mississippi Valley and the interpretation of early platform mounds. Finally, I briefly consider how the concept of temporal frontiers may be used to better comprehend the archaeology of other transitional periods in United States prehistory.

Kassadjikova, Kalina (UC Santa Cruz), Kelly Harkins (UC Santa Cruz) and Lars Fehren-Schmitz (UC Santa Cruz)

[337b] *Ancestry and Heritage at a South Carolina Rice Plantation*

During the 18th and 19th centuries, Georgetown County in South Carolina housed some of the largest slave plantations and rice agriculture in the New World. Today, the descendants of these enslaved laborers form the Gullah Geechee community and comprise a distinct African-derived creolized cultural praxis. This study concerns itself with the long-term trajectory of biological and cultural change experienced by the individuals living in the South Carolina Lowcountry. First, ancient DNA extraction and sequencing methods, population genomic models, and bioinformatic tools are used to link a group of 19th C enslaved laborers from Hagley Plantation, Georgetown county to populations in west, central, and east Africa. Then, the genetic analysis is contextualized within the cultural and social systems of the ancestral populations and the particular colonial regime operating at Hagley. Using a biocultural approach, this study aims for a better understanding of lineages severed by the transatlantic slave trade, the formation of new kinship and social networks under slavery, and conceptions of ancestry and heritage.

Kassadjikova, Kalina [337b] see Schaffer, William

Kate, Emily (Pennsylvania State University), J. Heath Anderson (Minnesota State University, Mankato), Douglas J. Kennett (Pennsylvania State University) and John Krigbaum (University of Florida, Gainesville)

[48] *A Preliminary Study of Epiclassic Human Mobility at Cerro Magoni in Tula, Mexico Using Stable and Radiometric Isotope Analyses*

In this poster, we present preliminary mobility data for ten individuals recovered from the summit of Cerro Magoni, an Epiclassic (ca. AD 600–900) hilltop settlement in Tula, Mexico. For decades it has been hypothesized that the Tula area may have experienced an influx of immigrants from northwestern Mexico during the Epiclassic period, and that these newcomers played an important role in the rise Tula Grande. Results presented here provide an important step forward towards testing the long-held migration hypothesis. Analyses of modern and archaeological faunal remains were conducted to establish local baselines for oxygen ($\delta^{18}O$) and radiometric strontium ($87Sr/86Sr$) and lead ($20nPb/204Pb$) ratios for the Tula Grande region. These baseline values were then compared to human $\delta^{18}O$, $87Sr/86Sr$, and $20nPb/204Pb$ values, derived from the analysis of tooth enamel, to identify individuals who may have migrated to the Tula Valley during the Epiclassic. For all individuals included in this study, bioarchaeological, mortuary, AMS radiocarbon dating and stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) data previously assayed are included to contextualize these new data. These new mobility data, in conjunction with previous results, will provide further insight into the population patterns of the pre-Toltec Tula Valley.

Kathuria, Sheeji [189] see Peacock, Evan

Katz, Gregory

[202] *Digging the Anacostia River Landscape: Geoarchaeology and the Buried Past in the National Capital*

The historic Anacostia River valley was a focal point for settlement by local Native American populations as well as European Colonial and post-Colonial populations. However, the valley floor had low-topographic relief, large marshes, and soils prone to erosion, leading to many grand efforts of dredging and land reclamation. Flooding led to further raising of the landscape in the early 20th century, and to the deeper burial of archaeological sites. Fortunately, the Anacostia River valley was well-mapped in the 19th and 20th centuries, and 3D approaches to landscape visualization have recently allowed archaeologists to model the historic valley in the last half of the nineteenth century. Models of fill thickness have been generated and tested through geoarchaeological borings and trenches. While the effort is piecemeal and being refined, the landscape approach with GIS modeling has yielded encouraging results.

Katz, Jared (University of California, Riverside)

[118] *The Numerous Faces and Voices of Ancient Maya Instruments: A Typological Analysis of Ancient Maya Musical Artifacts Based on Physical and Tonal Attributes*

Over the past several years, the Maya Music Project has documented over 430 ancient Maya musical instruments. In addition to photographing all of the instruments, over 160 musical artifacts have been 3D scanned, and audio recordings were made of many of the artifacts. This paper will focus on the typological analysis of instruments based not only on their stylistic and technological attributes, but also on the tones the instruments are able to produce, as it is clear the artisans who created these instruments had a solid understanding of the manipulation of pitches. In particular, this paper will analyze several types of instruments, including specific categories of ocarinas, globular flutes, and rattles. Certain types of instruments were made more frequently than others, and this research attempts to understand the cultural significance of these categories of artifacts. This paper will also describe the use of digital experimental archaeology as a useful tool when attempting to understand the internal structure of instruments, as numerous instruments have been recreated digitally, and then 3D printed. The playable 3D prints sound very similar to the original artifacts, demonstrating the success of this experimental approach.

Kaufman, Brett [210] see Fenn, Thomas

Kay, Janet (Princeton University)

[23] *Migration, Monuments, and Memory in Fifth-Century Britain*

The fifth century in Britain is one of dramatic cultural, social, and economic change, transforming the late-Roman communal landscape into one dominated by Anglo-Saxon kingdoms. These changes have often been attributed to the collapse of the Roman Empire or the arrival of immigrants from the continent. This paper uses ArcGIS, isotopic studies, and multivariate statistics to investigate the relationship between where people came from, where they chose to bury their dead, and what they sent with them. My preliminary analysis of data from more than 9,000 burials in over 100 cemetery

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populations indicates that changes in burial practices were the result of a larger shift from a society based upon Britain's relationship with the Roman Empire to one based upon its local communities, whether composed of natives, or newcomers, or both. No matter where people came from, no two communities reacted to the upheaval of the fifth century in the same way, and there were no monolithic or universal ways of relating the past to the present and future. New practices appeared, and old practices continued, some of which were better suited to some fifth-century inhabitants of Britain than others.

Kay, Marvin (University of Arkansas)

[122] *Ashes to Ashes, Dust to Dust in Caddoan Mortuary Ritual*

Sediment of varied textures and colors, ash among them, is highlighted from deliberately burnt Harlan-style charnel houses. These were erected in sub-mound pits. In one rendition that followed an earlier house burning, light gray ash alternates in the superior, or upward, position with the black charcoal layer of a collapsed burnt thatch and cane roof. The ash was levelled as a platform. This completed a mortuary cycle linked lineally to subsequent pyramidal mound construction. In other cases this dichotomy is retained as small marker mounds of dense black clay beneath light gray ash, as charnel pits and prepared flattop mound surfaces. Fire smoke and ash likely signified the passage of souls to the upper world, of life resurrected from death; whereas the black under layer was a metaphor of death.

Kaya, Deniz (University of Notre Dame)

[29] *Burning the House: The Importance of Excavation Methods in the Study of Space and Place in the Neolithic Household. A Case Study from Neolithic Bulgaria (6500–600 BC)*

The importance of understanding the use of space and the distribution of places in the household in the prehistoric setting has been recognized by the anthropological community. Unfortunately the archaeological context often does not always favor such inquiries, especially in the prehistoric setting. Thus, the extraction of information needed to make claims on how different societies distributed living areas in the house and in the greater village, cannot always be examined in detail. For the purpose of this paper, I will examine how the sites of the Early Neolithic (6500–6000 BC) villages of sites such as Slatina and Mursalevo in Bulgaria can contribute greatly to these questions. The ritual burning of the houses from these communities, and the particularities the excavation of these houses require can contribute greatly to how archaeologists approach the first step of data collecting: excavating. I will argue that the particularities in excavation methodology are the most important step in understanding what the house was like and what role it had in prehistoric people's lives.

[29] *Chair*

Kealhofer, Lisa [175] see Heng, Piphal

Kearney, Amanda [180] see Steelman, Karen

Kebler, Anna (University of Central Florida), Michael Callaghan (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)

[37] *Chemical Composition of Maya Slips: Analysis and Interpretation of Preclassic Sherds from Holtun, Guatemala Using pXRF Technology*

Slip, a fluid suspension of clay that is applied to the surface of a piece of ceramic, allows for increased control over the functional and aesthetic properties of the finished vessel. The potter can select a slip to provide a more appealing color, texture, and/or luster to the vessel's surface, while maintaining the favorable functional qualities of the paste. While slip color has long been used as an attribute for classification in the Maya lowlands, only recently have the raw materials of slips been used to inform studies of production and exchange, with much of this work using Late and Terminal Classic period ceramics. This paper presents the results of portable x-ray fluorescence (pXRF) analysis of the chemical composition of red, cream, and black slips on Preclassic ceramic sherds excavated in 2017 from Holtun, Guatemala. Variation, or lack thereof, in the chemical composition of the three colors of slip can suggest change in ceramic production, exchange, and differential access to pottery throughout the site. This research tests the utility of pXRF on slip and also informs models of Preclassic period ceramic production and exchange.

Keckler-Alexander, Kristin

[281] *Moderator*

Keegan, William (Florida Museum of Natural History)

[323] *Discussant*

Keene, Joshua (CSFA, Texas A&M University), Tyler Laughlin (Texas A&M University, CSFA) and Michael Waters (Texas A&M University, CSFA)

[8] *Archaeological Investigations of the Archaic and Paleoindian Occupations at Hall's Cave, Texas*

Hall's Cave is a well-studied paleontological site that has provided a detailed climatic record for the Texas Hill-country from the late Pleistocene through the Holocene. There have been no discussions, however, of the archaeological record of the cave deposits. Archaeological excavations at Hall's Cave conducted in 2017 revealed a 3 m thick, well-stratified sequence of sediments derived from the watershed outside the cave. Early deposits ranging from 18,000 to 14,000 cal yr B.P. contain the remains of horse, *Bison antiquus*, saber-toothed cat, and other species in well dated contexts. The archaeological record includes a burned rock midden, twenty hearths, projectile points, stone tools, and flakes that range from late Paleoindian to late Archaic. The hearths represent mostly short-term occupation episodes and the macrobotanical remains they contain provide a unique opportunity to understand diachronic subsistence and environmental changes for the region.

Keene, Joshua [103] see Carlson, David

Kegerise, Cory (PA Historical and Museum Commission)

[204] *Mind the Gap: Laws and Policies Related to Burial Places in Pennsylvania*

Pennsylvania has a long history of human occupation and an array of community types and settlement patterns ranging from large cities to sparsely populated rural communities. This geographic and cultural diversity resulted in varying burial practices including small family plots in farm fields, religious burial grounds, as well as private and publicly-owned cemeteries. As the state grew and changed throughout the 19th and early 20th centuries, the legislature enacted or revised laws affecting burial places and human remains in a piecemeal fashion, likely in response to specific projects and circumstances. This legal framework has not been substantially changed since the mid-20th century, leaving policy gaps that recent projects have exposed. Chief among these issues is how privately-owned, unmarked burial places are treated legally and ethically when remains are discovered, often during development activity. This session will explain the legal and policy environment for burial places in Pennsylvania as context for the 218 Arch St. project in Philadelphia.

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Kehoe, Alice**[42]** *The Postcolonial Imperative*

Formal dissolution of European empires following WW II, as they transformed into transnational financial powers, allowed subaltern standpoints and “traditional knowledge” (TEK) to be voiced. American archaeology shifted into CRM becoming the dominant field, reflecting in part the rise of tourism as a principal global industry, with local histories a selling tool. Then NAGPRA put American archaeology into a postcolonial position. While much of NAGPRA negotiations still falls into colonialist discourse, and paternalism still rules the BIA, a postcolonial standpoint is basic: there is no “prehistory,” every community has its history and archaeologists’ work must pay attention to those histories and knowledge—a rapprochement between Enlightenment universalist premises underlying “science,” and foundational premises held by non-Western nations. A postcolonial standpoint will conflict with academics’ high valuation of Theory, which in its universalist pretensions remains colonialist discourse. For some of us, “archaeologies of listening” describes our postcolonialist approach; working with ethnohistorians is an allied postcolonial approach. The ground is shifting, like tectonic plates uplifting ranges of TEK.

Kehoe, Michael K. [67] see Ludlow, Mark

Keith, Matthew [78] see Evans, Amanda

Kelleher, Deirdre (Temple University)**[296]** *Unearthing the Material Culture of Nineteenth-Century Irish Immigrants in the “City of Homes”: A Case Study from Elfreth’s Alley, Philadelphia, Pennsylvania*

In contrast to many other American cities, which developed distinctive ethnic neighborhoods during the nineteenth century, Philadelphia’s European immigrant populations were largely dispersed throughout the city during this period. Irish immigrants lived in every ward of Philadelphia as newcomers from various European countries settled along alleyways and courtyards throughout the city. Using Elfreth’s Alley National Historic Landmark as a case study, this paper argues that the dispersion, intermingling, and lack of segregation between immigrant groups in Philadelphia had implications for how newcomers navigated daily life and how the material culture they left behind can be interpreted as representations of material identity. A diverse population of European immigrants shared living spaces along Elfreth’s Alley during the nineteenth century, including residents from Ireland, Germany, England, Spain, Russia, the Czech Republic, and more. Archaeological investigations at two properties along the Alley did not unearth artifacts discretely linked to “Irishness,” rather an examination of the material culture of the built environment revealed common features across domestic spaces shared by immigrants from different ethnic backgrounds. The findings at Elfreth’s Alley highlight some of the challenges and limitations of uncovering material demonstrations of ethnic identity in densely populated urban contexts.

Keller, Angela (Statistical Research, Inc.)**[129]** *The View from Below: Plaza Spaces at Actuncan, Belize*

Formal plazas constitute the majority of public space in Maya centers and yet, until quite recently, plazas have not received the same investigative attention as the impressive pyramids and palaces that surround them. This neglect is largely due to the difficulty of investigating public plazas, which typically contain few artifactual or structural indications of their ancient use. Although the identification of activity in ancient plazas is technically challenging, a dedicated investigation of plazas is nonetheless essential to our understanding of how centers functioned in Maya society. Public plazas were the venues for the bulk of a center’s daily activities from ritual, dance, and sacrifice, to market trade and the settling of disputes. This paper presents the results of two seasons of plaza-focused fieldwork at the site of Actuncan, Belize combining rapid systematic data collection, soil chemistry analysis, macro- and micro-artifact analysis, remote sensing, and targeted excavations. This research program has allowed us to detect subtle patterns that may reflect distinctive past practices in the plazas of Actuncan.

Keller, Hannah (University of Colorado, Denver) and Naomi E. Cleghorn (University of Texas at Arlington)**[99]** *The Fauna of KEH-1 (South Africa) A Middle and Later Stone Age Site: A Pilot Study*

Knysna Eastern Heads Cave 1 (KEH-1) demonstrates an intense occupation sequence at a site overlooking the now sub-merged Agulhas Bank during multiple ocean progressions and regressions in the late Middle Stone Age and early Later Stone Age (46,000 to 18,000 Cal BP). The site contains numerous hearth features, densely stacked within the stratigraphic section, and has yielded large amounts of fauna. Here we report for the first time on the preliminary taphonomic analysis of the fauna, based on a sample of 1,142 specimens recovered from all major stratigraphic units. Nearly all KEH-1 faunal specimens are fragmented. Thus, an initial analytical goal was to assess the nature of this fragmentation and determine the extent to which it reflects nutrient processing rather than post depositional damage. In addition, 326 faunal specimens were chosen from throughout the stratigraphic sequence to provide a preliminary assessment of size classes represented, processing intensity, and post-depositional alteration. Our results suggest that the high rate of fragmentation is due to human processing of a wide range of prey size classes. Continued analysis of the KEH-1 fauna has the potential to elucidate the subsistence strategies of foragers in an extinct ecosystem across a critical shift in stone tool technology.

Kellett, Lucas (University of Maine at Farmington)**[207]** *The Formation of Agro-pastoral Communities in the Chanka Heartland (Andahuaylas, Peru)*

This paper examines how Late Intermediate Period or Chanka phase (~AD 1000–1400) communities were formed during a period of overlapping social and environmental risks in the Chanka heartland of Andahuaylas. In particular, the paper considers how aggregated hilltop communities formed and functioned under new social and economic conditions. Recent archaeological research from Andahuaylas suggests that the majority of aggregated Chanka phase ridgetop sites were likely inhabited by neither specialized agriculturalists nor camelid pastoralists, but rather populations which identified as agro-pastoralists. The paper suggests that threats of attacks by neighboring populations and climate induced economic risk, may have tethered populations to smaller localized territories which encouraged more fluid socio-political-cultural identities. The author argues that hilltop communities in Andahuaylas may have witnessed a shift to a more integrated and inclusive socio-ethnic identity rooted in an agro-pastoral subsistence economy. Finally, this paper challenges an oversimplified dichotomy and social division among traditional Andean agriculturalists and pastoralists, and argues that conceptions of community and ayllu require a more nuanced and flexible understanding, especially during times of heightened risk.

[207] *Chair***Kelley, Alice R.****[135]** *Burning Libraries and Drowning Archives: Shell Middens on the Maine Coast*

Climate change impacts on archaeological sites are equated with the burning of the great library of Alexandria for the scale and rapidity of the loss of cultural and paleoenvironmental data (McGovern, 2016). A portion of that destruction is often in the form of sea-level rise exacerbated coastal erosion. While threatened historic sites, such as lighthouses, generate support for remediation and even relocation, coastal aboriginal sites holding records of thousands of years of coastal occupation and scientific data are damaged and disappear each year. In Maine, over 2,000 shell middens are located on the mainland and island coast. Virtually all are eroding, and some have disappeared in the decades since identification. This presentation is a progress report on our successful efforts to develop a technique to use Ground-Penetrating Radar (GPR) as a rapid, non-invasive method to delineate the areal

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and vertical extent of Maine's eroding coastal shell middens to inform cultural management decisions. Additionally, we report on the early stages of building a citizen science network to undertake rescue excavations and monitor conditions and erosion rates at sites throughout the year.

[84] *Discussant*

[84] *Chair*

Kelley, Alice R. [84] see Miller, Jacquelynn

Kellner, Corina [25] see Perez Rodriguez, Veronica

Kelly, John (Washington University)

[215] *Space and Place in Mississippian Societies; Lynne Goldstein's Impact on the Study of Aztalan and Cahokia Landscapes*

Lynne Goldstein's contribution to our understanding of Mississippian societies in the Midwest is still an ongoing endeavor. Her research with its roots in the greater Cahokia area and within a few years at Aztalan has an important impact on my own efforts. Her dissertation research into the Mississippian cemeteries, Schild and Moss, was methodologically rigorous and provided insights into the manner in which non-elite cemeteries some 100 km north of Cahokia were spatially and socially configured. While at the University of Wisconsin-Milwaukee Lynne began a systematic study of Aztalan and the broader landscape of the Crawfish river, one of the first efforts employing GIS in the Midwest. Her work within Aztalan examined numerous aspects relating to the site's spatial organization especially the details of a unique landscape configuration known as sculpturery. This presentation focuses not only on the context of these contributions but also the impact of her scholarship on my understanding of Cahokia's broader landscape.

Kelly, Robert L. [105] see Robinson, Erick

Kelly, Sophia (Arizona State University), Andrew Landsman and Justin Ebersole

[202] *Implementing the NPS Cultural Resources Climate Change Strategy at the Chesapeake and Ohio Canal National Historical Park*

As a park characterized by a man-made watercourse adjacent to a river, the Chesapeake and Ohio Canal National Historical Park is uniquely situated to address the increasing impacts of climate-related flood events on cultural resources. This analysis presents a preliminary vulnerability matrix for cultural resources on the park, which include historic structures and features, historic and prehistoric archaeological sites, and canal infrastructure. We discuss how hazards posed by flooding affect the preservation and maintenance of these resources, and suggest possible management directions to prioritize cultural resource adaptation projects with respect to the four pillars of climate change response: science, adaptation, mitigation, and communication.

Kemp, Leonard [153] see Mauldin, Raymond

Kendell, Ashley (California State University, Chico) and Colleen Milligan (California State University, Chico)

[179] *Resurrectionists, Criminals, and the Unclaimed: Social Context of Cadavers in the 19th Century*

Cadavers have been used to study anatomy and practice anatomical dissection for over 2,000 years. For most of this time, the use of cadavers was neither ethical, nor legal. In U.S. medical study today, most cadavers come from body donation programs largely resulting from the Uniform Anatomical Gift Act (UAGA), first proposed in 1968. The UAGA followed a change in social context of cadavers. It introduced the body as property and provided individuals the right to donate their body following death. Before the mid-1900s, the lack of legal avenues for the acquisition of cadavers led to the 18th century practice of grave robbing. In the U.S., "Resurrectionists" exhumed and sold recently buried bodies to anatomists. To stop grave robbing, anatomy acts were introduced in the late 18th/early 19th century. Governed at the state level, these laws outlined which bodies could be obtained legally for use as cadavers. Most laws allowed the bodies of criminals, suicides, indigent, or unclaimed individuals to be used as cadavers. The Point San Jose collection offers an opportunity to understand the social context of anatomy laws during the 19th century and identify those people used in anatomical studies.

Kendrick, Brianna [38] see Cromwell, Richard-Patrick

Kennedy, Jason (Central Michigan University), Bradley Parker (University of Utah) and Matt Edwards (SWCA Environmental Consultants)

[211] *Plow Zone Archaeology in a Wari Imperial Center*

The immense size of most Wari Imperial administrative centers has limited the breadth of our understanding of the social, political, ritual and economic activities that may have occurred within these large rectilinear compounds. In order to address these limitations, the 2017 Nasca Headwaters Archaeological Project excavation season at Incawasi attempted to apply a more traditionally North American methodology to six 50x50 meter Wari patio groups in order to draw broad conclusions about the scope of activities at the site. A total of 457 shovel test pits were excavated in a 5x5 meter grid across the site. Incawasi has been heavily damaged by modern cultivation; however, experimental studies have shown that while plowing destroys the stratigraphy at a site the vertical and horizontal movement of artifacts is limited. The implications of this for Incawasi are that shovel test pits provide an ideal methodology to create large area, low-resolution data to understand the activities undertaken within these patio groups. This paper presents the spatial analysis of the finds from the 2017 season at Incawasi in order to highlight the functional use of space in a Wari administrative compound in the Upper Nasca River Valley.

Kennedy, Jennifer (Central Michigan University) and D. Andrew Merriwether (Binghamton University, SUNY)

[88] *Inferences about Class Structure from Burial Form and Mitochondrial DNA Relationships at Tall Šēḥ Ḥamad, Syria*

The Roman/Parthian period (200 BCE—300 CE) at the site of Tall Šēḥ Ḥamad, Syria existed during a period in the region characterized by political instability and military movement. This "borderland," existing at the extremities of both empires, created a unique sphere of potential interactions both on the individual level and broader scale. A cemetery from this period shows four distinct burial forms (mud-brick graves, earthen graves, amphora graves and clay sarcophagi). In an effort to better understand the site of Tall Šēḥ Ḥamad this study presents thirty nine molecular profiles of individuals from the Roman/Parthian period at Tall Šēḥ Ḥamad in conjunction with archaeological mortuary evidence to determine how individuals may be related to one another, how matrilineal relationships may relate to burial form as well as potential regional interactions. Genetic results indicate a relatively homogenous population with no evidence of a recent influx of new mitochondrial haplotypes during the period under consideration despite the political disruption in the region. Genetic distances between individuals in different burial forms, however, indicate a socio-economic distinction that influenced the ways in which related individuals were buried.

Kennedy, Sarah (University of Pittsburgh)

[240] *Life in a Colonial Mining Camp: Reconstructing Power and Identity in a Colonial Context (Puno, Peru)*

Mineral mining was a critical driver of the Peruvian economy during the early colonial period (AD 1550—1700). Peru's mineral wealth was used to fund the Spanish empire's geopolitical domination, often at the expense of indigenous Peruvians. Many were forced to labor in distant mines and work

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camp, decimating local communities. The south-central highlands of Peru were an especially rich area for mineral exploitation and mines, work camps, and processing mills have been identified throughout the Northern Lake Titicaca Basin. Despite being a major center for colonial mining, no archaeological research to date has been conducted in the region. This poster presents preliminary mapping and surface survey data from multiple colonial silver processing sites (often called ingenios or trapiches) located 10 km southwest of Puno. These sites exhibit a variety of indigenous and Spanish architectural forms and spatial patterns. Spatial analysis techniques are applied to compare the spatial layout of domestic buildings, work zones, and communal areas at each site, noting differential levels of accessibility and visibility. Analysis reveals how social inequality, restricted and controlled access, and difficult living conditions were part of everyday social life for indigenous miners and laborers at these sites.

Kennedy, Sarah [190] see Smith, Ryan

Kennedy Richardson, Karimah (Autry—Historic Southwest Museum—UCR)

[306] *A Forensic investigation of the Ralph Glidden Human Remains Collection of the Catalina Island Museum*

Members of the Gabrielino/Tongva community always felt that the Ralph Glidden Collection within the Catalina Island museum required a forensic style of investigation. Although they may have been discussing the entire collection, it is definitely applies to the human remains collections. The Catalina Island Museum human remains collection that was recently repatriated had received limited analysis. A few scholars incorporated the collection into larger discussions about the Gabrielino and Chumash cultural communities. Decker (1970) and Wlodarski (1978), summarized aspects of Glidden's collection, but an update regarding the overall understanding about the people represented in the collection are long overdue. Many assumptions have been made about what cultures are represented in the overall Catalina Island Museum human remains Collection. This poster is an opportunity to provide a comprehensive biological profile and a comprehensive osteological analysis of the people that Ralph Glidden and others excavated, that was performed during NAGPRA and in collaborative efforts with tribal communities.

[191] *Discussant*

Kennett, Douglas J. [48] see Kate, Emily

Kerchusky, Sarah [165] see Vaughn, Kevin

Kersel, Morag (DePaul University)

[138] *Curatorial Cures: Storage, Partage, and the Colonial*

The crisis in the curation of materials generated as a result of excavation and survey is one of the most pressing issues facing the discipline. Storage is of constant concern as questions of how to store materials, where to store materials, and how long to store these items confront archaeologists and license/permit-granting agencies around the globe. This is an examination of an innovative approach to solving the curation crisis of Early Bronze Age ceramic vessels from the Dead Sea Plain in Jordan. After the untimely death of the excavator, thousands of pots excavated at Bab adh-Dhra' in the 1960s remained in museum storerooms, unstudied, unviewed, and unloved. Archival, collections-based, and ethnographic research revealed a scheme (devised by the Jordanian Government and representatives of the American Schools of Oriental Research [ASOR]—the excavation sponsors) to distribute the tomb groups to ASOR member institutions. Twenty-four educational institutions throughout Australia, Canada, and the United States received tomb groups for research, study, and display. This creative solution to the burgeoning storage problem in Jordan resulted in the curation of threatened collections, educational access and display of archaeological material, and "artifacts acting as ambassadors on behalf of Jordan".

[280] *Discussant*

Kerwin, Ruby (Arizona State University)

[307] *The Development of Hydroelectric Power over Ancestral Land in Chilean Patagonia*

Chile is largely reliant on fossil fuels for energy and is working to transition to more renewable energy sources, specifically hydroelectric power. As part of this initiative, the state is proposing the construction of five hydropower dams in southern Chile. In this paper, we analyze the potential impact of this project on the ancestral land of the Mapuche. The Mapuche have been resisting the modern Chilean state's approach to water and power and are fighting for land rights and the preservation of their culture and archaeological history. Using geographic information systems analyses we identify which areas of ancestral lands would be flooded, including threatened archaeological and historical sites. We frame the conflict between the modern state and the Mapuche with personal interviews and literature analysis.

[307] *Chair*

Kerwin, Ruby [307] see Lane, Rachael

Kessler, Nicholas (University of Arizona)

[325] *Carbon Legacies of Dryland Agricultural Features in the Ancient Southwest*

This paper presents the results of a meta-analysis of soil organic carbon measurements associated with pre-Columbian dryland agricultural fields in the southwestern U.S. and northwestern Mexico. In aggregate, rock alignments and terraces are associated with significantly higher organic carbon concentrations, and this effect is pronounced in sandy parent material. The results support a hypothesis that resource conserving features constructed by indigenous farmers continue to influence the ecology of drylands by enhancing plant productivity in the most water limited settings.

Khalaf, Nadia (University of Exeter, UK)

[210] *Archaeological Survey and Geographical Information Systems (GIS) in African Archaeology: Perspectives from the Niger Valley, Benin*

The Niger River Valley in the north of the Republic of Benin, West Africa, has abundant archaeology that until recently has been under researched. During a systematic field survey carried out for my doctoral research as part of the European Research Council-funded Crossroads of Empires project led by Prof Anne Haour, over 300 new archaeological sites were discovered and 50,000 material culture objects recorded. This paper will discuss the methodology used to systematically survey the landscape of this region using field walking and satellite imagery and how the results were integrated within a GIS, creating the most archaeologically comprehensive map of the area ever made. The preliminary results of this research demonstrate that settlement favoured areas close to perennial and ephemeral fluvial systems. Furthermore, the spatial distribution of the sites discovered displayed strong evidence of spatial clustering, which has been shown in other West African contexts to be indicative of early urbanisation—however this may also be evidence of the slow destruction and segmentation of mounded sites.

Khalsa, Sant Mukh (CUNY Graduate Center)

[167] *Of Fish and Plague: Death as Economic Opportunity at the Medieval Fishing Station of Gufuskálar, Iceland*

The high morbidity (50% or greater) of Iceland's Black Death in 1404 C.E. disrupted a rigidly hierarchical Icelandic social order and led to an inability to enforce social and legal constraints on Iceland's labor classes. This newly untethered and mobile lower class searched for avenues for wealth creation previously unavailable. One avenue, in the century following Iceland's Black Death, was through fishing and fish exports. During this period, previously tightly restricted fish exports flourished in trade between European merchants and numerous fishing and trading sites around Iceland's coast. The 15th

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century fishing station of Gufuskálar on the northern coast of Iceland's Snæfellsnes peninsula demonstrates large and anomalous concentrations of wealth and European trade goods. The site also has evidence of increasingly specialized marine resource utilization. Whether Gufuskálar's resident fishermen were Icelandic or European, it is likely that this concentration of wealth was only possible through the temporary breakdown in Icelandic social hierarchy. Based on the zooarchaeological and preliminary artifactual data, this paper explores how social upheaval following Iceland's Black Death is connected to intensive preindustrial fishing and a late medieval European dependence on Icelandic marine resources.

Khatchadourian, Lori (Cornell University)**[181] Soviet Materiality and Its Ruins**

To borrow Yuri Slezkine's formulation, "the Soviet Union was an empire—in the sense of being very big, bad, asymmetrical, hierarchical, heterogeneous, and doomed". In this it differed little from the early empires that have long held archaeology's attention. But unlike its precursors, the U.S.S.R. was guided by a political ideology premised vigorously on the relationship between humans and things—between labor, the non-human inputs of production, and property. Imperial sovereignty rested on profound material dependencies that stitched the multiethnic "federation" together, while the individual Soviet subject was forged out of the proverbial hammer and sickle. As with all empires, the promised utopia never arrived, and the Marxist-Leninist "mattering" of politics came at a terrible human and environmental cost. The doom of this bold endeavor is palpable today in the physical ruins of Soviet socialism, which haunt the archaeological record of the contemporary past across Eurasia. Based on preliminary survey, ethnography, and archival research, this paper represents a foray into Soviet materiality and its afterlife, taking as its touchstone the former Soviet republic of Armenia and the industrial ruins that litter its urban and rural landscapes. What is to be done with imperial debris?

Khazraee, Emad [71] see Soroush, Mehrnoush

Khreisheh, Nada [227] see Stout, Dietrich

Kidder, Barry (University of Kentucky), Jacob Welch (Yale University), Scott Hutson (University of Kentucky) and Shannon Plank (University of Kentucky)**[162] *Us and Them: Regional Integration and Social Differentiation during the Terminal Preclassic at Ucanha, Yucatán, Mexico***

Often overshadowed by the splendor of massive monumentality to the south, Late Preclassic life in the Northern Maya Lowlands is a period of material and social experimentation, a balancing act between emerging social differentiation and an ideology of communal integration. During the latter half of this period, the secondary site of Ucanha in Yucatán was physically integrated into a micropolis via an 18-km long sacbe and experienced the creation of integrative civic spaces, a population apogee, and an influx of ceramic heterogeneity. Unlike the more rigid and historically ingrained materialization of social differentiation seen in the Late Classic, the material components of distinction during this time were more fluid, in general, and more ambiguous during and after this process of larger regional integration. The presence of possible extrahousehold feasting at a relatively isolated, larger domestic platform, an elite residence covered in stucco with iconography indicating governance and/or economic distinction, and various ceramic forms and aesthetic embellishments highlight emerging new materialities of differentiation. With an apparent depopulation by the Early Classic, it is likely these new expressions favored social inequality over communal cohesion.

Kidder, Tristram (Washington University) and Yijie Zhuang (Institute of Archaeology, University College, London)**[161] *The Tangled Roots of the Anthropocene: China from the Late Neolithic to the Song Dynasty***

The Anthropocene is now commonly defined as a geological event, or "golden spike" that begins in the later twentieth century with the detonation of nuclear weapons. While this event-based characterization serves a useful purpose in providing a formal geological definition, it tells us nothing of how humans developed the social, economic, technological, and moral capacities that allow us to affect natural processes at a global scale. Using archaeological and environmental data from China between the late Neolithic (ca. 5000 years ago) and the Song Dynasty (ca. 1000 years ago) we explore how the Anthropocene can be conceived as a process that developed slowly over time and that was conditioned by changing human interactions with the environment that were an outgrowth of shifting social, political and even religious practices and behaviors. This approach emphasizes that the Anthropocene is not the inevitable outcome of human technological progress but is, instead, the result of long-term transformations of human engagements with power, wealth and production.

[336] *Discussant*

Kidder, Tristram [291] see Grooms, Seth

Kidwell, Jasmine [222] see Waggle, Tawnya

Kieffer, C. L. (Museum of Indian Arts and Culture, University of New Mexico)**[267] *Exploring the Use of Multispectral Imaging in Ceramic Pigment Analysis***

Multispectral imaging cameras are frequently used in art conservation for identifying pigments as well as monitoring change in pigments over time. Multispectral cameras take multiple images at 370nm, 448nm, 476nm, 499nm, 519nm, 598nm, 636nm, 700nm, 735nm, 780nm, 870, and 940nm wavelengths with UV bandpass, visible bandpass, and long pass filters to increase the range of captured information to include UV reflectance and fluorescence emission images. This poster explores the ability to utilize this non-destructive technique to analyze variability of pigment recipes within ceramic types and between types. Mineral and organic black pigments from five Black-on-white ceramic types (Jemez, Cortex, Chuska, Red Mesa, and Abiquiu) from the American Southwest were used for comparative purposes. Pigment and reflectance values acquired from images via Image J software were compared both within types and between types with one-way ANOVA analysis. Results show varying levels of significant statistical difference between types and minimal difference within types.

Kieffer, C. L. [15] see Crews, Christopher

Kienon-Kabore, Timpoko Hélène (University of Félix Houphouët-Boigny of Cocody) and Vincent Serneels (University of Fribourg)**[32] *La Métallurgie Ancienne du Fer de la Zone 4000 de Siola (Kaniasso, Zone d'Odiénne, Nord-ouest de la Côte D'Ivoire)***

Près de Kaniasso dans la zone d'Odiénne, sur les sites de Siola, zones 1000 et 2000, et Doumbala, une séquence chrono-technologique en trois phases a été mise en évidence, caractérisées par trois traditions techniques différentes: KAN 1 (1300—1450 AD), KAN 2 (1450—1650 AD) et KAN 3 (1650—1900 AD). Des vestiges présentant de grandes similitudes ont été identifiés sur de nombreux sites dans la région.

Par contre, le site de la zone 4000 de Siola, dont l'étude sur le terrain a été reprise en 2015, présente un faciès complètement différent, la tradition technique KAN 4. Le site occupe une superficie de l'ordre de 2 km² et comporte environ 200 amas de scories, des enclos et des murets. On note aussi la présence d'un abondant mobilier domestique. L'organisation spatiale des amas de scories, l'architecture des fourneaux en fosse complètement ensevelis sous terre et la nature des déchets métallurgiques, se distinguent clairement des vestiges reconnus ailleurs. Les tuyères présentent de curieuses perforations latérales, une particularité inconnue par ailleurs.

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Mots clés : Côte d'Ivoire—Métallurgie du fer—Fourneaux—Amas de scories.

Kilby, David (Texas State University) and Marcus Hamilton

[127] *New Investigations at Bonfire Shelter: A Consideration of Bison Jumps and Their Implications for Paleoindian Social Organization*
Bonfire Shelter (41VV218) is a nationally significant site in the Lower Pecos region of the West Texas borderlands that preserves evidence of what may be the oldest and southernmost "bison jump" in North America. At least two major episodes of bison hunting are evident at Bonfire Shelter, one associated with Paleoindian Plainview and Folsom projectile points, and another associated with Late Archaic Castroville and Montell points. The approximately 12,000-year-old layers comprising Bonebed 2 appear to represent a singular example of this hunting technique in these early time periods, and are the subject of recent debate. There is disagreement as to whether one or as many as three hunting events are represented in Bonebed 2, and as to whether or not they truly represent bison jumps. This paper reports the results of renewed field investigations into the timing, context, and cultural associations of both bone beds at Bonfire Shelter carried out by the Ancient Southwest Texas Project at Texas State University.

The paper then considers the interpretation of these archaeofaunal deposits as bison jumps, and the implications of those interpretations for Late Pleistocene hunter-gatherer social organization in the Lower Pecos and the larger Southern Plains region.

Kilgore, Gertrude (Texas Tech University), Claire Novotny (Kenyon College) and Alyssa Farmer (University of Kentucky)

[157] *Domestic Activity Areas in a Late Classic Residential Courtyard Group at Chan Chich, Belize*
Households represent a foundational element of any society. The everyday activities that occur within domestic spaces construct and reinforce the social, economic, and political framework upon which societies are built. The 2017 field season of the Chan Chich Archaeological Project saw the first explicit study of domesticity and everyday life at the ancient Maya site of Chan Chich with investigations of final phase domestic activity areas in Courtyard D-4. This Late Classic residential group consisted of three structures centered around a shared courtyard space approximately 550 m east of the Main Plaza. We analyzed the use of structural, courtyard, and extramural spaces by using multiple lines of evidence from multi-elemental analysis of plaster samples and artifactual and architectural data. Analyzing these categories of evidence associated with three different contexts allowed us to reconstruct domestic activity areas at different phases of everyday life: the production, consumption, and disposal of household objects. This research contributes some of the first information about the functional and sociocultural relationship between domestic spaces, activities, and individuals at Chan Chich.

Killebrew, Ann [90] see Greenfield, Haskel

Killgrove, Kristina (University of West Florida)

[61] *Discussant*

Killick, David [242] see Stephens, Jay

Killion, Thomas (Wayne State University)

[254] *Gardens, Infields and Outfields: Cultivation Intensity, Neotropical Landscapes and the Evolution of Early Agricultural Systems*
Plant cultivation in and around residential locations and at greater distances from settlements are options early cultivators employed, supplemented by wild resources, to meet subsistence needs. The mix of plants, soils and cultivation practices varied by environment, distribution of resources, population density and other factors. This paper examines the role of gardens over the long transition from hunting and gathering to agriculture in tropical lowland environments. Ethnographic data, derived from a sample of neotropical contexts, are used to evaluate some of the earliest evidence (micro- and macrobotanical, isotopic and archaeological) for maize and other crops in lowland Mesoamerica.

Kim, Lynn (University of Texas at San Antonio) and Andrea Goytia (Universidad San Andres Bolivia)

[132] *A Colonial Space in the Camata-Carijana Valley: A Review of the Tambo, Maukallajta*
The Camata-Carijana Valley is situated on the eastern frontier of the Inka Empire in the Kallawayaya domain. Ethnohistorical accounts state the valley was occupied by the Kallawayaya and Chuncho groups from the tropical piedmont (Saignes 1984, 1985; Steward 1948). Therefore, the Camata-Carijana Valley offers the opportunity to study Inka, Kallawayaya, and Chuncho entanglements through time. This paper focuses on the site of, Maukallajta, in the Camata-Carijana Valley. Also known as Pueblo Viejo, Maukallajta was an Inka tambo. It was likely established to promote trade with other groups (Alconini 2012; Capriles Flores and Herrero 2006). More specifically, the research explores how the impact of Inka imperialism affected the architectural patterns of Maukallajta. Therefore, the location, organization, and architecture of Maukallajta will be analyzed to understand its nature and purpose (Moore 1992, 2011; Pozorski and Moore 1997). Terraces and roads associated with the site will also be examined. Maukallajta is just one colonial space in the Camata-Carijana landscape in eastern Bolivia. Other settlements, pre-Hispanic roads, and agrarian terraces are discussed to provide a regional perspective and to explore the relative impact of Inka imperial processes in the Camata-Carijana Valley.

Kim, Yong Jun (Seoul National University College of Medicine, Seoul, South Korea), Nilesh Jadhav (Dept. of Archaeology, Deccan College PGRI, Pune, In), Eun Jin Woo (Dept. of Oral Biology, Yonsei Univ, Seoul, South Korea), Dong Hoon Shin (Seoul National University College of Medicine) and Vasant Shinde (Dept. of Archaeology, Deccan College PGRI, Pune, In)

[56] *Harappan Necropolis of Rakhigarhi, India: Archaeology and Bioanthropology*
The number of Harappan cemeteries so far systematically surveyed is far less than that of contemporary settlements. Necropolis site at Rakhigarhi (India) was reported earlier but in small scale investigation. Our investigation for the last three seasons (2013 to 2016) was thus designed for improving this lacuna. We first classified each burial and analyzed statistically. The Harappan people practiced rather humble burial custom, but few were found differently and these burials look more socio-economically affordable than those found in typical burials. The health condition during life-time of the buried looks healthy according to bioanthropological investigation. Prone positioned burial is interesting since it was not as deviant cases. Rather, they would have held relatively higher social and ritual position in Rakhigarhi society according to anthropological and archaeological context. Collaborative work was designed for better investigation on the Harappan people's life and mortuary customs. We applied to systematic osteoarchaeological field methods, bioanthropological lab-analysis and other innovative methods. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2017R1D1A1B03030127) and National Geographic Foundation for Science and Exploration—Asia (Asia-21–15). Please contact DHS (cuteminjae@gmail.com) or VS (vshinde.dc@gmail.com) for any questions.

Kimball, Michael [29] see Brunswig, Robert

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King, Adam (SC Institute of Archaeology and Anthropology), Terry Powis (Kennesaw State University), Jaime Awe (Northern Arizona University), Gyles Iannone (Trent University) and Nilesh Gaikwad (University of California at Davis)

[256] *Tripping through the Underworld: Exploring Maya Ritual through Absorbed Residues in the Belize Valley*

While absorbed residues are widely used to explore subsistence-related questions, more recent work has used them to examine the use of elite and ritual beverages. In this paper, we explore absorbed residues found in ceramic containers and bone tubes recovered from caves, burials, and caches in the Belize Valley. The ceramic vessels presumably held liquids consumed or otherwise used in rituals in these settings, while the bone tubes delivered substances to participants in those rituals as enemas. Results of our analyses shed light on the kinds of substances used by the Classic Maya in their rituals associated with the underworld.

King, Allison

[331] *Living History in the Classroom: An Assessment of an Alternative Teaching Program*

This project was an assessment of the "Pioneers in Texas" structured historical program aimed at evaluating the effects of a Living History program on the participating students in an effort to expand the use of Living History pedagogy in standard curriculum. The program is conducted at the 1830s Jones Stock Farm at the George Ranch Historical Park (Park) in Richmond, Texas. The activity consists of lecture and participatory activities in the pioneer life experienced by one family of Austin's Old Three Hundred. The Park was interested in expanding an existing teacher-fed assessment to include students and their experiences; including, how the students recognized the Jones family as a real family, and not a historical construct. The Park wanted to assess how the program was effective in conveying history from the perspective of the Jones family and how this impacted the students. This assessment was completed collectively through a pre-project participation, observation, and group interviews.

King, Charlotte (University of Otago), Sian Halcrow (University of Otago), Andrew Millard (Durham University), Vivien Standen (Universidad de Tarapacá) and Bernardo Arriaza (Universidad de Tarapacá)

[87] *Interpreting Increments—What Can Isotopic Evidence Tell Us about Care in the Past?*

Maternal and infant care practices are deeply individual, as well as being affected by both cultural and environmental factors. Disentangling the various processes which lead to decision-making in the past is difficult, and bioarchaeologists must use multiple lines of evidence to begin to understand behaviours. New incremental isotopic techniques mean that it is now possible to look at individual maternal and infant experiences through tissue chemistry. However, incremental isotopic results are equifinal meaning that multiple interpretations of the data are often possible. This talk will focus on a group (n=5) of incremental isotopic profiles from infants and children from the Inka period site of Camarones 9 in northern Chile. Using these profiles, we will explore how knowledge of the archaeological context, biological factors which may affect isotopic values and consideration of sociocultural theory may allow better interpretation of results. In doing so, we highlight the different maternal and infant experiences seen in individuals from the same archaeological period, and the importance of the individual in archaeology.

King, Eleanor (Howard University)

[233] *Moderator*

King, Jason [66] see Fletcher, Brittany

King, Julia

[138] *Wonderful Things: Using Legacy Archaeological Collections for Research*

How does one go about using legacy archaeological collections—or any archaeological collection, for that matter—for research? The prospect can be daunting, especially if you are staring down dozens of dusty boxes on shelves. This paper offers direction for studying even the most untamed collection by understanding it as a type of secondary data—lessons learned while working with legacy collections from the Potomac and Rappahannock river valleys in Maryland and Virginia. Secondary data, a term that crosses disciplines, is, in the broadest sense, data collected by someone else and used to address new or different questions than those originally posed. Defining research questions, becoming familiar with a collection, creating checklists, reconstructing provenience, developing methods for sorting, coding, and re-coding collections data, and applying appropriate quantitative techniques are steps we identified and found useful for the study of older collections, some generated nearly 80 years ago.

King, Robert (Bureau of Land Management)

[261] *Implementing NAGPRA: A Look at BLM's Experiences in Alaska, 1990–2017*

The 1990 passage of the Native American Graves Protection and Repatriation Act (NAGPRA) resulted in new responsibilities and challenges for the Bureau of Land Management (BLM). These included working with museums and tribes concerning certain items in museums removed from federal land sometimes more than a century earlier. The BLM in Alaska has been actively involved with NAGPRA work since the early 1990s, and has completed numerous Federal Register Notices and repatriations with more in progress. This paper briefly looks at some of the unexpected issues and situations that have occurred over the years along with many successes.

King, Stacie (Indiana University)

[275] *Cultural Pluralism and Persistence in the Colonial Sierra Sur of Oaxaca, Mexico: Three Case Studies*

This paper explores the interactions between multiple groups of people in the Sierra Sur region of Nejapa and Tavela, Oaxaca in trans-conquest and Colonial Mexico. Bringing together ethnohistoric accounts, oral histories, and archaeological data in Nejapa and Tavela, I highlight three case studies to show that migration, conquest, and interregional trade created a complex, dynamic, pluralistic ethnic landscape prior to the arrival of the Spanish. As such, when the Spanish colonial regime took hold in the Sierra Sur, people in Nejapa and Tavela were already accustomed to making strategic choices about how to engage. Some distanced themselves from migrants, merchants, and militaries, while others embraced new opportunities for trade and exchange. Some used the Spanish legal system to protect or solidify their social and political standing, while others persisted in maintaining subversive and secret indigenous religious practices and spaces. Enslaved Africans, government officials, priests, and residents of various castas likewise struggled to find their places. Understanding the dynamics of the pluralistic cultural landscape of Colonial Nejapa requires bringing together various threads of evidence and accepting that identities in Nejapa were, and always had been, multiple, changing, and global, across time and space, before, during, and after Spanish colonialism.

[321] *Discussant*

Kingrey, Haden, Matthew Napolitano (University of Oregon), Geoffrey Clark (University of Oregon) and Scott Fitzpatrick (University of Oregon)

[13] *Exploring Manufacturing Variability in Calcareous Sand Tempered Pottery on Yap, Western Caroline Islands*

The oldest identified sites on Yap are identified by presence calcareous sand tempered (CST) pottery from deeply stratified deposits. With few exceptions, CST pottery, made from locally produced clay, has been recovered from Runglu and Pemrang, two sites in southern Yap, western Micronesia (northwest tropical Pacific). Although poor preservation conditions and small sample sizes make it difficult to reconstruct vessel size,

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detailed analysis of sherds demonstrates at least two sub-types. Recent excavations at Pemrang have yielded the largest sample of CST pottery ever recovered and allow for inter- and intra-site comparison. Results will help us understand the poorly understood early settlement of Yap.

Kinsman, James and David Asher (Armagh Observatory & Planetarium, College Hill)

[33] *Evidence of Meteor Shower Outbursts Recorded in the Classic Maya Hieroglyphic Script Using Orbital Integrations*

No firm evidence has existed that the ancient Maya civilization recorded specific occurrences of meteor showers or outbursts in the corpus of Maya hieroglyphic inscriptions. In fact, there has been no evidence of any prehispanic civilization in the Western Hemisphere recording any observations of any meteor showers on any specific dates. The authors numerically integrated meteoroid-sized particles released by Comet Halley as early as 1404 BC to identify years within the Maya Classic Period, AD 250–909, when Eta Aquariid outbursts might have occurred. Outbursts determined by computer model were then compared to specific events in the Maya record to see if any correlation existed between the date of the event and the date of the outburst. The model was validated by successfully explaining several outbursts around the same epoch in the Chinese record. Some outbursts likely observed by the Maya were due to recent revolutions of Comet Halley, within a few centuries, and some to resonant behavior in older Halley trails, of the order of a thousand years. Resonant behavior from both Jupiter and Saturn controlled dynamical evolution of meteoroids in apparently observed outbursts.

Kintigh, Keith (Arizona State University) and Jeffrey Altschul (Statistical Research, Inc.; SRI Foundation)

[247] *Convergence Research and the Coalition for Archaeological Synthesis*

Archaeological forays into the climate change debate have generally been through case studies that integrate archaeological, anthropological, and paleoenvironmental data into coherent, evidence-based narratives that document how cultural systems in a relatively small geographic region adapted to long-term climatic change. While these cautionary tales can play a valuable role in galvanizing public opinion, they generally have not influenced public policy. What is lacking are scalable inferences relating long-term cultural resilience and sustainability to social configurations and strategies for addressing environmental dynamics. Achieving these inferences demands that we move beyond case studies and leverage the vast amount of archaeological data captured in heritage studies in what the National Science Foundation has characterized as convergence research, “the deep integration of knowledge, techniques, and expertise from multiple fields to form new and expanded frameworks for addressing scientific and societal challenges and opportunities.” The Coalition for Archaeological Synthesis was formed to foster and support precisely this type of collaborative synthetic research. This paper describes how, through such research, the Coalition has the potential to transform archaeological practice and to allow our results to be incorporated in public debates and policy initiatives on subjects such as climate change.

[279] *Moderator*

Kirakosian, Katie V. (UMass Amherst)

[313] *Planting a Seed and Watching It Grow: Planning an Open Textbook from Scratch*

This paper outlines how this open textbook moved from an idea to a reality over the past year. As a non-traditional project in archaeology, the infrastructure for such a project had to largely be framed from scratch, including a social media and marketing campaign as well as a process for co-authoring and reviewing chapters. Although the textbook is not yet completed, lessons learned along the way will be offered with the hope that sharing our model will inspire more open textbooks in our field.

[280] *Moderator*

[149] *Discussant*

Kirk, Scott and Michael J. Kolb (Metropolitan State University of Denver)

[23] *A Mosque and a Castle: The Discovery of the Salemi Mosque*

In the summer of 2007 an elaborate, colonnaded gypsum-plaster floor was discovered outside of the Salemi Castle in western Sicily. Believed to date sometime between the 10th and 12th centuries, this feature was constructed during a period when the island of Sicily was repeatedly invaded and conquered by a series of expanding political entities. As such, interpretation of this feature has proved to be somewhat difficult. However, its orientation in an eastward direction may suggest that this structure was used as a mosque, possibly associated with an Islamic hilltop fortification similar to the hisn of medieval Iberia. In this presentation, we discuss both architectural and spatial evidence that suggests this find is comparable to other identified mosques found around the Mediterranean, and particularly those found across Sicily.

Kirk, Scott [85] see Balco, William

Kirker, Jennifer (Pick Museum, Northern Illinois University)

[163] *Outside Looking In: The Piedras Negras Near Periphery Re-examined*

Surveys in 1997 and 1998 recorded 89 Classic Maya sites with 254 structures in the near periphery of Piedras Negras, Guatemala. Twenty-five sites were test pitted and five were intensively excavated. Recent re-analysis of the ceramic, lithic and architectural data from these sites provides new insights into how the Late Classic Maya (A.D. 625–825) in the near periphery participated in the Piedras Negras kingdom. Population size and implications for conflict are considered. Comparison of material evidence from the center with the near periphery sites suggests how identity and agency might have been negotiated at Piedras Negras during its most volatile and dynamic period of growth, warfare and collapse.

Kirkley, Samantha (Utah Project Archaeology)

[168] *Connecting Project Archaeology and Girl Scouts Camps for Community-Based Learning Experiences at Ancestral Puebloan Sites in Utah*
Project Archaeology is an educational organization dedicated to teaching scientific and historical inquiry, cultural understanding, and the importance of protecting our nation's rich cultural resources. It is a network that makes archaeology education accessible to students and teachers nationwide through high-quality educational materials and professional development. Built on the Understanding by Design curriculum model, Project Archaeology: Investigating Shelter is a complete archaeological investigation curriculum and is endorsed by the National Council for the Social Studies. In recent years, this curriculum has been adapted to use in informal settings, such as Girl Scouts camps. Scouts had the opportunity to learn about the past through visiting Ancestral Puebloan sites and engaging with Elders from the White Mesa Ute Tribe and the Navajo Nation. Based on mini-assessments and verbal feedback, these experiential learning opportunities coupled with a powerful curriculum have been life changing for many. However, to more clearly show that our efforts have made a difference, Pre- and Post- assessments will be implemented to obtain quantitative and qualitative data that will improve programming and ensure that enduring understanding is taking place.

Kishimoto, Takumi [24] see Sweeney, Alex

Kissel, Marc (Appalachian State University)

[329] *Can We Talk about Modern Human Behavior in non-Homo sapiens?*

Discerning what makes *Homo sapiens* distinctive among the rest of the species on the planet has been a difficult task. One suggestion has been our use of symbolic culture, the use and transmission of symbols intergenerationally. There is much discussion, however, about who the first ‘symbol users’

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were, partly due to debates as to what actually makes something 'symbolic.' In this paper, I discuss how anthropologists first came to use symbol as the sine qua non of modern human behavior. Then, using archaeological and fossil data from the Old World, I show that many of the behaviors that are often suggested to be the sole purview of *Homo sapiens* have their genesis in the more remote past. Drawing from semiotic theory and the extended evolutionary synthesis, I argue that applying a more integrative theoretical framework can allow paleoanthropologists to discuss the behavior of our hominin ancestors without assuming too much or too little about their 'humanness.'

[329] Chair

Kistler, Logan (Smithsonian Institution), Saiful Islam (Drik, Bangladesh), Mark Nesbitt (Kew Royal Botanical Garden), Roselyn Ware (University of Warwick) and Robin Allaby (University of Warwick)

[143] *The Search to Resurrect Muslin Cotton in Bangladesh*

Bengal cotton muslin, a particularly fine type of woven cotton fabric, had legendary status where it was traditionally produced in East Bengal—now Bangladesh—for at least 2000 years. During the colonial influence of the British Empire, muslin was widely traded outside of South Asia, and became a valuable global commodity with major impacts on both local producers and foreign markets. Political turmoil and market forces, especially pressure from the East India Company, completely halted muslin manufacture in the early 20th century. As a result, "Phuti Karpas"—the variety of cotton required for its production owing to particular fiber characteristics, botanically *Gossypium arboreum* var. *neglecta*—was entirely lost. An extensive search was undertaken to locate any living example of *neglecta* in crop fields or in the wild, and a candidate wild population was identified. With only 100–250 year old herbarium specimens available for comparative materials, we use whole genome sequencing of modern and herbarium specimens to suggest that a wild-type Phuti Karpas has indeed been rediscovered. We describe molecular and morphometric results, as well as ongoing efforts to cultivate *neglecta* and revive traditional practices for muslin weaving.

Kitchel, Nathaniel (University of Wyoming) and Heather Rockwell (University of Wyoming)

[77] *Paleoindian Archaeology in the Munsungun Lake Region: Beyond Norway Bluff*

In the late seventies and early eighties Robson Bonnicksen identified and tested several fluted point occupation loci adjacent to chert deposits on Norway Bluff, Piscataquis County, Maine. Since that time various research projects have demonstrated the importance of chert from this region to the lithic economy of fluted point groups in northeastern North America. Despite these new insights little archaeological research has taken place in the Munsungun Lake region since Bonnicksen's original study. Here we present the results of our fieldwork from the summers of 2016 and 2017 that revealed the presence of additional lithic quarries in this location, as well as several potential fluted point sites associated with these newly identified quarry outcrops. These finds further demonstrate the importance of chert from the Munsungun Lake formation to the lithic economy of prehistoric groups in the region.

Klarich, Elizabeth (Smith College) and Laure Dussubieux (Field Museum of Natural History)

[141] *Making and Moving Pottery in the Northern Lake Titicaca Basin, Peru*

Pukara, in the northern Lake Titicaca Basin, was a regional center during the Late Formative Period (200 BC- AD 200). The Classic Pukara style is associated with monumental public constructions and sunken temples, elaborate stone sculpture, and a unique polychrome pottery tradition. Spotted felines, disembodied heads, camelids and plants, and anthropomorphic figures were incised and painted on incense burners, trumpets, and other special purpose ceramic vessels that were circulated in the Titicaca Basin and to neighboring regions. While there is limited direct evidence of ceramic production at Pukara, previous researchers have inferred centralized fineware production based on standardization measures such as size, shape, paste, and surface finish recorded from various collections. To further explore the nature of crafting practices during the Late Formative at Pukara, compositional analysis using LA-ICP-MS was recently completed of 150 samples, including clays collected near Pucará town and archaeological ceramics excavated from Pukara. We present the results of these analyses, which are used to address functional, chronological, and spatial variability in the production, circulation and consumption of Pukara utilitarian and ritual vessels during the Late Formative period.

Klassen, Sarah (Arizona State University)

[175] *The Adaptive Capacity of the Water Management System of Angkor, Cambodia*

This paper assesses the relationship between elements of adaptive capacity of a water management system among six time periods. The archaeological case study, Angkor, Cambodia, was the center of the Khmer Empire for over 600 years (9th-15th centuries CE). During this time, the Khmers developed one of the largest and most complex water management systems in the pre-industrial world. In this paper, I use geographic information system analyses to quantitatively and qualitatively assess six elements of adaptive capacity (the amount of water harnessed by the system, investments in infrastructure, human capital, redundancy, equal distribution of resources, and innovation) for six time periods. The relationships and trade-offs among the six elements shed light on agricultural production at Angkor as well as general theory on what elements contribute to the resilience of water management systems.

[175] Chair

Klassen, Sarah [307] see Kerwin, Ruby

Klaus, Haagen [65] see Shimada, Izumi

Klaus, Haagen (George Mason University)

[117] *Alterity, Resistance, and Autonomy: Mortuary Archaeology and the Diversity of Indigenous Responses to Spanish Conquest in Lambayeque, Peru*

Over the last few decades, archaeological narratives have shifted towards far more nuanced understandings of colonized peoples in favor of reconstructing nuanced and integrated understandings of indigenous perception, identity, biosocial interplays, and other responses to conquest. This work merges archaeological, ecological, and bioarchaeological contexts to help understand the significance of mortuary pattern data to compare postcontact cultural outcomes in Mórrope and Eten, two contemporaneous north coast Peruvian communities inhabited by native Muchik peoples (circa late A.D. 1530s—1750). In Mórrope, a biological disaster unfolded as the survivors of conquest created a resistance-driven hybrid Andean-Iberian culture. In Eten, microenvironment and a prosperous economy buffered against similar biological experiences as local peoples became thoroughly acculturated into the Spanish sphere. These outcomes are interpreted within a multi-scalar framework of alterity to explore how this diversity reflected diverse community strategies, engagements, and perceptions of "the other" in the negotiation of indigenous agendas and identities while enduring colonial subjugation.

Klehm, Carla (Washington University—St. Louis)

[210] *From Geophysics to Building a Predictive GIS Model of Archaeological Sites in the African Interior: Spatial Archaeometric Applications of the Bosutswe Landscapes Regional Survey, Botswana*

Expanding trade in gold and ivory in the first millennium linked sub-Saharan Africa to the Middle East and Asia through maritime and land-based exchange. This Indian Ocean trade supported the flow of exotic goods and ideas into the interior of southern Africa, where polities developed by the

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mid-13th century. The African experience has often focused on larger cities and coastal societies, or framed through viewpoints of those beyond the continent. In particular, landscape approaches, especially in the interior, have been few, particularly ones that integrate spatial archaeometric techniques.

Since 2014, Bosutswe Landscapes (BosLand) has combined geophysical, drone, and satellite remote sensing with traditional pedestrian survey and excavations to approach the local landscapes. This presentation introduces the BosLand project, especially our 2017 geospatial research. 2500 km² of multispectral imagery was used to locate several dozen archaeological sites around Bosutswe, most of which were previously unknown. The paper will provide an overview of the project, the decision-making process involved in obtaining imagery, the general approach used for identifying sites and the

predictive model, and early implications: practical logistics useful to Africanists interested in more fully integrating remote sensing into projects, especially those working in austere environments facing limited technological field resources.

[210] *Chair*

Klehm, Carla [286] see Follett, Forrest

Kleihege, Christopher [46] see Sagripanti, Jose-Luis

Klein, Cecelia

[209] *Of Eye Rings and Torches: The Fire Priests of Chichen Itza and Their Legacy in Aztec Tenochtitlan*

A number of enigmatic human figures in the imagery of late 9th-early 10th century A.D. Chichen Itza can be identified as fire priests, men whose task was to drill, tend, and/or oversee ritual fires reenacting the primordial birth of the sun from a flaming hearth at ancient Teotihuacan. Detailed analysis of the costumes, ceremonial responsibilities, and internal rankings of Chichen's Itza's fire priests reveals strong similarities to those of later Aztec fire priests as documented in painted manuscripts, stone carvings, and early colonial writings. These men, like the fire priests of Chichen Itza, dressed as the god known to the Aztecs as Tlaloc, who was the divine patron of the branch of the Aztec priesthood responsible for fire rituals. Although interesting iconographic parallels also appear at late 9th- early 10th c. Tula, whose legacy in Tenochtitlan is well documented, the Aztec priests' physical and structural similarities to Chichen Itza are more numerous and more compelling. This suggests that the Aztecs, by some means still undetermined, were directly or indirectly drawing upon information and/or memories passed down to central Mexico from Chichen Itza.

Klembara, Nathan

[220] *In and "Out" of the Cave: Queerness on the Upper Paleolithic Funerary Landscape*

Amongst many other facets of human life, the practice of burying the dead demarcates and changes a space, it becomes imbued and entwined with the identity of the deceased. The physical act of placing a body into the ground is a place-making practice, a performative act, and, in the process, the place becomes gendered. This has been true since the origins of burial practices in the human lineage, dating to at least the early Upper Paleolithic, and perhaps earlier. This paper is a preliminary attempt to look back at the European Upper Paleolithic burial record to examine these burials as queer spaces, and as a place for queer identity construction, reconstruction, and negotiation. The Upper Paleolithic has a severely limited number of burials, and thus these burial places—both cave or rockshelter and open-air contexts—and the individuals contained within them, can be considered queer, different, and non-normative. The queer nature of the embodied identities of these burials and their location has been hereto unexplored. Through an analysis of the intersection of bodies, grave goods, landscapes, and queer theory, the fluidity and contextuality of Upper Paleolithic gendered and sexual spaces and identities will emerge.

Klemmer, Amy (University of Wisconsin-Milwaukee)

[7] *Zooarchaeological Analysis of Fishing Strategies at Rio Chico, Ecuador (OMJPLP-170)*

The Rio Chico site was occupied almost continuously for 5000 years (ca. 3500 B.C.E. to 1532 C.E.) in a region of coastal South America that is heavily influenced by climatic events such as El Niño Southern Oscillation (ENSO). Evidence suggests that occupants of Rio Chico were heavily dependent on marine resources. The fishing strategies utilized at Rio Chico sustained the community over time, which allowed for the long-term development of an economy based on the *Spondylus* trade. This combination of climatic volatility, dependence on ocean resources, and occupation history provides an opportunity to study coastal resource usage over a long temporal span. This poster presents the results of a zooarchaeological analysis of a sample of faunal remains from the Florida Atlantic University (FAU) field school excavations conducted in 1997, 1998, 1999 and 2003. All remains were identified to the class level and a subset of this sample was identified to the family level. These identifications serve as the basis of this analysis. This analysis provides a foundation for further research to compare a coastal and an inland site in Ecuador, which will contribute to an understanding of the relationship between coastal and inland sites during times of environmental stress.

Klingelhofer, Eric

[51] *Assessing Threats to Coastal Sites: A Trial Run on St Croix, USVI*

The International Association for Caribbean Archaeology's Endangered Sites Task Force is concerned about the threat to coastal sites by rising sea levels. In March 2017, a small team of Mercer University non-archaeology students participated in a project on St Croix, USVI, to determine how local populations could best provide measurable information to professional archaeologists and cultural resource managers. The five-day project assessed ten sites assigned by the USVI Territorial Archaeologist. Through trial and error, the resulting 'Mercer Method' of data collection proved that using available smartphones and GPS proved much more effective than traditional survey procedures.

Klippel, Alexander [101] see Huang, Jiawei

Klokler, Daniela (Universidade Federal de Sergipe—UFS) and Fernando Almeida (Universidade Federal de Sergipe—UFS)

[70] *Valley of No Masters: Exchanging Experiences at the Valley of the Masters, Northeastern Brazil*

Field schools, and Methods and techniques in Archaeology classes are mandatory steps to achieve Master's or a PhD degree in most graduate programs in Brazil. We, as instructors noticed a certain mismatch in students' behavior in regard to decision-making in both situations: reticence during field activities, boldness during class discussions and debates. This dichotomy seemed to be related to field experiences in which the students had fewer opportunities to engage with other "more experienced-professional" archaeologists to make decisions. Inspired by calls for a more inclusive fieldwork experience we developed a proposal (tested in 2016 and 2017) in which students were collectively in charge of all decisions. We then encouraged debates and deliberations before any final determinations, and took the occasions to present distinct alternatives of action. The experience of continuous justification of decision making, of taking such decisions in a context with no hierarchy, and later the critical evaluation of the results obtained, turned out a considerable challenge for the students. In this paper we present the results—both archaeological and educational—of this innovative approach, and ideas we intend to implement in the future.

Klotsko, Shannon [79] see Davis, Loren

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Klugh, Elgin [251] see Castanzo, Ronald

Knaf, Alice (Vrije Universiteit Amsterdam), Joanna Ostapkowicz (University of Oxford) and Gareth Davies (Vrije Universiteit Amsterdam)

[139] *SIBA: The Research Potential of Bahamian/TCI Museum Collections*

Project SIBA (Stone Interchanges in the Bahamas Archipelago) brings together the largest corpus of Bahamian/TCI stone artefacts ever assembled—over 300 artefacts from eight international museums, including the Smithsonian's National Museum of the American Indian and the National Museum of Natural History. In an entirely limestone environment like the Bahamas/TCI, all hard stone had to be imported: our objective is to determine the source of these exotics. Integrating studies that combine the arts with state-of-the-art minimal-invasive laser ablation sampling for isotope studies, we aim to explore the wider social, political and economic connections between the archipelago and its wider Caribbean setting. The selected artefacts, including celts and anthropo/zoomorphic carvings, have well-documented collection histories, forming an exceptionally rich corpus for investigating materials and meanings. Museum collections offer a unique opportunity to study artefacts that are now rarely encountered in the archaeological record: in the Bahamas, such artefacts were mainly deposited in caves that were largely cleared for the guano-rich soils in the 19th century. Museum collections are therefore an integral component when looking at the wider archaeological context for these islands: without them, we lose connection to a large and important body of material that had clear value and meaning.

Knappett, Carl (University of Toronto)

[83] *Discussant*

Knell, Edward (California State University, Fullerton)

[21] *The Late Paleoindian Cody Complex Component at Lamb Spring, Colorado*

The Late Paleoindian Cody complex component at Lamb Spring, Colorado was recently reanalyzed. While best known for its possible association with Late Pleistocene fauna, the Lamb Spring Cody component with its nearly 2,000 bison bones, seven Eden projectile points, Cody knife fragment, and two flakes has largely been overlooked and incompletely described in the literature (excepting McCartney's study of the bison bones). To remedy the situation I: (1) use prior publications, reports and the original field notes to describe and interpret the component, (2) describe the recently analyzed chipped stone assemblage, and (3) compare Lamb Spring to other Cody complex sites in the region. The Cody component is in a paleo-stream channel that directly overlies the Late Pleistocene fauna, and has two spatially discrete levels separated by 4–5 cm of sediment. The occupation levels vary in projectile point technology and raw material preference. Though made from locally available lithic materials, the tool assemblage is fragmented and heavily resharpened. The projectile points are atypical in their lack of a dominant parallel collateral flaking pattern. Two (or more) small groups of Cody hunters used a stream channel to trap, kill and process some 27 bison between the late fall/early winter and mid-spring.

Knierim, Rebekka [183] see Dice, Michael

Knight, Charles (University of Vermont)

[31] *Ceramics, Ground Stone and Miscellanea at the Zaragoza-Oyameles Obsidian Quarry in Puebla, Mexico*

One result of the intensive, 5-m interval surface survey of the Zaragoza-Oyameles obsidian source area in Puebla, Mexico was the recovery of several artifact classes suggestive of prolonged habitation. Ceramic and ground stone artifacts recovered indicate that domestic activities were an important component of the obsidian procurement and production economy. Ceramics tended to concentrate in areas that also contained higher quantities of ground stone, but did not correlate with any one stage of obsidian reduction. The majority of identifiable ceramic vessels were ollas and cajetes, suggestive of domestic activities. Manos and metates were the most common ground stone artifacts recovered, although molcajetes, axes, and formal, worked hammerstones also were recovered. Manos and metates exhibited considerable variation in size and shape. When these indicators of domestic habitation are correlated to the obsidian surface data, patterns of domestic crafting at different intensities across space can be observed.

[285] *Discussant*

Knight, Vernon (University of Alabama)

[139] *Communities of Practice and Sequencing from Older Caribbean Collections in the NMAI and NMNH*

The Caribbean holdings of the National Museum of the American Indian and the Anthropology Department of the National Museum of Natural History contain material from historically important early excavations like those of M. R. Harrington in eastern Cuba in 1915 and Herbert W. Krieger in the Dominican Republic in 1928. Moreover, they include the results of early collection efforts by such luminaries as Jesse W. Fewkes and Theodor de Booy, which means that they contain some of the key specimens published in the early literature of the area. Like all major Caribbean collections assembled at an early date, these lack detailed archaeological provenance. However, they do often possess information concerning the site, municipality, or province of origin. Over six years, I have assembled a database of 1,100 small carvings of stone, shell, and bone from the Greater Antilles, including 162 from the Smithsonian. I show that despite faults in provenance information, these data can still contribute to the definition of stylistic communities of practice. Such regional communities of practice offer another perspective into current discussions of pre-Contact ethnic and linguistic diversity in the islands. Moreover, using nonmetric multidimensional scaling, I show how chronological information can be extracted from these data.

Knight-Iske, Geri and Emily Swain (Stantec)

[251] *A Place to Heal: Archaeology at St. Elizabeths Hospital*

Established in 1852 as the Government Hospital for the Insane, St. Elizabeths is situated on a bluff overlooking the historic City of Washington. Charles Nichols, the first superintendent, sought to provide a therapeutic setting in a picturesque environment for mentally ill patients to recover. Originally located outside the main core of the city, the campus has witnessed massive changes over its 150 years of operation. These changes often coincided with innovative new treatment practices for the mentally ill but were not always noted in the historic record, despite annual reports to Congress and extensive map and photographic documentation. Using GIS in conjunction with targeted archaeological investigations, we georeferenced key historic maps and conducted elevation and viewshed analyses to document and confirm many of these changes to the landscape and character of the campus over its lifetime. This paper will explore some of the conclusions we have reached and address the pitfalls of exclusively relying on documentary evidence when evaluating and investigating historical sites.

Knipper, Corina [140] see Fisher, Lynn

Knobloch, Patricia [211] see Jennings, Justin

Knoerlein, David

[138] *Museum Quality Images Every Time, "It's So Easy an Archaeologist Can Do It"*

With a background in forensics, David Knoerlein, vice president of Forensic Digital Imaging, is a certified evidence photographer who has developed a new and innovative process for the digital documentation of artifacts. Mr. Knoerlein will demonstrate how to capture museum quality images right out of

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the camera. Utilizing a customized tabletop camera station, he will demonstrate how to capture detailed diagnostic images of artifacts with pure white (shadowless) backgrounds. This combination of equipment and procedures will eliminate the need for post-processing (i.e. Photoshop), resulting in time savings while achieving the highest quality image. Mr. Knoerlein will also discuss quality control tracking methods and the use of procedural guides to ensure professional results.

Knoll, Michelle

[138] *Wrestling That 200-Pound Gorilla in the Room: Practical Solutions for the Care and Management of Associated Records*

In spite of the broadly recognized importance of associated records, they are often the last part of a collection to be organized, catalogued, and stabilized. Disorganized, or "lost" associated records are a source of frustration for researchers and collection managers alike. Conversely, well-organized and accessible associated records have many benefits to artifact collections including an increase in research potential, a legal foundation for ownership and control, and greater interpretive value. This presentation will discuss how the Natural History Museum of Utah is tackling the challenge of organizing, digitizing, rehousing, and managing over 150 linear feet of associated records. At the heart of this project is the premise that the care and management of archaeological associated records falls somewhere between the missions of archives and records management. As such, new professional standards should be established that meet the needs of this unique collection type.

[138] *Chair*

Knothe, Katherine [334] see Jones, Makensie

Knudson, Kelly J. [87] see Blom, Deborah

Kober, Brent

[193] *Moderator*

Kocer, Jacqueline

[115] *A Summary of Chipped and Ground Stone from Room 28, Pueblo Bonito in Chaco Canyon*

Chipped stone and ground stone from Room 28 backfill included fill from adjacent rooms and lends insight to the technology used during room occupation. I summarize both debitage and formal tool analyses with a special discussion on projectile point types. Most material proportions fall within the range of those in other Chaco Canyon assemblages but with a lower frequency of Narbona Pass and Zuni Spotted Chert. General types of ground stone are discussed in the analysis and jar lid metric data suggest a connection to the cylindrical jars recovered from Room 28. Much of the other ground stone material represents food production and crafting activities, while jar lids may be related to whatever process was used in cylinder jar consumption practices.

Kocer, Jacque [115] see Mattson, Hannah

Kocic, Miroslav [245] see Hanks, Bryan

Koenig, Charles (Texas State University, Shumla Archaeological Research and Education Center), Christopher Jurgens (Texas State University), J. Kevin Hanselka (Texas Department of Transportation), Stephen L. Black (Texas State University) and Charles Frederick (Consulting Geoarchaeologist)

[187] *Multidisciplinary Investigations of a Late Paleoindian Bison Butchery Event from a Southwest Texas Rockshelter*

Located in the Northeastern Chihuahuan Desert, Eagle Cave is one of the largest rockshelters in the Lower Pecos Canyonlands. Archaeologists previously excavated Eagle Cave in the 1930s and 1960s; however, no evidence had been recovered indicating Paleoindian occupation of the site. From January 2015 through February 2017, the Ancient Southwest Texas Project of Texas State University re-excavated a 4-meter deep trench through the center of this massive rockshelter in order to document and sample the complex stratigraphy. A primary research objective was to investigate the potential for Paleoindian-age deposits. During the 2016 field season we excavated into deposits older than 8500 RCYBP, and immediately exposed a scattering of fractured, cut, and burned bison bones. Among the bones were chipped stone debitage, lithic tools, decomposing plant remains, and a surface hearth containing charred bone, ash, and charcoal. Based on preliminary analyses and radiocarbon dates, this entire assemblage dates to older than 10,250 cal BP, and represents the secondary butchering and processing of a single *Bison antiquus*. This poster summarizes the ongoing spatial, faunal, macrobotanical, geoarchaeological, chronometric, and lithic analyses being conducted on this unique Late Paleoindian assemblage.

Koenig, Charles [8] see Black, Stephen L.

Koenig, Viola (Ethnologisches Museum)

[206] *Connecting Collections: Collectors of Pre-Columbian and Indigenous American Art in the Americas and Europe*

Speakers of this session are dealing with collections and museums in the Americas as well as Europe. They are sharing knowledge on the role of collectors of Pre-Columbian and indigenous American objects that represent the Pre-Columbian era and the colonial and later periods. Many of them were collected in the 19th and first half of the 20th centuries. Ever since collections were subject to all kinds of moves and treatments. Collections were divided, and objects have been dispersed. Can we virtually reunite divided collections that ended up in different museums and continents by creating shared digital platforms? In order to get the ball rolling I will introduce briefly a few different cases as examples of scattered collections housed today on both sides of the Atlantic Ocean.

[206] *Chair*

Koerner, Shannon (Colorado State University, CEMML), Eric Skov (Colorado State University, CEMML) and Brett Giles (Colorado State University, CEMML)

[332] *Eastern Plains Land Management and Archaeological Site Discovery Methods at Fort Riley, Kansas*

The cultural resource program at Fort Riley manages 100k acres in the Flint Hills province of northeastern Kansas. Variations in the Flint Hills landscape influence the use of different archaeological site discovery methods. While floodplain settings with deep soil deposits necessitate regular subsurface testing, higher elevation settings with low soil accumulation require less intensive survey methods. Many prehistoric sites in higher elevation, upland landscapes are expressed largely by surficial cultural deposits, some dating to the Pleistocene/Holocene transition. This paper highlights the unique Flint Hills landscape and wildland land management practices at Fort Riley that favor the use of pedestrian site discovery methods.

Koerner, Shannon [332] see Giles, Bretton

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Koetje, Todd (Western Washington University)**[34]** *Leukoma Seasonality and Maturity at WH-55, Implications for the Lacarno Beach Phase in the Pacific Northwest*

In addition to other sites in the middle Salish Sea, Western Washington University field schools have conducted several years of test excavation at 45WH55, resulting in an extensive collection from several spatially distinct areas of the site. Leukoma seasonality and maturity from samples in each area are used to address questions of site integrity and season of occupation. Comparable data from other sites in the region allows preliminary assessment of larger scale movement and seasonality patterns during the Lacarno Beach Phase.

Kohanski, Neil (California State University, Los Angeles), Toni Gonzalez (University of California, Santa Barbara) and Samantha Lorenz (Contested Caves Archaeological Project)**[157]** *Incensarios, Copal, and Speleothems: Interpreting the Function of Chultun 3 at Mul Ch'en Witz*

Chultunes are ubiquitous throughout the southern Maya lowlands, but their function is still under debate. A central problem in the interpretation of these subterranean features is the paucity of artifacts recovered from within them. Within Chultun 3 at Mul Ch'en Witz, an area located within the larger site of La Milpa in northwestern Belize, several artifacts suggesting ritual activity were encountered. These artifacts include an intact vessel, an incensario, burnt jute, fire-affected limestone, and speleothems. These artifacts were found in association with fragmented human remains, which suggests the importance of the items within the subterranean context. This poster will report on these artifacts, discovered during preliminary excavations by the Contested Caves Archaeological Project (CCAP) in 2017.

Kohler, Tim A. (WSU/SFI/CCAC)**[1]** *Moderator***[1]** *Discussant*

Kohler, Tim A. [27] see Ellyson, Laura

Kohut, Betsy (Millsaps College), George J. Bey III (Millsaps College) and Tomás Gallareta Negrón (Millsaps College)**[162]** *A Re-evaluation of Yotholin Pattern-Burnished: Evidence of Early Preclassic Ceramics?*

In 1958, Brainerd first described "the earliest deposits yet to come from Yucatan"—composed primarily of narrow-mouthed jar fragments recovered from the lowest strata of excavations at the Mani cenote. This type, classified as Yotholin Pattern-Burnished, has a medium-fine paste and unslipped surfaces that had been smoothed or burnished in decorative patterns.

Since then, similar wares have been recovered from Preclassic contexts at a number of other sites. Although Brainerd originally described Yotholin as an Early Preclassic type, other archaeologists have attributed it to the late Middle Preclassic. In this paper, we will revisit the contextual evidence surrounding Yotholin and discuss it in light of our work in the Puuc and recent reevaluation of Middle Preclassic ceramics in general. This reanalysis suggests that Brainerd's initial interpretation of Yotholin was correct and that it is contemporaneous with and/or slightly predates early Middle Preclassic Ek phase ceramics (900–700 BC). It is possible that Yotholin represents the earliest pottery yet identified in the Northern Lowlands. We examine the implications this would have for understanding the origins of the Maya in this region.

Kohut, Betsy [162] see Galvan, Melissa

Kohut, Lauren (Tougaloo College)**[75]** *Legacies of War: Fortified Landscapes and Political Transformation during the Late Prehispanic in the Colca Valley (Arequipa, Peru)*

During the Late Intermediate Period (AD 1000–1450), frequent warfare radically transformed the landscape of the Colca Valley in the southern Peruvian highlands. Widespread fortification not only marked a new defensive landscape, but also reflected and reinforced broader social and political transformations—including increasing settlement nucleation and the coalescence of new ethnic identities. Although many of the valley's fortifications were largely abandoned following the region's incorporation into the Inka state, this fortified landscape continued to shape social and political processes. The two largest fortified settlements not only continued to be inhabited, but grew and were transformed into local Inka administrative centers. This paper examines how the fortified landscape of the Colca Valley shaped long-term social and political processes drawing both on analysis of the importance of fortifications in the changing settlement patterns in the valley, and the local transformations of the large fortified settlements of Auquimarka and Malata. In doing so, this paper expands upon the notion of fortifications as "landscape patrimony" (*sensu* Arkush 2011), by exploring how defensive landscapes not only shape and entrench social and political relationships, but also how such built landscapes of war are themselves reimagined and reinterpreted in the face of social and political change.

[235] *Moderator***Kolata, Alan (University of Chicago)****[273]** *Discussant***[273]** *Chair***Kolb, Charles (National Endowment for the Humanities (Retired))****[69]** *Revisiting Clay Smoking Pipes*

An assemblage of 280 white clay smoking pipe fragments were recovered from a disturbed context during the construction of a marine basin and wharf at Barcelona Harbor, New York, on the southeastern shore of Lake Erie. Apparently packed in a wooden box or crate, this collection represents one of the largest unique and homogeneous collections fabricated during a brief period in a single manufactory from only a few molds. I summarize descriptive and quantitative analyses, probable provenance, and focus on date of manufacture. English pipe stems are assessed using four procedures: Harrington's (1954) histogram of time periods; Binford's (1962) linear formula; Hanson's formulas (1971) and the Heighton and Deagan formula (1972). Harrington's histogram of five basic time periods proved useful but the idea was critiqued and expanded; Binford converted the progression an easily-understood mathematical straight-line regression formula applied to most pre-1800 British colonial and federal sites. However, Noël Hume and Walker provided examples of Binford's formula that yielded dates inconsistent with other dating methods. Hanson proposed ten straight line regression formulas to replace Binford's single formula, and Heighton and Deagan developed a curvilinear regression formula based on bore size research. The results are contrasted.

Kolb, Michael J. [23] see Kirk, Scott

Kolbenstetter, Marie (McGill University)**[299]** *"Les Niveaux Céramiques au Honduras" Revisited: The Gulf of Fonseca in Regional Context*

In 1966, Claude Baudéz published a first attempt to compare ceramic typologies between different archeological areas of Honduras, published as *Les niveaux céramiques au Honduras: une reconsidération de l'évolution culturelle* (Baudéz 1966). This article encompassed his research in the Gulf of Fonseca, where he spent a field season surveying and excavating sites in 1964–65. Fifty-three years later, this article still constitutes one of the most

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extensive descriptions of the ceramic assemblage of the Honduran side of the Gulf. However, research in the surrounding regions of the Gulf in El Salvador, Nicaragua, and Honduras, has considerably advanced in the last thirty years, and contributed to a better understanding of ceramic types and their distribution. Through a renewed analysis of a sample of the ceramic material excavated by Baudez in the Gulf of Fonseca and a review of his typology, my paper presents updated considerations about distribution of ceramic types present in the Gulf of Fonseca between the Classic and Late Post-Classic periods, with a focus on the Late and Terminal Classic. To this end, recent research and established typologies are reviewed and compared as an attempt to create relations and equivalences between types, leading to better understanding of local variations.

Koldehoff, Brad [140] see Parish, Ryan

Koller, Jared (Boston University) and Stephen Acabado (University of California, Los Angeles)

[230] *Under the Church Bell: Reducción and Control in Spanish Philippines*

The Spanish conquest of the Philippines redesigned the indigenous landscape to adhere to the idealized orthogonal plan outlined by King Philip II's Ordinances of 1573, centered on the church plaza. This reconfiguration facilitated the successful political, economic, and religious control of the colonial possession. An aspect of this resettlement plan is the concept of Bajo de Campana (under the bell) that implied control through the ringing of the church bell. The plaza complex, which is exemplified by the policy of reducción, projects a Spanish ideal Catholic Society, whereby the configuration of the physical landscape was ordered. Reducción aimed to consolidate colonial control over Philippine indigenous communities by compelling prominent individuals to relocate into poblaciones within hearing distance of church-bells. Bell ringing ordered daily life by signaling times to congregate and by marking special occasions. The audibility of church-bells also marked the extent of the Crown's territorial holdings. To understand the processes associated with this colonial accommodation, we explore the social, religious, and environmental ramifications of Spanish settlement-building programs in the Philippines by examining spatial, acoustic, ethnohistoric, and archaeological data from plaza complexes located at two Spanish-era church sites: Quipayo and St. Francis of Assisi (both established in 1578).

Kollmann, Dana

[62] *Discussant*

Kolpan, Katharine (Iowa State University)

[282] *The Dread of Something after Death: Ownership, Excavation and Identification of World War II Axis Combatants in Europe*

Human remains possess an indexical quality that references once-living people. Human bone may also serve as a symbolic representation of larger ideas such as honor, vengeance or injustice. As such, human remains, as evidence of past criminal actions, have the ability to bring communities together, but also to tear them apart. In regard to the remains of soldiers who perished in the European theater during World War II (WWII), the presence of remains may serve to reinforce the perceived moral failings and criminality of other communities. However, they may also underscore the idea of victimization, even among people who might also have been considered the perpetrators of atrocities. Among the German dead from WWII, the remains themselves have highlighted the mythologized suffering of the German soldiers—particularly in the East—at the close of WWII, while also serving as a terrible reminder of the pain caused to the myriad communities victimized by the Reich. Meanwhile, the excavation of potentially Italian or Austrian Axis combatants has proved more complicated because the discovery of these soldiers disrupts long established narratives of Italian and Austrian victimhood.

[282] *Chair*

Kolyer, Glenn (CUNY Graduate Center)

[5] *The Bryant Site: Five Prehistoric Loci in the Esopus Creek Drainage*

Excavation of large sites in the Hudson Valley is often limited to the availability of resources and labor. The Bryant Site of Ulster County, New York, is a Late Archaic site located on approximately 54,000 m² of horizontal surface area on privately owned farmland. Scientific sampling of the site was conducted through survey using a grid-based plan. Each grid square was analyzed for debitage, fire-cracked rock, and lithic artifacts. The results of each unit were contrasted and compared. Through analysis of each square, five possible loci of prehistoric activity were discovered. While surface collections are not without their disadvantages or bias, and cannot replace excavation in terms of evidence collection, this process yielded data which was used to infer potential site use, seasonality, and dietary behavior. The data collected opens the door for future excavation and potential testing of long-term prehistoric settlement in the area.

Komakech, Wilfred [282] see Elgerud, Lucia

Komp, Rainer [190] see Ruby, Bret

Konzak, Michael [221] see Whitley, Thomas

Kooiman, Susan (Michigan State University)

[133] *Foodways and Technological Transformation in the Upper Great Lakes: A Multidimensional Analysis of Woodland Pottery from the Cloudman Site (20CH6)*

A novel combination of analytic methods is used to address the decades-long debate about diachronic subsistence pattern change during the Woodland period (AD 1—1600) in the Upper Great Lakes of North America. While some have argued for dietary continuity throughout the regional Woodland, others maintain that certain specific resources—including fish, wild starchy plants, and/or maize—were more intensively exploited over time. The Cloudman site (20CH6), located on an island off Michigan's Upper Peninsula in Lake Huron, is a multicomponent occupation spanning the Middle through late Late Woodland periods. The ceramic assemblage is therefore ideal for assessing dietary and technological change through time. Functional pottery analysis (of technical properties and use-alterations traces), stylistic pottery analysis, microbotanical analysis, absorbed lipid residue analysis, stable isotope analysis, and AMS dating are used in tandem to construct a chronological sequence of diet, cooking habits, and cooking technology and the relationships between them. The rich data resulting from the complementary nature of these diverse methods demonstrates the potential applications of this analytic suite to long-standing archaeological problems in other contexts.

Koole, Edward (Edward Koole)

[127] *Paleo-Indian Evidence from Rock Shelters of the Pains Region, Southeastern Brazil: Typology, Technology and Chronology of the Lithic Material and Its Classification in Three Horizons*

This presentation describes the archaeological context and the lithic variability for the paleo-indian period of the Pains region, an extensive karst situated in the upper São Francisco river valley, state of Minas Gerais, Southeastern Brazil. It gives an overview of what is known for the region using evidence from four limestone rock shelter sites, with a total area of 28m² excavated, the most important site being the Gruta do Marinheiro cave (20m²),

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and propose the separation of the lithic material of the region in three main industries, differentiated in terms of technology and typology as well as chronology, called Horizons, that reproduce regionally, the materials and archaeological contexts found in the Central as well as the Southern territories of Brazil.

Koolstra, Francis [34] see Cakirlar, Canan

Koontz, Rex (University of Houston)**[128] *A Tajín Deity Associated with Decapitation Sacrifice***

This presentation investigates the narrative context of a Tajín region deity whose diagnostic characteristics include a large hank of hair and an extended upper lip.

The figure appears in narrative scenes with the major Tajín deities, often playing what seems to be a subsidiary role. The most important association in these scenes is with a liquid-filled temple that plays a key role scenes of ballcourt ritual. The same deity appears in pars pro toto representations of sacrificial scenes with numerous figures from the Tajín court. Finally, the deity also appears in a complex aquatic scene on a portable sculpture. Certain consistencies in the imagery across narrative contexts and media suggest that this figure embodies the fruit of particularly important decapitation sacrifices. The depiction of decapitation sacrifice as a supernatural suggests that Tajín participates in the “animate head” symbolics that have been identified for large areas of the Americas, as described by Gillespie and others.

[128] Chair

Kornfeld, Marcel (PIRL—University of Wyoming) and Mary Lou Larson (PIRL—University of Wyoming)**[127] *Things Forgotten: The Unique of the Hell Gap Site***

Forager campsites are commonly thought of as locations where social activities occur, but most archaeologists focus on subsistence (butchery, processing), stone tool production and use, and how these systems relate to mobility strategies. The record is often silent when it comes to the behaviors incidental to what appears central economic endeavors. Often camps yield information beyond subsistence. Ochre, needles, beads, bone rods, structures, and context of various activities provide more holistic evidence of Paleoindian lifeways. Our paper considers implications of such remains at the stratified Pleistocene/Holocene boundary Hell Gap site.

Kosakowsky, Laura (University of Arizona)**[258] *“Pots, Potters, ...and Politics”: Classic Period Ceramic Spheres and Systems at Aventura, Northern Belize, and the Legacy of Joe Ball***

Early work in the 1970's by Joe Ball on Northern Belize ceramics from the site of Aventura highlighted its geopolitical location between multiple spheres of interaction. These spheres, reflected in the ceramics of the Classic Period, demonstrate that Aventura's intermediary position between the cities of the Petén to the west, and the Yucatan to the north no doubt contributed to its success and long occupation. My own research on the Aventura ceramics, begun in 2015 as part of the Aventura Archaeology Project, supports Joe Ball's early observations on Classic Period ceramics in Northern Belize. Furthermore, his important definitions of ceramic spheres and systems provide an excellent way to frame Aventura's long chronology and inter-regional connections through time. While still in its preliminary stages, I am hopeful that continuing work on the ceramics of Aventura will go beyond establishing a site and regional chronology, and highlighting inter-site connections, to telling us something more about “ancient Maya economic systems, political history, ceremonial behavior, ideology, societal structure, and community organization.” (Ball 1993)

[317] Discussant

Kosakowsky, Laura [147] see Robin, Cynthia

Kosiba, Steve (University of Minnesota)**[230] *Crumbling Infrastructure: Archaeological Perspectives***

Recently, the term “infrastructure” has gained a remarkable degree of traction in both academic and political discourses. Politicians, from the left and right, bemoan what they term “crumbling infrastructure,” offering fixes by way of material and technological improvements to roads, waterways, cities, and energy grids. Scholars draw on and expand posthumanist theories to analyze and expose how infrastructure does not just passively support social aims, but actively shapes (and subverts) human intentions. These discussions sharpen focus on the material characteristics and necessities of infrastructure, but frequently neglect to equally take into account the ideological mechanisms—processes of labor coordination, perceptions of progress, or projects for sustainable ecology—that are essential to and inseparable from infrastructure. With this paper, I ask how archaeologists, with their unique ability to record and interpret long-term socio-material processes, might add to such discussions of infrastructure. I argue that “crumbling infrastructure” is a misnomer because it defines infrastructure as fixed materials rather than fluid entities that are parts of broader assemblages comprising things, people, and ideas. I present data from Cusco, Peru, during early Spanish colonization to examine the interwoven ideologies and materials that can bring infrastructure into being, and relegate it to ruin.

Koskey, Michael [250] see Skinner, Douglas

Kosyk, Katrina (McGill University)**[263] *Communities of Engaged Performance: Investigating Soundscapes and the Sonorous Past***

The relationship between individuals and urban soundscapes can tell us about the personhood and sonic practices of people in the past. To reconstruct the interaction between a musician and audience in archaeological contexts, I introduce a novel theoretical framework called ‘communities of engaged performance’ (CEP). CEP is defined as the transmission of knowledge through performance resulting in variable group-specific sound practices. CEP is derived and builds upon theories of ‘communities of practice’ and is identifiable in the archaeological record as intentional modifications to both space and sound-related artefacts. CEP is especially pertinent to the discussion of multicultural social organization, because it denotes group identity based on consistencies within practices rather than by ethnic origin. For example, variation in instrument design, playing of a musical instrument (gestures, finger positions, etc.), or in soundscapes might suggest the presence of several distinct communities of engaged musical performance. On the other hand, consistency or shared practices across groups might reflect the development of a single performance community. A case study from Central America will explore these different aspects of CEP in a multi-ethnic landscape.

Kotar, Kathryn [16] see Walker, Samantha

Kotegawa, Hirokazu (Museo de Córdoba, Ver.)**[19] *¿Cuáles son los monumentos olmecas del sitio Estero Rabón?***

Uno de los grandes problemas de los monumentos escultóricos olmecas es que, para identificar la cronología y la cultura pertinente, la mayoría de ellos se ha perdido el contexto arqueológico. Por ello, existen algunos monumentos dudosos por su estilo y los de la procedencia desconocida en el

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corpus total de ellos. El sitio Estero Rabón es conocido como uno de los centros secundarios de San Lorenzo y fue reportado con la presencia de varios monumentos escultóricos olmecas. Sin embargo, casi todos estos monumentos del sitio no se saben la ubicación en donde fueron encontrados dentro del sitio. Hasta la publicación del catálogo de monumentos olmecas en la región de San Lorenzo Tenochtitlán por Ann Cyphers en 2004, los ocho monumentos fueron reportado aunque uno de ellos fue desaparecido actualmente. Esto fue ocurrido por la causa del abandono del sitio académicamente.

Durante los trabajos de excavación en este sitio realizados 2012–2015, los pobladores de la región nos reportaron la existencia de otras esculturas de piedra en el formato grande. Así, fue comenzado nuevamente un estudio sobre los monumentos olmecas del sitio. En el presente estudio, se analizarán estos monumentos del sitio Estero Rabón aclarando algunas confusiones para futuras investigaciones.

Kotegawa, Hirokazu [285] see Aguilar, Magdalena

Kotis, India (Kenyon College) and Jenna Hurtubise (University of Alabama)

[265] *Deciphering Social Structure: A Cognitive Approach in Examining Casma and Chimú Ceramic Iconography*

The choices groups make in the type of decorative techniques and styles on ceramics are referential to key components of a group's social structure. This research examines social aspects of the Casma and Chimú using a cognitive approach in analyzing iconographic elements on elite ceramics from Pan de Azúcar, located in the Nepeña Valley, Peru. Casma ceramics are locally made vessels where no two are alike and are characteristically defined by the presence of circle-and-dot and serpentine appliques. Comparatively, Chimú ceramics are mass-produced mold made vessels that are identifiable by its' polished exterior decorated with intricate designs and bird and monkey appliques. Based on the type of iconography the Casma and Chimú used for social expression we argue that the Casma were an internally driven culture while the Chimú were an externally driven culture. Additionally, elements of Chimú iconography show evidence for their imperialistic disposition and give us insight into the interaction between the Casma and Chimú during the Late Intermediate Period (A.D. 1000–1400) in the Nepeña Valley.

Kotoula, Eleni (University of Central Lancashire), David Robinson (University of Central Lancashire) and Clare Bedford (University of Central Lancashire)

[214] *Diagrammatic and Interactive Relighting Visualizations of Pictographs: Case Studies on Pinwheel, Boulder and Pleito Cave*

This presentation discusses two complementary approaches for visualization of pictographs; interactive relighting and diagrammatic representation. Visible and false colour Reflectance Transformation Images (RTI) provide enhanced visualization of texture in combination with colour enhancement. By extension, the proposed techniques offer the opportunity to explore the characteristics and application of paint as well as the layering and preservation state of pictographs. The extracted information can be formatted according to DOT language syntax and rendered in GraphViz as diagrams. The resulting diagrams are not only alternative ways for communicating analysis results but also useful tools for enhanced detection of patterns within a single pictograph and across panels. As demonstrated by case studies on Pinwheel, Boulder and Pleito cave (CA-KER-77), which showcase different scale and level of complexity, the comparative assessment of interactive relighting and diagrammatic visualizations is a step towards a more holistic approach for rock-art recording, documentation and analysis, that can be further enriched by spectroscopy and 3D digitization.

Kotsoglou, Anastasia (Cornell University), Samantha Krause (University of Texas at Austin), Luisa Aebersold (University of Texas at Austin), Fred Valdez (University of Texas at Austin) and Timothy Beach (University of Texas at Austin)

[243] *Soils, Sedimentary Rocks, and Scale: Recent Geoarchaeological Investigations at Colha, Northern Belize*

The Maya site of Colha is located on a karstic doline that is dominated by Tertiary and Pleistocene limestone and marls. This low-lying area, known locally as the Cobweb depression, encompasses a complex wetland system that is affected by Holocene sea level rise, human-induced vegetation changes, and both natural and anthropogenic erosional sequences. The dynamic landscape, coupled with a long history of human occupation, places this site in a complex geographic and cultural position within the greater Maya Lowlands. This paper focuses on the interplay between natural soil formation sequences, the built environment, and the temporal changes in resource extraction and utilization within the Colha core. Here, we specifically build upon previous research on soils and sediments of the greater Cobweb Swamp depression and how these soils form onsite. Accelerator Mass Spectrometry (AMS) dating, Magnetic Susceptibility, and Loss On Ignition methodologies are employed to further characterize the present soils and geologic resources. Geochemical and elemental techniques are applied to lime plaster samples in order to determine sourcing and production during Preclassic occupation. The data proffered from these analyses highlight the unique geologic context of Colha, demonstrate how these environmental resources were manipulated, and supplement broader work on local human-landscape interactions.

Kotsoglou, Anastasia [243] see Burns, David

Koutlias, Lauren (Texas State University) and Annie Riegert (Texas State University)

[302] *Deviancy, an Alternate Means of Child Veneration at the Maya Site of Colha*

The veneration of space is a process that at times incorporates deviant practices as a method of signifying key importance. The deposition of burnt infant remains and associated grave goods diverges from burial norms at the Maya site of Colha. In May of 2017, archaeologists with the Programme for Belize Archaeological project returned to the site after a multi-year hiatus. The burnt skeletal remains of an infant, between the ages of 1.5 and 2.5 were found in association with burnt pottery sherds, bifaces, and shells. The burial deviates from Maya inhumation practices at Colha and in Northwestern Belize generally and therefore signifies ritual practice of great import. The interment of remains and grave goods are associated with the structure 2032 in the 2000 sector. The location, presence of burning, and differential inhumation signifies the importance of this structure and are hypothesized to have contributed to a dedication or termination ritual of the associated structure. We explore the use of burning and child inhumation practices as a ritual method for structure commemoration.

Kovac, Milan (Comenius University in Bratislava)

[252] *Uaxactun as the Preclassic Dominant of Central Peten*

In the beginning of the 20th Century Uaxactun was considered to be the cradle of the Maya civilization. Later, other monumental Maya centers were found and scholars lost interest for Uaxactun. The former popularity of Uaxactun was interpreted as just a coincidence because the first large excavations were carried out there. Newly identified important Maya sites were considered to be older and more interesting. The new archaeological project in Uaxactun has dealt with the Preclassic horizon of the site for the past 10 years and recent results confirm that the first impressions 100 years ago were not so far from the reality. Uaxactun was ruled by the first Maya king's dynasties and has the biggest king's residence in the Preclassic Central Peten. Among the extraordinary findings are the largest stucco masks of the Maya world, amazing and large stucco decorations, a dynastic shrine with preclassic inscriptions on a jade scepter, fine Preclassic inscriptions on stelae and last but not least astronomic complexes of extraordinary accuracy. Fine art, early inscriptions, richness and monumentality of architecture lead us to the conclusion that in Preclassic times Uaxactun was politically and culturally one of the most important cities of the Maya world.

Kovac, Milan [33] see Beliaev, Dmitri

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Kovacevich, Brigitte [28] see Crawford, Dawn

Kowalewski, Stephen (University of Georgia)

[170] *Economic Institutions in Ancient Greece and Mesoamerica*

New studies have led to a deeper comprehension of economic variation and change in Late Postclassic Mesoamerica and the Archaic and Classical Greek world. Archaeological data on city-state settlement patterns, specialized production, trade, and household consumption, and new archival material and re-analysis of texts, have replaced primitivism, substantivism, and ideal-types.

In urbanization and demographic scale the two areas are comparable. Mesoamerican and Greek agricultural production was not simply for subsistence, but was market-oriented and market-dependent. Local and long-distance trade often functioned by market mechanisms. The economies had the capacity for real growth beyond Malthusian pace-keeping.

Greece and Mesoamerica contrast in their current states of method and theory. Mesoamerica has better samples of city and hinterland settlement patterns. Ancient Greece has fuller textual sources. Research on the Greek economy is more in touch with economic theory.

I focus on two differences. The Old World used silver and state-issued coinage as money; Mesoamerica had goods monies. In the Old World the firm, or corporate group for jointly carrying out economic activities, was larger than in Mesoamerica, where the household was the locus of specialized production. These differences had consequences in the relative capacity for appropriation and accumulation.

Kowalski, Jessica [84] see Weinstein, Richard

Koyiyumptewa, Stewart B. [72] see Price Steinbrecher, Barry

Koziarski, Ralph (AECOM)

[39] *Good Living in Hard Times: De-urbanization and Personal Wealth in Nineteenth Century New Market, Maryland*

New Market is a small community in Frederick County, Maryland, whose origins and early nineteenth century economic peak are tied to travel and trade, on the National Turnpike. Following the development of the B&O railroad during the mid-nineteenth century, use of the turnpike declined, subsequently shrinking the town's economy.

Excavations sponsored by the Maryland State Highways Administration have recovered datasets from two properties in New Market. Identified components include a late eighteenth century tavern or inn, an early nineteenth century home, mid-nineteenth century parsonage and workshop, and a late nineteenth to early twentieth century African-American home.

Faunal remains collected from each component were used to establish the relative economic and nutritional value within each assemblage. Access to meat at each component was then measured against the economic potential of the community as a whole, as documented in the historic record. Preliminary results show that decline in personal wealth, as measured by ability to purchase meat, lagged behind the decline of New Market as a commercial center. The lag may relate to improvements in trade and communications, which had allowed for the decentralization of the local economy, which in turn allowed individual actors to weather economic declines at specific nodes.

Kramer, Karen [63] see Greaves, Russell

Kramm, Natalie [168] see Connolly, Robert

Krantz, Sarah (Barnard College, Columbia University)

[8] *Interpreting Palimpsest Rock Art in the North American Southwest*

This paper examines what might be called the "palimpsest panel" rock art tradition of the northern Rio Grande region of New Mexico. Palimpsest panels are rock faces with petroglyphs that have accrued in a layered fashion through time. Prior research into such panels has typically focused on questions of chronology, each layer representing a distinct culture-historical era of iconographic production or a chapter in a linear chronology. Here, however, I move away from the traditional chronological approach, in order to examine the iconographic data present in the form of representation itself, the so-called palimpsest. The way that meaning develops through the act of layering itself is a process by which the icons interact and modify one another. Such an approach reveals not only the rich, information-laden periods between discrete chronological chapters but also demonstrates that palimpsests are far more than the sum of their parts.

Krasinski, Kathryn (Adelphi University), Brian Wygal (Adelphi University), Charles Holmes (University of Alaska, Fairbanks) and Barbara Crass (University of Wisconsin-Oshkosh)

[50] *Investigations of the Late Pleistocene Occupations at Holzman, Shaw Creek, Interior Alaska*

The Holzman site, discovered in 2015, is roughly one half mile from the confluence of Shaw Creek with the Tanana River in interior Alaska. To date, we have excavated 56m², revealing repeated occupations beginning in the Bolling-Allerod, and including an occupation in the Younger Dryas. Located near the Broken Mammoth, Mead, and Swan Point late Pleistocene sites, Holzman consists of a local stone flaking station, hearths, and thousands of faunal remains including organic implements on mammoth ivory. This paper reports initial zooarchaeological, lithic, and geochronological analyses placing Holzman in the broader context of the peopling of Alaska and the Americas.

Krause, Samantha (University of Texas at Austin), Timothy Beach (University of Texas at Austin), Sheryl Luzzadder-Beach (University of Texas at Austin), Thomas Guderjan (University of Texas at Tyler) and Fred Valdez (University of Texas at Austin)

[173] *Canals, Sacbeob and Defining Space in Ditched Agricultural Fields in the Three Rivers Region, Northwestern Belize*

In 2016 the Northwestern Belize Lidar Consortium acquired nearly 300 square km of LiDAR imagery that covers large areas of ancient Maya agricultural systems, including ditched and raised fields, reservoirs, terraces, and sacbeob. This new imagery allows us to map beneath the canopy and shows that over nearly 20 years without LiDAR we studied only a small spatial sample of these complex systems. We have tested these systems with multiple excavations, and used multiple proxies such as paleoecology, elemental geochemistry, and isotope analysis to reconstruct Maya management within wetlands. Through new LiDAR technologies and continued on the ground excavations, the study of these Maya agroecosystems has entered a period of great dynamism. The coverage of systems in northwestern Belize indicates intensive, polycultural complexes of upland terraces and wetland fields. Here, we present our current state of knowledge of the Birds of Paradise agricultural zone based on previous research and our new, ground-truthing through mapping and excavation efforts from the summer 2017 field season. Based on these new efforts we can better understand wetland agriculture both spatially and temporally within the framework of Maya urbanism and agricultural management in the Three Rivers Region.

Krause, Samantha [243] see Burns, David

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Kretzler, Ian [114] see Dewan, Eve

Krier, Jon [303] see Curteman, Jessica

Krigbaum, John [9] see Wallis, Neill

Kriss, Dawn (Objects Conservator), Ellen Howe (Metropolitan Museum of Art, conservator emeritus) and Judith Levinson (American Museum of Natural History)

[141] *A Technical Study of Post-Fire Painted Paracas Ceramics: Regional Exchange and Material Culture*

The Paracas culture and its impressive pottery tradition developed along the south coast of Peru in the Early Horizon period (approximately 800–100BC). A scientific study of manufacturing techniques and materials of post-fire painted Paracas ceramics at the American Museum of Natural History (AMNH) and Metropolitan Museum of Art (MMA) found a correlation between changes in material use and iconography and vessel form across time. Differences between colorant composition in the Formative/Early (approximately 900–500BC) and Middle (approximately 500–400BC) Paracas Periods suggest a shift in material usage, which correlates with likely cross-cultural exchange and interaction with the Chavin culture to the north. Additionally, a basic continuity in the production techniques utilized to form the Paracas ceramics and decorate their surfaces suggests an extensive network of regional exchange and collaboration. Differences identified in the paint plant binders further illustrate the importance of examining archaeologically excavated pieces in order to correlate differences that may be attributable to chronological sequencing or regional differences.

Kristan-Graham, Cynthia (Auburn University)

[28] *The Poetics and Politics of Acoustics at Chichen Itza, Yucatan, Mexico*

An archaeology of the senses expands the understanding of physical, tangible aspects of place to include qualities that are unseen, silent, or otherwise not readily perceptible. My paper analyzes acoustics at the late Maya capital of Chichen Itza. Sound—especially the human voice, animals, music, ritual, and dancing—were part of Chichen Itza's atmosphere. An analysis of soundscapes, along with the intersection of architecture, planning, and acoustics, augments what is known about the site's settlement, rituals, epigraphy, and imagery. For example, sounds could be heard in only a part of this large site. Consequently, sound at ground level and inside or atop buildings can be understood as limited resources available to different audiences and sectors of the site. Using digital archaeology to plot soundscapes, I consider how acoustics may have influenced the site plan; how acoustics may have embodied political and social concerns; and how Maya notions about sound expand an understanding of Maya places.

Kristiansen, Kristian

[113] *The Maritime Mode of Production: The Role of Seafaring in Bronze Age Societies*

As exemplified by Viking and Bronze Age societies in northern Europe, we model the political dynamics of raiding, trading, and slaving as a maritime mode of production (MMP). It includes political strategies to control trade by owning boats and financing excursions, thus permitting chiefs to channel wealth flows and establish decentralized, expansive political networks. Such political institutions often form at edges of world systems, where chieftains support mobile warriors, who were instrumental in seizing and protecting wealth. Particular properties of the MMP as relevant to Scandinavia are the fusion of agro-pastoral and maritime forces of productions.

[319] *Discussant*

Kristiansen, Kristian [245] see Earle, Timothy

Kroot, Matthew (Santa Clara University)

[160] *Discussant*

Kruchten, Jeffery (Archaeological Research Center of St. Louis, Inc./ University of Illinois)

[26] *Thunder, Lightning, Wind, and Rain: Exploring Engagements with Elemental Entities in the Closing of Emerald*

The Emerald Acropolis is an early Mississippian shrine complex constructed atop a high upland ridge approximately 25 kilometers east of Cahokia in southwestern Illinois. The termination and abandonment of a suite of special-use buildings located along an isolated spur at the base of the main ridge is strikingly different than the termination of similar non-domestic buildings throughout the region. These buildings, including large public structures, shrines, temples, and a sweat lodge, are adjacent to one of several ancient springs that would have been a powerful presence at the site. The closing of this portion of Emerald sometime during the early part of the Stirling phase (1100–1200 CE) is rife with water symbolism, including structured water-lain deposits and offerings that have ethnohistoric associations with Thunderbirds and violent thunderstorms. In this paper I establish thunder and associated elemental forces as sentient entities in the Mississippian world, and explore the engagement with them by those Cahokians concerned with the closure of this isolated cluster of buildings. Understanding Cahokians' relationships with these entities may shed light on the shifting socio-politics of the region during a potential time of stress

Krueger, Bradley (National Park Service)

[202] *Of Wharves and Watercraft: Exploring the Maritime Archeology of Theodore Roosevelt Island*

Situated in the Potomac River within the District of Columbia, Theodore Roosevelt Island serves as a living memorial to the 26th president of the United States. Secluded from the bustling capital city, the island's rich history extends beyond the memorial itself. It served as a site of American Indian occupation in the pre-contact era, hosted John Mason's plantation beginning in the late eighteenth century, was the training ground for the 1st U.S. Colored Troops during the Civil War and then home to African American refugees fleeing the South, and finally used for various recreational purposes through the early twentieth century, all prior to becoming a presidential memorial. Tightly woven into this history is a distinctly maritime thread, as the island could only be accessed by water prior to 1807. Even afterwards, water-based transportation and recreation continued to take place within the island's unique landscape. Remarkably, remnants of these maritime components are still preserved on the island today. From wharves to watercraft, this presentation summarizes the maritime history of the island and highlights two maritime archeological features.

Krueger, Erica (Florida Gulf Coast University), Jon Wittig (Florida Gulf Coast University), Michael Savarese (Florida Gulf Coast University), Kylie Palmer (Florida Gulf Coast University) and Antonio Arruza (Florida Gulf Coast University)

[224] *Impact of Oyster Overharvesting in Southwest Florida by Calusa Native Americans*

Recent research has demonstrated that overharvesting of Eastern oysters (*Crassostrea virginica*) by Calusa Native Americans was severe enough during the Caloosahatchee cultural period (500 BC–AD 1500) to have influenced the population demography of the shellfishery (Savarese et al., 2016). A shift to smaller individuals without a change in oyster growth rate was documented from the Late Archaic into the Caloosahatchee when Calusa population size increased considerably in the region. Modern oyster populations exhibit a return to Late Archaic size, suggesting that the Calusa did not impose a permanent genetic change on oyster capacity for growth. These patterns were displayed for two estuaries in Southwest Florida: Estero Bay and Pine Island Sound. New data from recent excavations from Mound Key, Estero Bay, further support these interpretations. 35 samples spanning ~

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AD 1000–AD 1400 all exhibit similar small sizes consistent with the Late Caloosahatchee period across the broader region. Additionally, taphonomic grading (sensu Savarese et al., 2016) also demonstrates that Mound Key's midden oysters were harvested for consumption, rather than mined strictly as building material. The relatively pristine preservation of oyster valve interior surfaces is consistent with the removal of oysters from their estuarine environment while alive and still articulated.

Krug, Andrew (University of Missouri), Kyle Waller (University of Missouri) and Christine VanPool (University of Missouri)

[225] *Isotopic Approaches to Marine Shell Exchange in the Southwest*

Excavations have uncovered millions of marine shells throughout the Southwest. However, it was not an easily obtainable resource. The nearest possible location was the expansive shorelines of Sonora, Mexico. Archaeological literature is full of hypotheses regarding shell procurement and exchange—models of down-the-line trading, least cost, prestige, and group membership. Each of these hypotheses agrees that where and whom the people of the Southwest interacted with to acquire marine shell are important to understanding regional exchange. A narrower geographic location would offer a more comprehensive understanding of the interactions between the procurers of shell and those that sought the molluscs. In this study, we further studies of economic interaction by comparing carbon and oxygen isotope ratios of Olivella, Conus, Glycymeris, and Nassarius shell from 76 Draw, a Casas Grandes site near Deming, New Mexico, with several published modern Gulf of California datasets. Building upon previous isotopic analyses of Southwestern shell, we determine the provenience of marine shells from 76 Draw and propose a model of marine shell exchange for the Casas Grandes world.

Krug, Ronald [48] see Neff, Linda

Krummel, Jordan and James Watson (The University of Arizona)

[88] *Archaeoethanatomical Analysis of Mortuary Practices in the Prehistoric Sonoran Desert and Implications for Interpreting Sickness through Postmortem Processing*

The La Playa archaeological site in the Sonoran Desert represents one of the earliest agricultural settlements in northwest Mexico. Over 310 mortuary features have been uncovered during salvage excavations since the site was discovered in 1930, revealing a wide variability in mortuary practices that may reflect specific treatments for pathological or transgressive individuals after death. This paper describes analyses of burials uncovered during the 2017 field season utilizing the taphonomy-centered archaeoethanatomical approach to excavation and interpretation. Using this approach, specific consideration was given to a number of burials with destructive cranial lesions that may be evidence for the earliest known cases of treponemal disease in the North American Desert West. Additionally, deviant burials uncovered during past excavations were reconsidered for evidence of pathology only visible using archaeoethanatomical analyses. Analysis revealed new insights into the mortuary behavior of these early agriculturalists, particularly concerning corpse processing before primary inhumation as well as cultural understandings of sickness. This has implications regarding social organization and the array of observed burial patterns at La Playa, from cremation, single and multiple burials, and deviant burials. These findings paint a broader picture of prehistoric inhabitants of the Sonoran Desert for whom limited cultural material has survived.

Krus, Anthony (Scottish Universities Environmental Research Centre) and Charles Cobb (Florida Museum of Natural History)

[119] *The Mississippian Fin de Siècle in the Middle Cumberland Region of Tennessee*

Bayesian chronological modeling is used to investigate the chronology for a large-scale human depopulation event during the Mississippian period (A.D. 1000–1700) known as the Vacant Quarter phenomenon. The Middle Cumberland Region (MCR) of Tennessee is within the Vacant Quarter area and six villages from the final phase of Mississippian activity in the MCR have been subjected to radiocarbon dating. Complete radiocarbon datasets from these sites are presented within an interpretative Bayesian statistical framework. The results provide a unique history of each settlement and demonstrate that Mississippian occupations at each site likely terminated in the mid-to-late fifteenth- and possibly early sixteenth-centuries A.D., which is 50–100 years later than the most recent estimate for the timing of the Vacant Quarter. Mississippian abandonment in the MCR was relatively quick, likely occurring over less than a century. The exact reasons for abandonment are not entirely clear but appear to be linked to climate change. A radiocarbon simulation experiment indicates that future robust radiocarbon dating with well selected samples could greatly improve the chronological precision for this late Mississippian activity.

[315] *Discussant*

Kruse, Andrea (University of Nebraska- Lincoln)

[238] *Digital History and Storytelling through Routt National Forest Past and Present Photographs*

Archaeology is changing from the data collection and specialized publishing to gaining deeper knowledge from past collections and sharing them to the wider public. Digital archives are now easily accessible with open source tools and the internet, which allows not only for collaboration with other researchers outside their agencies but engages a larger public with cultural heritage. This poster describes a digital archaeology project that uses historical photographs to engage and inform the public about the Routt National Forest in Northwest Colorado. It presents the methods used to digitally archive historical materials as well as employ these materials in diverse ways in digital exhibits that include mapping and multi-media. The multiple layers of information allow the public to explore Routt in order to learn about the early years of the forest and changes in forest structure, get digital access to restricted or inaccessible sites, as well as help plan their next trip to the forest. By digitally archiving photographs and using digital tools, Forest Service employees and the public can gain a new perspective on the past landscape areas they are studying for present-day heritage projects.

Kryder-Reid, Elizabeth [166] see Wilson, Jeremy

Kuboyama, Waka (Universidad de Waseda)

[6] *Crafting Process and Usage of "Axe-God" Jade Pendants in Pre-Columbian Costa Rica*

The "axe-god" jade pendants form the majority of Costa Rican jade artifacts. These pendants were valued for their "celt like shape" and did not function as real axes. Interestingly, some pendants do have abrasions on their axe edges. Because of that, it has been proposed that prior to being reworked into a corporal accessory, some of these pendants had been used as real axes or other tools. The "axe-god" pendants consist of two parts; the superior part with decoration of human or animals, and the inferior part presents undecorated axe. This unique shape of "axe-god" is also can be seen in gold, bone, and shell artifacts in Costa Rica. Hence, the inferior part of the axe pendants may have important symbolic meaning, and focusing on the axe part is of great significance. Both the crafting procedures and the basic form from which the pendant is shaped are closely related to the pendants

usage. In this study, a digital microscope was used to analyze use-wear and crafting techniques. As a result, I show that there were several ways to elaborate the "axe-god" possibly reflecting a variety of crafting groups.

Kuchelmann, Christian [34] see Cakirlar, Canan

Kuester, Falko [134] see Lo, Eric

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Kuhn, Steven (University of Arizona)
[227] *Discussant*

Kuijt, Ian (University of Notre Dame)
[4] *Material Geographies of Multi-family Neolithic Households*

This paper explores how people within Neolithic villages were potentially connected to co-resident multi-family households, and considers the potential material footprint of multi-family households within Neolithic villages. As seen from ethnographic cases, in some cases residential buildings of House Societies had a range of functions including as dwelling locations, origin-places, council houses, or meeting-houses. Echoing other research this paper decouples the social unit of the House from a single residence, and explores the case study of Çatalhöyük, in which the House can be modeled as linking multiple residential building. This paper provides insight into how members of Neolithic house societies appear to have used different building, rooms and / or spaces, in different ways. I argue that among house societies where people resided in a complex of buildings, select houses were invested with greater symbolism, were actively maintained as a means of perpetuating the House. Study of Çatalhöyük burial practices demonstrate that the living physically moved deceased household members from specific buildings / rooms where they slept, worked, and eat food, to pre-identified rooms at death.

Kuijt, Ian [296] see Donaruma, William

Kulick, Rachel (University of Toronto)
[146] *An Urban Micromorphological Perspective on Neopalatial Environmental Changes at Bronze Age Palaikastro, Crete*

Transitional phases between settlement periods on Bronze Age Crete are often associated with 'natural' destructive events. However, it is unclear whether these 'natural' destructive events and subsequent shifts in material practices were influenced by anthropogenic or environmental processes. For example, the end of the Neopalatial period on Crete occurred in the LM IB period; some researchers view LM IB destructive fires as indicative of human action during a phase of social and political instability, while others reason that destructive fires followed a massive natural disaster. Micromorphological evidence from archaeological sequences can correspond to occupational and transitional phases and provide information on transformations in the surrounding environment, creating a microecological narrative. These narratives can distill social responses to environmental stresses from the archaeological record. New micromorphological evidence from the 2013–2015 Palace and Landscape at Palaikastro excavations, from the previously unknown neighborhood on the southeast edge of the main Bronze Age town, identifies some of these socio-natural responses. Micromorphological evidence from this neighborhood of three newly-excavated buildings illustrates variations in site formation processes and establishes a local, microecological narrative for the Neopalatial (MM IIIA—LM IB) period and associated transitional periods, which may be connected to larger regional and Mediterranean narratives.

Kuma, Dela
[32] *Foodways in Atlantic Era West Africa—Ghana: Towards an Archaeology of Daily Life*

In the context of Africa, foodways are usually portrayed very differently than in the archaeology of food literature. Food in West Africa is depicted by its primary historians as shrouded in continuous food insecurities and largely lacking differentiated cuisines. However, recent archaeological and historical research in Atlantic era West African foodways have highlighted the dynamic nature of West African foodways. Despite these advancement, the full processes through which American crops became integrated into local African foodways is poorly understood. This paper critically reviews how Africanist researchers have discussed the incorporation of American crops into local foodways. Building on these works, I show how we can trace the impacts of local food choices on the broader Atlantic trade through my proposed ethno-archaeological research in Ghana-Amedeka. This paper situates these issues within the Atlantic era in West Africa. The Atlantic trade brought with it networks of connections and change, however these interactions did not happen in vacuum. They occurred within local situated social, political, economic, and historical contexts. I argue throughout this paper that the silence on these local social processes that shaped the contours of the Atlantic trade portray the multidirectional relationship that characterized the trade as unidirectional.

Kuma, Dela [220] see Logan, Amanda

Kurashina, Hiro [13] see Gilmore, Kevin P.

Kurin, Danielle [270] see Black, Valda

Kurin, Danielle [270] see Serra, Margot

Kurnick, Sarah (University of Colorado Boulder)
[85] *Political Authority and the Creation of Wilderness: American National Parks and Mexican Eco-Archaeological Parks*

Over the last several decades, scholars have reexamined the importance of spatiality to human life and argued that space is social, relational, and that it produces and is produced by social relationships. This reconceptualization of space has highlighted the ways in which the production of landscapes is integral to the creation, maintenance, and negation of social inequality and political authority. Recent archaeological approaches to studying inequality through landscape have taken a variety of forms, including analyses of political architectonics, panoptic spaces, and pre-existing places. An equally important practice includes transforming, or claiming to transform, wilderness into a built environment. Such claims affirm rulers' abilities to impose order on chaos and to control the natural, or seemingly natural, world by destroying it. This presentation argues that political leaders bolster their authority not only by proclaiming their ability to turn wildernesses into built environments, but also by emphasizing their ability to turn built environments into wildernesses. Put differently, political regimes not only claim to conquer nature; they also claim to create it. To examine this argument, the presentation will compare the creation and development of American National Parks and Mexican eco-archaeological parks, focusing on the relationships between governmental authorities and indigenous peoples.

Kus, Susan (Rhodes College) and Victor Raharijaona (Chercheur Associé, Université de Fianarantsoa, Mad)

[181] *The "Private(s)" Is(Are) Political: Girding One's Loins for Work, for Battle, for Provocation, and Ungirding for Insurgence*
Many societies archaeologists seek to understand are societies of primary orality. They are "lifeworlds" of primary subsistence. Their study demands a multiplicity of approaches. Certainly one needs a sensitive yet hardy material gaze (and touch). Further, one should seek sensuous engagement in subsistence and celebration. Additionally, one should cultivate an incitement to imagine how the poetic and philosophical, of both reflective thought and of speech, are anchored in the material experiences of the quotidian and the exceptional. Engaging in the challenges announced above, we discuss the Malagasy loincloth/salaka not only as an icon, index and symbol, but also as "matter" that mattered in the state politics of the Malagasy highlands. The salaka serves/ed as an icon of masculinity and of legitimate claim to rule, and as an Index of age, nobility, and "shame". It further served as a political symbol of incitement to competitive engagement. Yet, it also served as physical

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material in rebellion against imposed political authority and consequently as a symbol of cleverness/ruse in such contestation. Our discussion draws on archaeological evidence and recorded oral traditions from the time of 18th century “state” formation in central Madagascar, and from recent ethnoarchaeological fieldwork in the central highlands of Madagascar.

Kuypers, Martijn [92] see Bradshaw, Ryan

Kvetina, Petr (Institute of Archaeology Prague, Czech Republic) and Jiri Unger (Institute of Archaeology Prague, Czech Republic)

[118] *The Fast and the Furious. Innovations in Archaeological Visualisations at the Beginning of the 21st Ct.*

The aim of the paper is to discuss current possibilities of complex approach to 3D virtual presentation of archaeological information, both to public and professional archaeologists. Virtual archaeology including 3D objects, reconstruction of building structures and even past landscape scenes has been for several years a standard and specific way of documentation and interpretation. However, what is currently changing is the general availability of the necessary technologies. A common feature of new software solutions and new technological equipment is their high user-friendliness, which allows high-quality outputs without deeper knowledge of the issue or prior extended training. Another new important aspect is the low acquisition price of the software and equipment as compared to the previous period; moreover, many freeware tools have been created. Last but not least, there are new platforms for easy presentation and sharing of virtual data. In our talk, we will provide an overview of options for using the new 3D technologies especially for small heritage actors.

Kwan, Daniel (University of Toronto)

[284] *An Overview of Technological Changes in the Pottery of the Early Holocene Shangshan Culture, Zhejiang Province, China*

This presentation provides a preliminary overview of the diachronic modifications that occurred in the Shangshan ceramic technological tradition (approximately 11,400 to 8,600 cal. BP). It is hypothesized that Shangshan peoples engaged in low-level cultivation of rice and began the process of bringing this crucial cereal under domestication. The authors explore the relationship between changes in Shangshan pottery technology, culinary practices, and the emergence of rice cultivation as factors in the complex human-environmental interaction that occurred in the lower Yangtze Valley after 12,000 years ago. Pottery recovered from the Shangshan, Hehuashan, Huxi, Qiaotou, Miaoshan, and Changchengli sites serves as the focal point for the macroscopic component of analysis.

[61] *Discussant*

Kwan, Daniel [87] see Dorland, Steven

Kwoka, Jopshua [173] see Guderjan, Thomas

La Rosa, Vanessa [64] see Shoji, Kazuho

Labadia, Catherine (Connecticut SHPO)

[203] *The Connecticut State Archaeological Preserve Program*

In this introduction to Connecticut’s State Archaeological Preserve program, I will talk about the legislation that created it, the process for designating sites as Archaeological Preserves, and how these properties are used or managed after designation. Although the program has the explicit goal of site preservation, in practice it has spurred many additional benefits. Foremost among these additional benefits has been the forging of partnerships with the State Historic Preservation Office and inspiring stewardship for the sites so designated. While not every nominated site makes it to preserve status, just going through the process for consideration has made the value of these benefits more apparent to all involved. Nominations for archaeological preserve status have originated from a variety of concerned preservation groups, individual landowners, municipalities, state agencies, or at the request of SHPO. Many of the individuals or groups that have sought designation have not been traditional partners with SHPO’s archaeology program. More importantly, these individuals and groups have developed their own sense of stewardship over resources they cannot see, and has fostered a sense of stewardship in their communities.

[159] *Discussant*

[203] *Chair*

LaBelle, Jason (Colorado State University) and Kelton Meyer (Colorado State University)

[174] *Passing Through or Settling Down? Paleoindian Occupation of Colorado’s Southern Rocky Mountains, USA*

Colorado is well known for dense concentrations of Paleoindian sites found within its eastern plains and in multiple high altitude basins (Middle Park, Gunnison Basin, San Luis Valley) to the west. Prominent mountain ranges separate these clusters of sites, and the question remains, when were these mountains first crossed and/or utilized? These high altitude settings (elevations routinely topping 3000–4400 m) would have presented both challenges and opportunities for the earliest inhabitants of the region. This paper examines the occurrence and frequency of Paleoindian components within the montane, subalpine, and alpine ecosystems of the Front Range and the Medicine Bow Range of the Southern Rocky Mountains. Over 750 sites of all periods (276 prehistoric components) are recorded over an area encompassing seven 1:24,000 scale maps. While limited numbers of late Pleistocene materials are present (faunal remains, Folsom materials), these ranges are dominated by late Paleoindian occupations, found at Early Holocene Allen complex sites such as Carey Lake, Caribou Lake, Fourth of July Valley, and Rollins Pass. Archaeological data are summarized to discuss the timing of the initial occupation of these high mountains, identify the periods of most intensive Paleoindian use, and propose reasons for these early occupations.

LaBelle, Jason [127] see Meyer, Kelton

Ladefoged, Thegn (University of Auckland), Dion O’Neale (University of Auckland), Alex Jorgensen (University of Auckland), Christopher Stevenson (Virginia Commonwealth University) and Mark McCoy (Southern Methodist University)

[20] *The Dynamics of Māori Socio-political Interaction: Social Network Analyses of Obsidian Circulation in Northland Aotearoa*

The Polynesian colonists who settled New Zealand touched off the creation of a type of society not found in remote Oceania. Over the span of several centuries relatively autonomous village-based groups transformed into larger territorial hapū lineages, which later formed even larger geo-political iwi associations. A social network analysis of the spatial and temporal distribution of obsidian artefacts, an important stone resource that was used for a variety of tools, evaluates where and when new types of social forms came about in relation to diverse social and environmental contexts. Incorporating data from pXRF sourcing of obsidian artefacts and obsidian hydration dating we investigate the dynamic complexities of social interaction in Northland and gain insights into how Māori society was transformed from village-based groups to powerful hapū and iwi.

[20] *Chair*

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Ladron De Guevara, Sara (Sara Ladron de Guevara)**[128]** *The Eyes of God*

The deities of El Tajin seem to share a characteristic scroll eyebrow in bas reliefs as well as in mural paintings.

I will follow the representation of such an icon, trying to recognize possible origins, the outreach of the element and the symbolic associations in Mesoamerican time and space.

Laffoon, Jason (Leiden University) and William Pestle (University of Miami)**[323]** *Quantitative Paleodietary Reconstruction with Complex Foodwebs: An Isotopic Case Study from the Caribbean*

Stable isotope analysis is one of the most effective tools for paleodietary reconstruction and has been widely applied to a vast array of archaeological contexts including the Caribbean region. This region, however, possesses a particularly complex isotopic ecology, including both a large number of isotopically variable food sources and a high degree of isotopic overlap between different food groups. As such, to date, most regional paleodietary studies have been limited to descriptive and qualitative conclusions concerning the relative contributions of different food sources. In this study we apply an iterative Bayesian multi-source mixing model (FRUITS) to human stable isotope data from the prehistoric population of Tutu, St. Thomas, USVI, to generate quantitative and probabilistic individual paleodietary reconstructions. The isotope dataset includes both bone collagen ($\delta^{13}\text{C}_{\text{coll}}$ and $\delta^{15}\text{N}_{\text{coll}}$) and apatite ($\delta^{13}\text{C}_{\text{apat}}$) data. The results of two different dietary models using four and five distinct food groupings, respectively, are compared and assessed relative to other relevant archaeological evidence concerning past diet at the site. We highlight the potentials and limitations of multi-source mixing models for regional paleodietary studies, and their relevance to ongoing debates within Caribbean archaeology concerning the relative importance of different food sources such as manioc, maize, and seafood.

Lagia, Anna (Biological Anthropology, Albert-Ludwigs-University Freiburg)**[298]** *Contributing Bodies: The Foundation of the Modern Human Skeletal Collection of the University of Athens in Greece*

The capacity of humans to contribute positively even long after death includes not only donations and institutions but also one's own body. The human body and its parts provide the opportunity to bridge time in archaeological and forensic contexts and appreciate human history. In 1996–7 this capacity was aptly evaluated by the scientific committee of the Wiener Laboratory of the American School of Classical Studies in Athens and the foundation of the modern human skeletal reference collection for Greek populations was launched. Since then, a large number of contributions has led to the creation of a collection of more than 350 human skeletons at the University of Athens, known as the 'Athens Collection.' Fields of research involving the determination of sex, age, health and diet draw now directly from a collection of human remains for which these parameters are known. Today anthropology practiced in Greece and the Eastern Mediterranean has its own coordinates and sound foundations. In this presentation an appraisal is attempted of the course and dynamic of the development of this collection, known during its foundation as the 'Wiener Collection.'

Lakevold, Courtney [120] see Ives, John W.

Laluk, Nicholas (White Mountain Apache Tribe)**[114]** *Embracing the Ndee Past as the Present: Ndee Cultural Tenets as Sovereignty-Driven Practice and Community Well-Being*

In 2004 the White Mountain Apache Tribe passed a tribal resolution approving the White Mountain Apache Tribe Cultural Heritage Resources Best Management Practices (Welch et al.). These practices presented and delineated in guideline form discuss cultural heritage resource definitions; management and necessary steps before, during and after project implementation for any ground disturbing projects potentially adversely affecting cultural heritage resources on Ndee (Apache) trust lands. However, since the tribe's adoption of the practices little has been done in reference to the application of such tenets/concepts found within the guidelines to real world cultural and archaeological methods and practices. Moreover, diversity at the tribal community level during oral collaborative interviews demonstrates that tribal knowledge systems that drive such best management practices and overall sovereignty-driven research need to be considered as directly affecting how these practices might be applied at both the intra- and intertribal level. This paper suggests that such cultural precepts including respect and avoidance can be used and applied to Ndee research contexts that not only embrace such cultural tenets, but contribute to overall community well-being as well as a sense of balance, beauty and harmony known as Gozho for Western Apache communities.

Lam, WengCheong (Chinese University of Hong Kong Department of Anthropology)**[24]** *Early Globalization of the Han Empire in Its Southern Frontier and the Expansion of Iron Economic Network*

Even though the framework of early globalization has been proved as effective in illuminating ancient interregional interaction in many regions, its value and contribution to the archaeological study of ancient China has been overlooked in the literature. Focusing on the Han Empire, we employed statistical methods to exam variations in assemblages and frequencies of iron objects, one type of critical state finance in the Han political economies, from burials in the southern frontier of the Empire, including present-day Hunan, Jianxi, Fujian, Guangdong, and Guangxi. Although iron ware was commodities commonly found in the Han period, this study identified several cross-regional patterns of variation in the assemblages of iron ware from tombs, which were shaped by both local production, expansion of the imperial market network, and core-periphery relationship. By combing globalization framework and analysis of our big data, this presentation tries to shed new light on nature of integration and regional interaction of the Han Empire.

Lamb, Céline (University of Kentucky)**[142]** *Crafting, Ritual, and the Constitution of Rural Complexity: Household and Community Practices of Distinction and Affiliation at Chunhuayum, Yucatán*

As Maya archaeology has shifted away from urban-centric perspectives, recent research demonstrates that hinterland populations, like urbanites, were involved in diverse and shifting practices enabling them to build and negotiate complex relationships. Using a community approach, this paper examines non-agrarian activities practiced during the late Early and Late Classic (ca. 500–850 AD) by residents of Chunhuayum, a small yet socioeconomically diverse farming settlement located in northwest Yucatan. Through domestic assemblages and architecture, I argue that shell and chert craft production, and suprahousehold rituals, enabled three households to distinguish themselves more markedly from their neighbors while simultaneously partaking in the constitution of a local community. These activities, and their resulting relations of mutually constituting affiliation and distinction, are also related to nearby centers' faltering political clout and population decline. Reframing discussions of complexity to focus on the micro-levels of human interaction within a lower-order rural settlement, this research counters enduring assumptions about rural populations and contributes to a more inclusive and nuanced understanding of ancient Maya social complexity, in which hinterland people were diverse, active participants in local and regional historical processes.

[142] *Chair*

Lamb, Henry (Aberystwyth University, UK)**[198]** *The African Humid Period: Paleolimnological and Paleoecological Evidence*

From about 15,000 to 5,000 years ago, lakes and rivers existed across now arid areas of northern Africa, accompanied by extended ranges of vegetation, animals and human settlement. In eastern Africa, lake levels were very much higher than present, with now-closed lakes overflowing into

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the Nile and tributary rivers. While it is widely recognised that this African Humid Period resulted from an intensified African summer monsoon linked to the early Holocene precessional increase in summer insolation, its precise timing and geographical extent, especially its onset and termination, are widely debated. Vegetation feedback factors may account for differences in the rate of changes between insolation drivers and climatic response. Local factors, especially lake hydrology and morphology, undoubtedly account for differences in the timing of changes between sites. In this contribution, I will review some of the evidence for the African Humid Period, demonstrate these apparent anomalies, and attempt to clarify its temporal and geographical boundaries.

Lamb, Trevor (University of New Brunswick)

[199] *Incised Lines: Mortuary Ceramics and Their Role in Defining Protohistoric Chronologies in the Far Northeast 1900–1960*

The first half of the twentieth century saw the creation of many professional and avocational archaeological institutions in Eastern Massachusetts. These institutions were motivated to both understand the prehistory of the Northeast, and to build large museum collections for comparative and public engagement purposes. The drive to acquire largely intact objects led to the excavation of many graves throughout New England and the Maritime Provinces, but the frequent discovery of graves in Eastern Massachusetts due to urban expansion led to their heavy representation within the literature. A large body of incised ceramic vessels from grave contexts thus entered institutional collections during this period, and formed the core of what scholars and avocationalists used to define Protohistoric ceramic technology. This paper seeks to evaluate the persistence of these chronologies in the twentieth century, address later research which demonstrates the inappropriateness of applying these chronologies to much of the Far Northeast due to the contemporaneous use of cord impressed ceramics in areas of Maine and the Maritimes, and to serve as a starting point for future research concerning ceramic diversity in the Protohistoric Far Northeast.

Lambert, Shawn (University of Oklahoma)

[255] *A Provenance and Stylistic Study of Formative Caddo Vessels: Evidence for Specialized Ritual Craft Production and Long-Distance Exchange*

Instrumental Neutron Activation Analysis is used to determine whether Formative Caddo finewares (A.D. 850 -1150) were made locally in the Arkansas River Basin or produced by their Gulf Coastal Plain neighbors to the south. The preliminary INAA results, in concert with a stylistic study that indicates very few potters had the knowledge and skill to produce them, show that Formative Caddo finewares were made in the southern Caddo region and exported north to Arkansas River Basin mound centers for strictly mortuary use. These findings suggest an extensive history of specialized ritual production and long-distance exchange between two diverse Caddo communities much earlier than expected.

Lambert, Spencer (Brigham Young University)

[43] *Identifying Fremont Large Game Hunting Practices through the Modified General Utility Index and Strontium Isotope Analysis*

The analysis of faunal bones from several Fremont sites have resulted in complications when compared to the Modified General Utility Index (MGUI). In this research, I explore the processing and transportation techniques of Fremont hunters at Wolf Village by comparing skeletal frequencies to the MGUI. Then, I compare these frequencies with results of strontium isotope analysis on small artiodactyl teeth from Wolf Village to determine which species were obtained locally. I also identify the strontium baseline at Wolf Village and five other Fremont sites in order to identify evidence of trade between Fremont communities. The results of this research suggests that the MGUI does not seem appropriate for measuring the utility of animal portions by the Fremont. Reverse utility curves at several Fremont sites suggest that the Fremont were regularly bringing low utility elements back to residential sites at least part of the time. The MGUI can only consider caloric reasons for prehistoric hunters to return to habitation sites with low utility elements. Only when considering the social and economic reasons for transporting so-called low utility elements can archaeologists begin to discover the reasons behind the processing and transportation techniques of Fremont hunters.

Lambert, Spencer [10] see Bryce, Joseph

Lamothe, Francis (Ethnoscop), Karine Tache (CUNY Queens College) and Roland Tremblay (Consultant)

[225] *Human Presence and Intersocietal Interactions in the Laurentians (Quebec, Canada)*

The Laurentians is a region of rolling hills, mountains and lakes occupying a strategic position in the vast hydrographic basin that drains the northern shore of the Saint Lawrence River. Archaeological fieldwork undertaken since 2015 demonstrates the integration of this landscape within interaction networks encompassing several other regions of the greater Northeast at various time periods. Ceramic remains, notably, reveal close links between Algonquians of the Laurentians and both Hurons to the west and Saint Lawrence Iroquoians to the south. Ongoing analysis of organic residues preserved in these vessels will further document how such artifacts were integrated and used in the Laurentian landscape. Artifacts associated with the Fur Trade, on the other hand, illustrate commercial relationships that bonded Algonquin and their French allies at the beginning of the 17th century. By means of documentary sources and archaeological data, this poster draws a picture of the Laurentians, a landscape on which small nomadic groups inscribed their presence, interacted, and created social memories for over 5000 years.

LaMotta, Vincent M. [218] see Hedquist, Saul

Lamoureux St-Hilaire, Maxime (Tulane University)

[337] *An Empirical Study of the Economy of the Classic Maya Regal Palace of La Corona, Guatemala*

This paper reports on the final results of a multi-faceted study of the northern section of the regal palace of La Corona. This study sampled (n=328) both plaster and soil in three adjacent patios and adjoining middens. The plaster samples underwent a geochemical analysis (ICP-MS), while the soil samples underwent flotation analysis which recovered macro-botanical remains and micro-artifacts. These results were then combined to traditional artifactual data derived from five middens excavated within the sampled area. The combination of these datasets reveals invaluable information about the economic activities that occurred in the regal palace during its latest phase of occupation, spanning roughly 750–850 A.D. These activities included: food preparation; the manufacture of many different lithic, ceramic, and perishable artifacts; the combustion of various materials; the preparation of pigments; the storage of perishable and durable items; and the discard of every type of artifact. The results of this NSF-funded study inform on the pragmatic dimensions of the political-economy of the ancient institution that was the La Corona Regal palace.

Lamoureux St-Hilaire, Maxime [337] see Morales Forte, Rubén

Lamoureux St-Hilaire, Maxime [147] see Snetsinger, Andrew

Landa, Olga

[158] *La gestión y colaboración interinstitucional con la CFE y SCT para la protección del patrimonio arqueológico en Oaxaca*

La numerosa y acelerada construcción de infraestructura en México, suelen poner en riesgo la subsistencia de los vestigios arqueológicos ubicados a lo largo y ancho del territorio, los cuales deben ser salvaguardados, sin que esto signifique detener el desarrollo del país. En este sentido se planeó conjuntamente con la Comisión Federal de Electricidad y la Secretaría de Comunicaciones y Transportes, la instrumentación de mecanismos adecuados para que la realización de las obras sea planificada de manera que no afecte los vestigios de nuestro pasado y, en su defecto, el impacto

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sobre ellos sea menor, mostraremos los casos específicos de la introducción de los tendidos eléctricos y carreteras que están en gestión o construcción recientemente en Oaxaca y que han permitido registrar y conocer algunos sitios arqueológicos que no han sido investigados.

Landau, Kristin (Alma College)

[82] *The Dynamics of State Integration: A Neighborhood Perspective from San Lucas, Copán, Honduras*

In the early 2000s, Mesoamerican archaeologists adopted the “dynamic” model of state organization, positing that political centralization strengthened and diminished over time. Such fluctuations are due primarily to the inherent tension between the institutions of kinship and kingship, and consequent struggle for power in political, economic, and religious spheres. I argue that the intermediate scale of the neighborhood is best suited for analyzing how local- and state-level power structures intermix on the ground. Neighborhoods within cities capture both the everyday life of a diversity of residents, and articulate with larger state institutions and political economy. While the dynamic model is now widely accepted, very few studies show how state actors and local people actually navigate growing and waning power levels. I model such dynamics through the lens of Collective Action Theory, which specifically addresses the role of state actors in the everyday life of local residents through the concept of infrastructural power. I provide a case study illustrating the actions of San Lucas residents and the Copán state during moments of very high and very low infrastructural power. This perspective provides a more holistic understanding of ancient state organization.

Landivar, Tamara [324] see Ordoñez, Maria

Landsman, Andrew [202] see Kelly, Sophia

Lane, Amanda (Rhodes College), Katherine Cynkar (Rhodes College), Kimberly Kasper (Rhodes College) and Anthony Graesch (Connecticut College)

[153] *What's In a Seed?: An Experimental Archaeological Study of Elderberry (Sambucus sp.) Processing on the Pacific Northwest Coast*

Uncharred botanicals are commonly found on archaeological sites but seldom assigned interpretive significance owing to their assumed ambiguous origins. Thousands of uncharred, fragmented *Sambucus racemosa* (red elderberry) seeds have been recovered at Welqámex, a Stó:lō-Coast Salish settlement in the Upper Fraser Valley of southwestern British Columbia. In Stó:lō-Coast Salish territory and beyond, *Sambucus* was used as both a food and a medicine. Owing to the presence of cyanide-like glycosides, uncharred elderberry seeds are seemingly preserved in archaeological deposits for well over a hundred years. This poster highlights archaeological and experimental archaeological research addressing the stratigraphic and taphonomic circumstances under which unburned seeds can be linked to food-processing activities. We present the results of five experiments in which elderberry fruit was subjected to different preparation and cooking techniques.

Lane, Kevin (CONICET—Instituto de Arqueología)

[275] *When the Saints Come Marching In: Colony, Church and Change in the Andes (1480–1615)*

Spanish conquest of the Andes commenced in 1532 and, for all intents and purposes, was over by 1572. Yet, this somewhat simplifies the story. Throughout the Andean region, but especially away from the early strongholds of Spanish power, such as the towns and cities, conquest was a mixture of appropriation and negotiation. Drawing on research from the Ica Highlands (South-central Peru) and the Cordillera Negra (North-central Peru) this paper examines how Spanish religious orders initially occupied sacred indigenous sites, linking them directly to local cosmological landscapes. With time, the contradiction between an externalized (Andean—animated landscape) and an internalized (Christian—church) system of worship amid growing Spanish hegemony called for a renegotiation of this earlier *modus operandi*. In turn, this led to the abandonment of early church sites, in favor of churches in new town reducciones—imperial settlements which concentrated a declining indigenous population in more accessible areas—that led to a disconnect with the earlier Andean landscape. Nevertheless, the resulting Andean church was always syncretic, for instance, combining Christian saints with Andean deities, and local pilgrimage routes that directly evoked earlier indigenous sacred sites. Here we analyze the changing nature of this emergent syncretism.

[207] *Discussant*

[207] *Chair*

Lane, Kevin [224] see Whitlock, Bethany

Lane, Rachael (University of Sydney), Sarah Lane (Arizona State University) and Ruby Kerwin (Arizona State University)

[307] *Parting the Sea and Draining the Swamp: A Critical Review of Binary Approaches to Water Management*

Archaeology has the unique ability to observe how past societies' water systems were organized and managed. Indigenous approaches to water management in pre-colonialist societies, in both a conceptual and practical sense, often differed largely from those of their colonizers. Through three case studies, we evaluate and contrast indigenous relationships with water and those imposed by colonial powers. These case studies include the draining of lake of Texcoco by the Spanish in modern day Mexico city, modern development in Siem Reap, Cambodia, and the construction of the Aswan Dam to control the floods of the Nile river. We contend that decision making parties on water management in these contemporary cities have problematically based decisions for the organization and management of their water system on binary models of seasonality (i.e., wetlands/drylands). We find that a strict adherent to dichotomous treatments of water management may reduce the productive capacity of water management systems. A more faithful interpretation of indigenous approaches to water systems in these three cases may have led to a different outcome of improved productive capacity.

Lange, Frederick (Smithsonian Institution Department of Anthropology)

[263] *Exploring Mobility and Multi-directional Lifeways in Pre-Columbian Central America*

To paraphrase the symposium organizers, for decades changes in the pre-Columbian material culture of Central America were attributed to either migration or conquest. When I began archaeological research in Costa Rica in 1969 the endless debate was about Mesoamerican influence. Technological and iconographic linkages were frequently cited, but rarely were the mechanisms of the proposed linkages adequately defined or demonstrated archaeologically. In 2008, perhaps unduly influenced by having moved to California in 2004, I floated the concept of a “southern Mesoamerican Wedge” a la Kroeber. This wedge paralleled the Pacific coast and while the Paleo and Archaic periods were almost invisible, by the early Preclassic almost identical ceramics are found in the Soconusco, beneath downtown Managua, and in the Arenal region of Costa Rica. And, in a pattern even more complicated than was ever described for the Taki Wedge, the southern Mesoamerican Wedge is also intersected throughout Central America with river drainages that for all intent and purpose connected the Caribbean with the Pacific and low, natural “roads” or “saddles” between the volcanoes that accomplished the same objective. Investigating these complex adaptations, particularly involving groups of differing linguistic or ethnic backgrounds, requires new research designs and multi-country research.

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Lange, Richard (Arizona State Museum, University of Arizona)

[131] *The Southwest Journeys of Adolph F. Bandelier, Charles H. Lange, Elizabeth M. Lange, and Carroll L. Riley*

The US Southwest has attracted numerous adventurers and researchers since the mid-19th Century, including the three individuals noted in the title. Although more than 60 years passed between their respective journeys, their approaches to understanding native Southwest cultures were remarkably similar. Their work melded data and insights from ethnology, anthropology, history and historical documents, and archaeology. The later researchers could not have known when they began their journeys that telling the story of the earlier researcher would become a shared project that consumed much of their professional lives. That process took more than twice as long as the original researcher was in the field in the Southwest. This paper reviews the enduring legacies of these scholars and the circumstances that surrounded their efforts.

[218] *Discussant*

Langebaek, Carl [66] see Miller, Melanie

Langlie, BrieAnna (Binghamton University)

[254] *Gardening for Victory: War Gardens in the Ancient Andes*

During times of social and political crisis humans' most basic biological needs still need to be met: they need to eat. This means that during times of war, when state infrastructure breaks down and supply chains are threatened, people often take food security matters into their own hands. During 20th century conflicts, families ensured food security on the home front by building household gardens. Practically, the construction of war gardens resulted in decreased individual reliance on often fragile political systems and infrastructure. While this process could be viewed as isolating, families often viewed themselves as collectively contributing to the war effort by maintaining self-sufficiency. In this paper, I will look at historical examples of war gardens and victory gardens to assess how they provided an anchor of cultural continuity at the household level while at the same time altering broader demographic, economic, and political relationships. I will then use these data as a heuristic framework to consider how pre-Hispanic gardens transformed social relationships in the Peruvian Andes during times of war.

Langlitz, Meredith (Archaeological Institute of America)

[233] *Discussant*

Langlitz, Meredith [222] see Perez-Juez, Amalia

Lanoe, Francois [153] see Zedeño, Maria Nieves

Lanza, Christopher, Amanuel Beyin (University of Louisville) and Erik R. Otárola-Castillo (Purdue University)

[103] *Which Way Did They Go? Using Individual-Based Models to Identify Out of Africa Hominin Dispersal Routes*

There is a broad paleoanthropological consensus that hominins left Africa multiple times during the Pleistocene, but the geographic routes through which they exited the continent remains unclear. Although the Sinai Land Bridge and the Strait of Bab-al-Mandab on the southern end of the Red Sea are commonly implicated as the likely pathways used by early humans during their expansion out of Africa, the evidence supporting each route is still much debated. Here, we identify viable pathways for hominin dispersal from the Ethiopian-Afar basin toward the Sinai using Individual-Based Modeling (IBM) and computational statistics. We computed empirical probabilities for modern hunter-gatherers to occupy habitats with variable elevations, slopes, streamflow and Net Primary Productivities to input into our IBM. Results show that hominins could have followed multiple paths during their expansion out of the Ethiopian-Afar rift basins toward the Levant, including the western littoral of the Red Sea basin. This study sheds light on the geographic areas that may have facilitated hominin dispersal out of Africa, and lends support to the notion that coastal landscapes may have served as dispersal conduits during global expansion of hominins. Furthermore, the models identify key target areas for future survey.

Laparidou, Sofia [298] see McNamee, Calla

Lapham, Heather (UNC Chapel Hill), Gary M. Feinman (Field Museum of Natural History) and Linda M. Nicholas (Field Museum of Natural History)

[43] *Raising Dogs for Meat and Sacrifice: A Comparative Study of Classic Period Sites in Oaxaca, Mexico*

The domestic dog (*Canis familiaris*) became a staple in the meat diet of Zapotec peoples during the Formative period (1500 BC—AD 200) in the Valley of Oaxaca, Mexico, and continued to be increasingly important in subsistence and ritual into the Classic and Postclassic periods. Recent zooarchaeological research has identified low-intensity household management/production of animals and animal by-products at sites throughout the valley, with each settlement marked by its own unique signature of animal use. Households within each community also showed differences, both marked and subtle, in animal-based subsistence practices, dietary preferences, and use of animals and animal by-products. Drawing on data from dog skeletal remains and ceramic dog figurines, we examine dog raising, consumption, and use at the Classic period site of Lambityeco. We compare similarities and differences among households at Lambityeco and two other contemporaneous sites (El Palmillo and the Mitla Fortress) to gain a more holistic understanding of dogs in ancient Zapotec foodways, ritual practices, and craft activities.

LaPoint, Halcyon [48] see Lee, Craig

Lapp, Jennifer E.

[148] *Moderator*

[148] *Discussant*

Larkin, Karin (University of Colorado at Colorado Springs) and Michelle Slaughter (Avalon Archaeology and Metcalf Archaeological Cons)

[39] *Chasing the Cure: The Archaeology of Alternative Health Practices at a Tuberculosis Sanatorium*

Eighty years ago, Cragmor Sanatorium in Colorado Springs, Colorado was a celebrated asylum for wealthy tuberculars and one of the premier facilities in the West. In its heyday, Cragmor housed some of the wealthiest patients in the United States. In the 1950s, the sanatorium contracted with the Bureau of Indian Affairs to treat Navajo women with tuberculosis. Once it became part of the University of Colorado system in 1965, much of the original history was subsumed under the growing campus but a few features remain. This project seeks to recover some of the ephemeral features of the sanatorium that could help us put the history in context and better understand the alternative health practices employed by both patients and doctors at the sanatorium. As part of a survey and inventory of the cultural resources of UCCS funded by the Colorado State Historic Fund, we identified and recorded several sites associated with the original functioning of the sanatorium. Using archaeological testing and historical records, we illuminate institutional practices as well as describe alternative healing strategies employed by physicians and patients at Cragmor.

[39] *Chair*

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Larmon, Jean (University of Illinois at Urbana-Champaign) and Lisa Lucero (University of Illinois at Urbana-Champaign)

[85] *Cara Blanca Pool 6: Colonial Logging and the Evolving Landscape*

Cara Blanca, in central Belize, consists of 25 pools that run east to west along the base of a limestone cliff. The Pre-Colombian significance of the pools has been studied by the Valley of Peace Archaeology Project, yet little attention has been paid to their Post-Contact influence on the local and regional landscape. This paper explores the role that Pool 6, a shallow lake centrally located in the line of lakes and cenotes, played in colonial logging operations around Cara Blanca. The 2014 exploration of Pool 6 revealed equipment used in logging, as well as historic alterations to the landscape that facilitated the movement of hardwoods from inland towards the coast. While this presentation focuses on Post-Contact logging, its theoretical emphasis is on the resilient yet malleable nature of evolving landscapes. Through a relational perspective, archaeological sites lose the label of “in the past” and, rather, reveal their ever-developing life histories. Cara Blanca Pool 6 and surrounding features exemplify how a space—a landscape—can transform while retaining the core of its essence, tying together past and present.

Larsen, Eric

[53] *“So, have you tried...?”: Is It REALLY about Science... Or Is It about Authority?*

Some archaeologists and other preservationists perceive a growing hostility in conversations about cultural heritage issues. At times it feels as though people are questioning the very foundations of archaeological work. Other times, it seems as though people just think you need to apply the technique they recently saw used on TV or the web (a la the “CSI Effect”). The implications can leave the archaeologists feeling as though the public don’t believe we know what we are doing or that they are otherwise belittling the work we do. The questions/confrontations can be quite maddening—along the lines of answering the multiple “found any gold yet?” inquiries that come up at public sites (I share with fellow archaeologists that this utterance is really a hackneyed expression of interest by the visitor). Is there something else behind the threat that many are experiencing? May we be seeing the results of a changed environment where visitors increasingly feel empowered to question the “authority” of the archaeologists? Confronting skepticism or parrying suggestions that imply we don’t know what we are doing can be difficult. This presentation will consider re-framing our responses toward further engaging interested visitors and potential supporters.

Larson, Greger (University of Oxford), Laurent Frantz (University of Oxford), Angela Perri (Durham University), Ophelie Lebrasseur (University of Oxford) and James Haile (University of Oxford)

[212] *Testing the Dual Origin Dog Domestication Hypothesis*

Despite numerous investigations leveraging both genetic and archaeological evidence, the geographic origins of dogs remain unknown. On the basis of an ancient Irish dog genome and an assessment of the spatiotemporal appearance of dogs in the archaeological record, a recent paper suggested that dogs may have been domesticated independently in Eastern and Western Eurasia from distinct wolf populations. Following those independent origins, a mitochondrial assessment suggested that the Mesolithic dog population in Western Europe may have been replaced by a population from the East. To test this hypothesis, we are generating nuclear genomes of ~10 Mesolithic dogs sampled from sites in Europe and Western and Eastern Russia, and mitochondrial genomes from ~400 dogs spanning the last 15,000 years across Eurasia. The results of this analysis will reveal the phylogenetic affinities of dogs that were present across the Old World prior to the introduction of dogs associated with farming communities. This study will also allow us to pinpoint the timing of the European mitochondrial turnover and to assess whether there was a commensurate turnover at the nuclear level, thus directly addressing whether dogs were domesticated from more than one population.

Larson, Mary Lou [127] see Kornfeld, Marcel

Lash, Ryan (Northwestern University)

[309] *Movement, Intersubjectivity, and Sensory Archaeology—Insights from Western Ireland*

Movement is fundamental to bodily perception and to the formation of the archaeological record. Histories of movement shape our perceptual apparatus and generate embodied knowledge. This recursive constitution of bodies, movements, and materials simultaneously defines the challenge and opportunity of phenomenological approaches within sensory archaeology. Explicitly or not, most researchers use their own bodily experiences of movement as analogies for making inferences about the material and sensory consequences of bodily movements in the past. As imitative learning produces shared embodied knowledge among craftspeople, likewise, archaeologists can engage with movements and materials to produce some degree of intersubjectivity with bodies in the past. Drawing from archaeological and ethnographic fieldwork in western Ireland, this paper will propose simple guiding premises for undertaking a sensory archaeology of movement. To illustrate these premises, I discuss the changing material settings and practices of Irish pilgrimage and pastoralism between the medieval and modern period. I contend that interdisciplinary, collaborative research can play a vital role in refining phenomenological research by placing researchers’ subjective experiences in dialogue with descent communities, communities of practice, and relevant historical texts and imagery.

Laszcza, Aleksandra (University of Warsaw)

[17] *Pre-Columbian Textiles from Castillo de Huarmey: Fabric Structures and Iconographic Motifs as Indicators of Cultural Influences*

Castillo de Huarmey on the north coast of Peru is an archaeological site of pre-Hispanic Middle Horizon period (AD 600–900), widely known for the discovery of the first undisturbed Wari royal mausoleum. From 2012–2013 remains of fifty-eight elite female individuals were found accompanied by rich ceremonial offerings and grave goods, including textiles. The state of preservation and the condition of a large portion of the fabrics are poor, especially those coming from the primary burial contexts. However, technological analyses revealed the unique character of the textile collection, which utilized multiple and complex weaving techniques. These techniques were applied by highly skilled weavers to create sophisticated iconographic motifs, and even though there are only a few decorated and completely preserved textiles, analyses of smaller fragments enabled the reconstruction of complete patterns. Comparison with fabrics discovered at the Castillo de Huarmey site before the first systematic excavations, as well as with motifs known from other archaeological contexts and collections, suggests strong cultural influences from the central and southern part of Peru.

Latorre, Claudio (IEB & Departamento de Ecología, Pontificia Universidad Católica de Chile), Jacob Freeman (Anthropology Program, Utah State University, Logan), Erick Robinson (Department of Anthropology, University of Wyoming,), Eugenia M. Gayo (Center for the Study of Climate Change & Resilience) and Mauricio Lima (Departamento de Ecología & CAPES UC, Pontificia Un)

[105] *PeoPLE 3K: Understanding the Population Dynamics of the Americas in the Context of Regional and Global Environmental Change*

From the civilizations in Easter Island to the Mayas or to the collapse of the prehistoric populations in the Great Basin, researchers have proposed a wide range of hypotheses to disentangle the causes and drivers behind such pronounced demographic change. PeoPLE (PaleoClimate and the PeoPLing of the Earth) 3K is a new working group recently created by Past Global Changes (PAGES) to examine in detail how environmental change over the last 3000 years has affected, either by facilitating population expansions or by promoting civilization collapse, past human demographic change. Our approach is to use a Socio-Ecological Systems (SES) approach to facilitate integration of population structural change (based on summed probability distribution curves created from archaeological databases) and past climate change impacts on the environment. Our approach further uses models developed by population ecologists to propose a new understanding of how climate and human population size interact through resource utilization over time. We illustrate these ideas with examples of population change and collapse from the high Andes, the Atacama Desert, the Great Basin and Easter Island.

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Latorre, Claudio [86] see Mcrostie, Virginia

Lattanzi, Gregory (New Jersey State Museum)

[328] *The Abbott Farm National Historic Landmark: A Look into the Future*

When the Abbott Farm site was listed as a National Historic Landmark in 1976, it had already been well-known for a hundred years as a significant archaeological site. Now over 40 years later, the Abbott Farm continues to baffle archaeological scholars as to the precise meaning of its importance to prehistoric and historic native peoples of the region. Past research, present trends, and future analysis are discussed providing a myriad of evidence showing that this site continues to provide and yield information important to the prehistory of the Middle Atlantic region. Specific topics to be addressed in this presentation include the future role of NAGPRA in relation to the Abbott Farm site; the usefulness of semi-destructive and non-destructive analysis on artifacts; and the role that the study of trade and exchange and mortuary practices plays in our understanding of social complexity and connected landscapes within the Middle Atlantic region and beyond.

[328] *Chair*

Lau, George (Sainsbury Research Unit, UNIV OF EAST ANGLIA)

[333] *Tello and Carrión Cachot on Recuay Culture: A Visual Archaeology*

While the achievements of the great Peruvianist Julio C. Tello and his theories about Andean civilisation are well-chronicled, much less work has addressed his engagements with archaeological illustration, its practices and desires, especially beyond his signature Chavín work. This paper examines the imagery and arguments of key publications by Tello and his student and intellectual disciple, Rebeca Carrión Cachot, on the Recuay culture (ca AD 100–700). Together, they discerned the culture's fundamental diagnostics: pottery, architecture, stone sculpture and ritual practices associated with ancestor-fertility cult. Both employed these elements to epitomise archaeological styles and compartmentalise cultural regions, at the same time that they were positioned as units in broad comparative thinking (e.g., religion, complexity, diffusion, cosmology). The paper contends that their Recuay findings emerged largely out of collections work, ethnohistory and close analysis of objects and 'artworks'. Notably, field archaeology had little to do with their intellectual legacy on Recuay; rather it was won through ambitious visual arguments and analogies, and expressed most saliently by their use of illustrations in a 'visual archaeology.'

Lauer, Matthew [161] see Braje, Todd

Laughlin, Tyler [8] see Keene, Joshua

Laugier, Elise Jakoby (Dartmouth College)

[238] *Reconstructing Land-Use Histories in Ecologically Transitional Mesopotamian Landscapes*

This poster presents results of the Sirwan (Upper Diyala) Regional Project's (Kurdish Region, Iraq) 2017 offsite research in the Kurdish Region of Iraq. Off-site investigations of Mesopotamian landscapes provide evidence of land-use practices and inform our understanding of strategies and structures of past agro-economic systems. Thus, the aim of the 2017 season was to employ multiple remote sensing technologies (including magnetic gradiometry and drone-based imaging) to prospect for and associate land-use features with single-period archaeological sites in varying ecological zones. Remotely sensed evidence for synchronic and/or diachronic variation in land-use practices within the study region may provide insight into unique and varying management practices necessary in transitional ecological zones.

Laugier, Elise Jakoby [68] see Casana, Jesse

Laumbach, Karl [290] see Holloway, Richard

LaValley, S. Joey (Logan Simpson Design, Inc.)

[186] *Elko Litter: Analyses of an Elko Series Point Manufacturing Site in Central Nevada*

While Great Basin archaeologists use projectile points as time-sensitive markers, these typologies are based on the morphological characteristics of the finished artifacts. In most cases, points were produced elsewhere and curated to their final destination or they are found within a palimpsest containing a mixed bag of flaked stone tools and debitage. Seldom are archaeologists able to analyze debitage specific to the production of points. In 2016, Logan Simpson archaeologists recorded a small lithic scatter containing over 30 broken projectile points, 20 biface fragments, and thousands of flakes within a 30-by-30-meter area in central Nevada northeast of Monitor Valley. The site appears to be a spatially and temporally discrete Middle Archaic Elko series point retooling locus. As such, it provides a unique opportunity to analyze the debitage produced during the Elko manufacturing process and the spatial distribution of artifacts at this type of site. It is also presumed that the points were produced by the same individual or individuals and discarded at the same time. Therefore, an analysis to identify the morphological variability or continuity within the Elko series point type at a given point in time can also be performed.

LaValley, S. Joey [325] see Arnett, Abraham

Lavin, Lucianne (Institute for American Indian Studies)

[203] *The Venture Smith Site: An Eighteenth-Century African American Homestead in Haddam, Connecticut*

The Venture Smith homestead is an important eighteenth-century rural black archaeological site with a remarkable level of integrity, associated with a person significant to American history. Born about 1729, Broteer Furro was an African prince abducted and sold into slavery when only six years old. Thirty years a slave, he purchased his and his family's freedom and became a prosperous mariner-merchant-farmer and benefactor to fellow blacks. At his death in 1805, he owned over 100 acres of farmland, three houses, outbuildings, a wharf, and numerous watercraft. Respected by white neighbors/associates to whom he was known as Venture Smith, he became a local folk hero. Historical documents speak of his integrity, courage and strength. Smith's life story is critically important to the study of slavery in New England, to African-American history, and to American cultural heritage. He is the focus of ongoing research across several continents. The BBC produced a film on his life: *A Slave's Story* (2007). For reasons to be discussed, though not formally a State Archaeological Preserve, the Venture Smith site warrants consideration as a National Historic Landmark.

Law, Karly

[338] *Student Safety and Experience in Archaeology: Building a Diverse Future*

When people of color pursue college educations, safety is often a priority. Colleges and their respective departments, become their home, faculty become mentors, and their fellow students become their family. An enormous amount of trust is placed in our departments and we are often left feeling alone. As graduate students and Teaching Assistant's, we are required to receive orientation and training that address procedures within federal and institutional guidelines yet we receive no orientation to help us navigate abusive behavior, and consequently are placed in situations by those mandated to teach and mentor us, exposing us to harm and leaving us feeling powerless in both the classroom and the field. In archaeology, women

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and other non-cisgender students are at greater risk than their counterparts.

The Society for American Archaeology's 2017 statement on Sexual Harassment and Violence, formally recognizes that "intimidation...has been legally recognized as having a chilling effect on learning and workplace experiences..." This experience is further undermined by occurrences of discrimination, harassment, and differential treatment in the classroom, lab, and the field. It is imperative that we lobby for training, education, and resources.

Law Pezzarossi, Heather (Syracuse University)

[272] *Being 'Post-Indian' in 19th Century New England*

In the decades following the American Revolution, Native people throughout Southern New England took part in the development of a Native basket industry specifically targeted for settler consumption. Scholars have long acknowledged that basket styles communicated tribal and even familial affiliation among basketmakers and Native community members. But for customers, the objects represented a connection with a Native artisan who filled the role of the "Vanishing Indian," an emerging trope in popular culture and politics in the early decades of the Republic. Vizenor reminds us that his concept of the "post-indian" condition is often a study in the "simulation of absence," in which the absence of "ontologically "real" persons that conform to the stereotype of Indians circulating in the hegemonic US culture, Native American people simulate those images (Vizenor and Lee 2003: 161), the "post-indian" being a subject willing to engage with and push the accepted boundaries of a stereotypical Indian identity (Vizenor and Lee 2003). In this paper, I'll take a closer look at basketmakers' engagement and adept manipulation of developing colonial tropes of Indianess in light of Vizenor's ideas about what it means to be "post-indian".

Lawhon, Taylor (University of Alabama) and David Mixter (Binghamton University)

[147] *To Love and to Leave or to Never Have Loved at All?: Abandonment Deposits within the Late Classic Maya Palace at Actuncan, Belize*

In 2012, excavations were conducted within a Late Classic noble palace at the ancient Maya site of Actuncan, located in western Belize. Remains of a large deposit of Terminal Classic materials were recovered from a corner of the palace's primary courtyard. Based on its location on the courtyard surface and below collapse, the deposit was assumed to date to the period of the palace's abandonment. The placement of this deposit was contemporary with Actuncan's 9th-century renaissance as a post-royal capital after centuries of incorporation into polities ruled by kings located at nearby Classic period centers. Mixter and colleagues have argued that Actuncan's palace served as a noble's residence during the Classic period and was terminated during the Terminal Classic because of its symbolic association with external forces that had previously dominated the site. Drawing on new ceramic analysis, this paper looks in detail at the contents and context of the deposit to reassess the significance of the abandoned palace to Actuncan's thriving Terminal Classic community.

Lawler, Andrew

[194] *Discussant*

Lawler, Brooks (University of Alaska Fairbanks)

[250] *Clarifying Perceptions of Rock: Prehistoric Use of Common Toolstone in Tangle Lakes, Alaska*

Archaeologists have had difficulty agreeing upon uniform designations of certain kinds of toolstone that are not easily distinguishable visually. There are occasions when the archaeological definition of toolstone material and the geological definition of the same toolstone material do not match. A situation where this discrepancy might arise is when archaeologists give a more specific name to a cryptocrystalline silicate that is difficult to identify based on visual analysis. An understanding of the geological definition and geochemistry of toolstone can allow archaeologist to ask more specific questions about toolstone provenance, procurement, and use. The toolstone variability among sites in the Tangle Lakes Region is not well understood, and is thought to belong to two local quarries. This project seeks to understand the geochemical composition of two cryptocrystalline silicate toolstone quarries and visually similar artifacts from specific activity areas from three sites in the region at varying distances from the quarries. The toolstone variability will be defined by geochemical groupings using XRF and pXRF analysis. Future analysis will attempt to geochemically match the artifacts with the two quarries, and learn if there is more variation in the material than can be accounted for by the two quarries.

Lawler, Dennis [212] see Perri, Angela

Lawrence, John (California State University Northridge), Cathy Costin (Department of Anthropology, California State University), Kathleen Marsaglia (Department of Geological Sciences, California State University), Michael Love (Department of Anthropology, California State University) and Hector Neff (Department of Anthropology, California State University)

[95] *Petrography, Production, and Provenance of Ceramics from La Blanca, Guatemala*

The Middle Preclassic (900–600 BCE) was a critical time of political and social centralization in the Guatemalan lowlands. Of particular interest is La Blanca, one of the first polities to rise and show signs of regional influence and potential urbanization. To reconstruct everyday life I am using excavated ceramic refuse to observe dynamics surrounding three households. This, in turn, elucidates elements of La Blanca's political economy associated with the manufacturing and production of ceramics. To observe this I am adapting Dickinson's methods of mapping interaction spheres using petrography to a household level. Reviews of local geologic sources and 90 sherds have been collected. Petrographic examination of sherds has shown three distinct compositional groups: Mineralic, Volcanic, and Vitric. From these groups, representative samples have been selected and point counted using the Gazzi-Dickinson method. To correlate sherd samples to potential sources, three modern sands were sampled and seven Paleo sands from the Missouri University Research Reactor were provided. These samples were analyzed using the same methods as the sherds. Preliminary results indicate a local geologic provenance for raw materials and varied clay sources and manufacturing techniques among households. This suggests that each household was producing their own ceramics and trading amongst themselves.

Lawrence, Mike [256] see Cartagena, Nicaela

Lawrence, Mike [256] see Pierce, Karen

Lawton, Patrick (Michigan Archaeological Society)

[205] *Chiasin (The Big Rock): Mementos of Identity*

The story of Chesaning begins long before the first historic documents; the village's name originating from a massive stone pushed from Ontario by glaciers. This memento, known as the Big Rock, or "Chiasin" in the Anishinabe language was and continues to be an unmistakable feature on the landscape. According to pioneer histories, Chiasin was a place of prehistoric corn feasts and ceremonies. However, when visited in 1837, one such source reports a haunting lack of people. Where had the people of Chesaning gone?

Today the Big Rock lies adjacent to a schoolyard- accessible to the public, though without any accompanying narrative of explanation. Many children go through Chesaning's schools without discovering the Native American history around them. Why are some aspects of Chiasin's history remembered and others forgotten? Is the geological anomaly in the schoolyard the true Big Rock? The author will review archaeological and historical information

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from between the years 1600 and 1860 regarding the Chesaning area to shed light on these mysteries and to educate the public. Educational programming, interpretive signs, and the establishment of a Chesaning Historic Preservation Commission in coordination with the Chesaning Historical Society, Chesaning Township, and the Village of Chesaning are proposed.

Layco, Wendy (California State University Los Angeles), Jessica Strayer (University of California, Santa Barbara), Samantha Lorenz (Autry Museum) and Toni Gonzalez (University of California, Santa Barbara)

[134] *Cavetuns: Unexplored Theoretical Implications of a Discovery at Mul Ch'en Witz, La Milpa, Belize*

In June of 2017, the Contested Caves Archaeological Project (CCAP), explored what was thought to be a partially capped chultun at the site of La Milpa, Belize. On entering, however, it became clear that the feature was actually a small, natural cave with a classic chultun-style entrance carved into it. Two of the cave's three chambers contained small pools of water, which receded into the porous limestone, within days of their discovery. The pools make any possibility of storage infeasible particularly during the rainy season. Over the subterranean feature, the Maya constructed a rubble cored platform, identical to a platform constructed over another chultun at La Milpa. The cave—water association of this cavetun forces a consideration of the feature in terms of ancient Maya sacred landscape. The discovery of a hybrid cave-chultun further establishes a link between the two types of subterranean space.

Lazrus, Paula Kay (St. John's University)

[54] *A Long Walk from Town: Early 19th Century Landuse in the Territory of Bova*

In the early 1800s the majority of Bova's citizens live in their hilltop town while holding small plots of land in multiple locations, some quite a distance from the town itself. Archival records from notaries, diaries, and cadastral holdings paint a picture of an independent community of low income citizens plying their trades and rather detached from the larger economic systems around them. Despite the abundance of natural resources available in the landscape, the community was not fully integrated into the larger economic system of the region, other areas of the Italian peninsula, or the larger Mediterranean world. This poster explores the relationship between an individual's multiple landholdings and where within the landscape this land was located.

[54] *Chair*

Lazrus, Paula Kay [54] see Ullah, Isaac

Le Moine, Jean-Baptiste [230] see Halperin, Christina

Le Roux, Petrus [29] see Schulting, Rick

Lea, Trevor [106] see Wagner, Dustin

Leach, Melinda (University of North Dakota)

[180] *Rock Art in the High Rock Country: A Contextual View*

Prehistoric rock art increasingly is understood to be embedded in complex cultural systems of social routines, kin networks, economic landscapes, technological change, seasonal population movements, domestic and task-specific foraging behaviors, and variable gendered activities. The Holocene record of occupation and use of the High Rock Country in the Northern Great Basin provides an opportunity to explore such complex contexts of rock art. Rich lithic sources, strategic locations for hunting, and abundant gathering landscapes in the region are marked by substantial rock features, including petroglyphs and, more rare, pictographs. Focusing on a long history of research at the Massacre Lakes, Serendipity Shelter, and elsewhere in the High Rock Country, I examine rock art features in their ecological settings and their co-occurrence with associated milling equipment and obsidian from a wide range of volcanic sources. With these multivariate sources of information, a picture of shifting landscapes, social networks and gendered activities emerges to inform the context and function of rock art in the Northern Great Basin.

Leach, Peter [238] see Milton, Emily

Leach, Peter (University of Connecticut; Geophysical Survey Systems, Inc.)

[294] *Minimally-Invasive Geoarchaeological Investigation of a Sub-marsh and Intertidal Precontact Site in New Hampshire*

Many precontact archaeological sites in New England exhibit poor preservation of organic materials but they occupy relatively stable upland landforms. Conversely, intertidal and submerged sites often contain exceptional organic preservation but exist in or near high-energy and erosive environments. This paper describes minimally-invasive geoarchaeological investigations of an Archaic to Terminal Archaic site in New Hampshire that is buried by salt marsh peat, exposed at a rapidly-eroding shoreline, and discontinuously preserved in a dynamic intertidal zone. Two years of intertidal UAV mapping and digital photogrammetry have generated sub-centimeter digital elevation models and allowed very high resolution assessments of shoreline retreat and sediment mobilization. Recordation of exposed stratigraphic profiles is elucidating the multi-component stratigraphy and complex post-occupation submergence and salt marsh development. Coring the marsh and GPR experiments focus on paleogeographic reconstruction of pre-submergence upland landscapes. Other research areas include radiocarbon dating of occupation horizons and timing of submergence, macrobotanical analyses to identify depositional environments, and foraminifera sampling to constrain paleo-tidal levels. The main goal is to understand the timing and nature of submergence as part of a larger effort to model the preservation potential and location of other sub-marsh, intertidal, and submerged sites in the region.

Leader, George (University of Pennsylvania), Kimberlee Moran (Rutgers University-Camden), Jared Beatrice (The College of New Jersey) and Anna Dhody (Mutter Research Institute)

[204] *Preliminary Results of Material Culture from the Historic First Baptist Church Cemetery, Philadelphia (ca. 1700–1860) and Analytical Problems Arising from Stressed Excavations and the Lack of Formal Legal Oversight*

The material culture found in association with the skeletal remains recovered from the historic First Baptist Church of Philadelphia cemetery, which was in use from 1700–1860, provides a valuable glimpse into colonial and post-colonial burial practices in one of early America's most important cities. The interior material culture in the form of burial goods is most often minimalistic with few exceptions while the exterior material culture (i.e. coffin hardware) assists in relative dates while highlighting stylistic trends of the day. As one of the largest known collections of 18th and 19th century coffins yet unearthed in historic Philadelphia, the assemblage offers invaluable data on mortuary behavior of some of America's first citizens and immigrants. However, the difficulty in excavation, due to the lack of site access, time, and legal concerns created problems that are still felt in post-excavation analysis.

Leader, George [304] see Abdolazadeh, Aylar

Leader, George [204] see Moran, Kimberlee

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LeBlanc, Megan**[224]** *The Hydrologic and Geologic Dynamics of the Las Peñas Spring*

This presentation addresses the hydrology of agricultural terraces and a spring associated with the Late Intermediate Period (post AD 1200) site of Las Peñas located in the Moquegua Valley of Peru. Positioned 150 meters northwest of Las Peñas, the spring is located at roughly 2,700 meters in elevation and sits at the base of several agricultural terraces. This field system was presumably in production at the time Las Peñas was occupied and is still in use today. Using coring techniques, sediment samples, GPR data, and aerial photography, I examined the hydrologic and geologic dynamics of the landscape to understand their potential relationship to the people who occupied Las Peñas. These data were analyzed in combination with sediment samples from the site of Cerro X, an unexcavated potential Middle Horizon reservoir, to put the Las Peñas spring in the broader context of the Moquegua Valley. Small spring systems can teach archaeologists about water storage in arid, highland conditions. It can also provide unique insight on the ancient and modern hydrology of sloped agricultural terraces. Springs at the base of agricultural terraces provide fresh water resources for humans and their animals in an area where water is sparse.

LeBlanc, Steven (Harvard University)**[139]** *Discussant*

Lebrasseur, Ophelie [212] see Larson, Greger

Leckman, Phillip [268] see Heilen, Michael

Leclerc, Elizabeth [13] see Gilmore, Kevin P.

LeCount, Lisa (University of Alabama)**[129]** *Examining the Institutionalization and Transformation of Maya Kingship at Actuncan, Belize using Collective Action Theory*

Here, I summarize the major research questions and results from the Actuncan Archaeological Project, which has been on-going since 2001. The project was initially designed to examine the ways Preclassic Maya leaders institutionalized political authority from the perspective of household archaeology, but has expanded to include excavation of civic architecture and remote sensing in open spaces. My research is informed by collective action theory, and the degree to which leaders engaged in exclusionary and inclusive practices over the site's 2000 years of occupation. Findings have not supported my original exclusive power hypothesis in which early rulers circumvented kin-based authority by out-competing and fragmenting established households. Instead, the small number of founding elite and commoner houses enjoyed socio-economic prosperity during the Terminal Preclassic period when kingship was institutionalized. The rise to regional authority was rapid at Actuncan, which was built by burying an earlier settlement and greatly expanding civic structures. This expansion was achieved through inclusive practices that mobilized hinterland populations' labor and loyalties. Later, Classic-period elites experienced boom-and-bust cycles of growth and abandonment, which I argue is the result of elite competition for exclusive power. Evidence supporting these ideas is presented by contributors to this symposium.

[129] *Chair*

LeCount, Lisa [129] see Blitz, John

Ledbetter, Jerald [81] see Jones, Katherine

Ledford, Kelly (Florida State University)**[102]** *Let Them Eat Corn: Using Stable Isotopes to Explore Turkey Management in the Mississippian Period Southeast*

The eastern wild turkey (*Meleagris gallopavo sylvestris*) is a well-documented resource for Native Americans in the Southeastern United States. Recent research suggests that turkeys may have been managed by Mississippian period people in Middle Tennessee as opposed to being hunted solely in the wild. These conclusions are based on a combination of ethnographic sources, osteometric data, and other non-osseous evidence. As a part of my thesis, I extracted collagen from 12 prehistoric turkey specimens in Middle Tennessee to determine if their isotopic signatures reflect that of a wild diet comprised of grasses and shrubs, or if their signatures indicate their diet was supplemented with agricultural products like maize. I compare the isotope results from this analysis to other research from the Southwestern United States and Mesoamerica where evidence for the domestication of turkeys alongside maize agriculture by prehistoric people is well documented. This research is the first to apply stable isotope analysis to ancient turkey remains in the region. Our understanding of human-turkey relationships in the region is lacking and this study aims to provide a more holistic interpretation of the complex human-environmental relationships of the Mississippian period in the Southeast.

Ledogar, Sarah [304] see Jenz, Trisha

Lee, Craig (Metcalf Archaeological Consultants & INSTAAR), Pei-Lin Yu (Boise State University), Edward Jolie (Mercyhurst University), Kathy Puseman (Paleosciapes Archaeobotanical Services Team) and Halcyon LaPoint (Custer-Gallatin National Forest)**[48]** *Beyond the Points: Sociocultural Complexity Revealed by Non-hunting Artifacts from Melting Ice Patches in the High Alpine, Greater Yellowstone Area, USA*

The recovery of chipped stone projectile points, bows, dart and arrow foreshafts and shafts, and the remains of prey species—notably bighorn sheep (*Ovis canadensis*)—in direct association with melting Greater Yellowstone Area (GYA) ice patches illustrates that hunting was a primary activity for Native Americans at these features. The recovery of other, non-hunting related, types of organic artifacts at ice patches suggests a broader utilization of the alpine environment. Although fewer in number, these artifacts bolster the contention that the alpine archaeological record reflects repeated occupations by family units—or still larger groups—taking advantage of a seasonally enriched biome. Artifacts that will be discussed include cordage made from hair (undated), a ca. 1375 cal BP twisted object made of wapiti (*Cervus elephus*) hide, several wood objects of uncertain function ranging in age between ca. 6200 cal BP and 1370 cal BP, and a ca. 1340 cal BP basket/tray made of willow (*Salix* sp.). In concert with a growing appreciation for the robust, increasingly well-documented chipped stone record from non-ice patch areas within the GYA alpine, the non-hunting artifacts recovered at ice patches provide an important avenue for understanding how Native peoples integrated with these ecosystems.

Lee, Craig [155] see Neeley, Michael

Lee, Samantha (The University of Maryland)**[308]** *Trading In Children*

A decade of archaeology at Wye House Plantation in Maryland has yielded a multitude of information regarding the institution of slavery and the experiences of enslaved individuals. Whether or not enslaved peoples were deliberately bred systematically to produce children for sale by the master is a topic that has been generally neglected in modern scholarship. This practice demonstrates the inherent inhumanity of slavery and is an example of what the scholar Orlando Patterson describes as “the gendered nature of slavery.” Women and children were often the most exploited as a result of

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their sexuality, a practice that has continued today in the modern era. The Works Progress Administration's Slave Narratives present multiple firsthand accounts of the prevalence of this abhorrent practice in the United States. There is reason to believe that there may have been a breeding plantation among the properties of the Lloyd family, the owners of Wye House Plantation. This paper will focus on the gendered nature of slavery, the custom of slave breeding, and the possibility of a breeding plantation among the properties of the Lloyd family.

Lee-Thorp, Julia [249] see Santana Sagredo, Francisca

LeFebvre, Michelle (University of Florida)
[149] *Discussant*

LeFebvre, Michelle [51] see deFrance, Susan

Lefèvre, Christine [43] see Manin, Aurelie

Lehner, Joseph (University of Central Florida)

[171] *The Metallurgical Cycle and Human Responses to Material Fatigue*

Innovations in metallurgy had and continue to have significant and transformative effects on society. From mineral exploration and mining to primary metal production, manufacturing, and consumption across a range of social contexts, metallurgy influenced a wide range of distinctly human conditions. However, while metals are particularly transmutable, they also rapidly corrode back into increasingly stable mineral compounds in processes that people tried to mitigate and often unsuccessfully overcame. This paper discusses how metal production and consumption leads to this poorly studied phenomenon of material fatigue, where metals embrittle, corrode and ultimately fail, giving way to potentially systematic societal and environmental upheaval with oftentimes unpredictable and disastrous effects. Using ancient and modern case studies, this paper will then examine the human response to overcome the problems of material fatigue. In particular, we examine the case of the 1200 BC Cape Gelidonya Shipwreck found off the coast of southwestern Turkey, and whose cargo of copper ingot and alloy scrap metal demonstrates how some sectors of society worked alongside consumers to recycle fatigued metal. Examination of this metallurgical cycle—from minerals to metals and back again—affords a new perspective on the role of metal technology in human societies.

Lehner, Joseph [177] see Dumitru, Ioana

Lei, Xingshan [177] see Chastain, Matthew

Leight, Megan (CUNY Graduate Center), Brent Woodfill (Georgia State University) and Alexander Rivas (Washington University in St. Louis)

[176] *The Production and Exchange of Perishable Goods at Salinas de los Nueve Cerros and Atop the Coban Plateau*

Investigations at Cancuen, Sebol, Salinas de los Nueve Cerros, and other sites at the base of the Guatemalan highlands since the late 1990s have shown the importance of the region for importing and refining a variety of highland goods for the lowland market. While most of the emphasis has been placed on the goods for which there is direct evidence of production and exchange—obsidian, jade, iron pyrite, and other lithic commodities present in abundance at these and other sites—Demarest, Dillon, and other scholars have posited that these sites were also important nodes of exchange for perishable goods that are harder to find in the archaeological record.

This presentation will focus on two of these perishable commodities—salt and quetzal feathers, both of which have ample ethnohistoric descriptions of their production during and after the Spanish conquest, and both of which are common in Classic Maya lowland iconography. The authors will discuss production techniques, their importance in the lowland economy, and Precolumbian evidence for their production and exchange.

Leines, Madeline

[43] *Perceptions vs. Reality: Animal Lives in the Ancient Maya, Aztec, and Inca Cultures*

Past and present human-animal relationships have always been shaped by culturally-based beliefs, perceptions, and treatment of nonhuman animals, which in turn influence the lives of the animals in their environments. That being said, how accurate were ancient cultures in their attempts to understand animals, and how did subsequent human perceptions influence animal realities? What might it have been like as a nonhuman animal living near ancient peoples, based on biology and culture? What of the animals in Central and South America, for instance? This research provides an interdisciplinary, anthrozoological study of animal lives in the ancient Maya, Aztec, and Inca cultures. After a brief introduction to the cultures and species present among them, this paper delves deeper into an analysis of four animals (felines, deer, snakes, and canines) and their potential, culturally influenced realities. A comparison of these interspecies relationships reveals a cultural continuum based on ideological and practical proximity to nature, creating a framework for future studies of ancient, as well as present, human-animal interactions.

Leitermann, Garrett [91] see Crawley, Andrea

Lemke, Ashley (University of Texas at Arlington)

[244] *Anthropology Underwater: Landscape Archaeology above and below Water in the Great Lakes*

Submerged prehistoric landscapes have unique traits which make them invaluable to archaeologists—increased preservation of organic remains, Pompeii-like snap shots in time, and data that either do not exist on land or are deeply buried. These attributes make the few challenges that remain for conducting archaeology underwater more than worth the effort. Early human occupation in the Great Lakes has been difficult to investigate as acidic soils and dynamic water levels left many archaeological remains either poorly preserved or submerged. Ongoing underwater research in Lake Huron is beginning to fill gaps in our knowledge of early hunter-gatherers in this region, and provides unique data of caribou hunting 9,000 years ago using stone built hunting structures. Microregional investigations across this preserved submerged landscape have generated testable hypotheses for the location and nature of contemporary sites on land. Preliminary terrestrial research supports these hypotheses. Rather than separating archaeological research at the water line—connecting terrestrial and underwater records is a holistic approach for reconstructing prehistoric environments and forager adaptations. Anthropological archaeology underwater provides a theoretical framework for such a landscape approach to prehistoric occupations in the Great Lakes and elsewhere.

Lemoine, Ximena (Washington University in St. Louis)

[336] *Neolithic Pigs and People along China's Fertile Arc: Regional Expression and Domestication*

The foothills of mountain chains along river catchments, or "Hilly Flanks", have repeatedly been shown to be key to understanding the origins of agriculture throughout Eurasia. During the Neolithic, sites in the northern part of China's Fertile Arc (see Ren et al. 2016)—showing the earliest evidence of the cultivation of Chinese Millets—are situated along China's own "Hilly Flanks". In contrast, southern sites along the Arc cultivating rice, are located in a diverse array of landforms including piedmont plains and intermountain basins. Whereas the relationship between people, landscape,

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and the crops has seen significant academic study, the human-animal component has yet to be explored in detail. The pig is China's earliest endemic domesticate, and may have been domesticated multiple times in this region. Through demographic reconstruction and stable isotopic analysis of pig populations from early Neolithic sites from the northern and southern parts of the Arc, belonging to the Xinglongwa 兴隆洼 culture in Inner Mongolia—representing the northern part of the Arc—and Jiahu 贾湖 from the Huai River Valley in Henan—representing the southern region, this paper intends to understand how landscape and local contexts shaped human-pig relationships and trajectories of domestication and management during this critical period in Chinese prehistory.

Lemonnier, Eva and Charlotte Arnaud (CNRS-Paris 1 panthéon Sorbonne)

[142] *Defining Rurality at La Joyanca and Naachtun (Guatemala): Land Use, Architecture and Social Dynamics*

Based on the study of two Classic Maya Lowland sites, La Joyanca and Naachtun (Guatemala), this paper explores the topic of rurality through the parameters of potential land use, visible architectural variation, and plausible population mobility. La Joyanca was a medium-sized settlement surrounded by villages and hamlets all of which were recorded by means of conventional surface mapping, whereas Naachtun was a regional capital located amidst extended communities linked by causeways that have been identified through recent LIDAR survey. Paleoenvironmental information on land use is available in both cases. We aim at assessing ancient 'heartland' and 'hinterland communities', and their relationships, as an attempt at furthering the implied concepts. Relevancy of rural and urban categories is discussed.

Lemonnier, Eva [80] see Nondédéo, Philippe

Lentz, David L. (University of Cincinnati), Nicholas Dunning (University of Cincinnati) and Vernon Scarborough (University of Cincinnati)

[76] *Agriculture, Land Management and Expressions of Elite Control at the Ancient Maya City of Tikal*

While it seems evident that the elites and royal personages at Tikal influenced at least some aspects of day-to-day activities of the Maya inhabitants, it has not been clear how this influence became manifest, particularly in regard to agriculture and other aspects of land management decisions. Recent paleoethnobotanical and archaeological studies at Tikal, however, bring some insight to this cultural black box. Three examples from the paleoethnobotanical record provide empirical evidence that indicate how the Maya elite managed their forests, set aside certain tracts of land for special agricultural projects and constructed an irrigation system to reduce the vagaries of rainfall-dependent agriculture. The first example relates to the enormous beams of sapodilla (*Manilkara zapota*) wood that were used to construct Temples 1–4 and only could have come from old growth forests, likely in a protected context, as in a pak'-al. The second example is the Inscriptions reservoir, which was not a reservoir at all, but more likely a rejollada where specialty crops, such as cacao (*Theobroma cacao*) could have been cultivated. The third example is the Perdido reservoir that received drainage water from the Lost World plaza for subsequent use in irrigated maize (*Zea mays*) agriculture.

Lentz, David L. [153] see Wendel, Martha

Leon Estrada, Xochitl (Universidad Veracruzana)

[93] *Paisajes, recursos y su aprovechamiento en Los Tuxtlas, Veracruz, Mexico*

Síntesis de una investigación arqueológica que se enfocó en analizar y comparar la morfología del paisaje cultural de antiguos asentamientos prehispánicos en la sierra de Los Tuxtlas, Veracruz, México. Combinando aspectos de la geografía cultural, procesualismo, y unidades de paisaje geomorfológico se pudieron describir y analizar sitios arqueológicos en Los Tuxtlas, así como discernir las posibles dinámicas de agencia y adaptación del medio ambiente, uso del espacio y aprovechamiento de los recursos naturales, para inferir relaciones inter e intrarregionales que influyeron el desarrollo social, cultural y económico del área de estudio.

Leonard, Daniel (HDR), Kendra Rodgers McGraw (HDR) and Beniamino Volta (HDR)

[268] *DoD Legacy Data: Leveraging GIS and the Web for Success*

While facility-wide cultural resource management at large DoD installations has increasingly been managed with GIS, many organizations have legacy information in the form of hard copy reports and non-searchable site files. In order to successfully fulfill legal and ethical responsibilities as long-term stewards of cultural resources on these installations, it is imperative that DoD staff make the incorporation of these legacy records into their enterprise GIS management framework a priority.

For Edwards Air Force Base, HDR designed and deployed a web-based SQL server application to facilitate the document analysis and data entry from multiple archeologists into the established DoD cultural resources GIS schema. The application was developed to handle basic conflict resolution among data entries and facilitated streamlined QC reviews. The SQL application and web interface were designed to utilize a primary spatial table and secondary non-spatial tables. This allowed for additional contextual information to be added for historic properties, allowing for improved review process and research design capacity. In total HDR performed digital curation of over 4,800 site records on EAFB into an ESRI geodatabase file that is fully compatible with the installation's enterprise GIS, and contributed significantly to the long-term management of cultural resources on the installation.

Leonard, Daniel [162] see Glover, Jeffrey B.

Leone, Mark (University of Maryland)

[208] *Spirit Possession in the Chesapeake*

Proletarian drug foods north of the Caribbean in the Chesapeake area include spirits. Spirits include bourbon. Spirits include those of the dead, as well as the Holy Ghost. This paper attempts to introduce the concept of altered states of consciousness produced by both kinds of spirits. Can these be called proletariat drug foods?

The purpose of this paper is to ask whether spirits of either kind so dull the senses that an acute perception of reality escapes the exploited or merely produces the kind of patience that it takes to wait for the moment of revolution. Another way of asking this question comes from Linebaugh and Rediker's *The Many-Headed Hydra: Does capitalism inevitably destroy itself?*

[308] *Discussant*

[308] *Chair*

Leplongeon, Alice [198] see Brandt, Steven

Leppard, Thomas (University of Cambridge)

[161] *The Anthropocene: Present Singular or Past Plural?*

To what extent are Anthropocene dynamics prefigured or anticipated in microcosm during the later Quaternary, and how do scalar differences in environmental organization (result in anthropic processes working at different rates) complicate any search for a Golden Spike? Drawing on datasets from islands worldwide during the terminal Pleistocene and Holocene, this paper explores how humans drive change in biophysical systems,

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emphasizing similarities of type yet differences of scale between deep-time and more recent instances of human-driven environmental change. In so doing, an attempt is made (a) to underline long-term and general trends in human-environment interaction and (b) to suggest that the emerging biodiversity crisis represents a culmination of these trends rather than being fully qualitatively novel.

[125] *Discussant*

Lercari, Nicola (University of California Merced), Denise Jaffke (California State Parks), Jad Aboulhosn (University of California Merced), Graham Baird (University of California Merced) and Anaïs Guillem (University of California Merced)

[130] *Citizen Science Archaeology at Bodie State Historic Park*

Bodie State Historic Park is located in the western Great Basin, near the California and Nevada border and encompasses a 2,900-acre historical landscape comprised of buildings, archaeological sites, and features related to 80 years of Gold Rush era mining. Cultural and natural resources at Bodie are at risk of being lost due to wildfires, earthquakes, and lack of funding. Discussing the application of digital heritage methods in the Bodie 3D Project, this paper focuses on community-engaged preservation initiatives that will test the efficacy of archaeological citizen science. The project aims to engage local communities and the visiting public in recording archaeological resources through training and crowd-sourced field activities. UC Merced scholars and California State Parks cultural resources specialists collaborate on research data dissemination and outreach through mobile apps, Augmented Reality techniques, and digital documentation technologies. We hope that active involvement will lead to the public's appreciation of the park's valuable resources and foster a true sense of stewardship and preservation.

[172] *Chair*

Lercari, Nicola [172] see Lingle, Ashley

Lerner, Shereen (Mesa College)

[233] *Discussant*

Leroy, Stéphanie (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Saclay), Mitch Hendrickson (University of Illinois at Chicago, Department of A), Emmanuelle Delque-Kolic (LSCE-LMC14, CEA, CNRS, IRD), Enrique Vega (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa) and Philippe Dillmann (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa)

[175] *IRANGKOR Project: Production, Trade and Consumption of Iron in the Khmer Empire, Cambodia (9th to 15th c. CE)*

Investigation into material production and distribution is an important way of understanding the political and socioeconomic organization of premodern states. Iron, with its specific technological characteristics and diverse cultural utility, can be perceived as one of the most dynamic materials for facilitating social and cultural transformation. Reconstructing how iron was managed in the Khmer Empire is therefore a critical perspective for documenting the interrelationship between its multiple sociotechnical systems and greater historic trajectory. This paper discusses the combined results of technological, chronological and sourcing analyses of iron to generate a holistic view of Angkor's iron economy. This investigation was paired with extensive analyses of the vast iron production landscape of central Cambodia (INDAP project) and evidence from northeast Thailand. The focus will be on the issue of provenance to determine the origin of the production sites and how iron was incorporated into the broader exchange system. Combining multiple types of analyses enables us to identify changes in the production and consumption strategies of the Khmer state and how they translated into broader impacts felt across the empire.

Leroy, Stéphanie [137] see Dillmann, Philippe

Lertcharnit, Thanik [282] see Palefsky, Gina

Leslie, David (University of Connecticut) and Sarah P. Sportman (Archaeological and Historical Services, Inc.)

[294] *Lithic Analyses of Site 21–85, an Archaic–Woodland Period Site near Robbins Swamp and the Housatonic River, Connecticut*

Site 21–85 is a large, multi-component site, with Archaic and Woodland period remnants, located adjacent to the Hollenbeck River, a major tributary of the Housatonic River, and Robbins Swamp, the largest freshwater swamp in Connecticut. The location of Site 21–85 would have afforded past peoples access to the fauna and flora associated with Robbins Swamp, travel routes north and south through the Housatonic River Valley, and fresh water from the adjacent Hollenbeck River. The site is also located less than a mile upstream from the Great Falls, an important landmark along the Housatonic River. A portion of the site was threatened by a construction access road as part of a railroad project initiated by the Connecticut Department of Transportation; the impacts to the site were mitigated by a data recovery project, as required under state and federal laws. Excavations at the site revealed 17 cultural features, Middle Woodland pottery sherds, Middle and Late Archaic period diagnostic projectile points, as well as over 4,500 lithic artifacts. Here, we present the results of the lithic analysis of this data set, and frame the repeated occupation of this site within its broader ecological and cultural context.

Leslie, Katie (VCP St. Louis) and Melissa Frederick (VCP St. Louis)

[326] *Veteran Archivists: The Harry S. Truman Reservoir Project*

The Saint Louis laboratory of the Veterans Curation Program processes several archival investigations throughout each five month term, but few have been to the scale of the Harry S. Truman Reservoir Project. This project produced 23 boxes worth of documentation spanning over 268 linear inches. The Harry S. Truman Reservoir is the largest man-made lake in Missouri and covers over 100,000 acres of government owned and flood easement lands. To prepare for the construction of the dam, a number of contractors documented over 2,300 archaeological sites in nine counties; field work that spanned over five years. This paper will discuss an overview of important sites encountered in this archaeological survey, as well as the successes and unintended consequences of utilizing veterans new to the curation of archaeological collections.

Lesure, Richard (UCLA)

[59] *Exchange and Interaction in Proto-Mesoamerica: A Comparison of Late Archaic and Early Formative Interregional Networks*

Across much of Mesoamerica, the transition from Archaic to Formative occurred essentially simultaneously at 1800±100 BC. The earliest sedentary, ceramic-using villages occurred in clusters, but the clusters themselves were widely dispersed. They appeared in a variety of environmental settings, and they were surrounded by lands that were either empty or still inhabited by low-visibility/low-density populations. Given such patterns, it is far from obvious what factors would explain the simultaneity of the transition from Archaic to Formative. The goal of this paper is to assess the promise of one idea: that the transition to sedentism and pottery use was at least in part the product of intensified long-distance interaction and exchange in the later Archaic. The research involves assembling evidence on the presence, frequency, and source of artifacts of non-local origin at Archaic and Early Formative sites (obsidian is a significant but not exclusive focus of attention). Assemblages will be assigned as appropriate to four periods: Early-Middle Archaic (prior to 3500 BC), Late Archaic (3500–1900 BC), Initial Early Formative (1900–1400 BC), and Late Early Formative (1400–1000 BC). Is there evidence for heightened interactions during the later Archaic? How do Late Archaic interregional networks compare to those of the Initial Early Formative?

[262] *Discussant*

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Letouzé, Aliénor (CeRAP (Université Paris-Sorbonne/EHESS))

[30] *The “Sistema 7 Venado”, a Little-known Ceremonial Center at Monte Albán, Oaxaca: A Study of Its Architectural and Ritual Implications*
 For the past eight years, the French team from the CeRAP (Paris-Sorbonne University and the School for Advanced Studies in the Social Sciences in Paris) has carried out research at the Mesoamerican site of 7 Venado, which extends over 4 ha lying 400 m south of the South Platform of Monte Albán. Directed by Christian Duverger and Aliénor Letouzé, with the support of the INAH, the project has been able to date the site, whose chronology spans 800 BC to AD 300, and has also studied its spatial organization. It is composed of 14 buildings (pyramids, tall long platforms, etc.), arranged around 3 patios and 6 plazas articulated with monumental stairways. The work carried out since 2009 has enabled us to study new contexts at Monte Albán, first by excavating earlier buildings hidden under plazas, and second, by uncovering a large number of offerings of several types (caches, burials...). We propose to analyze the symbolic settlement of the Sistema 7 Venado through the spatial distribution of its architecture in conjunction with the evidence of ritual practices that marked the various cultural stages of this major archaeological site in Mesoamerica.

Levi, Laura (The University of Texas at San Antonio), Christian Sheumaker (The University of Texas at San Antonio) and Sarah Nicole Boudreaux (The University of Texas at San Antonio)

[28] *Pathways and the Power of Organizational Process: Defining Polity at Wari Camp, Belize*

The ancient Maya community of Wari Camp was organized into a quincunx pattern of four quarters delineated by the intersection of two inter-cardinal alignments. One was formed by a series of “temple-on-the-east” groups running northwest to southeast. The other consisted of a massive, northeast-to-southwest trending drainage modified for foot traffic. At their intersection stood an uncarved stela. Other stelae marked crossroads, while pairs of temple groups stood at entrances into the drainage road proper.

Michael Coe was the first to link the four-quarter scheme with Maya ritual practices celebrating the spatio-temporal limits of community. Other researchers demonstrated how such practices were essential rituals of royalty, some even noting the prominence of processional circuits among temple pairs. Still others pointed to the quincunx—the sign for road in Maya glyphs—as a fundamental trope in Maya thought and expression.

At Wari Camp, therefore, we have a confluence of material images that speak to some of the ways in which the most basic of Maya political units was constituted in symbol and action. This paper will attempt a deeper exploration of the powers inhering in such places, and will argue for the need to better identify them archaeologically.

Levi, Laura [37] see Boudreaux, Sarah Nicole

Levin, Anais (Grinnell College), John Walden (University of Pittsburgh) and Jaime Awe (Northern Arizona University)

[28] *Lithic Tool Use and Production in an Ancient Maya Neighborhood*

The use and production of lithic tools offers an avenue into the behavior and activities conducted in ancient residential and ritual contexts. We explore variability in the lithic assemblages of various contexts in the ancient Maya neighborhood of Tutu Uitz Na in the Late-Terminal Classic period (AD 700–900). Tutu Uitz Na is one of several neighborhoods surrounding the Lower Dover political center in the Belize River Valley. Variation in household lithic assemblages might vary based on the wealth and status of the occupants or specialized activities involving stone tools. This presentation comprises a synchronic comparative analysis of stone tools and debitage from an intermediate elite ceremonial and residential group, 4 commoner households of high and low status, a specialized lithic workshop and a ritual rockshelter associated with the intermediate elite group. The presentation will offer perspectives on the ways in which the study of lithics can illuminate the internal economic, agricultural, religious and political dynamics of a Classic Maya neighborhood, and the types of activities which people of varying statuses pursued.

Levin, Anais [82] see Walden, John

Levine, Marc (University of Oklahoma)

[248] *Monte Alban’s Main Plaza: New Perspectives Gained through Geophysical Prospection and Digital Mapping*

Ongoing scholarly debate concerning the function, meaning, and history of Monte Albán’s Main Plaza have important ramifications for our understanding of sociopolitical, economic, and religious life at the Zapotec capital. Although previous investigations have targeted many of the buildings that surround the plaza, none have focused explicitly on the plaza itself. This paper presents the preliminary results of the Proyecto Geofísico de Monte Albán (PGMA), a non-invasive study of the entire Main Plaza utilizing multiple geophysical prospection techniques, as well as microtopographic mapping via drone-aided photogrammetry and a robotic total station.

[60] *Discussant*

[248] *Chair*

Levine, Marc [143] see Monroe, Cara

Levine, Mary Ann (Franklin and Marshall College)

[66] *The Burial Ground at Otstonwakin: Native American Mortuary Practices in 18th Century Pennsylvania*

The multinational village of Otstonwakin was a key nexus of colonial and indigenous interaction where colonial identities were expressed as well as constituted through material remains. The sacred landscape that was used by the residents of Otstonwakin to bury their dead was disturbed by road construction projects in both the late 1800s and early 1900s. While the full extent of the cemetery associated with Otstonwakin is unknown, the burial ground is represented by four documented graves and a wide array of funerary offerings, including a rare brass embellished fabric garment. Through an analysis of eyewitness accounts, photographs, and curated material evidence, I discuss the significance of the striking mixture of Native-made artifacts and imported European commodities uncovered at the burial ground. The mortuary practices attest to both change and continuity and reveal the creation of new constellations of material objects in ritual contexts.

[66] *Chair*

Levinson, Judith [141] see Kriss, Dawn

Levstik, Linda S. [94] see Henderson, A. Gwynn

Lev-Tov, Justin

[297] *Animal Bones from Hazor, Israel and a Cautionary Tale of Interpreting Past Ritual*

Within recent years, feasting and other forms of ritual consumption have become more frequently identified in the archaeozoological record of the ancient Near East. Reasons for more frequent identification of ritual sacrifices and feasts vary, but two driving forces certainly are archaeological context, bones found in or near special architecture, and the cultural milieu formed by the region’s ancient textual record. In contrast, I have a skeptical

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tale to tell of ritual production and consumption. This tale takes place at the site of Hazor, a Bronze and Iron Age city mound in Israel. The site has all the correct elements to demonstrate ancient food-related rituals: It was a city of great size and importance; a place where excavations have revealed temples and/or impressive palaces, cuneiform texts and statues of gods; and which produced large bone assemblages. Yet archaeozoological analyses demonstrate a disjuncture between bone patterning on one hand and expectations set by texts and contexts on the other. The question is how to understand the bone debris left by Hazor's elite: Does it represent the diet of uncharacteristically proletarian rulers and priests, or does the patterning present a cautionary tale about too much reliance on text and context?

Lev-Tov, Justin [90] see Greenfield, Haskel

Levy, Thomas E. (University of California, San Diego) and Margie Burton (University of California, San Diego, Center for Cy)

[172] *At-Risk World Heritage and the Digital Humanities—An Overview of the UC Office of the President's Research Catalyst Project*
Recent current events have dramatically highlighted the vulnerability of the world's material cultural heritage. Funded by a University of California (UC) Office of the President's Research Catalyst grant beginning in 2016, the At-Risk Cultural Heritage and the Digital Humanities project catalyzes a collaborative research effort by four UC campuses (San Diego, Berkeley, Los Angeles and Merced) to use cyber-archaeology and computer graphics to document and safeguard virtually some of the most at-risk heritage objects and places. Faculty and students involved in this project are conducting path-breaking archaeological research covering more than 10,000 years of culture and architecture in Cyprus, Greece, Egypt, Ethiopia, Israel, Jordan, Morocco, and Turkey. Our aim is to link UC labs, libraries and museums to form a highly-networked collaborative platform for curation, analysis, and visualization of 3D archaeological heritage data. This paper presents a summary of the objectives of the project and digital field data acquisition and technical achievements since the inception of the project.

Levy, Thomas E. [68] see Liss, Brady

Lévy, Jessica (Pontificia Universidad Católica del Perú (PUCP))

[141] *A Pyro-Engraved Gourd from Cahuachi: Iconographic and Technical Analysis of a Nasca Masterpiece*
Pyro-engraved gourds discovered by the "Nasca Project" (CEAP) in Cahuachi, Nasca ceremonial center located in the basin of Río Grande, can provide new data about their manufacture and decoration. From a comparative perspective, we study artifact characteristics and archaeological records to understand an unusually large and complex pyro-engraved found during 1994 excavations as an offering associated with ceramics from the last phase of the Early Horizon (Ocucaje 8–9) and the beginning of the Early Intermediate Period (Nasca 1–3). Now on display at the Museo Didáctico Antonini in Nasca, the gourd has Paracas Necrópolis (Topará) and early Nasca elements in its decoration suggesting the existence of an efficient system of social cohesion based on shared rituals. Objects of power with similar iconography marking shared memory include textiles, ceramics, pyro-engraved gourds, and other artifacts related to funerary cult, ritual feasting and music, which express shared elements of social and political identity. The characteristics of the gourd, the production practices that convert it into an object of power, the stylistic conventions of the ritual imagery and its mythological references illuminate relationships between Andean populations and their environment.

Lewarch, Dennis [242] see Franklin, Paris

Lewis, Barnaby V. [72] see Darling, J Andrew

Lewis, Carenza (University of Lincoln)

[87] *Child's Play? Exploring Archaeological Evidence for Care-Giving in the 19th and 20th Centuries*

This paper will consider how archaeological evidence from two case-studies can inform our understanding of how attitudes to child care affected children's lived experience. I will explore the character and range of archaeological evidence relating to childhood from two very different sites, a 19th-century mission complex in San Diego and a mid-20th century council estate in Lincolnshire, comparing ratios of different types of finds (e.g. marbles, metal toys, doll parts and slate pencils) to consider how archaeology can illuminate differences in the way children were cared for compared with the 'norms' of English nuclear families in the 19th and 20th centuries.

Lewis, D'andra (Pennsylvania State University Student)

[98] *Scottish Whisky: A Community's Development and Global Impact*

For millennial alcohol has played a prevalent role in the development of communities and human interaction. Scotland is well known for the creation of whisky that made its way to America during the Colonial Period. The goal of this research is to identify the influence alcohol has had on the development of Scotland. Scotland whisky distribution has caused a change in laws, economics, health perspective, and tradition. According to Bill Walker, "Scotch whisky is more than a whisky. It is part of Scotland's heritage and folklore. It is used as a medicine to cure many ills. As a toddy, it can dispel colds and 'flu. In porridge, it can drive out the freezing cold of Scotland's winters. It lubricates the larynx and helps parties go with a swing" (Bower, 2016). As people began migrating from Scotland to America, they brought with them their knowledge of whisky production. Although the entire population of Scotland does not consume alcohol, this product can still be used as an indicator to understand their cultural background. It can also lend explanations to better understand drinking cultures in the United States.

Lewis, Keely (SC State Historic Preservation Office)

[228] *Chair*

Lexow, Gwen

[338] *Equity in the Academy and in Archeology*

Recent national media attention on issues of discrimination and harassment in the academy have generated robust discussion and inquiry into how to develop and sustain an environment that celebrates equity and equality and creates a culture where all can thrive professionally and personally. This presentation will sketch the broad contours of these conversations placing them in a national context and providing a framework to understand both institutional responsibilities and ethical imperatives. By outlining the nature and scope of Title IX and other civil rights mandates as they apply across the academy, this presentation provides a foundation for exploring the specific challenges of achieving equity in archeology.

L'Heritier, Maxime [137] see Dillmann, Philippe

Li, Li [304] see Abdolhazadeh, Aylar

Li, Xin [45] see Ma, Minmin

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Li, Yingfu

[336] *Mineral Resources and Metallurgical Technologies along the Southern Silk Road*

China's southwest region has vast terrain and diverse landscape with rich mineral resources. From the bronze age to the iron age, this area existed two very obvious metallurgical technology systems, "Central Plains" and "non-Central Plains". The coexistence of two systems is not only the result of "sinification", but also the result of the circulation of metallurgical resource and transmission of technology as social response in the mountainous environment in southwest China.

Li, Yuqi (Washington University in St. Louis)

[3] *3D Hydraulic Modeling of the Ancient Irrigation System at the MGK Site in Xinjiang, China*

Most archaeologists would agree that ancient irrigation systems preserve important information about the technology, economy, and social organization of past societies. However, considering that archaeologists generally lack training in hydraulics, it is often difficult for us to extract much information from an ancient irrigation system beyond basic description and chronology. Thanks to the recent development in drone technology and flow modeling techniques we now have the option of generating 3D models of ancient irrigation systems and evaluate their hydraulic performance on desktops. In this case study, we demonstrate how these new methods have helped us achieve a deeper understanding of a complicated irrigation system in Xinjiang, China. We further suggest that the application of these methods can be expanded to other areas of archaeology, such as surface surveys.

Libbon, Jonathan (SWCA Environmental Consultants), Karen Reed (SWCA Environmental Consultants), Aidan McCarty (SWCA Environmental Consultants), Erica Birkner (SWCA Environmental Consultants) and Seth Mitchell (SWCA Environmental Consultants)

[85] *From the Hills of Appalachia to the Shores of Lake Erie: Landscape Archaeology in Northern Ohio*

Northern Ohio is the intersection of several physiographic zones and drainage sub basins. Where the eastern edge of the dissected Allegheny plateau meets the broad till and Lake Plains of western Ohio, the difference in the landscape is apparent. Between 2015 and 2017, SWCA, worked to complete a 217-mile survey across Northern Ohio for a large natural gas pipeline project. The project investigated almost 10,000 acres, and recorded close to 500 archaeological resources. The dataset generated through this extensive survey provides a detailed look at the prehistoric landscape of northern Ohio. When combined with previously recorded sites and the results of other similar linear projects, the information generated by the project provides an excellent data set to compare prehistoric settlement patterns between physiographic provinces as well as identifying key features in the prehistoric landscape. With the increased development of natural gas infrastructure in the region, the authors' hope is to highlight the science being conducted behind the development and to convey the results of the archaeology being performed to the professional community.

Libbon, Jonathan [303] see Reed, Karen

Lieb, Brad (Chickasaw Nation), Tony Boudreaux (University of Mississippi) and Charles Cobb (University of Florida—Florida Museum of Natural)

[119] *Prelude to the Protohistoric: Late Mississippian Settlement Dynamics in the Central and Upper Tombigbee River Drainage*

This paper examines settlement patterns of the late pre-Contact era (1300–1500 C.E.) in the central and upper Tombigbee River, with a focus on the Blackland Prairie portion. Mississippian and Protohistoric settlement strategies and chronologies are overviewed with an eye toward understanding the coalescence of Contact-era polities and the abandonment of the Tombigbee floodplain. Climatological, sociopolitical, and demographic factors are evaluated. Decentralization as a bottom-up response to resource stress and a strategy of resistance to warfare and exploitation exacerbated by climate change may explain some pre-Contact population movements observed in the archaeological record.

[194] *Discussant*

Lieb, Brad [283] see Cobb, Charles

Liebmann, Matt (Harvard University)

[275] *Second Thoughts on First Contacts in the American Southwest*

The enigmatic first contacts between the Zuni people and Esteban Dorantes, an enslaved Moor, has provided fodder for historical and anthropological speculation for more than 475 years. Conjecture regarding what really happened between Esteban and the Zuni began within a few days of this initial encounter in 1539, and continues down to the present day. Despite centuries of debate, supposition, and guesswork based on scanty historical records, archaeological evidence has yet to be brought to bear on these events. This paper examines what the discipline of archaeology might bring to the study of first contacts throughout the Spanish Empire, comparing the events that occurred at Zuni in 1539 with first contact narratives from the Caribbean and Southeastern North America. It also investigates the implications of First Contact narratives for notions of cultural persistence and contemporary Native American identity in the 21st century.

Lightfoot, Kent (University of California, Berkeley)

[215] *The Future of Archaeological Research on Public Lands: A Case Study from California*

Lynne Goldstein has been on the front lines in developing innovative field programs for the study of diverse places in North America. This paper examines her influence on archaeological investigations undertaken at the Russian colony of Ross in northern California. A significant trend in the study of sites on public lands is the shift from broad-scale, high-impact excavations to low-impact field practices. The paper outlines her legacy in the development of coordinated research programs that involve museum investigations of older archaeological collections in combination with the strategic use of limited, fine-grained fieldwork.

Ligman, Michael (Logan Simpson), Tina Hart (Logan Simpson) and Michael L. Terlep (Logan Simpson)

[38] *Portable XRF Analysis of Rock Art Pigments Used in Pictographs across the Great Basin*

Although portable X-ray fluorescence (pXRF) has routinely been used successfully to identify the geochemical source of lithic materials across North America, comparatively few studies apply pXRF to compositional and geochemical sourcing studies of rock art pigments. Logan Simpson conducted exploratory in situ analyses using non-invasive pXRF to analyze the elemental composition of manufactured rock art pigments used to produce prehistoric pictographs at several rock art sites across the Great Basin. Results from these analyses are used to evaluate the potential of this type of analysis within the Great Basin region to: identify the minerals used in pigments; differentiate between pigment types; infer pigment preparation and application techniques; and detect the work of different artists, painting events, and re-touch episodes. GIS was also used to study the relationship between rock art sites and potential sources of pigments.

Lilley, Ian (The University of Queensland)

[145] *Discussant*

Lima, Mauricio [105] see Latorre, Claudio

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Lin, Sam (University of Wollongong)**[137]** *Archaeological Science or Scientific Archaeology: Where Does “Science” Lie in Stone Artefact Research?*

Archaeological science is defined as the use of scientific techniques, typically derived from the natural sciences, in archaeology. In lithic research, archaeological science studies have investigated topics ranging from identifying raw material sources, assessing artefact function and technology, to modelling socio-cultural and evolutionary changes. However, this method-centred definition of archaeological science has also led to a focus on the “sciency” appeal of techniques over basic principles of the general science method, namely falsification (“how do I know if I am wrong?”) and validation against uncertainty (“how confident can I be in my explanation as opposed to other explanations?”). Despite the flourish of archaeological science, much of lithic research still operate on analytical units embedded with implicit behavioural assumptions that are difficult to falsify, and a largely common-sensical reasoning process that favours explanations relatable to our modern daily experience. By reviewing other archaeological science approaches, it is argued here that a more explicit discussion of the general science framework is needed in lithic research, with particular concern over the nature of analytical categories, the integrity and confidence of inference, and the ability to objectively evaluate competing causal explanations for the formation of archaeological pattern through multiple lines of evidence.

Lin, Sam [200] see Douglass, Matthew

Lina, Zhuang (National Museum of China), Lin Liugen (The Archaeology Institute of Jiangsu Province) and Gan Huiyuan (The Archaeology Institute of Jiangsu Province)**[45]** *Ground Stone Tools from the Hanjing and Shunshanji Sites*

The Shunshanji and Hanjing sites are located in the northern part of the middle reaches of the Huaihe River, in Sihong county, Jiangsu Province, China. The two sites date to 8500–7700BP, the middle Neolithic period of China, and the distance between them is about 5 kilometers. Charred rice was recovered during flotation at both sites, and domesticated rice spikelet bases were found in a unit of the Hanjing site. Meanwhile, we revealed some features related to cultivation activities. All the findings suggested that the cultivation of rice emerged in this period. This study examines the subsistence economy and stone-tool production through research into raw material procurement, manufacturing technologies, and the function of stone tools and other stone objects unearthed from the two sites. We also make comparisons with other sites in the same period in China and discuss what role this area played in the origin of rice agriculture in East Asia.

The main methods applied in this research are use-wear and residue analysis for deducing the function of stone tools, and thin-section observations and field survey were conducted for sourcing.

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Linderholm, Anna [212] see Ameen, Carly

Lindley, Tiffany (The University of Texas at San Antonio)**[28]** *Examining Everyday Lives: Non-Elite Maya Households and the Terminal Classic Collapse*

In this paper I will discuss recent archaeological investigations at the Floodplain North settlement cluster, located within the Rancho San Lorenzo Survey Area in Belize’s Mopan River valley. My research investigates the adaptive responses of non-elite Maya to Terminal Classic (AD 780–900) socioeconomic and political transformations. Preliminary analysis indicates occupation continued at Floodplain North after the Terminal Classic collapse and the abandonment of nearby settlements. Materials recovered from patio groups in the settlement cluster suggest residents exploited the area and its resources over several hundred years, from the Late Classic through the Early Postclassic.

Excavations revealed a large structure with multiple construction phases and possible ancillary buildings. Within the structure, there were three separate interments each with multiple individuals. The burial data suggest the household group utilized the structure over a long period of time, culminating in the Terminal Classic. Preliminary analysis of a similar group in the settlement cluster revealed occupation of the settlement began as early as the Late Classic (AD 670–780). Investigations of Floodplain North provide a detailed look into the everyday lives of non-elite Maya prior to and after the Terminal Classic collapse.

Lindquist, Shayna (University of Kentucky)**[285]** *Chair*

Lindquist, Shayna [285] see Venter, Marcie

Lindsay, Audrey (Center for Environmental Management of Military Lands (CEMML)) and Timothy Murphy (Vandenberg Air Force Base—Contractor)**[214]** *The Honda Ridge Pilot Project: Microscopy and Stratigraphy at the Honda Ridge Rock Art Site, Vandenberg Air Force Base, California*

The Honda Ridge pictograph panel contains highly stratified elements painted on a smooth, reflective surface, offering a unique opportunity to explore prehistoric rock art production. We adapted non-invasive, digital microscopy methods from the Shumla Archaeological Research & Education Center to apply stratigraphic analysis within a 1m x 1m section of this superimposed, monochromatic panel. The reflective host rock preserves observable characteristics of prehistoric painting techniques, from brush strokes to finger whorls. By mapping the stratigraphy of these painting techniques, we hope to distinguish painting episodes within a relative layered sequence. If effective during the pilot study, we can apply these methods to the entire rock art panel and develop new questions about ancestral rock art production at Honda Ridge.

Lindstrøm, Torill Christine [34] see Troskosky, Christopher

Linford, Samantha (The University of Colorado Boulder)**[27]** *Design Analysis, Social Identity and Ancestral Pueblo Migration: Southwest Colorado to Northern New Mexico*

Between PIII and PIV the Southwest saw the largest shift in population from the Mesa Verde region (SW Colorado) to the Northern Rio Grande (N. New Mexico). Traces of this migration are difficult to identify in material culture, but Pueblo oral traditions document the migration from the North and discuss two moieties: summer and winter. My research aims to understand dual division within Pueblo society and whether summer and winter

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moieties can be referenced through ceramic designs before and after the migration to the Northern Rio Grande. Utilizing conceptual metaphor theory, I compare ceramic designs pre-migration in the Sand Canyon and Goodman Point Pueblo communities with designs post-migration in the Northern Rio Grande particularly at Cuyamungue and Tsama Pueblos. My research will investigate whether Tewa moieties emerged pre-migration or not. Several possibilities exist for the origin of Tewa moieties: 1) Tewa moieties emerged from kin-structured moieties (Whiteley 2015); 2) they emerged with great kivas in BMIII (Ware 2014). This research aims to contribute to the knowledge regarding the history of dual organization in this Puebloan tradition through the analyses of pottery designs, guided by ideas concerning the symbolic associations of Tewa moieties and Mesa Verde region pottery.

Lingle, Ashley (Cardiff University), Nicola Lercari (U C Merced), Arianna Campiani (U C Merced), Manuel Duenas Garcia (U C Merced) and Anaïs Guillem (U C Merced)

[172] *Terrestrial Laser Scanning and Conservation of At-Risk World Heritage*

Terrestrial Laser Scanning (TLS) is a well-established survey technique in archaeology, architecture, and earth science, which is able to deliver high-fidelity data of surfaces and structures as well as ultra-precise measurements of the morphology of stratigraphic layers. Analyzing and comparing terrestrial laser scanning point clouds captured over time, conservators utilize of an unprecedented amount of quantitative information on the rate of decay of archaeological and built heritage to be used for assessing surface material loss and structural soundness of walls and buildings, underpinning potential causes, and for planning physical interventions. This paper discusses the application of Terrestrial Laser Scanning and semi-automated point cloud data analysis and comparison methods for the conservation of the World Heritage UNESCO site at Çatalhöyük, Turkey. Çatalhöyük is constantly threatened by the fragile composition of its ancient mud brick architecture and the harsh continental climate of its environs, whose salinity is increasing. Specifically, this paper illustrates our preliminary results obtained by comparing surface material loss and volume loss in wall features that were digitally documented in a number of Çatalhöyük East Mound's buildings in the period 2012–2017.

Lingle, Ashley [172] see Campiani, Arianna

Linsin Wohlpert, Sasha [224] see Gibson, Samantha

Linstead, Erik [118] see Walsh, Justin

Lipe, William (Washington State University)

[96] *Discussant*

Lipkin, Sanna (University of Oulu / SUNY at Buffalo), Titta Kallio-Seppä (University of Oulu), Annemari Tranberg (University of Oulu), Erika Ruhl (SUNY at Buffalo) and Sirpa Niinimäki (University of Oulu)

[9] *Benefits of CT-Scanning in Study of Post-Medieval Funerary Items*

CT-scanning has for long been utilized in the research of mummified individuals, and has been a crucial method used to analyze also northern Finnish mummified human remains. Within Church, Space and Memory -project at the University of Oulu in Finland, eight individuals, mostly children, buried under floor planks of churches have been lifted up with their coffins, and taken for CT-scanning at the Oulu University Hospital. The CT-scans have proved to be suitable also for studying coffins, funerary textiles and associated accessories. This poster will present both benefits and restrictions of this method. CT scans densities of substances and allows analysis of substance surfaces and internal structure. Limitations include separating adjacent substances with similar densities. CT-scanning images for instance reveal tree rings of the coffins, mattress materials, different layers of textiles, and metal artefacts covered by fabrics. In our enquiries we have also micro-CT-scanned individual textiles from archaeological contexts. Micro-CT-scanning enables detailed study of textile structures and sewing patterns. Individually scanned items include caps and knitted products with multiple textile layers that otherwise could not be studied without breaking the items. The greatest benefit of this method is the undestructive research that allows to peek inside textile structures and coffins.

Lipkin, Sanna [25] see Ruhl, Erika

Lipo, Carl P. [156] see Raymond, Tiffany

Lippert, Dorothy (National Museum of Natural History)

[337a] *How the NMNH Rises to the Challenge of Using the Best Available Documentation for Repatriation*

The NMNH Repatriation Program is charged under the NMAI Act to use the “best available scientific and historical documentation” to identify the origins of the human remains and objects in its collections. The nature of the museum means that the office can rely on the scholarship of Smithsonian curators for assistance. In addition, copious records in the National Anthropological Archive and in the Smithsonian Archives are present that relate to the collections. However, the records sometimes obfuscate rather than clarify the origins of the collections. Cataloging efforts by the museum have sometimes mixed artifacts that were distinctively organized by the excavator. This paper will illustrate some of the challenges that face the NMNH repatriation program in bringing the best available knowledge to bear on repatriation decisions.

[166] *Discussant*

Lippi, Ronald (University of Wisconsin), Alejandra Gudiño, Estanislao Pazmiño and Esteban Acosta

[132] *Incas and Yumbos at Palmitopamba, Tulipe and Other Notable Sites on the Northwestern Periphery of Tawantinsuyo*

Survey and excavation data from the western Pichincha cloud forest of northwestern Ecuador have provided tantalizing evidence of an unusual relationship between Incas and the autochthonous Yumbo populations. The monumental pool site of Tulipe, the terraced hill complex of Palmitopamba, and the pucarás of Chacapata and Capillapamba all provide an extraordinary view of the tentative, late expansion of Tawantinsuyo into the sub-Andean jungle of northern Ecuador. After a dozen seasons of excavation and study in the Palmitopamba locality, we have evidence on Inca-Yumbo craft production, peaceful coexistence, absence of tribute, and a possible Inca refuge from the Spanish, among other information. These results are compiled in this study of Inca-local relations during the final years and at the northern extreme of the Inca Empire.

Lippiello, Lauren (FCC)

[73] *Watercraft: The Earliest Temples in Egypt*

Shared iconography and similar functionality associated with dated depictions of Predynastic watercraft and terrestrial shrines identify watercraft as the earliest manifestation of manufactured sacred space in Egypt. The resulting Mobile Sacred Space Paradigm describes watercraft as ritual objects (liminal negotiators) empowered to move through and, thereby, connect three ecologically distinctive landscapes as early as the Naqada IIB Period (and possibly Naqada IC). Results indicate that specific watercraft and their associated paraphernalia represent the earliest temple as the mound of creation, 3250 BCE, a window into the politico-religious foundations of the Egyptian State. The environmental flexibility as well as diachronic endurance of core religious values associated with watercraft suggest strong ideological continuity from the Predynastic through Dynastic Periods.

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Lira-Lopez, Yamile**[285]** *Aprovechamiento de la obsidiana por la población prehispánica del valle de Maltrata, Veracruz*

El valle de Maltrata se ubica en un punto intermedio de una importante ruta de comunicación, comercio e intercambio entre la Costa del Golfo y el Altiplano Central. Esto permitió que los asentamientos prehispánicos asentados en el valle contaran con la posibilidad de disponer de algunos tipos de artefactos y materiales que no se encontraban en la región cercana.

En cuanto a la obsidiana se refiere, la cercanía con los yacimientos del Pico de Orizaba permiten suponer que durante todo el desarrollo de los asentamientos desde el Preclásico hasta el Posclásico utilizaron esa materia prima para sus herramientas, importante para la vida cotidiana. Sin embargo, su uso como vía de comercio e intercambio, evidencia la presencia de otras materias primas en los artefactos de obsidiana como son los yacimientos de Zaragoza-Oyameles, Sierra de las Navajas, Otumba y Paredón.

Aquí se presenta la distribución de la obsidiana por tipo de artefacto y materia prima, obtenida en la recolección de superficie del valle, y de acuerdo a ello, podemos observar cómo fue utilizada por los distintos asentamientos identificados en el valle.

Lira-Lopez, Yamile [93] see De La Peña Paredes, Juan

Liss, Brady (University of California, San Diego), Matthew Howland (University of California, San Diego) and Thomas E. Levy (University of California, San Diego)**[68]** *Testing Google Earth Engine for Remote Sensing in Archaeology: Case Studies from Faynan, Jordan*

Satellite imagery and remote sensing have secured a place in the archaeological toolbox, but the scale of satellite derived data often results in large datasets with individual image tiles consisting of many gigabytes. Consequently, performing complex analyses on satellite data can be computationally intensive to a prohibitive degree. Google Earth Engine (GEE), an in-development, cloud-based platform for visualizing/analyzing satellite imagery, affords a solution for researchers with limited access to computational processing power (Gorelick et al. 2017). GEE is freely accessible through a web browser, but analysis is completed on Google's cyber-infrastructure, facilitating rapid analyses on any scale (including planetary). Moreover, through the GEE platform, users can create custom scripts to suit their specific research questions and needs. This paper explores potential contributions of GEE to archaeological research through two case studies. First, GEE was used to automatically identify specific archaeological features across the Faynan region of Southern Jordan. Second, GEE-based edge-detection and automatic vectorization was tested for mapping archaeological sites at the Iron Age (ca. 1200–900 BCE) site of Khirbat al-Jariya in Faynan. Through these trials, GEE proved a viable tool for archaeological research with significant potential to supplement traditional forms of archaeological survey and mapping.

Liston, Maria (University of Waterloo, Ontario)**[298]** *Exploring the Evidence for Infectious Diseases in Byzantine Thebes, Greece*

The excavation of an early and middle Byzantine cemetery, located in the former Sanctuary of Ismenion Apollo in Thebes, Greece, has provided an opportunity to examine the impact of infectious diseases in post-Classical Greece. The cemetery appears to be associated with a previously undocumented hospital, probably connected with the nearby church of St. Luke the Evangelist. The skeletons were found in rectangular rock-cut graves, all of which contained multiple burials. Two non-standard graves held multiple burials that had been placed in the cutting all at once. We interpret these as mass graves, associated with a catastrophic event, possibly the Justinianic plague. Other graves were used repeatedly, often with much of the upper bodies above the hips being removed prior to subsequent burials. 100% of the graves have multiple individuals with significant bone pathologies. The differential diagnosis of lesions suggests that leprosy was found in approximately 50% of the skeletons, supporting our interpretation that the cemetery is associated with a hospital or hospice. Leprosy appears to co-occur with other infections including brucellosis. Pathogen DNA analysis should help to confirm the diagnosis of these diseases and this project will provide a better understanding of the infectious pathogens that troubled Byzantine Thebes.

Litschi, Melissa (Southern Illinois University, Carbondale)**[65]** *The Biology and Mythology of Ancestor Lithification in the Andes*

Throughout human history, many cultures have told stories about people who turned to stone in death. What is the inspiration for these myths? How do they relate to taphonomic processes that affect deceased organisms? This paper addresses these questions in an Andean context by comparing pre-Hispanic narratives of lithification to post-mortem biological processes. In the Andes, tales of lithification focus on ancestors and local heroes, who, in their petrified state, continue to interact with the living by mediating between their descendants and supernatural deities. Ethnographies and ethnohistories describe large upright stones (huancas) and natural stone formations (huacas) who received the same care from their descendants as mummified ancestral remains and contextual evidence has allowed examples of modified and unmodified stone huancas to be identified in the archaeological record. The equivalency in the treatment of huancas and mummified ancestors raises interesting questions regarding the conceptual relationship between stone and the dead. One possible explanation argues Andean people were motivated to create this association by the desire to transfer qualities of stone (durability) to their ancestors. However, processes of lithification (fossilization) are not purely abstract mythologies. Could Andean beliefs regarding lithification also represent a compressed and abstracted interpretation of taphonomic processes?

Little, Barbara (University of Maryland, College Park)**[236]** *Discussant*

Little, Ruth [222] see McGill, Dru

Liu, Chin-hsin (California State University Northridge) and Coralia Guandique (California State University Northridge)**[56]** *Dental Health Assessment of Nil Kham Haeng and Its Implications in Prehistoric Central Thailand*

Three adjacent, chronologically overlapped, and metallurgically active sites in central Thailand were excavated by the Thailand Archaeometallurgy Project (TAP). This study focuses on dental pathology (caries, calculus, periapical abscessing, antemortem tooth loss, linear enamel hypoplasia) observed on human skeletal remains from Nil Kham Haeng (500 B.C.-A.D. 600) to investigate possible foodways and lifeways of its inhabitants. Among approximately 20 individuals represented, 16 have sufficient dental elements preserved for observation (252 teeth, 145 sockets). When the results are contextualized with another TAP site of Non Mak La and other contemporaneous sites in the region, Nil Kham Haeng shows high prevalence of dental calculus, moderate level of antemortem tooth loss, and negligible to no occurrence for all other indicators. This pattern is consistent with that observed across prehistoric Mainland Southeast Asia. This can be attributable to the consumption of rice and/or millet as staples and broad-spectrum diets. Combined with pending stable isotope analysis, a clearer picture of Nil Kham Haeng dietary pattern will contribute to the poorly understood human lifeways in prehistoric central Thailand.

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Liu, Siran (USTB), Thilo Rehren (STARC, The Cyprus Institute ; UCL Institute of Archaeology), Wei Qian (University of Science and Technology Beijing), Jianli Chen (School of Archaeology and Museology, Peking University) and Marcos Martín-Torres (UCL Institute of Archaeology)
[137] *A Complex History of Human-Environment Interaction Revealed by the Study of Metal Production Industries in Imperial China*

The study of technology with archaeological science approaches is a powerful proxy for investigating the history of human-environment interactions and provides essential information which could not be revealed by other types of evidence. This great potential was however not fully exploited in previous works. Here we present an on-going project of archaeometallurgical investigation of 7th-15th century silver-lead production sites in China. Environmental history study agreed that during this period, mineral coal replaced charcoal and became the main fuel of metal industry in China. Our investigation however reveals this is a rather complex and uneven process. In the more arid and densely populated north China coal-fired tubular crucibles were widely adopted in this period. In contrast, the south China smelters continued the more traditional furnace smelting process. More interestingly, crucible technology seems not to be embraced by iron and copper smelters until early modern period. Even in north China, large scale iron smelters still use charcoal rather than mineral coal. This work showcases the power of archaeological study of technology in enhancing our understanding of the complex history of human-environment interactions.

Liu, Xinyi (Department of Anthropology, Washington University in St. Louis)

[336] *Discussant*

[336] *Chair*

Liu, Xinyi [336] see Reid, Rachel

Liugen, Lin [45] see Lina, Zhuang

Liwosz, Chester (University of California, Santa Cruz)

[38] *Stones and Standing Waves: Integrating Interpretation with Emergent Methods in Petroglyph Studies*

Recent systematic study of petroglyphs and pictographs at select sites in the Great Basin and Mojave Desert explores archaeoacoustic connections between rock art and oral tradition. This project illustrates data collection procedures which integrate emergent, non-impacting methods, with interpretation facilitated by post-positivist thought. Research design is nonetheless framed within the scientific method. Systematic experiments incorporated into this study explore the viability of, and consistency with, a number of previous relevant studies. As the culmination of several field sessions at two dramatic slot canyon sites in Basin / Mojave convergence, results here graphically illustrate dramatic visual and acoustical qualities of potential sacred sites. Relevance of acoustical data is thoroughly substantiated within the contexts of Numic oral traditions linked with place and peoples. Discussion concludes with explanations of how datasets produced here, and elsewhere with comparable methods, may prove useful in addressing other avenues of theoretical exploration, especially archaeoastronomy and its implications.

Lo, Eric (Cultural Heritage Engineering Initiative, University of California, San Diego), Dominique Rissolo (Cultural Heritage Engineering Initiative, UCSD), Michael Hess (Dept. of Structural Engineering, UCSD), Dominique Meyer (Dept. of Computer Science and Engineering, UCSD) and Falko Kuester (Cultural Heritage Engineering Initiative, UCSD)

[134] *Photogrammetric Techniques for Digital Documentation of Subterranean Maya Architecture*

Photogrammetric techniques are increasingly being used for documenting cultural heritage sites for digital preservation and analysis, but the challenges of working in constrained spaces with difficult lighting conditions have encumbered widespread adoption in subterranean environments. The Proyecto Arquitectura Subterránea de Quintana Roo, coordinated by the Cultural Heritage Engineering Initiative (CHEI), at the University of California San Diego, in collaboration with the Instituto Nacional de Antropología e Historia in Mexico, is conducting a survey and program of digital documentation of cave shrines in Quintana Roo, Mexico. Due to rapid development and population expansion in the area, these sites are increasingly being exposed to the threat of vandalism, necessitating the development of efficient 3D reality-capture tools to fully and accurately document the sites before they are further damaged.

Lo, Eric [248] see Mercure, Danielle

Locascio, William (Florida Gulf Coast University)

[111] *Tree Island Life: Late Archaic Adaptations of a Northern Everglades Community*

The Wedgworth Midden (8PB16175), a Late Archaic tree island site near Belle Glade, Florida, produced large quantities of faunal remains during excavations undertaken by Florida Gulf Coast University in May of 2016. Analysis of these remains allows insight into patterns of resource acquisition and reveals ways in which people adapted to the local environment. Comparison of proportions of taxa from different occupational periods allows us to trace changes in resource use and sheds light on questions concerning the timing and nature of human settlement in the region and changes in strategies of resource acquisition through time.

Locascio, William [52] see Jones, Kelly

Lock, Gary [29] see Schulting, Rick

Lockard, Gregory (ERM)

[42] *International Lender Standards for Cultural Heritage*

This paper will provide an overview of international lender standards for cultural heritage and their implementation on development projects throughout the world. The paper will begin with a discussion of the history and objectives of international lender standards for cultural heritage. This discussion will focus on Performance Standard 8 (Cultural Heritage) of the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012), as the Equator Principles (2013) and many other multilateral lender requirements incorporate the IFC Performance Standards. The paper will then discuss how the standards are implemented by different kinds of development projects in different parts of the world. This discussion will be guided by example projects on which the author has worked in North America, Latin America, Africa, and Asia.

[42] *Chair*

Locke Barton, Angela

[179] *Shards of Medical History: Artifacts from the Point San Jose Hospital Medical Waste Pit*

While monitoring lead remediation activities around historic buildings at Point San Jose (now Fort Mason) in 2010, National Park Service archaeologists discovered thousands of human bones in a medical waste pit behind the former hospital. Large numbers of medical artifacts, primarily medicinal bottle shards, were also recovered from the pit. Many of these medicinal bottles were produced by the U.S. Army Hospital Department for a

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limited time during the Civil War (1862–1865). Such precise manufacturing dates help to firmly establish the terminus post quem for the pit. This assortment of Hospital Department bottles is rare in the archaeological record. Other medicinal bottles, alcoholic beverage containers, administrative supply bottles, food waste, and a few personal items including buttons, tobacco pipes, and one hair oil bottle comprise the remainder of the collection. In addition to establishing a date for the deposit, the specific nature of these artifacts may help to explain why the pit was created, as well as contribute to our understanding of late 19th century military medical practice.

Lockett-Harris, Joshua

[8] *Caves, Ancestors, and the Underworld: Bedrock Manipulation as a Strategy in the Development of Middle Formative Period Maya Socio-political Complexity, Based on Evidence from Ka'Kabish, Northern Belize*

Growing evidence suggests the ancient Maya conceptualized caves, as well as small crevices in the karstic bedrock (both natural and artificial), as sacred ch'een—portals of shamanic communication, which existed in a liminal realm between the physical world and the ancestral powers of the cave-riddled Underworld. Ch'een represented important ritual foci for the ancient Maya, as well as receptacles for sacred offerings. The interment of prominent ancestors and symbolically valuable materials within natural crevices or artificial bedrock openings—accompanied by ritual commemoration, competitive commensality, and the construction of public ritual architecture—represented a coherent strategy to cement a group or lineage's claim to an area, and legitimize their authority through control of the sacred space thus created. Based on evidence from Middle Formative Period (1000–300 B.C.E.) Ka'Kabish, Northern Belize, this poster will demonstrate that artificial openings in the karstic bedrock of the Maya Lowland were understood through ch'een ideologies of the sacred Underworld, and that the active manipulation of these ideologies served as a catalytic means of transcending existing social ranking in order to create increasingly complex socio-political hierarchies, in a process that would lead to the coalescence of divine Maya kingship, or chulul ahu.

Loebel, Thomas J. [212] see Perri, Angela

Lofaro, Ellen (University of Tennessee), George Kamenov (University of Florida), Jorge Luis Soto Maguino (Dirección Desconcentrada de Cultura de Ayacucho, P) and John Krigbaum (University of Florida)

[282] *Belonging and Exclusion in Early Colonial Huamanga (Ayacucho), Peru: An Isotopic, Religious and Archival View*

Built in AD 1605, La Iglesia de la Compañía de Jesús de Huamanga is the earliest Jesuit church in modern-day Ayacucho, Peru. Archaeological excavations underneath the church floor uncovered human and faunal remains dating to the 17th and 18th centuries CE. Only indigenous individuals appear to be buried underneath the church floors. Despite significant forced labor practices (mita) at the time, few individuals buried in the church show signs of bodily stress or disease prevalent in those engaged in mining. Beyond the simple and sometimes problematic dichotomy of Spanish and indigenous, it seems likely that additional divisions appeared when considering the application and avoidance of the mita system of forced labor. In addition to bioarchaeological evidence, ethnohistorical documents show that some indigenous Andeans used the Spanish legal system, church service and labor agreements to evade forced labor at the mines. Further, analyses of strontium isotopes reveal that one-third of the individuals were not born locally, correlating with census records documenting rural migration into the city. Indigenous Andeans actively shaped their lives, using migration and manipulation of Spanish religious and legal systems to avoid the harshest occupations, thus moving beyond the stereotypical Black Legend trope.

Loffler, German

[46] *Digital Standardization of Ceramic Nomenclature: A Case for Central Coast Peruvian Pottery Forms during the Late Intermediate Period*

In this paper, I present a generalized morphological typology for all Central Coast Peruvian ceramic vessels. Today, as in the past, similarly shaped (or in some cases identically shaped) vessel forms have been given different names by different authors, obfuscating another's researcher's ability to cross reference ceramic forms rapidly. As publishable material becomes increasingly digitalized and online accessible, it is not hard to imagine a "patch" program that identifies differently named vessel forms and auto-renames the forms to such a generalized morphological typology. The benefits are threefold: standardized typological names in all digital material, ability to access most relevant publications with ceramic vessels of interest, and rapid single word search parameters.

Loftis, Kat, Alexander Cherkinsky (Center for Applied Isotope Studies, University of) and Robert Speakman (Center for Applied Isotope Studies, University of)

[74] *Evaluating Collagen Pretreatment with XAD Resin*

The presence of exogenous organic carbon is a major concern when radiocarbon dating bone. In particular, the analysis of bone that has undergone diagenesis can be frustrating because the process of humification may potentially introduce contaminant organic carbon. Diagenesis occurs during burial and results from a combination of two distinct processes: (1) reactions involving indigenous organic carbon, (2) the complexation of collagen with soil humic substances. The radiocarbon measurement of altered bone, then, affects the age of the bone and reflects the presence of the exogenous humic carbon. Because the influence of contamination on radiocarbon measurements is dependent on the age of the sample, removal of humic carbon, particularly for older samples, is a necessity for accurate measurement. Pretreatment methods, such as XAD treatment and single-amino acid radiocarbon dating, have been applied to eliminate contaminant carbon and provide a purified sample for dating. In this study, we assessed the effectiveness of XAD for the removal of humics using a controlled study and present suggested modifications to the procedure.

Logan, Amanda (Northwestern University) and Dela Kuma (Northwestern University)

[220] *Foodscapes as Gendered Landscapes in West Africa*

Food is an integral part of how people interact with landscape, and tasks associated with food production, preparation, and consumption are often strongly gendered. Using gendered taskscapes (Logan and Cruz 2014) as a starting point, we forward the notion of foodscape as a lens through which to see the varied and multi-scalar forms that gender may take on a landscape. Using case studies from both ancient and modern West Africa, we examine how tracing food production, preparation, and consumption helps us recreate archaeological foodscapes and understand the diverse and gendered articulations of taste, labor, and power.

[237] *Discussant*

Lohman, Nicole (Bureau of Land Management)

[261] *Cultural Resources in an Era of "Energy Dominance": Process and Policy for BLM Oil and Gas Leasing*

The Bureau of Land Management's (BLM) mission of multiple use is unique among federal agencies. Managing areas with cultural resources for multiple use is a tricky balancing act of NEPA, NHPA, Native American Consultation, Bureau directives and policy, and Statewide policy. Add public scoping and consulting parties representing the local community and special interest groups and things get even more complicated. This paper discusses the challenges associated with oil and gas lease sales that BLM cultural resource specialists face every year. Landmark and innovate approaches to cultural compliance for lease sales will be discussed including issues associated with the "keep it in the ground" movement, lease sales near national parks and monuments, and the Badger Two Medicine case. How these lease sales have progressed has implications for future lease sales Bureau-wide. A discussion of the December 2017 Lease sale process and results for the Price Field Office will discuss the local implications of national policy and court decisions.

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Lohse, Jon (Coastal Environments, Inc.)**[59]** *Yuzanu 50, An Early Paleoindian Site in the Mixteca Alta*

Yuzanu 50 was discovered during a reconnaissance of the headwaters of the Yuzanu River as a scatter of debitage eroding from a barranca cutbank, from a palaeosol formed under wet meadows that lined the stream from the Terminal Pleistocene into the Holocene. Excavations exposed 15m² of an occupation surface buried 13.5m below modern ground surface. An excavated assemblage consisting almost exclusively of biface reduction debris made of materials that crop out further upstream indicates that this was a short-term occupation with retooling as a primary activity. A broken preform and characteristics of the flaking debris provide indications of reduction strategies. Two informal flake tools and a pair of non-diagnostic bifaces reflect generalized activities. There are few bones, but a long bone diaphysis from a deer-sized animal has cut marks. Radiocarbon dating suggests an age of around 12,750 cal BP. While not extensive, Yuz 50 is among the most securely dated early sites in southern Mexico, and indicates that Pleistocene foragers inhabited high altitude environments, were familiar with local lithic outcrops, and probably used barranca floodplains in their subsistence activities. The large number of megafaunal bones in the same palaeosol complex raises the possibility that these included hunting large prey.

[59] *Chair*

Lohse, Jon [59] see Borejsza, Aleksander

Loiselle, Hope**[10]** *The Historical Ecology of Dolphins and Porpoises off the Oregon and Pacific Northwest Coasts: Contributions from Zooarchaeology*

Wide-scale excavations were undertaken in the middens at Seaside, Oregon in the 1960s and 1970s. However, due to the overwhelming amount of faunal material, much of it remains unanalyzed. This project focuses on the material from the Par-Tee midden (35CLT20). The only cetaceans analyzed from this midden are whales, leaving a knowledge gap about prehistoric human interaction with smaller cetaceans, such as dolphins and porpoises. Using the cetacean comparative and reference collection at the Smithsonian Institution's Museum Support Center, the small cetacean remains have been identified. Species composition and abundance data are compared with modern stranding data to help elucidate whether small cetaceans were actively hunted or if stranded animals were scavenged. Additionally, the small cetacean data from Seaside will be placed into the broader context of small cetacean exploitation in the northeastern Pacific Ocean and compared to data from other archaeological sites. This allows for a temporal and spatial analysis of small cetacean species abundances and distributions in the region. This data is also compared to herring data of the northeastern Pacific, a common food source of small cetaceans, to note if there is a possible correlation between the two.

Loiselle, Hope [195] see Perez, Erina

Loma'omvaya, Micah [218] see Young, Lisa

Longman, Darren [264] see Zborover, Danny

Loosle, Byron**[261]** *Why We Shouldn't Wait until a Project Is Proposed*

Tribal officials suggest the National Historic Preservation Act should more appropriately be called the National Mitigation Act. For several years we worked to develop policy to direct more effort into identification of areas of cultural concern even before projects proposals were received. We advocated production of appositely designed projects to reduce the amount of adverse effects and mitigation. This effort included encouraging the use of the planning process to assemble data and add protections to important areas. The recent rescission of the Bureau of Land Management's Planning Rule creates challenges in our effort to refocus cultural resource management away from mitigation. In light of current administration policies to open lands for development, what can be done to protect important resources before a project is proposed? We will examine several available options.

[261] *Chair*

Lopez, Eos [248] see Blancas, Jorge

Lopez, Escee (Department of Anthropology, California State University, Los Angeles), Santos Cisceneros (Department of Anthropology, California State University), Shelby Medina (Department of Anthropology, California State University), Jessica Morales (Department of Anthropology, California State University) and Rene Vellanoweth (Department of Anthropology, California State University)**[225]** *Economic and Style Trends of Shell Beads from the Tule Creek Village Site (CA-SNI-25) of San Nicolas Island, California*

Native peoples of Southern California developed complex systems of trades through non-monetary exchanges of items such as beads. Through these exchanges and interactions, socioeconomic structures within intra-local and extra-local communities evolved to fit individual governing societies. The Tule Creek Village was the epicenter of cultural and social development during the Late Holocene on San Nicolas Island. It harbored a myriad bead types distributed among the residential and ceremonial complexes at the site. In this study we analyze the stylistic, spatial, and temporal sequences of beads to understand the fluctuating market trends in the village and interactions with surrounding societies.

Lopez, Julieta (UNAM), Shigeru Kabata (UDLAP), Tatsuya Murakami (Tulane University) and Manuel Ramirez (UDLAP)**[262]** *Monumental Architecture in Central Mexico during the Terminal Formative: New Findings from the Tlalancaleca Archaeological Project, Puebla*

Tlalancaleca was one of the largest settlements before the rise of Teotihuacan in Central Mexico and has been known for the presence of early talud-tablero facades (a combination of sloping walls and vertical panels) and other cultural elements inherited by Teotihuacan. This paper presents preliminary results of excavations, which were carried at monumental structures at Tlalancaleca. It examines the construction techniques used for monument building (including talud-tablero facades), the degree of urban planning, and the temporal relationship between monumental construction and the urban development based on new radiocarbon dates. Preliminary analysis suggests that monumental construction and reconstruction was heightened during the Terminal Formative period and was associated with urban expansion after the eruption of Popocatepetl around AD 50. While there was no central avenue at Tlalancaleca, we have noted a certain degree of standardization of main axes for monumental building. Such a standardization suggests the integrated nature of several monumental complexes. Finally, we discuss the implications of our findings for better understanding sociopolitical dynamics in Central Mexico during the Terminal Formative.

Lopez, Julieta [262] see Murakami, Tatsuya

Lopez, Kirsten (Oregon State University) and Brian Haley (Oregon State University)**[265]** *Sourcing Archaeological Textiles in the Northern Great Basin: Evaluation of Baseline Geochemical Data*

Archaeological textiles are by nature ephemeral artifacts, leaving the development of analytical methodologies within the realm of culture history stylistic analysis until recently. Developments in geochemical sourcing methods have opened the window to new forms of analysis, including geographically sourcing the materials with which a textile is made. In particular, strontium isotope ratios with their long-term stability relating to

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archaeological time scales are well-suited for this type of analysis. This purpose of this poster is to take a look at the geographical area of interest, specifically the Chewacaun Basin which is home to Paisley Caves in south-central Oregon, and some of the oldest dated textiles in the Great Basin region. Geochemical data were gathered via surface water sampling throughout the basin and stream tributaries, as well as surface soil and plant samples. These data are presented through Geographic Information Systems to delineate geochemically discreet areas of the basin in preparation for sourcing discarded basketry fragments and textile production waste of the Late Pleistocene and Early Holocene.

Lopez Bravo, Roberto (Universidad de Ciencias y Artes de Chiapas)

[142] *A Tale of Two Communities: Changing Aspects of Rurality at El Lacandon, Palenque, Chiapas*

Research focused on El Lacandon, a rural community in the outer hinterland of the Late Classic Palenque polity, has allowed the understanding of shifting patterns of relationships between the urban and the rural realms in two specific times: 1) at the end of the Late Preclassic period, when Palenque developed from a rural village into a dynastic capital; and 2) at the end of the Late Classic period, when the ruling dynasty developed new political strategies for hinterland integration.

López Carranco, Karla Itzel [158] see Andrade Pérez, Axel

López Corral, Aurelio (Instituto Nacional de Antropología e Historia)

[31] *Where Is Camaxtli? Assessing the Iconography of Tlaxcallan Collective Government*

Scholars have acknowledged, for many decades, that Late Postclassic Tlaxcalla (n1250/1300–1519 A.D.) was a state level political entity ruled by a form of collective government having Camaxtli as its main patron deity. Both conceptions are constantly reproduced in academic work although they derive explicitly from sixteenth century historical sources. Unfortunately, few works have undertaken the task of contrasting colonial writings against archaeological evidence in order to test if such information is valid. In an effort to better understand prehispanic Tlaxcallan sociopolitical organization, including the role of Camaxtli as a group unifying figure, this work examines the degree of collective ideology dissemination among the different social sectors by identifying political propaganda in artistic expressions such as polychrome pottery, mural painting, sculptures and figurines. Recognizing artistic depictions of deities, individuals, cargo positions, leaders, or ancestors is relevant to anthropological theory because it can shed light on aspects of the prevalent form of governance, its political orientation, and the ideological traits reproduced throughout the society.

López Corral, Aurelio [31] see Ibarra, Thania

López López, Alba (Formative Etlatongo Project) and Ricardo Higelin Ponce de León (Indiana University Bloomington)

[288] *Funerary Architecture in Public Space: The Case of Burial 10 at Etlatongo, Mixteca Alta, Oaxaca*

Mesoamerican architecture is characterized by its variety of forms, constructive techniques and functions through time. This can be seen in the Formative pre-urban settlement at Etlatongo, Mixteca Alta, Oaxaca, which was occupied from the Early Formative to the Postclassic period, where among the architectural configurations, we can find structures associated to different human activities.

From all burials founded in public spaces at Etlatongo, we observed that no burial has funerary architecture, with exception of Burial 10. Thus, Burial 10 has architectural characteristics such as a line of stone slabs similar to other funerary architecture pattern in Oaxaca.

It is possible that beyond this funerary structure, considering as a physical element, lies an ideology or reason to be, so Burial 10 could reflected one traceable feature to an organized form of society.

Therefore, this paper will address the relevance of the architecture and characteristics of burial 10, and a brief comparison with the spatial distribution of burials founded in public spaces at Etlatongo.

López Mazz, José (Universidad de la República, Uruguay)

[43] *Prehistoric Dogs in the Uruguay Lowlands*

This paper presents archaeological information about domestic dogs (*Canis lupus familiaris*) recovered in prehistoric sites in the southeastern lowlands of Uruguay. The presence of dog in the archaeological record is associated to horticultural activities of hunter-gatherers adapted to the very dynamic conditions of this flood ecosystem during the Holocene. Dog findings in mounds have a recurrent and unique association with burials. This context allows a starting discussion on the economic, social, and symbolic/ritual significance of these animals.

[43] *Chair*

Lopez Varela, Sandra (UNAM)

[152] *Discussant*

Lopez-Finn, Elliot (University of Texas at Austin)

[209] *"A Curious Ambivalence": The Iconography of Long-Distance Trade Goods in Postclassic Mexico*

The Postclassic Mexica maintained what Sophia and Michael Coe (2005) refer to as a "curious ambivalence" regarding cacao: despite its prevalence in everyday life as currency, the plant rarely appears in artistic programs and consumption was highly restricted via sumptuary laws that controlled social behavior. The visual scarcity of this crop extends into divine imagery—for instance, cacao remained an important aspect of Ek' Chuah, the Postclassic Maya merchant god, but does not appear among the connotations of his almost-identical Mexica counterpart known as Yacatecuhtli. This disconnection between visual versus economic consumption resonates with ethnohistorical evidence of an anxiety over cacao due to its luxurious and foreign nature—and by extension the larger tensions inherent in relationships with long-distance trade goods. In this work, I examine not only what foreign goods appear in the visual vocabulary of the Mexica, but the connotations of 'place' in their artistic contexts. In addition, I argue that the dearth of cacao iconography reflects larger tensions. As the Mexica expanded the boundaries of their empire in search of foreign products, the imperial artistic program broadcasts a complicated narrative of a people wrestling with identity in the face of increasing connections with far-flung places.

[209] *Chair*

Lord, Edana [51] see deFrance, Susan

Lordkipanidze, David [41] see Coil, Reed

Lorenz, Samantha [134] see Layco, Wendy

Lothrop, Jonathan (New York State Museum) and Christopher Ellis (University of Western Ontario)

[120] *Fluted Point Variation in Glaciated Northeastern North America*

Recent syntheses for the adjacent glaciated regions of the eastern Great Lakes (EGL) and New England-Maritimes (NEM) document similar fluted point sequences associated with early and middle Paleoindian populations. Current consensus holds that these fluted biface sequences fall within a time range of 13,000–11,600 calendar years before present, and probably derive from Clovis populations (or their immediate descendants) that

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colonized the glaciated landscapes of the Northeast from west and south. Here, we (1) discuss ongoing analyses of collections that provide additional insights on stylistic and technological variation through time in the glaciated Northeast, (2) draw comparisons with Clovis biface reduction sequences and forms, and (3) consider implications for the developmental relationships of these northeast fluted biface sequences to Clovis point technology.

Loubser, Johannes (Stratum Unlimited, LLC)

[113] *The Transformational Properties of Water and Rock Art*

Water helps breach the rock surface in both physical and perceptual ways. The addition of water facilitates the production of petroglyphs not only by weakening the bond between particles in sedimentary rocks but also with the moist particles acting as an effective abrasive slurry. The addition of water to natural earth pigment powder allows the colorant to effectively enter pores and interstices. Many virtually invisible petroglyphs and pictographs "magically" appear when covered with a thin layer of water. Southeastern Indians stood on damp surfaces or were partly submerged in water when producing petroglyphs. They also purified in rivers prior to major undertakings, such as producing or visiting petroglyphs. Numerous accounts mention these Indians entering the domain of spirit beings behind the rock surface through a waterfall or river pool. Some still believe that ocean and spring water are connected and practice rituals where ocean water is poured over a petroglyph boulder to animate its surface and to mix potent medicines from different realms.

Loucks, Jordon (University at Albany) and Jessica Watson (University at Albany)

[331] *Preservation in Peril: Patterns of Politics and Archaeology over the Past 100 Years*

In an era of uncertainty in the significance of cultural resources, an evaluation of the history of legislation that protects and manages effects on cultural resources is of paramount importance. At the federal level, the environmental policies that ensure evaluation of cultural resources are at risk in today's political climate. To understand how to best maintain and improve protections and mechanisms of cultural resource investigation, the following paper evaluates the history of cultural resource law in the political environments in which they were created, and provides suggestions for activism that could be employed to continue to refine cultural resource law in the twenty-first century. Archaeologists have a responsibility to improve resource evaluation and provide updated mitigation strategies in the face of an anti-environmental political landscape.

Louderback, Lisbeth (Natural History Museum of Utah, University of Utah), Nicole Herzog (Boise State University), Bruce Pavlik (Red Butte Garden, University of Utah) and Tom Dillehay (Vanderbilt University)

[86] *Re-evaluating the Earliest Evidence for Wild Potato Use in South-Central Chile*

The earliest evidence of wild potato use anywhere in the world comes from Monte Verde (southern Chile), where tuber fragments were recovered from hearths that directly date to 14,500 cal B.P. Those tubers were tentatively assigned to a wild potato species (*Solanum maglia*) based on their starch granule morphology, which, according to Ugent et al., could be distinguished from the granule morphology of the domesticated potato (*S. tuberosum*). Recently, that identification has been called into question by Spooner et al., correctly pointing out that there is considerable variation in the size and shape of starch granules. This project extends this work by conducting a systematic study of starch granules from tuber reference materials of *Solanum* species that occur within a few hundred kilometers of Monte Verde. All reference materials were obtained from the USDA/ARS Potato Genebank and the International Potato Center and include *S. chacoense*, *S. kurtzianum*, *S. maglia* and *S. tuberosum* subsp. *andigenum*. We will present our approach to starch granule identification, clarifying whether the critical diagnostic features used by Ugent et al. allow with certainty an unequivocal assignment of the Monte Verde archaeological tubers to a single species.

Louderback, Lisbeth [86] see Herzog, Nicole

Love, Michael [95] see Lawrence, John

Lovis, William (Michigan State University)

[215] *Landscape Marking, the Creation of Meaning, and the Construction of Sacred and Secular Spaces: Rethinking the Birney "Mound" in the City of Bay City*

The so-called "Birney Mound" on the Saginaw River in lower Michigan is revisited from the vantage point of long term landscape perception, marking, naming, and memory. The natural raised postglacial beach feature, a deposit of light sand, is the major landscape prominence on the Saginaw River drainage. At times during high water stands in the basin the location was the entrepot to the system from Lake Huron, and during later recessional episodes became the first highly visible landform encountered in upstream travel. The "mound" was employed for ritual purposes and cumulative mortuary behaviors for 5000 years. As recently as the late 18th century it harbored a Native American cemetery, and during the early 19th century it continued its prominent role of place as the site of major treaty negotiations. Such continuity of use reifies its status as a persistent place with attached and transmitted intergenerational information, and potentially transcending specific named ethnic/tribal groups; it is a cumulative historical space. This rethinking of the Birney "Mound" clearly situates the locale as a multigenerational landscape anchor point in indigenous knowledge and wayfinding systems.

Low, Marika [41] see Pargeter, Justin

Lowe, Lynne (Centro de Estudios Mayas, UNAM)

[176] *Chiapa de Corzo: rutas de intercambio e interacción cultural entre las regiones zoque y maya*

Chiapa de Corzo se distinguió como una de las principales capitales zoques en la Depresión Central de Chiapas por casi dos milenios, hasta su abandono a finales del periodo Clásico. Su localización sobre una meseta elevada, que dominaba el valle del río Grande o Grijalva, resultó estratégica en el control de una de las principales vías de comunicación y transporte de recursos entre la costa y las tierras altas mayas. El sistema de comunicaciones asociado al río Grijalva constituyó el eje de una de las rutas de mayor importancia desde tiempos prehispánicos, con diversas conexiones fluviales y terrestres. La región destacó por su producción de cacao, maíz, algodón, ixtle, copal y otros productos vegetales, además de plumas preciosas y minerales apreciados, como la ilmenita, el caolín, la sal o el ámbar; asimismo, era la ruta de entrada para bienes foráneos sumamente valorados, como la obsidiana y la jadeíta, que llegaban desde el altiplano guatemalteco. El estudio de diversos contextos arqueológicos funerarios y rituales excavados en Chiapa de Corzo han aportado información fundamental para establecer la existencia de rutas de intercambio e interacción con el área maya desde el periodo Formativo Medio.

Lowery, Darrin (Chesapeake Watershed Archaeological Research)

[79] *A Chesapeake Bay Paleoindian Legacy: Marine Transgression, Shoreline Erosion, and Archaeology*

The Chesapeake Bay at present encompasses approximately 4,479 square miles of estuarine water and it contains almost 12,000 linear miles of coastline. Numerous archaeological sites occur along the margins of the bay and its tributaries. Thousands of these sites are regularly threatened by the daily onslaught of wind and wave activity. The Delmarva Peninsula, which encompasses the eastern margins of the bay, has revealed approximately 350 Clovis-style fluted projectile points. Later and potentially earlier Paleo-American sites have also been discovered. Most of these sites and their associated assemblages have been found along the actively eroding shorelines of the peninsula. The purpose of this paper is to

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highlight the natural coastal erosion threats observed at several Paleoindian sites and to offer simple solutions to address the loss of these important sites. A few of these rapidly disappearing sites have been partially investigated over the past 35 years and offer unique insights into regional Paleoindian adaptations.

[159] *Discussant*

Lowman, Christopher (University of California, Berkeley)

[305] *Many Ways of Working: Archaeological Methods at the Arboretum Chinese Quarters, Stanford, California*

Farmers, gardeners, builders, cooks, janitors, launderers, restaurant-owners: the Chinese diaspora community in nineteenth century Stanford, California, was made up of men, and a few women, who took on many ways of working to support themselves, their families, and their communities. Their integral role in the development of the Bay Area's infrastructure is sometimes obscured because of systematic exclusion, destruction, and erasure in the late nineteenth and early twentieth centuries. Because of this, sites outside of major urban centers are often invisible. However, using a combination of oral history, archival research, and archaeological methods including remote sensing, survey, and excavation, the Chinese Arboretum Quarters project pieced together the way a Chinese community, outside of a Chinatown, lived, worked, and survived in an era of racialized immigration restriction.

Lowry, Justin [18] see Paling, Jason

Lowry, Sarah (New South Associates, Inc.), Shawn Patch (New South Associates, Inc.) and Lynne Sullivan (University of Tennessee)

[286] *The Works Progress Administration, Tennessee Valley Authority, and Geophysics: Bringing Together Digital Geophysical Data and Historic Excavation Results for Comprehensive Data Sets*

Under contract with the Tennessee Valley Authority (TVA), New South Associates, Inc. conducted comprehensive geophysical surveys of five Mississippian sites in the Tennessee River Valley between 2013 and 2017: the Bell Site (40RE1), the Cox Mound (1JA176), Hiwassee Island (40MG31), Ledford Island (40BY13), and Long Island (40RE17). The Works Progress Administration (WPA) conducted salvage excavations on all of these sites in the 1930's and the information available from their notes and limited reporting were the primary data sets used to study these sites prior to the geophysical survey. These notes and maps were often lacking detailed narrative and none of the maps could be georeferenced. The geophysical surveys expanded on these earlier data sets to survey the entire landscape, but comprehensive excavations could not be conducted. Combining the results from the geophysical surveys with those from the WPA surveys has brought the scanned legacy data into the digital world. The complementary data sets provide a more detailed understanding of each site's archaeology across nearly 100 years of research.

Lozada, Maria (University of Chicago), Kristie Sanchez (Washington University in St. Louis), Rex Haydon (University of Chicago Hospitals), Hans Barnard (Cotsen Institute of Archaeology) and Augusto Cardona (Centro de Investigaciones Arqueológicas de Arequip)

[335] *The Ramada Mortuary Tradition: At the Crossroads of Nasca and Wari in the Vitor Valley, Southern Peru*

In this paper, we discuss the mortuary tradition affiliated with the Ramada communities that inhabited the Vitor Valley of Southern Peru around 550 CE. Our field excavations in 2012 and 2015 revealed a long-standing tradition of mortuary treatment that persisted even after the arrival of the Wari in the area. While many components of this tradition appear to have originated locally, other components closely parallel Nazca populations, including patterns of trauma, funerary ritual and the presence of "trophy heads". The collective nature of the burials suggests the inclusion of both sexes, and all age groups. Interestingly, we have detected a form of secondary burial for neonates and infants. Our data suggest that many of them were not buried at the time of death, but rather at a later time, positioned next to adult women. In this context, we argue that the Ramada mortuary tradition in the Vitor Valley was part of a long-standing practice that remained remarkably unchanged despite co-habitation of the Valley with altiplano populations, and that promoted ongoing communication between the living and the dead. These collective burials may point to social and/or biological units that were perpetuated even after death.

Lozada, Maria [335] see Barnard, Hans

Lozano, Stephanie (University of California, Riverside)

[33] *Teotihuacan References Found within Classic Maya Inscriptions*

This paper explores Teotihuacan references found within the corpus of ancient Maya inscriptions. Classic Maya inscriptions analyzed for this investigation were derived from monumental architecture to ceramics. In the last decade more references to Teotihuacan within Classic Maya hieroglyphic writing have surfaced within the archaeological record and in museum collections. However, recently there has not been an in-depth study that analyzes the context of these recently uncovered references. First, this paper reanalyzes previous studies of the aforementioned topic. Second, it examines recent Teotihuacan references found within Classic Maya inscriptions which reveals new insights to the relationship that existed between the Classic Maya and the ancient city of Teotihuacan from Central Mexico.

Lozano, Sergi (IPHES), Luce Prignano (University of Barcelona), Francesca Fulminante (Cambridge University) and Ignacio Morer (University of Barcelona)

[146] *Network Models for the Emergence of Transportation Infrastructures in Central Italy (1175/1150–500 BC ca)*

The period between the Late Bronze Age and the Archaic Age is a time of change and development in the Italian Peninsula, leading to the formation of the first city-states.

In this study, we focused on the Tyrrhenian regions of Latium Vetus and Southern Etruria, by analyzing the emergence of the network of terrestrial routes as it has been inferred from archaeological evidences. Our goal was to explore the mechanisms that shaped the overall structure of these past transportation infrastructures.

To this end, we designed network models corresponding to three competing hypotheses about the dominant mechanism underlying the creation of new connections. After comparing several synthetic networks generated by those models with the corresponding empirical systems, we obtained different outcomes for each of the two regions. In the case of Southern Etruria, the model simulating a simple form of cooperation was able to accurately reproduce all the relevant features of the network for the whole period under study. On the contrary, for Latium Vetus, each model could reproduce only some of the features at some of the ages. However, if we add a "rich get richer" bias to the cooperative model, its performance improved significantly.

Lozano Bravo, Hilda (UNAM, Estudios Mesoamericanos.), Jose Luis Ruvalcaba (Instituto de Fisica, UNAM), Ana Maria Soler (Instituto de Geofisica, UNAM) and Luis Alberto Barba (Instituto de Investigaciones Antropologicas, UNAM)

[89] *Floors, an Archaeological Material: The Case of the Plaza de la Piramide del Sol, Teotihuacan, Mexico*

Human beings have modified surfaces to make them habitable, with time they made other floors to give it a better finish. The process was recorded in the floors interiors; we can observe the materials used in its elaboration and how they changed through time. Additionally, we can conduct other studies which help us understand the time-frame between structures. Floors are a complex material and their study helps us identify social aspects seen in

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past studies of other materials such as ceramics, architecture, among others.

In this investigation we employed archaeomagnetic, chemical, geological, and six non-destructive physical analyses. Moreover, these studies were performed on fragments from three kinds of floor that correspond to distinct surface levels found in southern sector of Plaza de la Piramide del Sol, Teotihuacan during the 2014 excavation season.

Finally, we will present results gained from FTIR, XRD, and Raman analyses, from unconsolidated samples, SEM consolidated block sample studies against unconsolidated samples—as well as thin section findings. We will close by presenting archaeomagnetism dating results from which four construction periods were identified—as well as the benefits and drawbacks of using this methodology on a floor with the particular physical characteristics possessed by the analyzed Teotihuacan floors.

Lu, Hongliang (Sichuan University)

[336] *Discussant*

[336] *Chair*

Lucas, Virginia (University of Nevada, Las Vegas) and Levent Atici (University of Nevada, Las Vegas)

[187] *Faunal Exploitation Practices at the Steve Perkins Site, a Lowland Virgin Branch Puebloan Site Located in Southern Nevada*

To date, there has been little research conducted concerning the faunal exploitation practices of the Lowland Virgin Branch Puebloans in Southern Nevada. This project examines faunal remains from the multi-component Steve Perkins site, which was occupied from the Basketmaker II period (A.D. 400–800) to the Pueblo II period (A.D. 1000–1150). This project aims to provide insight into the subsistence strategies and exchange economies of the Lowland Virgin Branch Puebloans. By identifying the faunal remains, subsistence practices and exchange networks are evaluated. With transitions from the more mobile Basketmaker II period to the sedentary Pueblo II period, faunal assemblages are expected to shift to reflect the more sedentary lifestyle.

Lucero, Lisa (University of Illinois at Urbana-Champaign)

[213] *Introduction to the Intersection of Sustainability and Climate Change in Tropical Social Systems*

In 2015 world leaders adopted the United Nations 17 Sustainable Development Goals detailed in The 2030 Agenda for Sustainable Development. Recently, policy makers, archaeologists and other tropical scholars have been working with UNESCO Mexico, focusing on sustainability in tropical regions. One of the session discussants, Dr. Nuria Sanz, Director of UNESCO Mexico, has laid out the key aspects of particular important to tropical areas, resulting in the focus on five of the 17 goals: Goal 6—Ensure availability and sustainable management of water and sanitation for all; Goal 12—Ensure sustainable consumption and production patterns; Goal 13—Take urgent action to combat climate change and its impacts; Goal 15—Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; and Goal 16—Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. In this this paper, I discuss how archaeological data on ancient tropical societies can assist in devising strategies to address goals, with a particular focus on addressing the intersection of climate change and sustainability.

Lucero, Lisa [85] see Larmon, Jean

Lucet, Genevieve (IIE-UNAM) and Irais Hernández (Instituto de Investigaciones Estéticas, UNAM.)

[172] *About the Reliability of Archaeological Information*

To study Mesoamerican architecture and urbanism, their graphic description is required. This description must be accurate, and it is traditionally expressed in coded and scaled drawings.

For decades, archaeologists have produced extensive documentation of their excavations, which institutional services in charge of the registration of monuments have supplemented to obtain complete inventories in order to support conservation and restoration activities. However, this material has been generated with recording methods where human intervention was important and indispensable to define quality. These data were then represented by line drawings and scaling of the initial measurements. Many times, the material that comes to us has been drawn, traced, digitized and printed. In other words, to the initial errors, many more were accumulated that diminishes the precision of the representation.

I will compare the quality of the information generated a few years ago with the documentation obtained from an aerial photogrammetry survey. I will develop the problem of human intervention in the registering vs. automated systems and the exhaustive representation vs. traditional planimetry. I will speak about the problem of reliability of data in order to share information in a wide digital context.

Luchsinger, Heidi [265] see Mazow, Laura

Lucidi, Maria Rosa [29] see Colantoni, Elizabeth

Lucquin, Alexandre [50] see Admiraal, Marjolein

Ludaescher, Bertram (University Illinois, Urbana-Champaign)

[279] *Discussant*

Ludlow, Mark and Michael K. Kehoe (President—Northern Shenandoah Valley Chapter of)

[67] *On Finding Smoke Town, a Late Eighteenth to Mid-Nineteenth Century, Rural Free Black Community Populated in Circa 1791 by Some of the 452 Manumitted Slaves of Robert Carter III*

This paper discusses the findings of initial excavation of a portion of the elusive rural free black community cartographically known as Smoke Town or Leeds Town, situated on the Shenandoah River, Warren County, Virginia. This community was populated by some of the 452 slaves manumitted by Robert Carter III by his Deed of Gift of 1791. Robert Carter III was an affluent grandson of Robert 'King' Carter. This Deed of Gift was the largest single manumission of slaves in America until the American Civil War—an event, of which few are aware. The excavated portion of Smoke Town dates from late eighteenth to the mid-nineteenth century. There are also prehistoric components to the site from the Late Archaic and the Early Woodland periods: An Early Woodland prehistoric hearth was found partially within the historic period fireplace and below the historic period chimney foundation. The physical evidence of the site is introduced and the excavation procedures and results used in the interpretations are presented. Discovery came as the result of two archaeological metal detecting surveys, reconnaissance and systematic. Excavations illuminate manners in which newly freed slaves of African descent conducted their lives, in contrast to plantation slave lifeways.

Lueth, Friedrich [190] see Ruby, Bret

Luiza da Silva, Viviane [206] see Feest, Christian

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Lukezic, Francis (Maryland Archaeological Conservation Laboratory)
 [149] *Discussant*

Lulewicz, Isabelle (University of Georgia), Neill Wallis (Florida Museum of Natural History) and Victor Thompson (University of Georgia)
 [35] *Village Aggregation and Native Subsistence Practices at a Middle Woodland Mound Center, Gulf Coast Florida, USA*

Current research at Garden Patch (8DI4), a Middle Woodland mound center with circular village construction in northern peninsular Gulf Coast Florida, provide quantitative insights into the timing and temporality of monument construction and village aggregation. Here, we combine previously modelled radiocarbon assays with new isotopic data on season of collection and habitat of exploitation. The four-phase model of site occupation when combined with the new isotopic data provide new insights into the relationship between Native subsistence practices and rapid village construction events.

Lulewicz, Isabelle [222] see Speakman, Robert

Lulewicz, Jacob (University of Georgia)

[83] *Multilayer Networks and Relational Plurality: The Scales and Sources of Social Capital across Southern Appalachia, A.D. 1150–1350*

The scale and structure of the relationships through which social capital is generated, amassed, and controlled must be understood if we are to evaluate the emergence and evolution of organizationally complex social, political, and economic institutions. At any one point in time however, actors or entities are undoubtedly embedded and engaged in a number of distinct, yet overlapping, relational fields. In this paper I interrogate three networks, representing three separate sets of relationships, situated at local, regional, and continental scales, to investigate the emergence of Etowah as a major sociopolitical center in the Southern Appalachian region of the southeastern United States. It is often posited that processes of Mississippianization are tied to shifts in political strategies towards those that emphasize exclusive relationships and the emergence of elite networks. While these extant narratives often focus on the actions of individual leaders or the characteristics of particular communities, this paper quantifies the actual scale and organization of these emerging relational structures and the effects of these structures on the distribution of social capital across Southern Appalachia. Using data on ceramic production and regional signaling behaviors I evaluate the plurality of network strategies through which different kinds of social capital were accessed.

Luley, Benjamin (Gettysburg College)

[170] *Money and Inequality in Roman Mediterranean Gaul, ca. 125 B.C.–A.D. 100*

The Roman conquest of Mediterranean Gaul between 125–121 B.C. significantly altered the Celtic societies living in the region. Two of these dramatic transformations were the increasing use of coins in economic transactions, and a marked rise in socio-economic inequality within the conquered province. This paper examines the connections in Roman Mediterranean Gaul of the first century B.C. through the first century A.D. between the emergence of a monetized economy, debt, and increased socio-economic hierarchy, concentrating on the ancient settlement of Lattara (today modern Lattes in the région of Occitanie of France). Although coins, mainly from the Greek colony of Massalia (modern Marseille), were already present before the conquest, their use appears to have been limited. After the Roman conquest, the (at least partial) monetization of the local economy at Celtic settlements in Roman Mediterranean Gaul like Lattara significantly transformed notions of wealth and value, with a new interchangeability of wealth emerging. Combined with the colonial trauma of land confiscations and enslavement, this interchangeability of wealth allowed for the increasing concentration of wealth in an increasingly smaller number of individuals, holding ever more social power of others.

Luna, Leandro [105] see Peralta, Eva

Luze, Meredith

[337a] *Applying pXRF Technology to Repatriation at the National Museum of Natural History*

The Anthropology collections at the National Museum of Natural History (NMNH) have a long history of treatment with pesticides and contact with other materials that contain potentially hazardous elements. When the NMNH Repatriation Office began to use portable x-ray fluorescence (pXRF) technology, it focused on identifying potentially hazardous elements on archaeology, ethnology, and physical anthropology collections. If identified, the Repatriation Office attempted to determine the source of these elements, particularly from substances used and applied by the original makers and users of the objects and from substances applied during their curation. The Repatriation Office has since expanded the application of pXRF beyond hazardous materials testing, working with tribes to find new ways to address questions and meet their needs for and beyond repatriation. To date, pXRF has been used to assist in dating sites and human remains by analyzing metal alloys, to attempt to reassociate human remains with funerary objects, to reassociate commingled human remains, and to source artifacts and human remains. Many of these approaches have been undertaken at the request of tribes and have now been incorporated into the standard documentation process for all objects and human remains requested for repatriation.

Luzzadder-Beach, Sheryl [153] see Wendel, Martha

Lyall, Victoria

[206] *Connecting Collections: The Ancient Americas in American Museums*

Museum collections resemble the tastes and character of the donors and curators that assembled them. This subjectivity lends them an idiosyncratic character. Nevertheless, the early network of dealers and donors connects many museums across the United States. Institutions like the Saint Louis Art Museum and the Denver Art Museum, for example, are linked through such relationships. This paper examines the history of such relationships and the manner in which collection histories may shed further light on the development of pre-Columbian art in the United States. Museums played an essential role in the popularizing of the Americas across the United States both through the growth of their collections and exhibitions. This paper will consider specifically the Denver Art Museum's (DAM) collection, and the role early directors and curators played in its development.

Lyle, Robin [95] see Schleher, Kari

Lynch, Joshua (Center for the Study of the First Americans)

[250] *Assessing Variability in Toolkit Functionality: Differential Wear Patterns on Projectile Technologies from Late Pleistocene/Early Holocene Interior Alaska*

Much of the early theoretical framework for our understanding of the colonization and occupation of interior Alaska has been established on technological variability in lithic assemblages of the region. This initial research has been limited in scope, focusing on the presence or absence of microblades. Recent research has sought to push beyond the significance of debatably diagnostic tool forms, microblades, in defining cultural complexes and has attempted to more fully address models of behavioral variability including mobility, lithic landscape learning, seasonality, site-specific or prey-specific variability, and raw material constraints. Comprehensive inter- and intra-site use-wear studies represent a promising avenue for better understanding the functionality of important elements of lithic tool kits. This paper presents a morphological, macroscopic, and "low-power" microscopic usewear analysis of bifacial projectile points and microblades from 15 late Pleistocene/early Holocene sites located in interior Alaska

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designed to more accurately define the functional roles and differential use of these technologies at an intersite and intrasite level. After establishing the functional roles of specific lithic projectile elements and point types, archaeologists can improve interpretations of late Pleistocene/early Holocene assemblage variability, especially as it relates to foraging behavior, landscape use, and site function.

Lynn, Christopher [168] see Stewart, Ashley

Lynnerup, Niels (University of Copenhagen), Damgaard Peter (Centre for GeoGenetics, Natural History Museum), Hansen Henrik (Centre for GeoGenetics, Natural History Museum), Morten Allentoft (Centre for GeoGenetics, Natural History Museum) and Ashot Magaryan (Centre for GeoGenetics, Natural History Museum)

[143] *We just need a few milligrams...*

Destructive analyses of human remains, i.e. analyses dependent on small biological samples from human, archaeologically found, bone or teeth, have yielded important new data and added to knowledge about our past. Yet, more studies generate even more studies, and the demand is clearly rising for more samples made available. This is especially the case for those collections, which are very unique in terms of geography (Greenland) or time period (Danish mesolithic). At the same time, these unique collections also represent a limited resource; it is doubtful how many more Greenlandic or Danish Mesolithic skeletons will be found in the future.

Aside several major studies on Danish prehistory, we have also undertaken exploratory "proof-on-concept and feasibility" studies, and methodological studies, comparing different sampling techniques. The presentation will focus on sampling techniques over the last twenty years, describe the rising curatorial awareness of the implications of sampling, including ethical considerations, as well as the results of our methodological studies.

Lyon, Jerry (Tierra Right of Way Services, Ltd.), Barbara Montgomery (Tierra Right of Way Services, Ltd.) and Jeffrey Jones (Tierra Right of Way Services, Ltd.)

[325] *Deciphering the Dairy Site: Settlement Dynamics and Early Hohokam Developments*

The Dairy site is a long-lived prehistoric locality situated at the juncture of the Tortolita Mountains piedmont and the Santa Cruz River floodplain north of Tucson, Arizona. Although the site has yielded important evidence of early Hohokam settlement and cultural developments, the sporadic nature of investigations, the lack of data from early fieldwork, and the destruction of significant portions of the site by the original Shamrock Dairy operation provide substantial challenges to understanding the occupational history and structure of this important prehistoric locality. Since 1999, archaeologists with Tierra Right of Way have investigated much of the locality and revealed extensive loci dating from the Tortolita through early Hohokam (Snaketown and Cañada del Oro) phases. This paper synthesizes previous and on-going research at the site to address the emergence of a local Hohokam tradition in this unique locality. We contrast early Hohokam cultural developments at the Dairy site with the plaza-centric village-based developments identified elsewhere by highlighting alternate agricultural strategies, settlement dynamics, and ideological and mortuary patterns.

[325] *Chair*

Lyons, Patrick (Arizona State Museum), Don Burgess (Arizona State Museum), Marilyn Marshall (Arizona State Museum) and Jaye Smith (Arizona State Museum)

[218] *New Perspectives on the Maverick Mountain Phase Roomblock at Point of Pines Pueblo*

Emil Haury's 1958 synthesis of the Pueblo III-Pueblo IV period (A.D. 1265–1450) archaeology of Point of Pines Pueblo, in east-central Arizona, is the US Southwest's classic case study in how to reliably infer ancient migrations. Field school excavations conducted between 1946 and 1960 uncovered compelling traces of immigrants from the Kayenta region of far northeastern Arizona and southeastern Utah. Noting evidence of a fire in the part of the pueblo referred to as the Maverick Mountain phase roomblock, and the rarity of Maverick Mountain Series pottery in deposits post-dating the conflagration, Haury concluded that the locals at Point of Pines burned these rooms in order to drive the Kayenta immigrants out. Recent research with the site's collections and their associated records has revealed indications of ritual architectural closure behavior similar to that documented at the Homol'ovi villages, a key indicator being enriched deposits. The nature of these deposits suggests that, rather than the locals, the immigrants set fire to the roomblock. In this paper, we describe this new evidence and consider the implications for understanding interactions between locals and immigrants at Point of Pines.

[280] *Discussant*

Lytle, Whitney [173] see Cap, Bernadette

Ma, Minmin (Lanzhou University), Lele Ren and Xin Li

[45] *The Study of Isotopic Baseline in the Gan-Qing Region, Northwestern China*

We analyzed the baseline for dietary study through stable isotopes in the Gan-Qing (Gansu and Qinghai provinces) region in prehistory. Total 283 animal samples from 4 sites were collected and analyzed. We found that herbivorous $\delta^{15}\text{N}$ values did not change much in the Hehuang region between 3200 BCE and 2000 BCE, indicating that the range of nitrogen isotopic baseline was relatively stable in different time. The range of herbivorous $\delta^{15}\text{N}$ values from the Hehuang region around the 2000 BCE is from 1‰ to 6‰. The herbivorous $\delta^{15}\text{N}$ values from the Hexi Corridor varied from 2‰ to 10‰. This result shows that the nitrogen baseline in the Hexi Corridor was higher than that in the Hehuang region. It is probably related with the drought climate in the Hexi Corridor. The results indicate that isotopic baseline is particularly important for dietary research using stable isotopic methods in northwestern China.

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Macdonald, Danielle (University of Tulsa) and Lisa Maher (University of California, Berkeley)

[4] *Every Block of Stone Has a Statue Inside: Epipalaeolithic Engraved Plaquettes and Art at Kharaneh IV*

Artistic objects are thought to be one of the hallmarks of the Natufian period, marking a florescence of artistic behavior appearing prior to the origins of agriculture. However, with continuing research into Early and Middle Epipalaeolithic sites in the Levant, new discoveries of 'symbolic' artifacts are increasing our understanding of even earlier artistic and symbolic pursuits. In this paper we present an engraved plaquette from the Middle Epipalaeolithic context of Kharaneh IV, eastern Jordan. Using white-light confocal microscopy, we analyze manufacturing traces to identify the gestures and tools used to create the plaquette. This artifact, although the only engraved piece recovered from Kharaneh IV thus far, links into wider networks of Epipalaeolithic interaction and cultural exchange. Placing the Kharaneh IV engraved object into regional context with other Early/Middle Epipalaeolithic artistic artifacts, we explore wider networks of interaction prior to the Natufian.

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[4] Chair

MacDonald, Brandi Lee (University of Missouri Nuclear Research Reactor), David Stalla (University of Missouri Electron Microscopy Core), Xiaoning He (University of Missouri Electron Microscopy Core) and Tommi White (University of Missouri Electron Microscopy Core)

[89] *Microanalytical Insights into Pigment Selection and Preparation in British Columbia Rock Art*

Pictographs are important archaeological locales that can provide insight into histories of mineral use and pigment preparation. We present the results of a series of microanalytical explorations of a pictograph panel at Boling Point, Babine Lake, British Columbia. Examination by high-resolution microanalysis (SEM-EDS, TEM, FTIR, micro-Raman) has revealed evidence pertaining to source selection of the iron-oxides used to produce the pictographs, the weathering and condition of the panels, and potential evidence for pigment enhancement by pyrotechnology. The pictographs at Boling Point were painted on an outcrop of argillaceous limestone covered in a kaolinitic weathering deposit. This natural canvas, and subsequent accretionary deposition, has aided in the long-term preservation of the panel. The pigment is composed of a homogenized mixture of ferrihydrite and hematite that was biogenically produced *ex situ*, most likely in a spring deposit, by aquatic iron-oxide producing bacteria, including *Leptothrix ochracea* and *Gallionella* spp. Preliminary results of high-sensitivity magnetometry also suggest that the pigment was thermally altered to induce iron oxide phase change to enhance colour properties. Our results demonstrate the potential of microanalytical applications in rock art studies, and have implications for pigment source selection, preparation practices, and decision-making in the placement of pictographs in British Columbia.

[152] *Discussant*

MacDonald, Douglas (The University of Montana)

[140] *Cougar Creek Obsidian: Quarry Activity and Secondary Processing of a Minor Yellowstone Obsidian*

The University of Montana conducted an archaeological survey of the Cougar Creek valley, Yellowstone National Park, Wyoming, in 2017. We mapped Cougar Creek obsidian outcrops, procurement areas, and secondary processing sites. XRF analysis of natural and cultural samples of the snowflake obsidian show a distinct chemical composition, even though its creation event is coeval with the famous Obsidian Cliff ca. 180,000 years ago (ca. 30 miles northeast). Due to its highly variable quality, Native American hunter-gatherers conducted extensive cobble testing prior to removal from the quarry area. They also mined pits and trenches to obtain the best quality material. A review of Yellowstone XRF-studies show use of Cougar Creek obsidian since the Paleoindian Period. There is a significant distance-decay reduction in its use, with local sites showing intense exploitation. In contrast, the material represents only ca. 1% of all XRF-sourced obsidian artifacts in the Greater Yellowstone Ecosystem. Thus, its significance lies in its use as a local source of stone, with little evidence of regional or national distribution such as occurs with the nearby Obsidian Cliff obsidian.

MacDonald, Douglas [334] see Pfau, Justin

MacDonald, Taylor [270] see Smith, Emily

Machause López, Sonia (University of Valencia)

[136] *Walking into the Shadows in the Iberian Ritual Caves (6th–1st Centuries BC)*

The power of the underground has attracted ritual practitioners over the centuries. Natural places, such as caves, have some intrinsic sensorial power which helps to create a ritual atmosphere. In the Iberian Iron Age (6th–1st centuries BC), ritual production has been recognized in some caves through the identification of the material patterns, along with other physical and sensorial particularities. Although each cave is different, those cavities in which we find evidence of ritual practice have certain elements such as water, complete darkness or ritual memory. These elements are important to the performance of ritual activities, because they call up sensorial feelings. It is unlikely that the entire audience participated in the whole ritual process. Some practices, performed in the dark zones of the caves, would have been reserved for specific individuals based on class, age, and gender. In this paper I reconstruct ritual performances based on context and analyses of artifact assemblages.

MacIntosh, Sarah (University of Nevada, Las Vegas), Levent Atici (University of Nevada, Las Vegas) and Sachihito Omura (Japanese Institute of Anatolian Archaeology)

[71] *Assessing the Correlation between Bone Artifacts and Body Part Profiles: A Case Study from the Central Anatolian Site of Kaman-Kalehöyük*

This paper investigates the production of bone artifacts during the Bronze Age (ca. 3000–1200 BCE) at the central Anatolian site of Kaman-Kalehöyük. At this time, small agrarian societies transformed into more complex polities and states, which gave way to a more centralized and specialized market economy. These transformations in sociopolitical and economic organization resulted in other changes as well. For example, animal exploitation patterns began to reflect a more regulated economy to meet food production, distribution, and consumption demands. Urbanized food management systems also had to meet the demands of craftspeople and specialists, if any, who might have preferred certain skeletal elements over others. In a rural site like Kaman-Kalehöyük, craftspeople, in particular, would use bone as raw materials readily and constantly available for production purposes. More specifically, we seek to elucidate whether preferences for specific bone elements reflect changes in the demands for consumer goods such as game pieces, jewelry, furniture inlays, archer's thumb rings, bone shaft looms, and needles. More broadly, we aim to test whether there are correlations between changes in sociopolitical and economic organization and production of bone tools through time.

MacIsaac, Heather (Indiana University of Pennsylvania)

[43] *Revisiting the Keeshin Farm Site: A Study on Continuity and Change in Subsistence Practices at a Langford Tradition Settlement*

The American Midwest served as a place for the exchange of materials and culture, and as the political center of North America by AD 800. The rise of the Mississippian polity of Cahokia altered the religious, political, and social structures of long-established Midwestern cultural groups in contact with Cahokia, including the populations of the Oneota and Langford Tradition settled along the Mississippi River and its tributaries. While Mississippian period (AD 900–AD 1500) artifacts have been found in Langford Tradition contexts, there exist conflicting views on the range and depth of Cahokian influence on these populations. A study of faunal remains associated with the Langford Tradition Keeshin Farm site in Rockford, Illinois, and comparison of results from similar sites reveal changes in subsistence as a reaction to influence from both Cahokian and Oneota sources. Analysis of the Keeshin Farm faunal assemblage includes measuring dental wear patterns, determining seasonality for hunting, and identifying processing techniques for *Cervus canadensis* (wapiti), *Odocoileus virginianus* (whitetail deer), and other mammals commonly used for food. Keeshin Farm results are then compared to those at Hotel Plaza, Gentleman Farm, and Zimmerman sites in Illinois to provide further insight into continuity and change in Langford Tradition subsistence.

Mack, Jennifer [88] see Noldner, Lara

Mack, Stephanie (United States Forest Service), Caitlin Ainsworth (University of New Mexico) and Emily Lena Jones (University of New Mexico)

[115] *Intrusive Taxa Identified in the Re-excavation of Room 28 in Pueblo Bonito, Chaco Canyon*

Archaeological sites are attractive places for burrowing rodents, but determining which specimens are intrusive can be a challenge. The fauna from the 2013 re-excavation of Room 28, due to its complex depositional history and rich rodent assemblage, provides an opportunity to explore different

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methods of identifying intrusive rodents in archaeological sites. In this paper, we use four lines of evidence to identify intrusive remains from human subsistence activity: 1) frequency of surface modifications suggesting human consumption or butchery; 2) frequency of cranial elements; 3) frequency of complete skeletal elements; and 4) distribution by depth. Taken together, these lines of evidence indicate a mix of intrusive and non-intrusive rodents the Room 28 faunal assemblage.

Mackay, Helen [126] see Shillito, Lisa-Marie

Mackie, Madeline (University of Wyoming)

[43] *What Are the Chances? Estimating the Probability of Coincidental Artifact Association with Megafauna Remains*

There has long been a debate about the frequency of megafauna hunting or dismemberment by early Paleoindians in North America. Proposed megafauna kill sites are heavily scrutinized. Sites which contain limited artifacts, but no projectile points are often discounted or classified as 'possible' kill sites due to their limited cultural materials. This begs the question, just how likely (or unlikely) are artifacts to be accidentally associated with megafauna remains? Using a computer model, the likelihood of accidental cultural association with animal remains (in this case proboscidean) can be estimated. In the model proboscidean remains and archaeology sites were realistically distributed on a landscape using variables from predictive modeling and the modern proboscidean ecological record to understand the frequency of coincidental spatial associations. While no computer model can exactly replicate real world circumstances, this analysis allows for a base understand of the frequency and most common circumstances which produce accidental archaeological associations. This model viewed alongside the archaeological record establishes another basis for evaluating possible megafauna kill or dismemberment sites.

MacKinnon, Marla [15] see Drake, Stacy

MacLellan, Jessica (University of Arizona)

[262] *Household Ritual and the Development of Complex Societies in Formative Mesoamerica: Comparing the Maya Lowlands and Central Mexico*

Recognizing that households contribute to—rather than simply reflect—broad social changes, scholars working in the Maya lowlands and Central Mexico argue that domestic ritual played a role in the emergence of complex societies in Formative (or Preclassic) Mesoamerica (c. 1000 BC—AD 300). Certain aspects of household-level, ritualized activities are shared across Mesoamerican cultures. However, major differences within and between the two regions show that a variety of social organizations were constructed and transformed over the course of the Formative period. The site of Ceibal, in Guatemala, provides key data for understanding the social processes that took place in the Maya area. Along with public rituals, early domestic practices influenced the development of very different kinds of city-states that would characterize the Maya lowlands and Central Mexico during the subsequent Classic period.

Macphail, Richard [224] see Graham, Elizabeth

Macrae, Scott (University of Florida)

[40] *Agricultural Strategies and Intensification: A Study of Risk Management in the Southern Maya Lowlands*

The decisions and consequences behind the intensification of agricultural strategies among past societies has long been a topic of debate among archaeologists. These discussions are often dominated by factors of population dynamics and production capacity. This paper will explore the less discussed factor of risk management. Controlling the variation of production in regard to fluctuating natural and social pressures was critical to past agrarian societies and undoubtedly played a role in the development of their intensive agricultural strategies. This is addressed by examining the geo-intensive agricultural strategy of the ancient Maya located in the hilly region of the North Vaca Plateau, Belize. The GIS modeling of a combined assemblage of datasets that include archaeological fieldwork, remote sensing (LiDAR), pedological analysis, and climatic reconstructions reveals the functional qualities of the agricultural terracing that forms the basis of the production strategy in this region. Results present the properties of terracing in relation to hydrological flow and erosion as well as their ability to increase land suitability for production by decreasing variation in the face of climatic fluctuations. Identifying the functional qualities of this intensive agricultural strategy will demonstrate an intentional action to ameliorate the risks experienced in the North Vaca Plateau.

Macrae, Scott [56] see Iannone, Gyles

Mader, Christian (German Archaeological Institute), Markus Reindel (German Archaeological Institute) and Johnny Isla (Peruvian Ministry of Culture)

[141] *Sea Shells in the Mountains and Llamas on the Coast: The Vertical Economic Organization of the Paracas in Palpa, South Peru (370–200 BC)*

This research analyzes excavated materials of the Paracas culture (800–200 BC) in southern Peru, particularly obsidian artifacts, malacological finds, and camelid bones. In doing so, different methods including archaeometric techniques, quantification, artifact classification, and species determination are combined to elaborate natural origin, making, distribution, and utilization of the objects. The Paracas remains were excavated by the Palpa Archaeological Project and mainly derive from three representative sites situated at distinct altitudes on the western Andean slope: Jauranga (285 masl), Collanco (1,630 masl), and Cutamalla (3,300 masl). Accordingly, the Late Paracas period (370–200 BC) in the Palpa valleys (Andean Transect) serves as a case study for this archaeoeconomic approach.

The results show exchange processes in the western Andes that are characterized by unbalanced commodity flows. Resources from the highlands such as obsidian, camelids and their products—for instance wool—arrived at the Pacific desert strip in large amounts, while marine resources such as sea shells reached highland regions only in small amounts. Raw materials were not just procured in the mountains, there were also strategic production centers like Cutamalla. All in all, consumption at coastal settlements like Jauranga needs to be seen as the driving force behind the Paracas economy.

Madrid González, Mariela Viridiana (Universidad Veracruzana)

[93] *El diseño de la actividad. La relación de los petrograbados y los talleres de lítica en la Costa este de Los Tuxtlas*

La Zona Costera del volcán de Santa Marta, al este de Los Tuxtlas, cuenta con la presencia de afloramientos basálticos que fueron aprovechados de diferentes maneras desde el Formativo medio hasta el Clásico tardío. En esta zona, han sido identificado contextos arqueológicos de explotación que corresponden a talleres dedicados a la producción de artefactos de lítica tallada y pulida. Una característica de algunos de estos talleres, es la presencia de petrograbados, algunos con diseños sencillos, algunos con diseños complejos. En este trabajo, se analiza la relación espacial de las áreas de producción, los petrograbados y los elementos del paisaje para establecer si existe una relación entre los diseños plasmados y la actividad realizada en los talleres.

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Madsen, Christian K. (Greenland National Museum/The National Museum of Denmark), Jette Arneborg (National Museum of Denmark), Ian Simpson (University of Sterling), Michael Nielsen (Greenland National Museum & Archives) and Cameron Turley (City University of New York)

[34] *(Almost) Making It in the Margins: Medieval Norse Adaptation to the Arctic Fjord Environments*

The medieval Norse settlements in Greenland formed the westernmost frontier of Scandinavia, and the Old World, between ca. AD 980–1450. A Norse society of perhaps only some 2500 farmer-hunters settled two subarctic niches: the Eastern Settlement in South Greenland with ca. 550 sites and the smaller Western Settlement 500 km north in the inner parts of the Nuuk fjord region and with only some 90 sites. For still not completely understood reasons, the latter was completely abandoned by AD 1350–1450, the former a generation or two later.

This presentation reports the preliminary findings of two coupled projects that attempt to recognize key drivers of Norse settlement change and deterioration: Winter is Coming Project (WiCP) and Comparative Island Ecodynamics in the North Atlantic Project (CIE). WiCP investigates agriculturally marginal areas to understand Norse settlement and land use dynamics in settings highly susceptible to climatic. CIE compares the ecodynamics of long-term societal development in Iceland/Greenland. However, rather than reveal new clues to Norse settlement decline in Greenland, the two projects have over the last 5 years demonstrated more examples of successful adaptation, complex settlement dynamics, and societal change in agriculturally marginal fjord areas that offered the Norse other opportunities.

[277] *Discussant*

Madsen, Christian K. [135] see Harmsen, Hans

Maezumi, S. (University of Exeter), Jose Iriarte (University of Exeter), Diana Alves (University of Exeter), Mark Robinson (University of Exeter) and Denise Schaan (Federal University of Pará)

[116] *Evidence of Pre-Columbian Polyculture and Agroforestry in the Eastern Amazon*

The scale of pre-Columbian impact on Amazonia is one of the most debated topics in archaeology and paleoecology. To address this issue, an interdisciplinary approach combining archaeological soil profiles and lake sediment cores from the lower Tapajos are used to investigate climate-human-ecosystem interactions over the past 8,000 years. Pollen and phytolith data indicate the presence of polyculture crops including *Ipomea*, *Manihot*, *Zea mays*, and *Cucurbita*. The presence of Theobroma, Mauritia/Mauritiella, Myrtaceae, Brosimum, Attalea, Lecythydaceae (Bertholletia), and Caryocar suggest the exploitation of naturally occurring trees of economic importance. Pollen, phytolith and charcoal data do not document large-scale pre-Columbian deforestation at this site. The presence of polyculture, trees of economic importance, and rainforest vegetation suggest Formative Pre-Columbian populations (ca. 4000 cal yr BP) employed diverse subsistence strategies that combined forest and fire management, polyculture and soil amelioration that maximized subsistence diversity without large-scale land clearing. These data provide evidence of resource diversification, improved food security, and sustainable anthropogenic landscapes during increased climate variability and expanding pre-Columbian populations in the late Holocene. This provides an example of long-term example of sustainable anthropogenic landscapes that can inform management and conservation efforts for sustainable futures of Amazon ecosystems in the 21st c.

Maezumi, S. [213] see Iriarte, Jose

Magargal, Kate

[58] *The Ecology of Cooking with Firewood*

Cooking food conferred an energetic advantage to our pre-human ancestors and became one of the hallmark characteristics of the human strategy set. Accessing fuel remains a common problem for many human societies. Yet anthropologists do not often take the costs of gathering fuel into account when modeling subsistence and settlement. This paper presents a model that incorporates firewood tradeoffs into human choices about what to eat and where to live, and examines a hypothetical case for the North American Great Basin. Applications of this model in both archaeological and modern ethnographic contexts will allow anthropologists and ecologists to illuminate firewood-mediated relationships between people and woodlands.

Magargal, Kate [36] see Parker, Ashley

Magaryan, Ashot [143] see Lynnerup, Niels

Maggard, Greg (Oklahoma Department of Transportation)

[127] *Late Pleistocene Aggregation Sites on the Peruvian North Coast: A New Look at Paján Settlement*

Although specific examples are rare, the concept of seasonal or periodic group aggregation is often employed by studies of early foragers in the Americas as a functional process to explain the formation of social networks, information exchange, group ritual, exogamy, and the long-distance movement of materials. In spite of frequent use when modeling mobility and settlement, the material, spatial, and social characteristics of aggregation sites remain poorly understood. Here, we provide two examples of aggregation sites related to the Late Pleistocene-Early Holocene Paján complex of northern Perú. These early foragers occupied an ecotonal boundary zone along the western Andean foothills, which afforded access to the nearby Pacific coastal plain and adjacent highlands. Paján settlement organization has been characterized as primarily logistical, with small task- or resource-specific locations and basecamps located in proximity to resource-rich zones. Two large sites (Je-431 and Je-790) in the Río Seco de Chamán drainage provide evidence for and insights regarding the aggregation process, as well as Paján social organization. We contend that these sites primarily served to organize communal foraging parties, as well as nodes for the exchange of information and materials.

[127] *Chair*

Magnani, Matthew (Harvard University)

[58] *Contemporary Archaeology in Indigenous Communities?*

This presentation critically evaluates both the historic and present trajectories of the field of ethnoarchaeology and its outgrowths as practiced in indigenous communities today. This paper draws on long-term fieldwork conducted amongst two distinct communities who inhabit Arctic Europe and east Africa. I reflect upon the development and current state of ethnoarchaeology—often used as a tool to interpret archaeological remains of the deep past—and suggest new potential functions and responsibilities for the subfield.

Magnani, Matthew [36] see Campbell, Wade

Magnoni, Aline [173] see Miller, Stephanie

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Maher, Lisa (University of California Berkeley) and Danielle Macdonald (University of Tulsa)

[295] *Becoming Neolithic or Being a Hunter-Gatherer? Reframing the Origins of Agriculture through a Longue Durée Perspective*

Searching for the origin points of major cultural revolutions and transitions has long been a driver of archaeological research, yet led to research focused on perceived boundaries, rather than continuity. Research into the origins of so-called modern human behavior, the origins of social complexity, the earliest domesticates, among others, all focus on defining moments of change that may be undetectable in the archaeological record. Perhaps some of the most enduring archaeological questions revolve around the 'origins of agriculture'. In this paper, we explore changing historical conceptions of the 'origins of agriculture' in Southwest Asia in archaeological discourse and how, through the lens of the *longue durée*, we can trace aspects of material culture, human action, and complex human-landscape dynamics in deep time. Using examples from the Epipalaeolithic of eastern Jordan, we address current debates on Neolithization by exploring the implications of perspectives that focus on 'becoming' Neolithic and 'being' a hunter-gatherer. Through this perspective we discuss different scales of material culture analysis; from the 'ethnographic' lens identifying individual behaviors in the past, to the *longue durée* of material culture trends. This multi-scalar perspective gives new insight into how we construct cultural boundaries and understand change during the 'origins of agriculture'.

Maher, Lisa [4] see Macdonald, Danielle

Maher, Ruth (William Paterson University) and Jane Downes (University of Highlands and Islands)

[135] *Sustainable Heritage through Community Engagement and Education*

In addressing the problem of burning libraries, this paper focuses on sustainable heritage through public awareness and civic engagement. Political rhetoric and limited first-hand experience has created a system whereby the impacts of climate change, coastal erosion, and rising sea levels are no longer a priority; and for students, it has become but a distant concern. This paper addresses these problems through education programs designed to (i) get students involved in the archaeology of coastal sites, (ii) help students better understand their own heritage and preserve it; and (iii) encourage students to take an active part in maintaining their landscapes, environments, and heritage through civic engagement projects. This approach has been successful in our study regions; and preliminary results are presented here.

Mahoney, Maureen (Seminole Tribe of Florida THPO)

[111] *Chair*

Maijanen, Heli [90] see Synsteliën, Jennifer

Majewski, Teresita (Statistical Research, Inc.)

[331] *What Did We Learn? SAA's Discovering the Archaeologists of the Americas Pilot Project*

SAA has an ambition to investigate the demographics of the archaeological profession in the Americas, looking to bring together knowledge and advice on how the profession of archaeology (in cultural resource management, academic, government, museum, self-employed, and other contexts) is structured throughout North, South, Central America, and the Caribbean. SAA has now carried out the first step toward this goal, which has been to carry out a targeted pilot project, gathering data on archaeological employment in two test areas—Chile and New Mexico. Doing this has allowed us to test the proposed methods and to obtain feedback on processes in order to learn about how the full study could ultimately best be conducted.

[149] *Discussant*

Makin, Mike (The College of William and Mary)

[255] *The Materiality of Feasting: Pottery as an Indicator of Ritual Practice in Late Woodland Virginia*

The Hatch site in Prince George County, Virginia is arguably among the most significant precolonial sites in the region. After it was excavated in the 1980s, the collection was stored away and went largely unstudied for the last thirty years. When I first began my research on this 'orphaned' site, I was struck by the large pit features containing evidence of ritual feasting and a wide variety of ceramic types. Adhering to the old trope that 'pots equal people', I initially assumed that this site was one in which different groups aggregated for rituals that increased social bonds, eventually helping them coalesce into the Algonquian groups encountered by the first English colonists. As my research progressed, I came to realize that the ceramic varieties are more indicative of the ritual practice itself than they are of different groups of people. Hatch is a site that appears to be of great ritual significance to the Late Woodland people of coastal Virginia. The artifacts found in the site's pit features, including Abbott Zoned Incised—an elaborately decorated ceramic ware—strongly suggest this. This paper presents my research into these ritual practices and my thoughts on the significance of the ceramic types associated with them.

Makowski, Krzysztof and Roberto Pimentel (Warsaw University)

[211] *Skilled Craftsmen, Ancestors Cult, and Hegemonic Strategies of the Wari Empire*

The comparison of new evidence obtained from Pachacamac and Castillo de Huarmey sites sheds new light on the character of Wari presence on the Peruvian Coast. Both sites are contemporary (Late Middle Horizon, ca. 800–1100 AD) and most new information comes from funerary contexts. In both cases, imitations of foreign styles, originated in the south coast and highlands, as well as the local ones are present in the iconography found in the offerings. Recent analyses lead us to the conclusion that most artifacts were locally produced by local and foreign artisans, except for rare portable items such as wooden artifacts and textiles. Additionally, the character of the iconography corpus does not correspond to the hypothesis of the existence of Wari religious proselytism since the local traditions prevail in the forms and possible iconography content known from both sites. Rather, the presence of an imperial power with hegemonic character manifests in the reorganization of production, symbols of power, and in the diffusion of new funerary paradigm.

Makowski, Krzysztof [132] see Carmen, Mayra

Malca Cardoza, Hernando (Ministerio de Cultura, Piura) and Alexis Mantha (Champlain College, Saint-Lambert)

[207] *Ayllu There in the Upper Marañón? Founding Ancestors and Political Dynamics in the Rapayán Region of Ancash/Huánuco during the LIP*

Andean scholars generally conceive the ayllu as representing a group of people who consider themselves to be related by common descent and who collectively possess and exploit resources (land and water). In many regions of the Andes during late pre-Hispanic times, ayllu members retraced their common origin and kinship ties through the celebration of a mummified founding ancestor. Ayllus could either be small or large and often the smaller units were hierarchically integrated into the larger ones. As result, ayllus tended to be nested and multi-scalar social organizations where an individual could be linked to a hierarchy of ancestors. In this paper, we seek to determine whether the largely farming communities of the Rapayán region of the Upper Marañón during the LIP (1000–1450 C.E.) displayed a social organization characteristic of the ayllu or not. Through excavated evidence and the analysis of architectural forms and spatial distribution, we are able to infer the existence of hierarchy of founding ancestors as well as some of the water and farming lands exploited by their descendants.

Maldonado, Antonio [74] see Méndez, César

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Maldonado Vite, María Eugenia [128] see Richter, Kim

Malhi, Ripan [212] see Witt, Kelsey

Maline, Sophia (University of California, Berkeley), Melanie Miller (University of Otago, Dunedin, New Zealand), Jillian Swift (Max Planck Institute for the Science of Human Hist) and Christine A. Hastorf (University of California, Berkeley)

[9] *Reconstructing Recipes: Stable Isotope Analysis of Food Residues from a Year-Long Cooking Experiment*

Charred food residues provide a unique window into ancient peoples' culinary cultures, and chemical analyses of burnt meals can help us identify the ingredients used to create specific recipes. However, limited experimental work leaves us wondering—when we find residue in an ancient pot, are we viewing the remains of the final meal cooked in that pot or is it the product of multiple recipes? Does the chemical signature of the residue accurately reflect the meal(s) cooked in that pot? Seven archaeologist-cooks each prepared a distinct recipe, in the same ceramic (un-glazed) pot, once a week for a year, and periodically sampled the charred residues for stable isotopes of carbon and nitrogen. During the final weeks, the cooks swapped recipes to see if the final meal would “over-write” the previous year’s cooking events, or if the chemical signature of those earlier meals would be retained. Our isotopic data show a consistent relationship to each recipe’s ingredients. However, the isotopic data from the final residue collection indicate the charred material was not only from the last recipe cooked but retained material from earlier cooking events. Therefore, archaeologists are cautioned in interpreting charred pottery residues as they potentially reflect multiple meals.

Mallios, Seth

[258] *Archaeological Ceramic Analysis as a Vehicle for Anthropological Holism at 1607 James Fort: An Essay in Honor of Dr. Joseph W. Ball*
Joseph W. Ball spent a highly successful and influential career identifying archaeological insights into the Maya through detailed, rigorous, and creative ceramic analyses. In honor of his many contributions, this paper draws on Dr. Ball’s methodological and theoretical approaches by using ceramics as a springboard for deeper anthropological discussions into daily life at Jamestown Island, Virginia during the first half century of English settlement (1607–1657). Distinctions in artifact frequencies between Fort-Period and Post-Fort Period features uncovered by members of the ongoing Jamestown Rediscovery Project are consistent throughout nearly every artifact type are most pronounced among ceramics. Expanding the analysis from a core dimensional focus on space, time, and form to broader thematic issues of diachronic trade patterns and intercultural exchange laterality, this presentation identifies key nuances in exchange directionality and economic inequity that reflected the deterioration of English/Powhatan Indian relations during the first quarter of the 17th century. Drawing in other subfields of anthropology in a holistic manner—another cornerstone of Joe Ball’s research—it becomes clear that the sequence from bilateral intercultural exchange to unilateral intercultural exchange to no exchange at all was not only a barometer of failing relations; it was a catalyst as well.

Mallol, Carolina [126] see Eguez, Natalia

Maloney, Jillian [79] see Davis, Loren

Manahan, T. (Kent State University)

[80] *Household Resilience, Political Collapse, and Community Transformation: Late-Terminal Classic Transition of the Ancient Maya Center of Xuenkal*

Across the Maya Lowlands, the Terminal Classic Period (AD 800–1000) represented a time of dramatic sociopolitical transformation. Investigation of the Northern Maya lowland site of Xuenkal, shows an abrupt break in the pattern of steady demographic growth during the Terminal Classic, associated with the center of Chichen Itza 45 km away. Xuenkal presents a unique case to evaluate this transition as it contains discrete households associated with the Late Classic zenith of local political centralization as well as Terminal Classic constructions associated with Chichen Itza Sotuta materials. Comparisons between the two groups show differing strategies of household socioeconomic integration. This presentation explores the local transformation from the perspective of both polity and household as outside pressures disrupted longstanding trends. Finally, the patterns of household and political transformation are compared and contrasted with the case of Copan, Honduras.

Manahira, George [114] see Douglass, Kristina

Mandel, Rolfe (Kansas Geological Survey)

[182] *The Contributions of Vance T. Holliday to the Earth Sciences*

Vance T. Holliday, the recipient of SAA’s 2018 Fryxell Award for Interdisciplinary Research, has devoted his career to applying geoscientific methods and theories in archaeological investigations. Vance’s scientific contributions, however, go beyond archaeology; he has played an important role in facilitating our understanding of landforms, sediments, and soils that provide the context for archaeological sites. The sites he has investigated, with a focus on their geomorphology, soils, stratigraphy, and paleoenvironmental records are in a variety of landscape settings. Those settings include playas, draws, river valleys, dune fields, and loess-mantled uplands. Through decades of research, he has been instrumental in developing our knowledge of late-Quaternary landscape evolution, soil genesis, and especially soil stratigraphy. Against the backdrop of Vance’s long and productive career as a geoarchaeologist, this paper provides an overview of his contributions to the Earth sciences.

Manin, Aurelie (University of York), Camilla Speller (University of York), Gregory Pereira (CNRS, UMR 8096 Archéologie des Amériques) and Christine Lefèvre (MNHN, UMR 7209 Archéozoologie Archéobotanique)

[43] *Captive Birds and Pet Keeping in Ancient Mesoamerica: The Case of Scarlet Macaws from Vista Hermosa (Tamaulipas, Mexico, 1300–1500 AD)*

In Mesoamerica, the tropical colourful birds were highly valued for their feathers. Among them, the scarlet macaw (*Ara macao*) provided bright red, blue and yellow feathers that were traded to the Central Mexican Highlands and, beyond Mesoamerica, until the American Southwest. As suggested by ethnohistoric records, some birds may have been maintained in captivity and harvested to supply the demand in feathers. In spite of examples of large-scale macaw management in the American Southwest, there is no such archaeological evidence for Mesoamerica, and in particular within their native regions. In this presentation, we investigate the osseous remains of two scarlet macaws from the Postclassic site of Vista Hermosa, Southern Tamaulipas, Mexico (1300–1500 AD) to clarify their relationship with the Huastecan population. Using osteological markers and stable isotopes, we show that the birds were kept in captivity, maybe as pets. By identifying captive birds outside of the major political centres of Central Mexico, these results shed new light on aviculturist practices in ancient Mesoamerica. In addition, the archaeological evidence of captive macaws in the Huasteca is consistent with ethnohistoric observations, and could help to understand the origin of the captive-reared scarlet macaws found in the American Southwest.

Manin, Aurelie [169] see Forest, Marion

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Mann, Allison, Susanna Sabin (Department of Archaeogenetics, Max Planck Institute), Kirsten Ziesemer (Faculty of Archaeology, Leiden University, Leiden), Kirsten Bos (Department of Archaeogenetics, Max Planck Institute) and Christina Warinner (Department of Archaeogenetics, Max Planck Institute)

[143] *Differential DNA Preservation in Archaeological Dental Calculus and Dentin Has Implications for Ancient Microbiome Research*
Ancient DNA (aDNA) studies of preserved microbiomes from dental calculus and paleofeces shed light on the evolution of these complex microbial communities, as well as both human health and behavior in the past. Despite recent advances in the recovery and authentication of aDNA, environmental contamination and inconsistent molecular preservation remains a continuous concern. Recent studies suggest that dental calculus may provide a better preservation environment for DNA than other archaeological materials, yet this hypothesis has not been systematically tested. In this study, we adopt a non-targeted shotgun approach to analyze the preservation of microbial and human DNA in 48 paired dental calculus and dentin samples from archaeological contexts. These represent a broad spatial and temporal breadth and thus contribute to a better understanding of DNA preservation in dental calculus independent of burial context, age of the sample, and depositional environment. Our investigation demonstrates that dental calculus offers a robust preservation environment for endogenous microbial DNA. In addition to the strong microbial signal, calculus consistently contained low amounts of human DNA, and thus may serve as an appropriate source of DNA for analyses of archaeological materials stemming from environments less conducive to molecular preservation.

Mann, Evan

[35] *Conch, Whelk, or Clam: Comparing Southern Florida's Indigenous Shellfish Collection Patterns*

The populations of southern Florida are an exemplary case of indigenous groups who organized into large political entities without the advantages of agriculture. This is due to the populations' close proximity to vast amounts of marine resources. Among these resources, many shellfish (both gastropods and bivalves) were used not only for nutritional sustenance, but also made up an important proportion of the tool industry, and as trade goods between these local populations and those at a distance. This work discusses and explores shell-midden artifacts to reconstruct the collection practices of two large populations, the Calusa and the Tequesta, as well as another smaller group inhabiting the Florida Keys, the Matecumbe. Results indicate significant variations in collection practices, despite the three groups sharing territory in the southern area of the Florida peninsula and having access to similar marine resource habitats. This methodology holds great potential to better understand the relative importance of different marine resources among the populations of southern Florida.

Mann, Rob (St. Cloud State University), Charles Peliska (St. Cloud State University) and Jacob Dupre (St. Cloud State University)

[39] *"A Very Good and Substantial Fort" or "More like a Child's Playhouse": The History and Archaeology of Civilian Fortifications during the U.S.—Dakota War of 1862 in Minnesota*

In August 1862 long-simmering tensions between the Dakota and Euro-American traders, settlers, soldiers, and government officials boiled over into open warfare. For nearly two months militant Dakota warriors, ostensibly under the leadership of renowned chief Little Crow, attacked Euro-American settlements and military installations. In response, settlers across southwest and central Minnesota either fled the region or attempted to fortify their settlements. These so-called "settlers' forts" of the U.S.—Dakota War of 1862 are today a largely unexplored part of Minnesota's archaeological record. To date, no comprehensive archaeological survey has been undertaken to locate and document these frontier fortifications. These civilian fortifications, some constructed in a little as twenty-four hours, ranged from imposing fortresses to little more than makeshift barricades. The U.S.—Dakota War of 1862 was a seminal event in the history of Minnesota. Although relatively unknown outside of the state, the impacts of the U.S.—Dakota War of 1862 are far-reaching and ongoing in many Minnesota communities, both Native American and Euro-American. This paper details historical and archaeological research on civilian fortifications at Fair Haven, St. Cloud, Sauk Centre, Paynesville, and Forrest City by graduate students and faculty at St. Cloud State University.

Mantha, Alexis (Champlain College, Saint-Lambert)

[264] *Different Dead for Different Purposes: The Ancestors and Ancestral Spirits of Rapayán in the Peruvian Central Andes*

During the Late Intermediate Period (1000–1450 C.E.), the inhabitants of the Rapayán region in the Peruvian central Andes created a complex landscape for the dead. These were disposed of in natural caves along cliffsides surrounding residential sites as well as in a variety of above-ground mausoleums constructed at highly visible locations. In this paper, I develop a typology of sepulchres and analyze their spatial patterning. Building on ethnographic and ethnohistorical material, I argue that the different types of mortuary constructions and their specific distribution across the Rapayán landscape reflected different kinds of mortuary programs. On the one hand, rituals honoring the dead located in caves and smaller mausoleums grounded people in place and participated in the construction of group identity. I suggest that the deceased in this funerary program became ancestral spirits and were likely commemorated as an anonymous collectivity. On the other, rituals celebrating the deceased placed in tall multi-story buildings distributed at the top of hillside embodied political competition among kin groups and were ultimately used to legitimize power. I suggest that the deceased in this funerary program became ancestors and were celebrated as the named founding ancestors of kin groups.

Mantha, Alexis [207] see Malca Cardoza, Hernando

Manzanilla, Linda [31] see Froese, Tom

Manzano, Bruce (University of Kentucky), Thomas Royster (University of Kentucky), Bernard Means (Virginia Commonwealth University), George Crothers (University of Kentucky) and Robert Selden Jr. (Stephen F. Austin State University)

[90] *Faunal Identification Using 3D Scanning*

Recent developments in 3D scanning and printing are increasingly being used in zooarchaeology. Our research takes the use of 3D technology further by attempting to develop a method that will enable the identification of bones based on 3D scans. This exploratory approach uses a series of standardized measurements on 3D scans of key skeletal elements to determine the statistical probability for the best fit of an unknown bone to known comparative materials. An example of this approach is shown in the 3D database generated on key elements of the guinea pig (*Cavia porcellus*), gray squirrel (*Sciurus carolinensis*), passenger pigeon (*Ectopistes migratorius*), and rock dove (*Columba livia*).

Manzano, Bruce [35] see Randall, Connie

Maradiegue, Walther (Northwestern University)

[333] *Images of the Living Past: 19th-Century Moche Archaeological Photographs and Everyday Indigeneity in the Northern Peruvian Andes*

This presentation analyzes late 19th-century photography of Moche pre-Columbian buildings, as a way to inspect the buildings' incorporation into everyday indigenous lives. I will focus on the work by German scientist Hans Heinrich Brüning (1848–1928). First arrived as an engineer hired by the most important sugar haciendas of the region, Brüning's interests quickly shifted towards archaeological and ethnographic studies during his stay in the Northern Peruvian Andes between 1875 and 1920. His work was mainly focused on pre-Columbian Moche buildings and in contemporary indigenous Moche populations, to the extent that his photographs are the earliest documents of its kind. In this presentation, I will explore how Brüning's images prove how these buildings were part of contemporary indigenous roads, religion and labor; and how this incorporation defined scientific understandings

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of indigeneity in this Andean region. In this sense, Brüning's images are relevant as they serve as ethnohistorical documents, as well as given that they substantially explain the trajectories of archaeological sciences in this Andean region. Finally, I explain how the meaning these images communicate is key to understand 20th-century and present uses of these photographs by Moche descendants.

Marcucci, Derrick (Landmark Archaeology, Inc.), Susan Gade (Landmark Archaeology, Inc.) and Antonio Martinez Tunon (Landmark Archaeology, Inc.)

[239] *The VerHage Site: A Late Archaic Seasonal Village located in Walkkill Drainage of Southeastern New York*

In summer 2017 Landmark Archaeology, Inc. conducted data recovery excavations at four Late Archaic sites in southeastern New York within the Walkkill drainage near the town of Goshen. Excavations at the VerHage Site, a Late Archaic Lamoka Phase (ca. 3000–2500 BC) site and the largest of the four investigated sites, identified pit features, post-molds and house patterns, yielded a large lithic assemblage, and found glacial erratics used for food processing and tool production. The recovery of a large number of formal bifaces and groundstone tools as well as the presence of massive roasting pits indicate that hunting and processing of wild plant foods were tasks undertaken at the settlement. By comparing the density and diversity of the VerHage artifacts and features with those of the other three sites, we interpret the site functioned as an aggregation center seasonally occupied by regionally interacting kin based bands.

Marcum-Heiman, Alesha (University of Louisiana, Monroe) and Diana Greenlee (University of Louisiana—Monroe)

[156] *Beyond the Boundaries: Systematic Survey of the Poverty Point Landscape*

The monumental core of Poverty Point (16WC5) has been the focus of considerable archaeological research, particularly since the early 1980s, but the broader spatial context of the site is less well known. Indeed, it has been estimated that < 12% of the Poverty Point Compatible Use Zone (PPCUZ), a nearly 5-km radius catchment area around the site, has been formally surveyed. The PPCUZ, which was established for management purposes, approximates the daily foraging radius for hunter-gatherers in a resource-rich environment. In 2017, the Poverty Point Station Archaeology Program initiated a systematic investigation of the PPCUZ. Working with volunteers and local landowners, a siteless survey approach is used to acquire data necessary to characterize past uses of the PPCUZ landscape. This poster presents the results of the first season of investigation and preliminary observations regarding patterns of land use and settlement in the area immediately surrounding Poverty Point.

Marean, Curtis [89] see Murray, John

Marek-Martinez, Ora (Northern Arizona University- Native American Cultural Center)

[166] *What Would Larry Do: Archaeological Practice with, by, and for Native American Communities*

The fight for inclusion of Native Americans in archaeology and anthropology hasn't been an easy road; it has been divisive, contested, and sometimes violent. The need for allies and advocates for Native American inclusion in the field has become apparent through the tireless work of Larry Zimmerman. His scholarship has shaped generations of archaeologists and anthropologists in numerous ways. The ethical dimensions of his work are a testament to the need for change in the field and are a reminder that archaeologists must work within the field to push boundaries and move beyond what is considered 'fact.' In this paper, I discuss the implications of Larry's scholarship and practice on my own work as an Indigenous archaeologist, ways that we can better engage his approach and lessons learned, and ways that we can contribute to the breadth of knowledge created by Larry J. Zimmerman for the benefit of Indigenous peoples.

Marengo, Nelda Issa (University of California Riverside)

[33] *Warriors and Violence in the Iconography of Chichén Itzá*

En Mesoamérica las representaciones gráficas sobre guerra, violencia y conflicto, son una constante que se encuentran en diversos sitios y en diferentes periodos. Para el Epiclásico (650–900 A.D) en el centro de México, y para el Clásico Tardío/ Terminal (600–900 A.D) en el área Maya, esta temática comienza a presentar cambios, tiende a ser más explícita y a compartir algunos elementos entre sitios contemporáneos. Chichén Itzá floreció durante este momento de cambios y muestra de ello es la presencia de dichas características en la iconografía plasmada en la arquitectura y en la pintura mural del sitio, así como en los distintos artefactos encontrados en excavaciones arqueológicas. Estas representaciones gráficas han sido motivo de diversas lecturas e interpretaciones. Mediante este trabajo busco contribuir a su entendimiento desde una perspectiva en donde se puedan observar las dinámicas sociales inherentes en los eventos bélicos incorporados en la iconografía de Chichen Itzá.

Marengo, Nelda Issa [330] see Romero, Ashuni

Marin Jave, Rosa [17] see Pozorski, Thomas

Marino, Marc (University of Arkansas), Lane Fargher (Centro de Investigación y de Estudios Avanzados de), Nathan Meissner (University of Southern Mississippi), Verence Heredia Espinoza (Centro de Estudios Arqueológicos, El Colegio de Mi) and Richard Blanton (Purdue University)

[31] *Commercialization, Consumption, and Political-Economic Strategies in Late Postclassic Mesoamerica: A Comparative Study of Access to Projectile Points at Tlaxcallan and Santa Rita Corozal*

Over the course of the Postclassic Period (A.D. 950–1521), commercialization was on the rise in ancient Mesoamerica, reaching its apex at the time of contact with Europeans. Extant information indicates that both interregional trade and regional market integration increased during this time, especially during the Late Postclassic (A.D. 1250/1300–1521). Yet, researchers have little comparative published information on household consumption from well-excavated residential contexts for this period. In this paper we compare access to formal lithic tools (projectile points) at two Late Postclassic sites with differing governing structures: Tlaxcallan (located in Central Mexico), and Santa Rita Corozal (located in coastal Belize). Specifically, we investigate the degree to which political-economic factors affected production and access to projectile points, including the accessibility of non-local raw materials used in their production, and their distribution among various households. We test whether households with differing social statuses monopolized or controlled finished points, and if the raw materials used to produce them varied among households on the basis of status. Finally, we consider the degree to which these patterns correlate with differing political-economic strategies employed by governing officials at the study sites.

Mark, Andrew (Boston University), Justin Holcomb (Boston University) and David Carballo (Boston University)

[48] *Towards a Wave-of-Advance Model for Predicting the Spread of Prismatic Blade Technology in Mesoamerica*

The diffusion and spread of material culture is a cornerstone of archaeological research, particularly understanding the variables which dictate the structure of dispersal. Recent evolutionary approaches have sought to address technological spread through mathematical modeling. One model, the reaction-diffusion model, suggests diffusion occurs at the population scale as a wave-of-dispersal. While previous researchers demonstrated the efficacy of this approach regarding the peopling of a landscape, there remains a need to demonstrate how the model can shed light on the spread of ideas. In this study, we seek to test if the dispersal of prismatic blade technology throughout Mesoamerica occurred as a wave-of-dispersal. Our first

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objective is to create a database containing the variables required for analyzing the wave-of-advance. Next, we developed general rates at which we predict ideas to have spread based on ethnographic data. Finally, we analyzed the database information and the predicted rates together, testing the validity of using a wave-of-advance model to predict the spread of blade technology. The results enable us to better understand technological change and exchange relations in Mesoamerica. By generalizing the results we can engage in larger theoretical debates such as the relationship between the development and transmission of ideas.

Marken, Damien (Bloomsburg University)

[80] *Classic Maya Urban Settlement Dynamics: Planning and Mobility Introduced*

Following decades of debate, most scholars accept Classic Maya cities as the hearts of spatially expansive, low-density urban settlements. This introductory paper will summarize past and current perceptions of Maya urbanism, emphasizing potentially overshadowed considerations of urban planning, mobility, and community dynamics—fundamental cross-cultural features of urbanization—and their detection in lowland settlement patterns. The recent florescence of research deriving insight from urban theory has been positive as it reminds scholars that Maya cities were urban phenomena, not simply political capitals, and must be treated as such. But the trend to emphasize monumentality in urban layout continues, to the near exclusion of other processes critical to urbanization, such as mobility, neighborhood community building, and resource management. There is a strong need for increased residential excavations across Classic urban landscapes, and we should be prepared to develop audacious programs following recent LiDAR surveys. Maya urbanism was a complex mesh of social, economic, ritual, and political networks, balanced between potentially conflicting household and social group loyalties, resulting in changing urban structures through time and space. It will require a long-term disciplinary commitment to household and neighborhood excavations to fully uncover the temporal and regional dynamics of Classic Maya urban systems.

[80] *Chair*

Marken, Damien [80] see Menéndez, Elsa

Markert, Patricia (Binghamton University)

[58] *A Tale of Two Places in D'Hanis, TX: Combining Linguistic Anthropology and Historical Archaeology to Study Place-Making on the Texas Frontier*

In this paper, I discuss an archaeological approach to place-making that incorporates elements of linguistic anthropology, drawing from narrative analysis and Bakhtin's chronotope to analyze oral histories from a small town in southwest Texas. D'Hanis originated as an Alsatian colony on the Texas frontier, one of four settled by empresario Henry Castro in the 1840s. By the 20th century, the town had not simply transformed but moved—the railroad had caused a rupture in the settlement that resulted in an “old” and “new” D'Hanis, two competing towns with the same name approximately a mile apart. Today, few structures in Old D'Hanis remain, while New D'Hanis retains the aesthetic of a western railroad town. Archaeologically, this paper examines the spatial and material strategies that residents used to create two places out of one. Narratively, it examines how the town narrates a sense of place in the past and present. This paper aims to explore how we, as archaeologists, might approach the intersections of material and narrative strategies in our studies of place. Further, it suggests that linguistic anthropological methods and theories offer opportunities for historical archaeologists to better understand how people create and maintain places in space and through time.

Marketou, Toulou [298] see Vitale, Salvatore

Marks, Theodore [32] see McCall, Grant

Marks, Yvette (Department of Archaeology, The University of Sheffield) and Roger Doonan (Department of Archaeology, The University of Sheff)

[89] *Copper Smelting in the Early Bronze Age Aegean*

Our understanding of Early Bronze Age copper smelting in the Southern Aegean has improved dramatically in the last two decades through a combination of fieldwork, laboratory analyses and experimental reconstructions (Betancourt 2006, Bassiakos, 2007, Pryce 2007).

The currently accepted model for primary copper production has been largely based on the outcome of an experimental campaign (Pryce et al. 2007). While this study accepts the value of experimental archaeology it challenges the current model and the specific manner in which the “Aegean perforated furnace” is used. The new study has implications for ideas of resource perception and establishing the techno-typology for early copper metallurgy in the region.

These implications are discussed within the context of the early transmission of metallurgy across Eurasia and the diversity of early technologies. The Aegean region is shown to be a critical location for providing a perspective on the specifics of transmission.

[89] *Chair*

Markussen, Christine

[286] *Discussant*

Markussen, Christine [286] see Simon, Katie

Marquardt, William, Victor Thompson (University of Georgia), Karen Walker (Florida Museum of Natural History), Michael Savarese (Florida Gulf Coast University) and Lee Newsom (Flagler College)

[35] *Cooperation and Coercion: Geography, Ecology, Climate, and Surplus Production in the Rise of the Calusa Kingdom*

The Calusa of southwest Florida were the most complex and powerful society in Florida during the sixteenth century AD. They relied for protein not on agriculture, but on aquatic resources harvested from shallow-water estuaries. Our interdisciplinary team is exploring the evidence for surplus production and intensification against a background of environmental challenges and opportunities. We focus on Mound Key and Pineland, the two largest Calusa towns. We think that cooperative heterarchical relations among coastal and inland polities gave way to coercive hierarchical relations after ca. AD 1000. Major canals, large midden-mounds, and fish-capture/storage facilities were constructed following a ninth-century hiatus during a challenging period of global cooling known as the Vandal Minimum. The succeeding Medieval Warm Period ameliorated the productivity of the shallow-water estuarine environments around Mound Key and Pineland, providing new opportunities. We think that certain leaders were able to mobilize surplus labor to construct canals, maintain and rebuild structures, procure resources from faraway mainland forests, and coordinate and oversee the engineering of “watercourt” structures that probably functioned as fish traps and/or fish storage areas. We interpret this commitment to place as a way that successive members of a lineage transmitted political and social capital.

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Marquardt, William (University of New Mexico, United States Forest Service), Alexis O'Donnell (Maxwell Museum of Anthropology), Karen Price (Maxwell Museum of Anthropology), Katie Williams (Maxwell Museum of Anthropology) and Heather Edgar (University of New Mexico, Department of Anthropology)

[306] *Mortuary Analysis of St. Joseph Sanatorium, Albuquerque, New Mexico: A Multidisciplinary Approach*

In 1984–1985 several sets of human remains were inadvertently discovered at St. Joseph's Hospital in Albuquerque, New Mexico. These remains were excavated by the University of New Mexico and the Office of Contract Archaeology. In all a total of 12 individuals were excavated from this previously forgotten cemetery. St. Joseph's Hospital was established by the Sisters of Mercy in 1902 as a tuberculosis sanitarium for well-heeled clients to rest and recuperate in what was then thought of as one of the healthiest cities in the United States. Sanitariums like St. Joseph were established throughout the New Mexico territory to attract more wealthy individuals to settle the territory and finally make their bid for statehood stick. Initial analysis of skeletal, dental, and funerary data seems to partially contradict this model that has held for the role sanitariums played in late territorial New Mexico. Of the individuals whose dental morphology could be analyzed, most (5/8) were of Hispanic ancestry, and at least two individuals (2/8) were of African American ancestry. Coffin hardware and funerary artifacts were uniform and indicative of middle- or lower-middle-class socioeconomic status. These data suggest a more nuanced view of tuberculosis treatment during the late territorial period.

Marquardt, William [35] see Savarese, Michael

Marquez, Lourdes [302] see Granados Vazquez, Geraldine

Marsaglia, Kathleen [95] see Lawrence, John

Marshall, Fiona [99] see Hu, Lorraine

Martens, Vibeke Vandrup (NIKU—Norwegian Institute for Cultural Heritage Research) and Michel Vorenhout (MVH Consult and IBED, University of Amsterdam, the)

[135] *The Follo Railroad Environmental Monitoring Project in Medieval Oslo, Norway*

In conjunction with a large urban infrastructure project, renewing the Norwegian railroad through the listed monument of the Medieval town of Oslo, an environmental monitoring programme was established. The Medieval town consists of extensive archaeological remains preserved in situ. The monitoring programme focusses on the following questions: What is the influence of building an encased railroad next to a medieval monument? How are the unsaturated conditions influenced next to the new railroad? And how does such a large urban infrastructure project affect the preservation conditions of the archaeological deposits in the unsaturated zone further inside the monument? This paper presents the archaeological setting, the installed equipment and monitoring plan as well as the first results of the long-term monitoring that started in 2016.

Martin, Cecelia [94] see Carr, Philip

Martin, Erik (University of Utah), Daron Duke (Far Western Anthropological Research Group, Inc.) and Andrew J. Hoskins (Far Western Anthropological Research Group, Inc.)

[92] *Trends in Paleoindian Projectile Point Technology during the Pleistocene-Holocene Transition at the Old River Bed Delta, UT*

The fossil Old River Bed delta, located in the Great Salt Lake Desert, UT, contains one of the highest concentrations of Paleoindian archaeology within the Great Basin. Occupied from 13,000 cal B.P. until its desiccation around 9,500 cal B.P., this productive marshland provided a wide array of dietary resources utilized by the region's inhabitants during the Pleistocene-Holocene transition. However, changes in climate, local hydrology, and human populations during this dynamic period likely substantially altered the distribution and relative abundances of these resources. Here we analyze a large sample of projectile points from the delta's distal portion to examine how hunting technology and behavior responded to this hypothesized shift in dietary resources. We propose that the observed trends of decreasing point size and manufacture investment through time are the result of Paleoindian hunters increasingly targeting smaller prey species (*Odocoileus hemionus*, *Ovis canadensis*, *Antilocapra americana*) as larger prey went extinct (*Mammuthus*, *Bison antiquus*) or decreased in abundance (*Bison bison*).

Martin, Fabiana María (CEHA-UMAG), Francisco Juan Prevosti (CONICET-CRILAR) and Luis Alberto Borrero (CONICET-IMHICHU)

[7] *Cueva Nordenskjöld, Última Esperanza, Chile: A Late Pleistocene Faunal Assemblage*

Cueva Nordenskjöld is a cave located in the Cerro Benitez, at Última Esperanza, Chile, above 150 masl, and accordingly beyond the highest stand of the Late Glacial Consuelo paleolake. The study of its Late Pleistocene faunal remains -Mylodontinae, *Hippidion saldiasi*, Camelidae, *Panthera onca mesembrina* and a large undetermined carnivore- is crucial for the understanding of the process of biological colonization of the Cerro Benitez area, where ephemeral Late Pleistocene human occupations were defined. The faunal assemblage appears to be mainly the result of carnivore activities.

Martin, Samuel

[40] *A Relationship between Seasonal Flooding and Raised Agricultural Fields in the Llanos de Mojos, Bolivia*

The Llanos de Mojos, Bolivia, a seasonally flooded savanna region in the western Amazon lowlands, has several types of artificial landscape modifications that point to a significant pre-Columbian occupation with some approximately as old as 500BCE. These earthworks include 40–50,000 raised fields which were used as a regional-wide agricultural technique to grow a variety of crops. This paper focuses on the relationship of these fields to their hydrological environment. Using GIS in conjunction with digitized data from the Proyecto SIG Arqueológico del Beni and the Dartmouth Flood Observatory at the University of Colorado this paper analyzes large-scale regional variation in the presence of flood water and the placement of raised fields within distinct hydrological constraints. It is suggested that their construction is associated with the amount of nearby regional flooding that is the result of topographical, geomorphological, and riverine relationships. These separations can be seen along distinct intraregional lines, dividing the denser fields in the northern part of the Llanos from the less dense southern section. By focusing on these kinds of seasonal hydrological distinctions, the results demonstrate that crop cultivation may have relied on the placement of raised fields to facilitate water management.

[40] *Chair*

Martin, Simon (University of Pennsylvania Museum)

[209] *Stepping Out: The Maya Underworld and the Red Temple at Cacaxtla*

The murals of Cacaxtla, Tlaxcala, have long thrown the issue of Central Mexico-Maya interaction into high relief. There we find the richest evidence of interaction between these two cultural zones, though whether this amounts to citation, appropriation, fusion, or immigration is open to debate and contestation. This paper re-examines the stairway murals of the Red Temple for what they tell us about a Maya world seen through a Central Mexican lens. A particular focus falls on the link between image and physical space in these paintings, which make them experiential as well as visual.

[337] *Discussant*

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Martin, Stephanie (University of Arizona)**[12]** *Least Cost Path Analysis of Maritime Routes in the Ancient Aegean*

The Least Cost Path analysis in ArcGIS has been a critical tool in archaeological reconstructions of movement and connectivity, but until recently these analyses have been limited to land travel. From the Neolithic onwards, sea travel was an equally important mode of transportation in the Aegean and wider Mediterranean. In this study, I utilized the Least Cost Path tool in ArcGIS to model sea travel in the Aegean.

Bathymetric data and speed and direction of local wind and currents were inputs in a Least Cost Path analysis which examined sea routes of man-powered vessels in the Aegean Sea. Using May averages to approximate optimum sailing weather and known Bronze Age port cities, a surface raster was created from scaled bathymetric data and a cost surface raster was based on current speed and direction and wind speed and direction. The application of a Least Cost Path analysis for sea routes successfully modeled maritime routes around the Aegean for a man-powered vessel. The model can be improved with future research and the creation of a specific sea travel cost algorithm, and incorporating sailing parameters.

Martin, Worthy (IATH, University of Virginia), Carrie Heitman (University of Nebraska) and Paul Reed (Archaeology Southwest / Salmon Ruins)**[130]** *The Salmon Pueblo Archaeological Research Collection (SPARC) Project : Making the Data Accessible*

Supported by the National Endowment for the Humanities, the Salmon Pueblo Archaeological Research Collection (SPARC) Project was initiated in 2015 by the Center for Digital Research in the Humanities at the University of Nebraska Lincoln, the Institute for Advanced Technology in the Humanities at the University of Virginia, Salmon Ruins Museum, and Archaeology Southwest. The primary goal of the SPARC Project is creation of an online digital archive of materials from excavations at Salmon Pueblo in the 1970s. The finished archive will contain more than 15,000 scanned images (photographs, maps, drawing), roughly 30,000 pages of scanned original Salmon field forms, and a portal allowing access to more than 250,000 lines of data from dozens of Salmon databases. SPARC will be go live on the Internet in mid-2018. The variety of archaeological methods: discovery and recording, applied to the Salmon Ruins site over the years present interesting challenges for creating an internet accessible archive of the discoveries at this important "Outlier" to the primary Chacoan great houses. In part, this paper will discuss the implementation of IIIF for both documents and images, divergent epistemologies with regard to object/image data and metadata, and the ethical and political issues involved in this project.

Martindale Johnson, Lucas (Far Western Anthropological Research Group Inc.), Daron Duke (Far Western Anthropological Research Group Inc.), Jennifer DeGraffenried (U.S. Army Dugway Proving Grounds) and Bruce Kaiser (U.S. Army Dugway Proving Grounds)**[154]** *Examining Handheld XRF Inter-instrument Variation: A Collaborative Project Using a Large Assemblage from the Great Basin*

Collaborating with multiple XRF instruments enables larger than normal datasets to be analyzed in a short period. The portability of instruments is important to analysts working together in one location as groups of specimens can be analyzed simultaneously. However, certain protocols must be followed so there are no discrepancies among instruments. We present our project's methodological controls, such as shared source library and calibration, and preliminary results. The study consists of over 6,000 obsidian and fine-grained volcanic artifacts from Paleoindian assemblages from western Utah's Old River Bed delta. We demonstrate that inter-instrument variation is insignificant within our regional context when all analysts follow strict instrument controls.

Martinez, Desiree (Cogstone Resource Management)**[166]** *Oh Captain, My Captain: Transforming the Practice of Archaeology*

For many Native American community members, becoming an archaeologist can be a difficult choice. This is especially true if you have witnessed the wanton destruction of your sacred sites, the disrespectful treatment of your ancestors by archaeologists and have been taught by your family and community to see archaeologists solely as grave diggers. My review of the archaeological literature and interaction with archaeologists during the 1990's only supported this perspective, bringing doubt to my ability to successfully enter an unwelcoming discipline. However my introduction to Larry Zimmerman's writings such as "Made Radical by My Own" and "Sharing Control of the Past" was a ray of hope to me; that a non-archaeologist understood and fought for the inclusion of Native Americans and their perspectives in the practice of archaeology. This presentation will describe how Larry Zimmerman has helped transformed archaeology into a more inclusive one through his scholarship, support and mentorship of not only the author but other Native American archaeologists and cultural practitioners.

[191] *Discussant*

Martinez, Desiree [306] see Kennedy Richardson, Karimah

Martinez, Maria**[139]** *Accessing the Object Collections at the Smithsonian's Institution National Museum of the American Indian and National Museum of Natural History*

As museum object collections continue to be an important mainstay to anthropological research, collections access is in high demand, and can sometimes feel like a daunting task. This is particularly relevant when working with large museums such as the Smithsonian Institution. Knowing where collections are housed, the scope of collections, and means of access for data including collections history, images, and archival material contributes significantly to achievement of research goals. The National Museum of the American Indian (NMAI) and the National Museum of Natural History (NMNH) are stewards to both archaeological and ethnographic collections, many of which are unique. NMAI's object collections represent over 1200 Indigenous tribes/communities from throughout the Western Hemisphere, whereas NMNH curates historic and prehistoric collections from around the world. This paper will offer an overview of each museum's collections, including some of the most important highlights, each museum's online access portals, and policies and procedures for accessing the collections for research, including culturally sensitive collections and scientific analyses. This presentation provides a great opportunity for junior and senior scholars to explore and access the rich Smithsonian collections.

[139] *Chair***Martinez, Sonia****[193]** *Discussant***Martínez Cadena, Claudia****[25]** *Arqueología de la infancia en la Frontera Norte Mesoamericana durante el Epiclásico. El caso de El Ocote, Aguascalientes.*

El estudio enfocado en la arqueología de la infancia nace con la necesidad de conocer el papel desempeñado por los infantes en la sociedad. Es a partir de este enfoque que se han ido perfeccionando los diferentes métodos y técnicas para investigar la infancia en el pasado.

Los niños pertenecen a uno de los sectores de población más vulnerable social y biológicamente, es por ello que en los trabajos arqueológicos se comienzan a considerar como objeto de estudio, sobre todo cuando se busca conocer el modo de vida que llevó una sociedad del pasado.

La región de estudio en la que se enmarca esta presentación es la llamada Centro-Norte, localizada en la Frontera Norte de Mesoamérica. Las investigaciones en esta región respecto a este enfoque no existían, hay estudios que delimitan las interrelaciones culturales entre regiones, otros se enfocan en conocer patrones de asentamiento, manufactura de cerámica, lítica, concha y hueso, para conocer las tecnologías que desarrollaron,

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respecto al análisis de los enterramientos existen estudios pero ninguno enfocado en los infantes. Por lo tanto, el objetivo de este trabajo es presentar los resultados del análisis osteológico y funerario de los infantes recuperados en el sitio de El Ocote, Aguascalientes.

Martinez Tunon, Antonio [239] see Marcucci, Derrick

Martinez Vazquez, Dante Bernardo [55] see Castillo Flores, Fernando

Martinez-Bentley, Leila [293] see Hsu, Teresa

Martínez-Tagüeña, Natalia (CONACyT-CIIDZA-IPICYT), Lorenzo Herrera-Casanova (Comcaac Indigenous Community) and Luz Alicia Torres-Cubillas (Comcaac Indigenous Community)

[131] *Comcaac Collaborative Ethnohistory: The Importance of Objects, Places, Routes and Leaders*

In collaboration with Comcaac community members of Sonora, Mexico, oral accounts are combined with archival documents and with archaeological survey. For the colonial period in Sonora, historians and anthropologists have mostly relied upon archival documents written by representatives of the Spanish empire, in addition to information from historical archaeology. The Comcaac knowledge immersed in oral traditions balances some of the inherent biases in the Spanish documentary record, and sheds light on aspects of their history where the documents are mute. Initially we describe Comcaac historical accounts about the "Cazoopin" (Spaniards) that mention first encounters with Spanish sailing ships and their opportunistic adoption of Spanish material culture. We then discuss the relevance of place and routes among the different historical narratives. To finalize with a discussion on how, both Comcaac oral accounts and the documentary record, provide ample descriptions of leaders. It is argued that the importance of Comcaac masculine war leaders is a cultural practice similar in some respects to Spanish and Western emphases on prominent individuals. Through collaboration multiple spatial and temporal configurations documented in our research provide unique insights into the role of subject/object-place relationships and practice in cultural continuity, tradition, and cultural transformation.

Martinón-Torres, Marcos (UCL Institute of Archaeology)

[137] *Chair*

Martinón-Torres, Marcos [137] see Liu, Siran

Martius, Naomi L. (University of California, Davis), Isabelle Sidéra (Maison Archéologie et Ethnologie René-Ginouvès, Ce), Teresa E. Steele (UC Davis & Max Plank Institute for Evolutionary An), Shannon P. McPherron (Max Plank Institute for Evolutionary Anthropology) and Ellen Schulz-Kornas (Max Plank Institute for Evolutionary Anthropology)

[89] *A New Methodology for Understanding How Bone Wears Using 3D Surface Texture Analysis*

Use-wear analysis provides a tool for studying traces produced on animal bone during manufacture and use. Often, these analyses have been qualitative, describing the surface two-dimensionally, and have led to inconsistencies between researchers. Studies have focused on interpreting final traces and lack a foundation in understanding how the traces developed. Here, we propose a new methodology for studying bone surface traces that will reduce the problems of unreliable and unreplicable results in more traditional qualitative analyses. We seek to understand the basics of use-wear formation over time by incrementally taking impressions of bone specimens subjected to a controlled, mechanical experiment. Our study assesses how bone wears during extended use on three materials (leather, fresh hide, or bark), starting from three modification states (unmodified, modified by flint or by sandstone). 3D surface texture analysis is used to quantitatively measure various features of bone surfaces, such as surface roughness [Sa], peak curvature [Sp_c], autocorrelation length [Sa_l], and lower material ratio [Smr₂]. This novel quantitative and experimental approach, which focuses on the incremental process of use-wear formation, will enhance our understanding of the use of bone as a raw material and can be directly applied to archaeological materials and questions.

Marwick, Ben (University of Washington) and Erik Gjesfjeld (McDonald Institute for Archaeological Research, Un)

[103] *Modelling the Innovation and Extinction of Archaeological Ideas*

The history of archaeology is often told as a sequence of prominent individuals and their publications. Due to the focus on big names and big papers, the diversity of archaeological publications is often underestimated. Here we introduce a quantitative method that illuminates historical trends in archaeological writing by investigating a large number of journal articles. We use a Bayesian framework developed for estimating speciation, extinction, and preservation rates from incomplete fossil data. We model archaeological ideas within this framework by equating citations of archaeological literature to occurrences in the fossil record. We obtained reference lists for 12,000 journal articles published between 1977 and 2017 and explored the chronological distribution of cited papers to identify periods of innovation and extinction. We discuss how our modeling approach helps to quantify the diversification of archaeological publications and our broader understanding about the history of archaeological thought.

[316] *Discussant*

Mascia, Sara (Historical Perspectives, Inc.)

[203] *A House Divided: John Brown's Birthplace and the Path to Freedom*

On December 2, 1859, John Brown was hanged following his conviction for murder, slave insurrection, and treason resulting from his raid on a federal arsenal in Harpers Ferry, Virginia two months prior. Brown anticipated and hoped that his actions might spur a rebellion that would spread throughout the South bringing freedom to all enslaved persons. To some people he was a murderous lunatic; to others he was a martyr for the abolitionist cause; and, to many he was a hero whose actions sparked the onset of the Civil War. Brown was willing to commit such extreme acts, including the deaths of his two sons because of his belief that slavery should be abolished at all costs.

Following his execution, John Brown's birthplace in the hills of northwestern Connecticut became a pilgrimage destination for those who revered the man and the principles he championed. Although the house itself was destroyed by fire in 1918, the site has remained a destination for sightseers and admirers and is now a Connecticut Archaeological Preserve. In order to better understand Brown's motivations, one must examine his early life and the people and ideas that that most influenced him.

Mashaly, Hamedy [32] see Silverstein, Jay

Mason, Owen (INSTAAR University of Colorado)

[250] *Discussant*

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Masson, Marilyn (University at Albany SUNY)

[109] *The Significance of Debt to Household and Political Economies of Postclassic and Contact Period Maya Societies*

Debt was important to late Maya societies in religious and political terms. This paper explores the many facets of debt that tied together household and regional economies, including bottom-up mechanisms employed by families and communities, as well as top-down institutions that garnered support for religious and political bureaucracies. Graeber's distinction between moral and impersonal economies outlines a comparative continuum with profound implications for issues of human rights in the past. Where did Postclassic and Contact Period societies fit on this continuum, and does this approach help to revise the mercantile model of greater prosperity that tends to characterize this era?

[109] *Chair*

Mastran, Chuck (John R. White Community Archaeology Association)

[274] *Excavations at the Springfield Furnace, Mercer Co., PA, and the Euro-British Charcoal Iron Technological Tradition in America*

An archaeological field investigation, inaugurated by John R. White of Youngstown State University in 2007, ultimately revealed the remains of an antebellum, single tuyere, charcoal iron blast furnace located in Mercer County, Pennsylvania. The facility, originally called the Seth and Hill Furnace, is presently known as the Springfield Furnace by locals. The configuration, constructed generally of heavy ashlar and rubble detritus, is listed historically as utilizing heated air, or 'hot blast' (Lesley 1859:108). Hot blast was a technical innovation in the 1830s geared to economize on time, labor, and fuel and thus increase iron production. Revelations include the discovery of an intact hearth-forehearth locus associated with a preserved tuyere embrasure that is capped by an integrated, protective iron tuyere box within the base of the hearth proper. Further, an intact "Staffordshire" type water-cooled breast was discovered. The untimely passing of White in 2009 created a vacuum for his students and volunteers from all walks of life. The group of dedicated field technicians created the John R. White Community Archaeology Association to continue this important work. The present report is an attempt to educate a potential readership about 'lost worlds' in their own back yards.

Masucci, Maria (Drew University)

[141] *Pottery Rituals and Ritual Pottery: Ceramic Production, Use, and Disposal among the Guancavilca of Coastal Ecuador (AD 800–1532)*

The Colonche Valley of coastal Ecuador represents an east-west corridor as well as the apex of north-south interconnected valleys. Hilltop sites of the Manteno-Guancavilca (AD 800–1532) have been reported across the high flat ridgetops of these valleys since the early 20th century. Recent comparative analysis of surface vessels at newly discovered sites in the eastern Colonche Valley demonstrates the coalescence of examples of all types found at sites throughout the valleys. Mineralogical and elemental analyses in conjunction with raw material sourcing and formal and contextual analyses of the ceramic component provide a window into ritual practices, societal transformation, and intraregional interaction. Preliminary results suggest that the formal and paste variants represent sub-regional or community distinctions and that the sites in the eastern Colonche Valley may have represented a social and ritual confluence. The ceramic analysis and results are contributing to interpretations of the way in which social and ritual practices were central as part of and contributing to societal reformulations across a broad landscape of southern coastal Ecuador, culminating in what is known as the Guancavilca cultural phase. The vessels represent the unique communities but their presence together represents the ethnogenesis of a broader community identity.

Masur, Lindi (University of Toronto)

[86] *Food Production in the Borderlands: Paleoethnobotanical Investigations of the Western Basin Tradition in Ontario*

This paper presents the results of a paleoethnobotanical analysis of the early Late Woodland (A.D. 1000–1300) Western Basin Tradition (WBT) sites informally known as the Arkona Cluster. Relatively little is known about WBT human-plant interaction as compared to their maize-bean-squash cultivating Iroquoian neighbors. Culture-historical models of the WBT are proving to be outdated, overemphasizing the supposed difference between WBT 'hunter-gatherer' subsistence strategies and Iroquoian farming. Recent isotopic analyses have suggested archaeologists have been underestimating the amount of maize consumed among the WBT peoples at this time, and limited excavation and botanical analysis has hindered the revision of our understanding of their subsistence practices. Plant remains from the Arkona Cluster sites, however, show WBT peoples were indeed cultivating maize, calling into question our conceptualization of their food production, landscape construction, and mobility. Paleoethnobotanical methods were employed to elucidate plant-human interaction of these culturally-distinct peoples residing at the periphery of Iroquoian territory and influence. This paper will present macrobotanical data from flotation sampling, as well as micro-fossil (starch grain) data from ceramic and groundstone residues to provide more meaningful cross-cultural comparisons of food production during the early Late Woodland period in Ontario.

Matarazzo, Tiziana [294] see Singer, Zachary

Math, Kathryn

[33] *Fang & Feather: The Origin of Avian-Serpent Imagery at Teotihuacan and Symbolic Interaction with Jaguar Iconography in Mesoamerica*

The Central Mexican city of Teotihuacan rose to prominence in the last century BC and lasted for six centuries. The civic plan was arranged around two main perpendicular avenues lined with temples and public monuments. By the third century AD, the population was housed in apartment compounds. On the walls were murals depicting ornately dressed administrators, armor-clad warriors, and fantastic creatures. These murals were the birthplace of the Feathered Serpent. My research proposes that the Feathered Serpent of Teotihuacan was a new deity serving as a symbol of the city; conceived in direct opposition to the jaguars used to symbolize kingship in contemporary Mayan polities. Past studies have treated the murals of Teotihuacan as either literal representation of supernatural deities or as a set of signs to be translated like a language. This study concludes that there is an intermediate interpretation wherein the feathered serpent is both a god and a symbol of identity. This is found in the representations of Teotihuacanos outside of Teotihuacan and outsiders within the barrios of Teotihuacan. Thus, Mesoamerican states not only foregrounded concepts of community identity, but also actively recognized those of other polities they came into contact with.

[33] *Chair*

Mather, Rod [159] see McCabe, Chris

Mathers, Clay (The Coronado Institute)

[131] *Moho Rising: Sixteenth-Century Battlefields, Lived Lives, and the Creation of Archaeological and Historical Frameworks that Work*

For more than 170 years, archaeologists and historians have offered a range of arguments in an attempt to locate the site of the 1541 siege of Moho. Although historical records of the Vázquez de Coronado entrada provide tantalizing clues about the whereabouts of this major battle, generations of scholars have often used an odd amalgam of description, assertion, and evidence to postulate the geographic location of this significant historical site. Carroll Riley's interest in the deep history of the American Southwest and Mexican Northwest—like Bandelier, Hodge, Kidder, Hewett, and others before him—intersected with this persistent question. The definitive identification of Moho, and the reasons that has now become possible, would have interested him intensely. Assembling the archaeological and historical evidence to not only position Moho in space, but locate it in an historiographic milieu of ideas, and in social fabric of sixteenth-century Native-European interactions, are the primary goals of this discussion. The paper emphasizes the value of three key components in constructing successful analytical approaches to the Early Historical Period and addressing the rich veins of

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complexity inherent within it, including: nested scalar analyses using archaeological and other multivariate data, wide-ranging comparison, and thick prediction.

Mathews, Jennifer (Trinity University)

[173] *Taming the Maya Jungle: Decauville Railroads in 19th and Early 20th Century Yucatán*

Starting in the nineteenth century, industries like henequen, chicle, hardwoods and sugarcane required the installation of narrow-gauge railroads across the Yucatán Peninsula. Mules, horses or people pulled low and flat, four-wheeled wooden carts along these rails, which connected haciendas, ports, and remote jungle camps. These rails brought supplies from “civilization” or commodities out of the forest for distribution. This paper will explore the role that railroads played during this period. For the elites who ran commodity industries, Decauville rails were part of the modernizing infrastructure used to “tame” the jungle and speed up labor production. For the workers, the rails were laid atop stone roads built by their ancient ancestors, along jungle paths that their families had walked centuries, or through agricultural fields on lands formerly theirs. They were a tool used to exploit labor in a brutal process of forest and agricultural extraction for global commodity consumption, and a symbol of their loss of property rights, resources and the ability to feed their own families. And yet, in some cases, the rails that traversed into the forest allowed Maya workers to be away from the watchful eye of managers, hidden away in the untamable forest.

[173] *Chair*

Mathiowetz, Michael [68] see Searcy, Michael

Mathwich, Nicole (University of Arizona)

[195] *Range Limits: Semi-feral Ranching in Spanish Colonial Arizona*

In North America, the introduction of livestock as part of the Columbian Exchange had profound social and ecological consequences for indigenous communities. Historical ecology offers a holistic landscape approach to a phenomenon that archaeologically has often been viewed through shifts in diet and butchering practices. This study examines the creation of range practices at Spanish colonial Mission Lost Santos Angeles de Guevavi, near what is today Nogales, Arizona. Using multiple lines of evidence, this paper proposes a set of indicators to identify semi-feral ranching in both the archaeological and historical record. Isotopic evidence shows that semi-desert grasslands were most affected by the introduction of cattle and sheep. Faunal and historical analyses suggest cattle ages were loosely monitored, and animals were culled at an older age than optimal for meat and grease extractive strategies. These findings indicate a low investment strategy, which may have helped indigenous groups maintain traditional agricultural and gathering practices, augmenting their resilience in the colonial period. Finally, this paper explores how semi-feral cattle ranching was sustainable under historical conditions, but has since become an ecologically and politically problematic practice in the modern American West and used to justify U.S. federal interventions without community consultation on reservations.

Matisoo-Smith, Elizabeth [51] see deFrance, Susan

Matsumoto, Mallory (Brown University), Andrew Scherer (Brown University) and Omar Alcover (Brown University)

[163] *Fortified Capitals: Understanding Defensive Systems at Piedras Negras and Yaxchilan*

Prior reconnaissance efforts in the Middle Usumacinta River region have identified a series of low walls associated with Tecolote, La Pasadita, and other border sites in the Yaxchilan kingdom. Similar defensive features have also been identified at the Piedras Negras secondary center of La Mar. These walls are interpreted as the foundations for wooden palisades, and served to protect not only immediate communities, but also the kingdom at large. However, this paper presents the first evidence that Piedras Negras and Yaxchilan, the polity capitals, were fortified as well. Walls near both sites have been identified through survey, and defensive features at Piedras Negras have been excavated to better understand their chronology, construction, and function. Moreover, recent work at the Late Preclassic site of Macabiler, located in the southern reaches of the Piedras Negras kingdom, highlights the deep temporal depth of fortifications in the region. These findings suggest a broader, regional tradition among Maya communities of using the landscape as an instrument in political interactions, and encourage incorporation of the natural environment into studies of Classic Maya politics.

Matsumoto, Yuichi [178] see Tsurumi, Eisei

Mattes, Jill (University of Zurich)

[299] *Architecture of Pre-Columbian Northeast Honduras*

In 2017, the postclassic settlement of Guadalupe on the north-east coast of Honduras revealed remnants of wattle and daub (bajareque) constructions. This was an important finding as information on precolonial architecture in north-east Honduras has been scant, due not only to the low number of archaeological investigations in the area, but to the use of highly perishable materials in these constructions. Despite this, recent ethnographic reports have provided indispensable information about colonial-era materials and traditions. This paper examines the archaeological record of Guadalupe along with archaeological, ethnohistoric and ethnographic reports to examine what viable information can be retrieved on precolonial architecture in north-eastern Honduras. It reviews a range of architectural findings discovered through archaeological investigations, and offers a comparative analysis with findings from adjacent (predominantly southern) regions where traditional construction techniques are still commonplace today. This research stands to reveal new and valuable information about the construction techniques, traditions and architectural history of Guadalupe.

Matthew, Laura and William Fowler (Vanderbilt University)

[275] *Yet Another Tale of Two Cities: Santiago en Almolonga and San Salvador in the Early Sixteenth Century*

The first Spanish foothold in Guatemala took root during the first invasion of Guatemala led by Pedro de Alvarado in 1524 at the Kaqchikel city of Iximche. Historians regard this as the first capital of Santiago de los Caballeros de Guatemala. After its location at Iximche, Santiago had two sequential locations near Olintepeque and in Chimaltenango. The ruins of the first permanent Santiago de Guatemala, founded in 1527 in the Valley of Almolonga and destroyed in 1541, lie beneath the modern village of San Miguel Escobar. An indigenous town of several hundred resettled Mexican auxiliaries and their families located in the village of Almolonga or “Ciudad Vieja,” grew up about two kilometers to the west. The acta de fundación of Santiago implies a grid-plan layout, but we know almost nothing of the spatial organization of these centers since they lack detailed archaeological investigation. We know them primarily through extensive historical research. In contrast, San Salvador, founded by an expedition from Santiago in 1528, also known archaeologically as “Ciudad Vieja,” has been the subject of detailed archaeological investigation as well as historical research. Contextual comparisons between these two closely related early Spanish colonial urban centers has proven very useful.

Matthews, Christopher (Montclair State University)

[201] *Ethnography, Routine Archaeologies, and Social Justice Research*

As the organizers of this session argue, understanding the ethics of engagement in archaeology is maturing rapidly and we are reaching the point where our community engagements are no longer self-evident. Rather we increasing understand that they need interrogation and critique, and this needs to be an embedded part of our routines. This paper will argue that knowing the nature of our engagements requires a deep ethnographic reading

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of the contexts of our research and the multiple roles it plays in the communities we engaged in our research. This approach draws from the transcendental empiricism described by Deleuze, such that what we do in becoming engaged, even in the most routine way, requires consistent analysis of how those we engage with come into view and why they become open to collaboration. Such an analysis is the basis of ethnographic archaeology, or the effort to understand how archaeology is and can be an agent in the communities we work with. I illustrate this approach in a review of my engagement with the Native and African American community in Long Island, New York.

Matthiesen, Henning [135] see Harmsen, Hans

Mattioli, Tommaso [136] see Diaz-Andreu, Margarita

Mattson, Hannah (University of New Mexico) and Jacque Kocer (University of New Mexico)

[115] *Ornaments from Room 28, Pueblo Bonito*

In the late 1890s, the Hyde Exploring Expedition collected over 650 finished ornaments from Room 28 in Pueblo Bonito. UNM's recent re-excavation of the room, including material derived from backdirt from adjacent rooms as well as intact floor and subfloor deposits, produced thousands of additional ornaments and pieces of lapidary debris. This paper presents the results of the analysis of this combined assemblage and discusses its significance in relation to ornaments found in other portions of the structure. Importantly, this study finds that Room 28 contains high frequencies of specific types of ornaments most associated with specialized depositional contexts. More specifically, the Room 28 assemblage is characterized by the co-occurrence of ornament forms and materials that otherwise distinguish high-status burials (particularly Room 33) and kiva offerings.

Mattson, Hannah [190] see Murphy, Beau

Matute, Varinia [252] see Acuña, Mary Jane

Maughan, Gideon [105] see Freeman, Jacob

Mauldin, Raymond (UT San Antonio), J. Kevin Hanselka (Texas Department of Transportation), Cynthia Munoz (Center for Archaeological Research, UT San Antonio) and Leonard Kemp (Center for Archaeological Research, UT San Antonio)

[153] *Old Collections and New Approaches: Estimating Mast Resource Use in the Lower Pecos Canyonlands of Southwest Texas*

Baker Cave is a dry rock shelter with exceptional organic preservation in the Lower Pecos Canyonlands of southwest Texas. The site is best known for high floral and faunal diversity in a Paleoindian-age hearth excavated in 1976, the first of three seasons (1976, 1984, 1985) the Center for Archaeological Research (CAR) worked at the site. Only those 1976 excavations have been reported in any detail. This poster summarizes analyses to estimate mast resource use over time at Baker Cave based on samples from the 1984 and 1985 collections, curated at CAR. Field notes for the most recent excavations are currently unavailable, and much of the 1984 stratigraphy is rumored to have been mixed. The present analysis emphasizes an excavated area with multiple radiocarbon dates that fall between 877 +/- 26 (905–728 cal BP) and 9,143 +/- 38 RCYBP (10,408 and 10,299 cal BP). Through quantification (e.g., counts, ratios, weights) of nut remains in this deposit, and direct dating of multiple samples of this resource class for temporal control, we develop a gross measure of nut resource use over a 10,000-year period.

Mauldin, Raymond [105] see Hard, Robert

Maurer, Kathryn [98] see Connell, Samuel

Mauricio, Ana (Pontificia Universidad Católica del Perú)

[64] *Los Morteros and Pampa de las Salinas: Early Monumentality and Environmental Change in Preceramic Peru*

Los Morteros is a preceramic archaeological site located on Pampa de las Salinas, in the lower Chao Valley, north coast of Peru. Archaeological excavations in 1976, Los Morteros was identified as a "stabilized dune" whose top was used as a cemetery for pre-pottery people around cal. 5000 BP. Excavations in 2012 and 2016 have uncovered a very long and complex history of occupation of Los Morteros which includes the presence of early adobe monumental architecture dating before 5500 cal. BP, more than 1000 years earlier than this type of architecture was previously recognized in the Chao Valley. On the other hand, Pampa de las Salinas is a preceramic archaeological complex composed by more than 20 archaeological sites and features including monumental sites, shell middens, geoglyphs, and trails, all of which combined into a preceramic ceremonial landscape. Our research has shown that the preceramic occupation of Los Morteros and Pampa de las Salinas was closely related to constant environmental transformations of the local environment.

[64] *Chair*

Maxwell, Ashley (University of South Florida) and Robert H. Tykot (University of South Florida)

[185] *Stable Isotope Analysis of the Diet of Romans and Langobards in the Veneto from Late Antiquity to the Medieval Period*

Limited isotopic research has been conducted in the Veneto, Italy during the transitional period after the fall of the Western Roman Empire and arrival of the Germanic Langobards in the sixth century AD. Questions remain of the local implications of diet during this period of instability, when invasions and population decline occurred. Thus, this research compares Roman and Langobard populations from late antiquity to the medieval period using stable isotope analysis on bone collagen, apatite, and tooth enamel for 78 human individuals and 10 faunal remains to investigate diet in the Veneto. The results indicate variations in diet within and between the populations. The late antiquity sites are more consistent with a C3 plant diet with some marine and terrestrial animal contributions, while the Langobard sites are varied. This study shows that in late antiquity people in the Veneto still relied on a traditional Roman diet of fish and C3 resources after the fall of the Western Roman Empire; however, the incoming Langobards show variation in their utilization of resources, with some consuming more of a C4 diet with millet. This preliminary research may indicate a change in resource allocation during the initial transition into Italy for the Langobards.

May, Sally [113] see Brady, Liam

Mayer, James [182] see Hill, Matthew E.

Maynez, Miguel Angel [293] see Ruvalcaba, Jose Luis

Mazow, Laura (East Carolina University), Heidi Luchsinger (East Carolina University) and Kristen Rozier (East Carolina University)

[265] *Adapting to Changing Resources: A Petrographic Analysis of Iron I Pottery from Tel Miqne-Ekron*

The arrival of foreigners to the southern Levant at the beginning of the Iron Age (1200–1000 BCE) has been recognized in the material culture, as have changes in this material culture over time. These developments, resulting from interaction with the local population, have been interpreted as

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assimilation, acculturation, creolization, and most recently entanglement. In this poster, we examine these transformations through the lens of technological, i.e. those aspects of pottery manufacture that reflect shared technical choices and transmitted knowledge. At the site of Tel Miqne-Ekron, morphological analysis has defined two distinct but contemporary potting traditions: a non-local and an indigenous one. In this study, petrographic analysis of ceramic thin sections are used to first test these observations. Secondly, we examine changes over time in clay and temper use. As raw material use is tightly linked to almost all other aspects of the ceramic production process, e.g., drying time, firing, manufacturing style, vessel function, many observed stylistic changes in the non-local ceramics probably resulted from the need for foreign potters to adapt to local resources. Recognizing shifts in raw materials, and thus resource acquisition, should provide new insights into understanding the working relationships between these two co-habiting populations.

Mazzariello, Joseph, Michael Harrower (The Johns Hopkins University) and A. Catherine D'Andrea (Simon Fraser University)

[210] *Empire of Aksum Settlement Patterns: Site Size Hierarchy and Spatial Clustering Analyses*

Settlement pattern analysis has long remained a key means of examining the social, economic, and political relationships among archaeological sites and the way those relationships changed through time. Two common approaches involve: 1) analyzing the relative sizes of sites to evaluate possible site size hierarchies, and 2) analyzing the spatial distribution of sites across landscapes to evaluate possible clustering or dispersion. This paper applies more statistically rigorous methods than commonly employed, namely Ripley's K Multi-Distance Spatial Cluster Analysis to evaluate possible spatial clustering/dispersion, and Bayesian Information Criterion (BIC) analysis to evaluate possible site size categories/hierarchies. These methods are performed on archaeological site data from two distinct areas of the northern Ethiopian highlands collected by the Eastern Tigray Archaeological Project (ETAP) and Southern Red Sea Archaeological Histories (SRSAH) Project. Results show strikingly similar patterns in the two areas, including an increase in the number of sites and decrease in average site size over time, site clustering only during the Pre-Aksumite period, and a lack of site size hierarchies that are predicted by traditional models of state-level settlement patterns.

Mazzia, Natalia [120] see Flegenheimer, Nora

McAllister, Christine [226] see Ives, Gay

McAllister, Martin (Northland Research, Inc.)

[193] *Moderator*

McBride, Kevin (University of Connecticut)

[159] *New Perspectives on the Native History and Archaeology of Block Island*

Supported by the U.S. National Park Service's Historic Preservation Fund program to identify coastal archaeological sites damaged by 2012's Hurricane Sandy in Rhode Island, archaeological surveys of Block Island were conducted in 2014 and 2015. The survey identified 163 archaeological sites of which 33 were tested and partially excavated. Previous archaeological surveys of Block Island concluded that a high frequency, density, and complexity of Woodland (2700—400 years before present (B.P.) and Contact Period (400—350 B.P.) archaeological sites located on landforms immediately adjacent to the interior salt ponds with far fewer, and much less complex sites located on the bluffs along the seaward coastline. Larger and more complex permanent and semi-permanent village sites were believed to be located almost exclusively along the salt ponds with smaller temporary and task specific sites associated with freshwater swamps and ponds throughout the interior and near coastal areas of the island. The identification of several large seaward Woodland and Contact Period coastal sites suggest a much more complex settlement pattern than previously believed. These sites are believed to represent spring fishing camps, indicating that earlier reconstructions of Native settlement patterns on Block Island need to be revised.

McBride, Kevin [294] see Wilson, David

McBrinn, Maxine (Museum of Indian Arts and Culture, Santa Fe), Lenora Tsosie (Navajo Nation) and Joseph Aguilar (University of Pennsylvania)

[138] *How to Update a Classic: The Renewal of Here, Now and Always at the Museum of Indian Arts and Culture*

Here, Now and Always (HNA) opened at the Museum of Indian Arts and Culture (MIAC) in Santa Fe, NM in 1997. This permanent exhibition is an introduction to the peoples of the US Southwest and was the first in the US to be curated by an expansive community. It was developed through the participation of more than thirty individuals and with seven core community curators. The community voices dominate the exhibit text and the community curators determined the exhibition message, object selection, and layout. HNA later served as the model for the initial exhibits at the National Museum of the American Indian.

Over the course of twenty years, however, HNA has not been updated, so that today it suffers from a static design, obsolete technology, and noncompliance with the Americans with Disabilities Act. MIAC has embarked on an ambitious plan to renew and update the exhibition while honoring the original curators and the inclusive process through which it was created. This paper addresses our plans to update the archaeology in the exhibition while respecting the intent of the original curators and the sensitivity of the topic.

McCabe, Chris (University of Rhode Island), Rod Mather (University of Rhode Island) and Timothy Ives (Rhode Island Historical Preservation and Heritage)

[159] *The Rhode Island Archaeological and Historical Geographic Information System (GIS) Development Project*

In 2017 the Rhode Island Historical Preservation and Heritage Commission teamed up with the University of Rhode Island's Applied History Laboratory to develop a Geographic Information System (GIS) incorporating the state's complex assortment of archaeological and historical sites. With support from the National Park Service, their objective is to collect and share the stories of Rhode Island by creating a fully operational and sustainable geospatial database of known archaeological sites and listings in the Rhode Island and National Registers of Historic Places. Along the way, multiple layers of diverse yet highly relevant supporting information are also continually being added to the system. These include geographic, jurisdictional, and environmental data from the Rhode Island Geographic Information System (RIGIS), orthographic and infrared imagery from the USGS, bathymetric and navigational information from NOAA, RIDEM wetlands data, USDA soils information, and a wide array of historical maps, nautical charts, and analytic digital imagery.

McCafferty, Geoffrey (University of Calgary)

[263] *The Pipil/Nicarao Migration from the Perspective of Pacific Nicaragua: An Archaeological Critique of Mythistorical Mobility*

Ethnohistorical sources describe migrations from central Mexico of Nahuatl and Mangue speakers, known as the Pipil/Nicarao and the Chorotega, who settled along the Pacific Coast of Central America in the centuries prior to European contact. According to these accounts the new groups introduced cultural and religious traits into settlements in El Salvador, the Pacific coast of Nicaragua, and northwestern Costa Rica. Beginning in 2000, archaeologists from the University of Calgary have investigated various sites along the shore of Lake Cocibolca, searching for evidence of migration

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and colonization of the region. Based on these intensive excavations we have NOT identified evidence of the Pipil/Nicarao, and characteristics of the Chorotega are enigmatic at best. Although innovative features do appear beginning about AD 700, particularly in terms of polychrome ceramics and mortuary patterns, the evidence supports only limited Mexican contact but with more interaction with greater Central America. This paper will present excavated data to critique the historical sources, with the conclusion that the historical myths are not reliable chronicles for interpreting pre-Columbian migrations.

[263] *Discussant*

McCafferty, Geoffrey [263] see McCafferty, Sharisse

McCafferty, Sharisse (University of Calgary) and Geoffrey McCafferty (University of Calgary)

[263] *Praying to the Predator: Symbols of Insect Animism on Luna Polychrome*

Pacific Nicaragua has long been noted as a cultural crossroads, especially featuring historically documented migrants from central Mexico. Following ethnohistorical accounts, Nahuatl speaking groups colonized the Rivas area in the Late Postclassic Ometepe period. The most prominent diagnostic ceramic of this time was Luna Polychrome, often found in mortuary contexts. This paper presents a detailed analysis of over 50 Luna vessels from the Mi Museo collection. The overarching theme of the painted designs relates to the Praying Mantis. This interpretation coincides with oral traditions relating the mantis as the "Madre Culebra", a powerful and revered predator of the insect world and closely affiliated with female symbolic authority. The association of these vessels with mortuary ritual suggest links to the Nahuatl deity Cihuacoatl, a goddess of death and regeneration, whose name also translates as 'woman serpent'.

McCall, Grant (Tulane University) and Theodore Marks (University of Iowa)

[32] *Beer in the Desert: Archaeological, Ethnohistoric, and Experimental Perspectives on Early Beer Brewing in the Central Namib Desert, Namibia*

For the better part of a century, archaeologists have surmised that beer brewing played a significant role in a range of major social and economic changes having to do with origins of agriculture. This paper examines an unusual case of early beer brewing, which likely originated during the Middle Holocene among the Later Stone Age (LSA) populations of the hyper-arid Central Namib Desert of western Namibia. In this paper, I discuss practices of modern traditional beer brewing in the region and I offer archaeological evidence implying the relatively deep antiquity of these practices. I also present the results of an experimental program aimed at replicating these traditional beer brewing practices. Based on this combined evidence, I argue that beer brewing played a key role in helping LSA populations in the Central Namib Desert process complex and labor-intensive food resources and that it held particular advantages in coping with the extreme aridity of the region. Finally, I explore some of the social consequence of beer brewing in the Namib, past and present.

McCarty, Aidan [85] see Libbon, Jonathan

McCauley, Brea [118] see Collard, Mark

McCheyne, Phil (Athabasca University), Julia Moss (Bryn Mawr College) and Danielle Kurin (University of California Santa Barbara)

[270] *Cranial Modification and Presence of Wormian Bones in Chanka Crania*

The Chanka of ancient Peru (1000AD—1400AD) employed cranial modification. The most common reshaping methods involved including wrapping material around the head of an infant. This project investigates the correlation between cranial modification and wormian bones in Chanka crania. We sampled 26 adult crania and recorded qualitative and quantitative data on head shape. We also observed wormian bone presence, location, and size. Crania that exhibited significant sexual dimorphism (to be characterized as male or female) were correlated with head shape and wormian bone attributes. We used a similar approach to compare data between wormian bones in both modified and unmodified crania. There continues to be much debate regarding the etiology of wormian bones: either based solely on genetics, or a combination of environmental factors. Our initial results suggest that cranial modification is linked to (and a potential cause of) wormian bones, particularly in the lambdoid suture. These data also demonstrate a compelling link between cranial modification intensity (head elongation) and a higher frequency of wormian bones presence and ossicle size.

McCloskey, Galen (Northern Arizona University)

[184] *Analysis of Prehistoric Flagstaff Cultural Developments*

The chronology of prehistoric cultural developments within the American Southwest has been a subject of interest and debate since the archaeologists began to study the region. Although archaeologists have recognized patterns of aggregation throughout the Southwest, the degree to which the patterns are synchronous through prehistory remains uncertain. This research focuses on the development of a cultural chronology of the prehistoric Flagstaff area ranging from A.D. 600 through A.D. 1300, constructed using tree-ring data and mean ceramic dates. The chronology tracks the development of cultural phases based on aggregation and ceramic traditions. I compare resulting chronology to other chronologies to test a theory of simultaneous development in the Southwest region.

McClung de Tapia, Emily (IIA-UNAM MEXICO) and Guillermo Acosta-Ochoa (IIA-UNAM-MEXICO)

[262] *Early Subsistence and Settlement in the Basin of Mexico: Preceramic and Pre-urban Indicators*

The race to stay ahead of modern human impact on preceramic and early ceramic sites in the Basin of Mexico is particularly dramatic. Recent investigations at sites located in three sectors of the Basin of Mexico, all of which are threatened to some degree, contribute to a broader understanding of the kinds of communities that anticipated increased complexity in social, economic and political spheres that ultimately developed into early urban centers such as Cuicuilco and Teotihuacan. Excavations at San Gregorio Atlapulco, Tepexpan and Altica add new data to the ever-increasing picture of the range of adaptations to different environmental conditions and available resources in the Basin. While current data are still extremely fragmented, these new developments complement earlier studies such as those undertaken at Zohapilco (Niederberger), Terremote-Tlaltenco (Serra Puche) and Cuanalan (Manzanilla), thus filling in some of the gaps that will be increasingly more difficult to bridge as time passes.

McClung de Tapia, Emily [59] see Acosta-Ochoa, Guillermo

McClure, Sarah, Claire Ebert (University of Pittsburgh), Emil Podrug (Sibenik City Museum) and Douglas J. Kennett (The Pennsylvania State University)

[310] *Identifying Animal Management Practices Using Oxygen Isotopes in Neolithic Croatia*

Transhumance is a typical Mediterranean adaptation for securing adequate forage and water for domesticates by seasonally bringing animals to new pasture. However the antiquity of this adaptation is unclear. We present new oxygen isotope data from the Dalmatian coast, Croatia, to test the hypothesis that Neolithic herds were seasonally transhumant. Incremental sampling of ancient animal teeth produced data that are compared with modern isotope data of water showing altitudinal variation to assess the timing and onset of seasonal transhumance in the eastern Adriatic.

[317] *Discussant*

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McClure, Sarah [189] see Zavodny, Emily

McCool, Jon-Paul [91] see Huntley, Ashley

McCool, Weston (University of California at Santa Barbara)

[75] *Regional Defensive Strategies and Chronic Warfare in the Southern Nasca Region*

Warfare was a prevalent phenomenon throughout the Andes during the Late Intermediate Period (AD 1000–1450; henceforth LIP). A salient research topic within broader investigations of conflict is how populations cope with chronic warfare. This presentation utilizes geostatistical analyses of architectural and topographical features to reconstruct defensive coping mechanisms among LIP groups living in 12 fortified settlements in the southern Nasca highlands of Peru. Analytical results reveal a regional defensive pattern whereby the smallest most vulnerable groups invested the most in fortifications and occupied the least accessible hilltops. Variation in fortification investment within each site was driven by differences in the accessibility of approaches leading to a site's residential sector. This research demonstrates that LIP populations made optimal trade-offs between competing defensive variables, revealing highly patterned regional defensive strategies that vary from defensive practices observed in other LIP regions. This variation is likely the result of groups implementing defensive strategies to cope with local patterns of warfare.

McCormick, David (Yale University)

[154] *Cotzumalguapa's Lithic Industry: Procurement, Production, and Distribution of Obsidian Artifacts of a Late Classic Mesoamerican Polity*
Procurement, production, and distribution of raw materials loom large in discussions of prehistoric economies. Over the past three decades surface survey and excavations in and around the Late Classic polity of Cotzumalguapa revealed the presence of several obsidian dumps, the result of a large-scale lithic industry. These deposits contain production debitage from most phases of blade-core reduction but no nodules and relatively very little cortex, suggesting that obsidian came into Cotzumalguapa as prepared cores. Within the deposits cores occur in low frequencies and when found are generally nearly exhausted. The presence of both a primary prismatic blade-core and a secondary but significant bifacial and unifacial projectile point industry are indicated by both the debitage and the finished and near finished artifacts discarded in the obsidian dumps. As visual analysis suggests and geochemical analysis has confirmed the vast majority of the obsidian comes from the Guatemalan Highland sources of El Chayal and San Martín Jilotepeque; however, other sources are represented.

McCorrison, Joy (The Ohio State University), Mark Moritz (The Ohio State University), Ian Hamilton (The Ohio State University), Sarah Ivory (The Ohio State University) and Konstantin Pustovoytov (University of Hohenheim)

[283] *Pastoral Territoriality as a Dynamic Coupled Human-Natural System*

Despite research indicating that contemporary pastoral societies are more dynamic than previously assumed, there is a tendency to view South Arabian pastoralists as timeless heirs of a stable, ancient system or along a historical continuum of response to exogenous factors like the development of civilization, introduction of camels, or global climate change. In research triggered by NGS support, we propose a new conceptual model for pastoral mobility regulated by dynamic feedback loops in human-natural systems. Inspired by archaeological data showing pulses in monument construction and settlement—indicators of territorial behavior—we argue that pastoral ecosystems are non-linear and cycle between more open and more closed regimes while grazing land cycles between more and less productive states due to changes in population and cover. We report new research using archaeology, paleoecology and agent-based modelling that will integrate model simulations with empirical records for a better understanding of pastoral mobility over 7000 years in Southern Arabia.

McCoy, Mark [20] see Ladefoged, Thegn

McCray, Brian (Vanderbilt University)

[178] *Tracing Interaction Networks in a Mosaic of Politico-Geographical Regions at the Site of Wimba, Amazonas, Peru*

The ecological setting and the political formations located in the Ceja de Selva raise unique terminological and conceptual questions for the study of interaction networks. Specifically, how do we best recreate meaningful “archaeological regions” within a mosaic of ecological zones and groups with poorly known culture histories? Presenting results from the Proyecto Arqueológico Wimba—2016, this paper analyzes the chronological development of the Wimba site within the Ceja de Selva of eastern Amazonas, Peru. Based on stratigraphy, radiocarbon dates, material culture, and architecture, Wimba went through both periods of local development and periods of involvement in regional interaction networks in the Late Intermediate Period (1000–1450 CE). The site is located along strategic pathways between the highland Chacha and eastern lowlands, and it includes diverse structures and open spaces that hosted communal gatherings. Excavation results show a long-term occupation that includes at least three phases of architectural construction. Recovered materials indicate that intra-regional exchange networks were most prevalent until the final occupation, when the impact of highland groups was felt. This paper argues that communal gatherings functioned as centrifugal forces in interaction networks, and most importantly helped “emplace” a regional network that incorporated multiple nearby ecological regions.

McCuiston, Emily

[184] *Evaluating the Radiocarbon Record of the Lower Pecos Canyonlands*

The Lower Pecos Canyonlands archaeological region in southwest Texas and northern Mexico at the eastern limit of the Chihuahuan Desert is best known for the excellent organic preservation and polychrome pictographs found in dry limestone rockshelters. Radiocarbon dates from the Lower Pecos Canyonlands (LPC) can be used to address broad research questions pertaining to economic strategies (e.g., earth oven plant baking and bison hunting), and settlement patterns, as well as narrower topics such as the development of distinctive material culture (e.g., sandal types). The LPC radiocarbon data, consisting of over 500 assays, are derived from upland, terrace, and rockshelter sites excavated over the last 60 years, as well as curated objects spanning from the Paleoindian through Proto-historic periods. The majority of these data, over 300 assays, are from rockshelters. Preliminary analyses highlight the potential and limitations of the extant LPC radiocarbon data.

McCurdy, Leah (The University of Texas at Arlington)

[180] *Plaster Art: “Graffiti” in a Sage’s Chamber at El Castillo Acropolis of Xunantunich, Belize*

In 2016, we discovered a sage’s chamber in the El Castillo acropolis at the ancient Maya site of Xunantunich, Belize. In the Late Classic Tut Building on the east side of El Castillo, all interior and exterior plaster walls are incised with “graffiti.” The total number of elements documented is nearly 300 with themes ranging from human and animal forms to glyphs and multi-figure scenes. We expect to encounter more in future field seasons. Based on a variety of factors, we view this as practice art created by scribes/sages in training and for preparatory purposes. It appears that Maya scribes were using plaster walls as chalkboards to learn iconography, experiment with features, and sketch for various projects. The term “graffiti” does not adequately reflect these finds and their implications for understanding ancient Maya culture. These ‘plaster art’ finds share many qualities and conservation concerns with rock art. Further, our recording methods parallel many of the strategies employed in rock art studies across the world. With

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this paper, our goal is to present our findings, discuss labels and methodologies, and open a dialogue with rock art specialists for the benefit of “graffiti” studies in the Maya region and Mesoamerica generally.

[94] *Chair*

McDaid, Christopher [42] see Seibel, Scott

McDavid, Carol (Rice University)

[327] *Reflections on Pragmatism and Academic Life*

Pragmatism is a challenging approach for a host of reasons—some emerge from the cultural behaviors and institutional structures of the academy, and others from the inequities that persist in modern society. It is also a profoundly satisfying one, when it “works”. This paper will reflect upon the opportunities and pitfalls encountered while “using” pragmatism over the past 20 years (practicing public and community archaeology, working with community groups and professional societies, editing a journal, and participating in other aspects of academic and professional life).

McDonald, Erin (University at Buffalo)

[98] *Peopling the Landscape: The Pollen Record and Nomadic Pastoralism in Iron Age Ireland*

The people of the Irish Iron Age are often referred to as ‘invisible’ due to their seeming absence from the archaeological record. Ceramics, so often associated with domestic activities, are not a part of the Iron Age material culture. Burials and domestic settlements dating to the Iron Age exist, but they are the exception to the generally sparse archaeological record. In the absence of sufficient material culture and settlement patterns, other means of studying the people of the Iron Age must be considered. Pollen, sampled from cores extracted from peat bogs, provide the means to reconstruct local vegetation and identify human impact and abandonment in the landscape. Examination of the pollen record from four bogs in the Midlands of Ireland show a pattern of low-intensity pastoralism, suggesting people lived in dispersed, likely nomadic, communities during much of the Iron Age. The Iron Age records indicate a starkly different way of life than that of the preceding Bronze Age and succeeding Early Medieval Period.

McDonald, Fiona [166] see Wilson, Jeremy

McDonough, Katelyn (Department of Anthropology, Texas A&M University)

[126] *Dietary Insights from a Middle Holocene Latrine Feature at the Connley Caves (35LK50), Oregon*

The Connley Caves site is composed of eight rockshelters situated in a south-facing ridge of welded tuff on the margin of Paulina Marsh in the Fort Rock Basin of central Oregon. Poor preservation of perishable materials and the removal of much of the Middle Holocene deposits at the site with a backhoe during archaeological excavations carried out in the 1960s limit our knowledge of this period at the Connley Caves. Recent excavations conducted by the University of Oregon uncovered a small alcove between Caves 4 and 5 containing undisturbed Middle Holocene deposits, including a dense concentration of well-preserved coprolites interpreted as a latrine feature. Twelve of these coprolites have been analyzed for microscopic and macroscopic remains to investigate prehistoric diet and environment at the site. A wide variety of plants and animals were represented in the coprolite contents, suggesting a broad-spectrum diet that included seeds, fish, birds, and mammals. Results of the coprolite analysis are presented here, in conjunction with new radiocarbon dates and cultural materials from this feature.

McDonough, Katelyn [47] see Shpall, Cahill

McElvaney, Katherine (University of Houston)

[306] *A Comparative Bioarchaeology of Health and Status in Pre-Classical K’axob and Cuello*

This paper explores whether there is a statistical difference in rates of non-specific infection between two Maya pre-classic villages, K’axob and Cuello, and whether these findings can be correlated to social status within and between the two villages. Using representative skeletal samples from these populations, an osteological analysis is performed to determine the presence of non-specific infection markers in the form of periosteal reactions. Any signs of reaction are scored by level of severity and stage of healing, and results from the samples are compared. Combining these health indicators with other socioeconomic factors can be informative about the social status of individuals and allow both a correlation of infection rates among suspected elite versus non-elite individuals, as well as make a socioeconomic versus health status comparison between two villages within the region coexisting within the same period. Results may aid future inquiry into non-specific infection rates among the pre-classic Maya of the lowlands, and provide an overall picture of health within a framework of social conditions during this pivotal time-period in Maya development. Furthermore, if infection rates are similar between K’axob and Cuello, this information could be used to make inferences about other similar Maya groups during the pre-classic.

McElwain, Mitchell E. [242] see Franklin, Paris

McFarland, Christopher (UC San Diego), Ho Jung Yoo (UC San Diego), Rosemary Elliott Smith (UC San Diego), Thomas E. Levy (UC San Diego) and Falko Kuester (UC San Diego)

[172] *Online Data Curation: CAVEBase, ArchaeoSTOR, University Libraries and Long-Term Digital Archiving*

Although new technologies have made it possible to document historical and archaeological sites in greater detail than ever before, and have made it faster and easier to disseminate information, they have also brought about new challenges, especially in connection to long term data preservation. As the quantity of information stored digitally continues to grow it becomes increasingly important to actively curate the information now, for present and future reuse. Not only does data need to be protected against catastrophic and attritional loss, such as from hardware failure and personnel turnover, it also needs to be well-documented and discoverable in the correct contexts to be useful.

This paper provides a brief look at three ongoing projects at UC San Diego which address these challenges: CAVEBase, ArchaeoSTOR, and the UCSD Library Digital Collections. These projects explore new methods of entering, cataloging, interfacing with, preserving, and disseminating digital archaeological data such as 3D models, point clouds, high resolution photographs, videos, reports, and associated descriptions and metadata.

McFarlane, Christopher [21] see Cottreau-Robins, Catherine (Katie)

McGill, Dru (North Carolina State University), John Wall (North Carolina State University), John K. Millhauser (North Carolina State University), Vincent Melomo (William Peace University) and Ruth Little (Longleaf Historic Resources)

[222] *Saving Oberlin: African-American Historic Archaeology and Preservation in Raleigh, North Carolina*

Free African-Americans established Oberlin Village outside Raleigh, North Carolina in 1866 at the end of the Civil War. Within two generations, the people of Oberlin had constructed churches, a school, a cemetery, shops, and many homes. Today, Oberlin continues to be an important site for African-American history and identity. For example, Oberlin Cemetery (established 1873) is one of only four African-American cemeteries in Raleigh.

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The cemetery's more than 600 graves include many leading African-American figures in Raleigh's history, and several unique features such as a rare wooden marker and graves covered in sea shells and some likely decorated with glass bottles. However, the village and its historic and archaeological resources are threatened by development and gentrification. This poster highlights collaborative efforts between a local non-profit group, the Friends of Oberlin Village, and university scholars and students in the region, to document and save Oberlin through such efforts as cemetery surveys, grave-marker research, comparative studies of freedman villages, and public education.

[321] *Discussant*

McGinley, Patrick

[14] *Geophysical Applications at the Site of Fort Halifax, PA (36DA0008)*

Fort Halifax was constructed in Dauphin County, PA, by the British during the French and Indian War as part of a line of fortifications along the Susquehanna River. It was only garrisoned for about a year, from 1756–57, before being abandoned and dismantled by the end of the war. Due to its brief existence, the precise location of the fort has been lost, although the name of the modern town of Halifax perpetuates its connection to the area. Additionally, past historical research regarding Pennsylvania's colonial forts has preserved some crucial information about the site and its location. Several attempts have been made in recent years to locate the fort and study archaeological remains within the bounds of Fort Halifax Township Park, yet, to date, evidence of its walls or associated buildings has not been uncovered. This research builds upon earlier work by searching for evidence of the fort in a new location within the park. Geophysical surveying techniques are being applied to detect the presence of potential archaeological features indicative of the eighteenth-century fort. Ultimately, this project seeks to strengthen the bond between the people of Halifax and their town's history by improving their understanding of the township's colonial period.

McGovern, Thomas H.

[1] *Discussant*

[135] *Chair*

McGuire, Chloe [155] see Jazwa, Christopher

McGuire, Randall (Binghamton University)

[166] *Setting Things Right: Indigenous Archaeology in Sonora, México*

Larry Zimmerman taught us how to do Indigenous archaeology. He told us do not rob graves or lick bones, to ask questions that Indigenous people need answered, to put aside academic capital, to collaborate, to be radical, to listen, to be humble and to atone for the transgressions of our discipline. Such a transgression occurred in the Sierra Mazatan of Sonora, México. In 1902, a party of Yaqui warriors freed hundreds of enslaved Yaquis from haciendas near Hermosillo, and they sought refuge in the Sierra Mazatan. Days later Mexican troops outflanked the Yaqui warriors and attacked the camp of women and children killing 124 Yaqui. Three weeks later Ales Hrdlicka collected the skulls of 10 individuals, human bone, hats, blankets, weapons, and a cradle board from the battlefield. He shipped these materials to the American Museum of Natural History in New York City. The bi-national Proyecto Cerro Mazatan project worked collaboratively with the Yaqui tribes of Sonora and Arizona to repatriate the human remains and other materials that Hrdlicka took from the battlefield. The collaboration was a success and in the fall of 2009 the National Museum of American History returned the remains to the Yaqui People.

[110] *Chair*

McKenna, Moriah [303] see Harris, Sarah

McKeown, C. Timothy

[60] *Discussant*

McKillop, Heather (Louisiana State University)

[192] *Discussant*

McKillop, Heather [95] see Howie, Linda

McKinney, Holly [250] see Skinner, Dougless

McKnight, Justine

[328] *Current Middle Atlantic Paleoethnobotany*

A growing body of research from across the Middle Atlantic reveals patterns of native plant use that are both highly variable and unique within the North American landscape. This paper provides an overview of the current state of paleoethnobotanical research across the region, with a focus on the Chesapeake Bay where maize (corn) was a relative latecomer to the native subsistence regime. Multiple lines of evidence (including macro and micro-botanical data, direct radiocarbon assays and stable isotope research) illuminate the track and timing of maize adoption, and inform our understanding of the cultural processes that influenced this transition. The dearth of evidence of a farming antecedent (the Eastern Agricultural Complex) and evidence for a firm reliance on complex systems of natural resource management are central to the discussion.

McKnight, Matthew (Maryland Historical Trust)

[231] *The Maryland Archaeological Synthesis Project: One State's Solution to Archaeology's Crushing Gray Literature Problem*

Since passage of the National Historic Preservation Act fifty-two years ago a growing body of valuable data has been generated by state agencies, CRM professionals, and preservation officers. Unfortunately, this data is usually trapped in an archaic paper-based format, restricted geographically to a single state archive. All too often the data is brought to light only to be "reburied" in the SHPO's library where it may be largely inaccessible to researchers scattered throughout the country. This paper describes how the Maryland Historical Trust is addressing this problem through the establishment of a secure, online, searchable catalog of raw data and CRM reports.

McLaren, Whitney (Colorado State University) and Julie Esdale (Colorado State University)

[332] *No Digging within 50 Meters*

Fort Wainwright Training Lands in Central Alaska have been dedicated to the army mission since the early 1960s with consistent military training to support worldwide deployment. Fort Wainwright's Donnelly Training Area encompasses over 25,000 acres of maneuver terrain specifically designed for live-fire training of the 1/25th Stryker Brigade. This training area is ideal for missions pertaining to mobilization, off road combat vehicle exercises, and excavation of maneuver positions. The terrain that is ideal for army training activities was also ideal for hunting and camping over the last 14,000 years. Approximately 200 archaeological sites are located within the maneuver corridor. In 2016, a multinational training with over 8000 soldiers was carried

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out in this area. The Fort Wainwright Cultural Resource Management Team created and implemented a protection plan to minimize adverse effects to archaeological sites within the boundaries of the exercise with large success.

McLeester, Madeleine (University of Chicago)

[297] *"Every Plant is Medicine:" Overlapping Categories in Food Production and Ritual*

Wild plant collection is often a key component of food production. Yet, despite its dietary import, collection practices remain under-researched and "wild" plants are typically relegated to the margins of our archaeological analyses. Drawing on historical medicinal records, I discuss the practices surrounding the collection of medicinal plants and these plants' intricate entanglements in food production systems. In this presentation, I use the early 20th century ethnobotanical works of Huron Smith to explore possibilities for collection area, plant use, time of collection, and enacted rituals to expand current understandings of foraging practices. Using these records, I reconstruct foraging areas and determine the extent of landscape brought into production. I also discuss how medicinal plants in this region challenge our categories of wild, medicinal, and food, as plants can intersect multiple categories and aid their users in other forms of food production, like hunting. This presentation encourages us to rethink our archaeological categories and questions about modes of food production, including the spatial expanse of production systems, labor organization, and ritual.

McLeester, Madeleine [26] see Schurr, Mark

McManamon, Francis (Center for Digital Antiquity—ASU)

[172] *The Digital Archaeological Record (tDAR): An Archive for 21st Century Digital Archaeology Curation*

Archaeological research both produces and uses substantial amounts of data in digital formats. Researchers undertaking comparative studies need to be able to find existing data easily, efficiently, and in formats that they will be able to access and utilize. Researchers creating or recording data need a repository where they can place the data they generate so that it will be discoverable, accessible, and preserved for long-term use. The Digital Archaeological Record (tDAR) is a broadly accessible domain repository for archaeological and archaeologically-related data and information. tDAR is especially helpful and useful for Cultural Resource Management (CRM) firms, public agencies, individual scholars, and research organizations that are not affiliated with, and therefore unable to access and use, institutional digital repositories, such as are maintained by some major research universities. Researchers with access to institutional repositories still may prefer to use tDAR since it is tailored to archaeological and other cultural heritage data and information. Current users of tDAR include academic researchers, public agencies, CRM firms, and others organizations responsible for archaeological data and resources.

[96] *Discussant*

McManamon, Francis [231] see Ellison, Leigh Anne

McManus-Fry, Ellen [212] see Ameen, Carly

McMenemy, Moira [214] see Allan, Pamela

McMillan, R.

[90] *Discussant*

McNamee, Calla (Wiener Laboratory for Archaeological Science, ASCSA)

[298] *Experimental Archaeology as a Tool for Understanding Microbotanical Taphonomy*

Microbotanical residue analysis, particularly starch grain and phytolith analysis, of ground stone artifacts has become a well-established method for investigating subsistence practices, plant processing patterns, and tool use at prehistoric sites around the world. Within the Aegean, however, where wheat and barley are the primary staple grains, microbotanical analysis of stone tools has only recently been incorporated into on-going research. A collaboration between PlantCult, a European Research Council funded project of the University of Thessaloniki, and the Wiener Laboratory (ASCSA) is advancing work on this important topic through experimental research. As part of PlantCult's multidisciplinary study of food culture, grinding experiments have been conducted utilizing different tool types and a variety of Aegean staple resources. This paper presents the microbotanical component of this research, which addresses four questions: 1) the impact of grinding time, material type, and tool type on phytolith and starch morphology, 2) the effect of sampling methodology, specifically dry brushing, wet brushing, and sonicating, on recovery, 3) the assemblage of microbotanicals on re-utilized tools, and 4) the potential for recovery from archaeological materials. Although directed toward Aegean research, this study highlights the usefulness of experimental studies and provides comparative data relevant to research in other regions.

[298] *Chair*

McNamee, Calla [298] see Vitale, Salvatore

McNeece, Avery [168] see Stewart, Ashley

McNeil, Cameron L. (Lehman College, CUNY)

[76] *Capturing the Fragrance of Ancient Copan Rituals: Floral Remains from Maya Tombs and Temples*

Pollen analysis of Classic-period temple and tomb spaces in Copan's Acropolis revealed a range of plants important to ancient Maya ritual practice. Some of these species were not represented in macroremains in ritual or household contexts. Scholars have described temple spaces as thick with the odor of burned offerings and copal, but added to this would also have been the fresh and heady fragrance of blooming buds and greenery, adding a fecund perfume to the areas of ritual supplication. These botanical adornments and offerings were undoubtedly tied to mythical associations, as they are in some modern Maya ritual houses. Analysis of pollen from sediment cores, and macroremains from middens, aided in the interpretation of ritual botanical materials, emphasizing the importance of understanding the complete ecological context of a community in the interpretation of species commonly found in ritual spaces. Few archaeological projects in the Maya area take floor samples for pollen analysis from buried temples and tombs. As this paper will demonstrate, this is a tremendous loss regarding our understanding of ancient Maya ritual practice, nearly as great a loss as the failure to take residue samples from vessels.

[297] *Discussant*

McNeil, Cameron L. [142] see Barrios, Edy

McPherron, Shannon P. [89] see Martisius, Naomi L.

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Mcrostie, Virginia (Pontificia Universidad Católica de Chile. Departamento de Antropología), Eugenia Gayo (Center for Climate and Resilience Research (CR)2,), Claudio Latorre (Departamento de Ecología & Centro UC del Desierto), Calogero Santoro (Instituto de Alta Investigación, Universidad de Ta) and Ricardo De Pol-Holz (GAIA-Antártica, Universidad de Magallanes)

[86] *Pre-Columbian Introduction of Legume Trees Prosopis Algarobia Section and Geoffroea decorticans into the Atacama Desert of Northern Chile during the Late Holocene*

Our recent research in the Atacama Desert (18–27°S) proposed that *Prosopis* trees, *Algarobia* section (*Algarrobo*) were introduced during the late Holocene by humans and dispersed through cultural and natural factors. At least 41 direct AMS on seeds and pods retrieved from archaeobotanical and paleoecological contexts (rodent middens and leaf litter deposits) show that the earliest presence occurred ~4200 cal BP but most dates fall over a thousand years later, during and after the Formative period. This hypothesis is further supported by the available biogeographic and phylogenetic data for this genus in the Americas. Another cultural valued tree *Geoffroea decorticans* (Fabaceae-Mimosoideae), may have also been introduced into the Atacama. Here we present a review of the taxonomy and biogeography of this genus, as well the preliminary results of AMS dating on paleoecological and archaeobotanical remains associated to Archaic occupations, giving a mean age of ~500 cal BP. Ongoing studies aim to generate a large dataset of AMS dates and phylogenetical analyses across the region to gain a better understanding of the status of these trees. Moreover, a comprehensive approach of their cultural management is mandatory to assess the pre-Columbian and ecological history of this arid landscape.

[86] *Chair*

Mcrostie, Virginia [105] see Gayo, Eugenia

McTavish, Rachel (University of Wisconsin-Milwaukee)

[43] *Fish Butchering and Processing in Archaeology: Proposed Methods for Academic and CRM Analyses*

Globally, fish are recovered from archaeological contexts, but often a thorough analysis for how fish were processed is often overlooked due to time constraints or a lack of attention paid when examining a faunal assemblage. While the butchering of medium to large mammals is often undertaken as part of a zooarchaeological analysis, fish bones are often ignored or cut marks missed. This can be due to a variety of factors, including limited time and varying levels of expertise. This project addresses a series of variables for setting up a good basis for time sensitive and/or large projects to incorporate accurate fish processing data within an analysis. Experimental work, various levels of student skills, timelines, and laboratory space set-up were used to create a series of potential parameters that can be replicated in lab, classroom, and garage settings, to increase the likelihood of successful data collection. Two Late Prehistoric sites from the Great Lakes region are used to track the success rates in different settings for novice and experienced student researchers' abilities to learn and distinguish cut marks on fish bone.

Means, Bernard (Virtual Curation Laboratory)

[53] *Here Not Be Dragons from the End Times: Exploring Virginia Archaeology Using the 3D Printed Past*

What to do when a museum visitor asks you if your dinosaurs are dragons from the end times? At their invitation, the Virtual Curation Laboratory at Virginia Commonwealth University (VCU) teamed with the Virginia Museum of Natural History (VMNH) to create an exhibit entitled Exploring Virginia to use archaeology as a way of encouraging critical thinking. This exhibit drew on over 120 3D printed artifacts from archaeological sites across Virginia and the globe. VCU students in the inaugural Visualizing and Exhibiting Anthropology course taught by the senior author selected the objects to be 3D printed. These students also helped design text to teach museum visitors about the length and diversity of human habitation of Virginia and the Commonwealth's natural setting. How archaeologists approach the past, and how they address complicated issues, such as Virginia's sordid history of enslavement, were themes integrated into the exhibit. During the exhibit's run from September 2015 to June 2017, 93,389 individuals visited the exhibit and learned how archaeologists contribute to our understanding of humanity's place in a changing world. In addition, nearly 27,000 people viewed 360 degree photos of the exhibit on Google Street View, enabling the exhibit to reach a broader audience.

[280] *Discussant*

[53] *Chair*

Means, Bernard [90] see Manzano, Bruce

Medina, Shelby [225] see Lopez, Escee

Medina Martínez, Lorena and Raúl Barrera Rodríguez (PAU-INAH)

[31] *Hallazgo del Templo de Ehecatl Quetzalcoatl de México-Tenochtitlan*

Entre los años 2009 y 2010 el Programa de Arqueología Urbana (PAU) del Instituto Nacional de Antropología e Historia (INAH), llevó a cabo excavaciones en el predio de Guatemala 16 del centro histórico de la Ciudad de México. Durante dichas excavaciones se encontró parte de uno de los templos del recinto sagrado, el templo dedicado al dios del viento, Ehecatl; más tarde, entre el 2016 y 2017 el PAU concluyó la excavación y restauración de dicho edificio. Como resultado de estos trabajos se han definido y verificado aspectos como la ubicación correcta, la forma de los diferentes elementos arquitectónicos, las medidas y la temporalidad del templo; así mismo, se ha logrado salvaguardar la integridad de los bienes muebles e inmuebles que por su valor resultan de gran importancia para la arqueología e historia de México.

Es importante seguir investigando y documentando la herencia de la capital mexicana; por ello, el propósito de esta exposición es el de dar a conocer los resultados de las excavaciones así como los resultados preliminares del análisis de los materiales arqueológicos del templo de Ehecatl, uno de los más representativos del recinto sagrado de México Tenochtitlan.

Mehrtash, Alireza [71] see Soroush, Mehrnoush

Mehta, Jayur (University of Illinois Urbana-Champaign)

[94] *Cultivating Archaeology through Project-Based Learning*

In project-based learning, students are expected to be at the center of discovery, wherein educators set the parameters of inquiry with complex and engaging questions and learning happens when students gain knowledge and skills through frequent check-ins, structured lectures, and with both open-ended and guided research. Under this model, I used indigenous cultigens, agricultural cash crops, and creole gardens to guide students in learning about the complexities and nuances of prehistoric archaeology, Native American history, and the Conquest and Colonization of the New World. Herein, I provide a formalized lesson-plan easily adapted and implemented to small college and high-school classrooms.

Meier, Douglas [77] see Foecke, Kimberly

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Meier, Jacqueline (Trent University)

[217] *Faunal Perspectives on Occupation Intensity and Use of Space at Neolithic Kfar HaHoresh*

During the transition to agriculture in southwest Asia, patterns of settlement site use reflect a major shift in the use of space by the Pre-Pottery Neolithic period. Diverse types of sites were utilized by this time, including locales primarily for ritual activities. More studies of ritual site use are needed to clarify how space was organized and used during the Neolithic Transition. This paper presents evidence of animal selection and refuse management to investigate the intensity of site occupation and use of space at Kfar HaHoresh (10,600–8,700 cal. BP), the only Pre-Pottery Neolithic site in the southern Levant that served a primarily mortuary function. I employ zooarchaeological methods to assess the intensity of site occupation based on the degree of hunting pressure that humans placed on small game from the environment immediately surrounding the site. Taphonomic analysis of faunal refuse deposition is used to further illuminate the use of space, namely cleaning practices. These combined results reveal continuity in the organization of ritual space over time, despite a shift in occupation intensity, and clarify the interrelationship of ritual and habitation site use as farming life-ways developed.

Meiggs, David [297] see Chase, Brad

Meinekat, Sarah (University of Tübingen), Christopher Miller (University of Tübingen) and Kurt Rademaker (Northern Illinois University)

[127] *A Geoarchaeological Approach to Site Formation and Structures of Inter-zonal Paleoindian Sites in Southern Peru*

A key question in the settlement of the Americas is how early forager groups adapted to different ecological settings while maintaining social connections. Quebrada Jaguay (QJ-280) on the Pacific Coast and Cuncacha Rockshelter in the Andean highlands of southern Peru, exhibit very different subsistence adaptations, yet these sites were linked within a common settlement system in the Terminal Pleistocene and Early Holocene. Here, we present the results of multidisciplinary geoarchaeological investigations at both sites. During the excavations various structures and features, as well as complex site formation processes were encountered, raising questions about, amongst others, behavioral factors in the sites' formation. This was addressed by combining micromorphology with pedological and FTIR analyses. These techniques provided insights, invisible to the naked eye, about the sedimentary components, and depositional and post-depositional processes of both sites at a microscale that we could link to the overall site structures. The geoarchaeological approach to the site allowed us get a better understanding of single features and structures in the sites, as well as to investigate the influence of natural and human factors in a site's formation.

Meissner, Nathan [31] see Marino, Marc

Meister, Nicolette (Beloit College, Logan Museum of Anthropology) and William Green (Beloit College, Logan Museum of Anthropology)

[138] *Solutions for Stabilizing and Caring for Inorganic Archaeological Collections*

Inorganic archaeological objects (e.g., stone, glass, ceramic, and metal) may require special care as a result of their archaeological context or properties of composition or manufacture. This paper reviews the agents of deterioration specific to inorganic archaeological objects and demonstrates how to identify preservation concerns and stabilize sensitive collections. Specifically, the use of silica gel storage for archaeological metal will be discussed and demonstrated.

Mejía Ramón, Andrés (The Pennsylvania State University), Christian John (University of California, Davis), Jessica Munson (Lycoming College) and Christopher Morehart (Arizona State University)

[101] *Repurposing Scale in Three Mesoamerican Centers: Landscape Archaeology and High-Resolution 3D Modeling at Teotihuacan, Altar de Sacrificios, and Los Mogotes*

With the rise of structure from motion (SfM), affordable unmanned aerial vehicles, and other advances in remote sensing, landscape archaeology is at a watershed moment. These new tools allow for the mapping and digital reconstruction of large swaths of land rapidly enough to be reviewed in the field at a spatial, spectral, and temporal resolution that rivals any previous technology. Away from the field, these reconstructions are invaluable datasets that can be used to analyze the landscape at scales ranging from a few square centimeters to over a dozen square kilometers. This conceptual normalization of broad scales of the landscape to a size that we can comfortably interact with has wide implications when it comes to initial project design, on-the-ground decision-making, data analysis, and broader outreach. In this presentation, these possibilities are interactively explored with color, high-resolution (between three to five centimeters) digital landscape reconstructions of Teotihuacan and Los Mogotes in Central Mexico and Altar de Sacrificios in the Petén Lowlands, along with Parrot Sequoia high-resolution (between seven to ten centimeters) multispectral imagery for the two highland cases.

Melgar, Emiliano (Museo del Templo Mayor-INAH) and Reyna Solís (Museo del Templo Mayor)

[209] *The Mayan Style Lapidary Objects in Mesoamerica outside the Maya Region: Provenance, Manufacture, Distribution, and Symbolism*

Across Mesoamerica and outside the Maya Region, archaeologists have found different greenstone lapidary objects with glossy appearance and particular iconography and aesthetics that were considered as jadeite and crafted by the Maya. Unfortunately, their detailed analysis to confirm these assumptions is scarce. In this paper, we will show the study of Mayan style lapidary items from different sites, like Teotihuacan, Monte Albán, Teteles, Tula, Tamtoc, and Tenochtitlan. We employed Micro-Raman Spectroscopy, X-Ray Fluorescence, X-Ray Diffraction, and Energy Dispersive Spectroscopy, to determine their chemical composition and mineralogical characteristics. These techniques allowed us to identify two raw materials, jadeite and green quartz from the Motagua Valley in Guatemala. Also, with technological analysis of their manufacturing traces, Experimental Archaeology and Scanning Electron Microscopy, these objects showed two patterns of manufacture that share the tools and techniques detected on Mayan jewelry, especially on jadeite pieces. Based on these results, we could infer the symbolism of these exotic greenstones in the burials and offerings outside the Maya Region as long-distance prestige goods for the elite members and powerful sacred items for the priests.

Melomo, Vincent [222] see McGill, Dru

Melton, J. Anne (University of Minnesota), Emily Briggs (University of Minnesota) and Kele Missal (University of Minnesota)

[304] *What's Shape Got to Do With It? Evaluating the Degree to Which Motion and Material Type Influence Edge Outline of Obsidian Flakes*

Often in the study of stone tools, without the application of microarchaeological studies and the presence of microwear, little is left to distinguish how the tool was used originally and what the tool may have been processing. Was it used for scraping? Sawing? Slicing? Was it slicing bone? Scraping animal hide? Is it even possible for archaeologists to discern such behaviors from the tool without having access to definitive microwear traces and/or residues? In this study, we test whether the shape of a flake's edge may yield information regarding its utilization. More specifically we look at whether certain performed motions and usage on varying material types result in similar effects on the overall outline of the flake edge over time. An experimentally produced obsidian flake assemblage is utilized, with the targeted flake edge outlines mathematically defined using Elliptical Fourier Analysis (EFA) and statistically evaluated in R before, during, and after use. Effects of variation in the pre-use edge outlines on the discrimination after

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use between behavioral categories are evaluated. From the results, we establish expectations for the ability of EFA to statistically distinguish edge shapes according to motions performed in use and/or the material type being processed.

Melton, Mallory (University of California Santa Barbara)

[76] *Towards a Social Paleoethnobotany of Urbanization: Integrating Macrobotanical and Microbotanical Data to Explore Foodways at La Blanca, Guatemala*

This paper uses macrobotanical and microbotanical remains to investigate the impacts of developing sociopolitical complexity on the foodways of Middle Preclassic inhabitants of the Pacific coast of Guatemala. I use these datasets to explore how urbanization affected food-related practices of residents of La Blanca (900–600 BCE). Macrobotanical remains from house floors facilitate comparisons between elite and commoner foodways, while starch grains and phytoliths extracted from grinding equipment, domestic cooking wares, and large vessels used for communal meals directly identify foods prepared for various occasions. This study critically contributes to our understanding of how early urbanization impacted the daily lives of ancient inhabitants of the Southern Maya Region.

[310] *Chair*

Melton, Mallory [310] see VanDerwarker, Amber

Meltzer, David (Southern Methodist University)

[182] *The Geoarchaeological Contributions of Vance T. Holliday*

Vance T. Holliday has played a key role in developing our understanding of the late Pleistocene geological history, climate and environment of North America, especially the Great Plains, and of the context and chronology of Paleoindian sites. The localities he has worked on, and to which much is owed to his interpretation of their geoarchaeological setting and histories, include iconic localities such as the Clovis, Folsom, Midland and Plainview type sites, and especially the Lubbock Lake site, where his decades of research and fine-grained studies have made it a model of a geoarchaeological study. At these sites and others where he's worked, his research is routinely marked by efforts to understand the broader processes of landscape evolution, and how such changes impact our ability to find and understand archaeological sites.

[182] *Chair*

Meltzer, David [44] see Eren, Metin

Menaker, Alexander (University of Texas-Austin)

[100] *The Inka Empire in the Valley of Volcanoes, Southern Peruvian Andes*

States and empires attempt to incorporate and transform local landscapes and cultural practices in efforts to legitimize their social orders. Research on the Inka Empire in the Andagua Valley of the Southern Peruvian Andes has shown how these processes are incomplete and become entangled with local practices and the stubborn materiality of history. This poster presents recent archaeological and anthropological research, identifying the reach and effects of Inka Empire and distinguishing local pre-Inka and non-Inka cultural occupations and practices. This research reveals the tensions of empires evident in local settlement patterns, cultural practices and material culture, such as, stone offerings and monoliths (huancas), and ceramics that were marginalized and expanded during Inka rule. The painted stone disc and tablet tradition, in addition to larger stone features, articulated and manifest relations of history, power and space among local inhabitants in the valley. In Andagua, Inka imperial statecraft sought to re-orient local populations' relations with the landscape, shifting from local huacas and ritual locations in the southern edge of the contemporary town of Andagua to emphasizing the volcanic flows of Ninamama and the broader valley through the placement of an ushnu (ceremonial platform).

Ménard, Clément [198] see Brandt, Steven

Mendel, Catherine and Deanna Grimstead (The Ohio State University)

[187] *Persistence in Turkey Husbandry Practices in the Southwest and Four Corners Region: The Isotopic and Ethnohistorical Evidence*

Research has demonstrated an independent domestication event of Turkey (*Meleagris gallopavo*) occurred in the Southwestern USA between 200 BC—AD 500, which was separate from the domestication of turkey within the Mesoamerican world. While aDNA analyses revealed this as a separate and distinct event, we still know little about how turkey husbandry was practiced in the prehistoric Southwest, USA, Northwest, Mexico, and Four Corners regions. Our research applies carbon and nitrogen isotopes to a sample of archaeological turkey bones from Tohatchi Flats, New Mexico, USA. We contextualize these data, by comparing the data to wild modern turkey and additional data from other sites in the region. Results indicate some maize foddering and/or scavenging suggesting penning was not the dominant management strategy, while time periods during and after the medieval climatic anomaly (MCA) show a shift to confinement and maize foddering as the dominant strategy. The intensification of husbandry practices is an expected outcome of resource stress associated with the MCA, and this is also the time period when turkey pens begin to appear in the regional archaeological record. Isotopic expectations derived from ethnohistorical accounts suggest general continuity in both passive and intensive management strategies when compared to the prehistoric data.

Mendelsohn, Rebecca (Smithsonian Tropical Research Institute)

[153] *Ritual and Domestic Plant Use on the Southern Pacific Coast of Mexico: A Starch Grain Study of the Formative to Classic Period Transition at Izapa*

In southern Mesoamerica, the transition from the Formative period to Classic period (100 B.C.- A.D. 400) was a time of population decline, cessation of monumental construction, and the abandonment of many sites. Environmental explanations such as drought and volcanic activity have been proposed as potential trigger factors for the widespread collapse at the close of the Formative period. Current evidence suggests that residents of the early capital of Izapa, located on a piedmont environmental zone of the southern Pacific coast, fared better than neighbors in other early cities during this transition. From their piedmont location, residents of Izapa would have had access to plant resources from a wide variety of environmental zones, including the coastal plain, estuaries, mangrove swamps, and the beach. This study applies starch grain analysis, a microbotanical technique, to ceramics and ground stone pieces recovered from domestic ritual and refuse deposits at the Formative period capital of Izapa. Documentation of the diversity of plant foods used by Izapa's population is intended to better understand the resilience of this coastal population during a period of potential environmental stress, when maize agriculture may have been a less reliable source of food.

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Méndez, César (Centro de Investigación en Ecosistemas de la Patagonia), Andrés Troncoso (Universidad de Chile), Amalia Nuevo Delaunay (Centro de Investigación en Ecosistemas de la Patag), Antonio Maldonado (Centro de Estudios Avanzados en Zonas Áridas) and Daniel Pascual (Universidad de Chile)

[74] *High Resolution Chronology of the Human Occupation South of Choapa Basin (31°34' -32° S), Chile*

The area south of Choapa basin in Chile has long been subjected to archaeological research through scientific as well as cultural research management projects. Surveys, excavations, and sampling over these roughly 5000 km² area has yielded over 370 radiocarbon dates plus over 120 thermoluminescence dates (almost 0,1 dates/km²). Dates range from 30000 cal BP to modern, but the human occupation is constrained in the last 13,000 years. Such chronometric resolution allows discussing the intensity of occupation of the different environments and landscapes over time. Also, it provides means to compare the human chronological signature with the available local paleoclimatic data to discuss if aridity, and therefore shortages in resources, exerted pressure over the human groups inhabiting this area. The distribution of dates is not constant, but rather fluctuating and even showing certain periods devoid of chronological signature. It also exhibits a significant increase in the last millennia coupled with a higher intensity of occupations as suggested by the abundance of late age archaeological sites. The high resolution of the chronology of the southern Choapa basin contrasts with that of neighbor areas that may have alternative time distributions as suggested by preliminary data gathered over the last years. FONDECYT #1170408, #1140837.

Méndez, César [184] see Reyes, Omar

Mendizabal, Tomas [260] see Wake, Thomas

Menéndez, Elsa, Damien Marken (Bloomsburg University) and Keith Eppich (Colin College)

[80] *Late-Terminal Classic Community Mobility and Migration at El Perú-Waka'*

Recent archaeology at the Classic Maya city of El Perú-Waka' has revealed a number of distinct communities making up the urban occupation. These communities possess their own cycles of settlement, florescence, and abandonment. Taken together, these cycles seem to show two distinct aspects that directly pertain to Classic Maya urbanism. One, it shows the urban landscape to be in a continuously changing state. The urban ruins encountered by researchers are the end product of centuries of such shifting settlement and rarely reflect contemporaneous occupation. Two, urban and hinterland communities across the city likely display a variable degree of mobility through time. The El Peru communities described in this paper appear to originate elsewhere and, after abandonment, migrate again. The shifting settlement reflects not just change over time, but mobility, a fundamental dynamic in urban settlement patterns. This paper investigates these phenomenon as evident from the archaeological record of El Perú-Waka', Guatemala. Communities occupy a position on the landscape, sometimes marginal positions, sometimes privileged ones, and seem to insert themselves into a preexisting urban system.

Mensah Abrampah, David

[67] *Slavery without Slaves: Archaeology of Frederikssted Plantation and Its Implications for Plantation Archaeology in Ghana*

In 1803, Denmark and Norway abolished the trans-Atlantic slave trade, which took effect on 1st January 1803. However, this did not end slavery itself in Africa. Intensification of cash-crop agriculture on the West African coast by the Danish colonists provoked an upsurge in the local slave trade. As the Danish plantation economy solidified, increasing numbers of enslaved people were engaged to labour in these plantations in Ghana. The research examines the documentary and the archaeological data of one of the earliest Danish plantations (Frederikssted plantation) established in 1794 in Dodowa, in Ghana. Frederikssted and other Danish plantations are part of the building blocks of long-term cultural contact spanning almost two centuries (1658–1850) between Denmark and Ghana, and they offer this research the opportunity to gauge the continuities and discontinuities in contemporary. The excavations and the resultant material culture reveal that Frederikssted plantation site represents different episodes of occupation, abandonment, and reoccupation. Indigenous local elites who reoccupied the plantation (after its collapse in 1802) have play a crucial role in shaping the plantation landscape, which provides a new way to understand plantation archaeology in general.

Mentzer, Susan [126] see Schumacher, Mara

Menz, Martin (University of Michigan)

[301] *Weeden Island Shell Rings from the Bottom-Up: The View from Old Creek*

The transition to Weeden Island mortuary and ceramic expressions along the Florida Gulf Coast also coincided with a shift in settlement. During this interval, around A.D. 600–750, earlier Swift Creek shell rings were abandoned and Weeden Island rings established nearby. In many cases, these Weeden Island shell rings were substantially larger than their predecessors, however, some anomalously small, isolated Weeden Island rings have also been recorded, such as the Old Creek Shell Ring (8Wa90) in the St. Marks Wildlife Refuge. Presented here are preliminary results from recent fieldwork at Old Creek, including analysis of ceramics and radiocarbon dates, intended to place this site within the larger sequence of cultural and settlement change on the Gulf Coast during the late Middle and Late Woodland periods.

Mercure, Danielle (University of California San Diego), Dominique Meyer (University of California San Diego), Eric Lo (University of California San Diego), Tanya Anaya (University of California Irvine) and Traci Ardren (University of Miami)

[248] *Photogrammetric Registration of Excavation and Sacbe Segments at Yaxuna*

Using aerial imagery in archaeological sites has been viewed as a powerful tool for site recordation. At the Maya site of Yaxuna, located 20km south of the ancient ruins of Chichen Itza and on the longest recorded Maya sacbe, we provide a case study of aerial survey work, combining altitude varying imagery from fixed wing and multirotor aircrafts. Combining such multi-scale imagery allows us to relate excavation scale to landscape wide architecture and layout. Features such as terrain, monumental and residential architecture, can be made more visible in a broader context through derivative products from photogrammetry, including but not limited to digital elevation models, watersheds, hillshades and vegetation color. At the site of Yaxuna, we use orthomosaic and photogrammetric registration to contextualize residential buildings with the sacbe which links to the sites of Ekal and Coba. The notable importance of the sacbe was highlighted by past exchange of people, goods and ideas between these communities, and is now pronounced by physical features in construction architecture and physical layout. Results are used to illustrate the major advantage of using aerial imaging for rapid extraction of site-wide architectural layouts.

Mercure, Danielle [330] see Meyer, Dominique

Meredith, Clayton (University of New Mexico) and Keith M. Prufer (University of New Mexico)

[224] *The Rise and Fall of the Forest Canopy: An Application of Compound-Specific Stable Isotopic Analysis to a Holocene Sequence of Soils as a Record of Human Impacts in Southern Belize*

Derived from lipid-rich plant tissues (primarily leaf waxes), long chain n-alkanes are a durable organic biomarker whose relative abundance is used in paeoecological studies as a proxy marker of plant species composition, and as an indicator of biomass burning. Isotopic composition of individual n-alkane components preserves signals that reflect both hydroclimate and canopy height. These properties can be employed to examine spatially

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integrated signals of anthropogenic land clearance in lake cores and buried soils. Presented here, are preliminary results of analysis of leaf-waxes recovered from soil profiles collected by the Uxbenká Archaeological Project near the site of Tzib'te Yux Rockshelter in southern Belize. Our research indicates these profiles include a Holocene-length sequence of deposition including the transition to agriculture, as reflected in a rapid shift in $\delta^{13}C$ of bulk soil organic matter, as well as the subsequent return of broadleaf forest following the Classic Period Maya occupation. Combined with geomorphic indicators of erosion, and a high precision climate record derived from a local speleothem, the profile presents an ideal test case for the application of plant-wax data in the SE tropics of Mesoamerica.

Mereuze, Remi (University Paris 1 Pantheon—Sorbonne) and T. Max Friesen (University of Toronto)

[16] *Building a Database to Understand the Architecture of Arctic Wooden House Remains*

Western Arctic archaeological sites hold the remains of wooden houses occupied during the second millennium AD by ancestors of the present Inuit people. Although the permafrost helps to maintain these features in excellent condition, the giant puzzle resulting from the collapse of the frame makes it hard to understand their original architecture. During the ArcticCHAR project, we excavated a house at Kuukpak (Northwest Territories, Canada) in 2014 and 2016. Facing the complexity of this feature, we created a new strategy to help us interpret this tangle of wooden remains. Combining both computer techniques (i.e. G.I.S, photogrammetry) with traditional field recording methods required a robust database to connect all of these data. In this paper, we explain the design of the database and the technical choices we faced during its creation and implementation, with one of our main goals being to use open-source software. Without a doubt, this methodology will help us to understand the building techniques of these impressive Western Arctic houses. Additionally, the use of open-source products will ensure the reproducibility of our method.

Merrick, Megan (Florida State University) and Tanya Peres (Florida State University)

[102] *Zooarchaeology of Domestic Activities at a Weeden Island Shell Ring in the St. Marks National Wildlife Refuge*

The purpose of this research is to examine different domestic activities at the Mound Field site (8Wa8), a Weeden Island shell ring in Wakulla County, Florida. Zooarchaeological analysis was conducted on the faunal remains recovered in 2016 from six excavation units at Mound Field. These units represent different hypothesized areas of domestic activities from across the site. The differential deposition of food remains may reveal more about the patterns of activities in which people participated, and can help to develop a more complete reconstruction of both the site and the environment.

Merriman, Christopher [77] see Dennehy, Timothy

Merritt, Stephen (University of Alabama at Birmingham), Monica Avilez (CUNY, Lehman College) and Jonathan Reeves (George Washington University)

[99] *Bone Preservation, Specimen Identifiability, and Outcrop Shape—A Preliminary Investigation of Early Pleistocene Taphonomy at Koobi Fora, Kenya*

Fossil bone surface assemblages include differential specimen preservation (weathering stage, cortical surface exfoliation, polish, roundedness, fracture type) and identifiability (taxonomic or anatomical precision). Three 1x1 meter inventory squares placed on steep, moderate, and minimally sloping areas of a fossiliferous outcrop test whether outcrop shape is a megabiases that influences assemblage attributes. A digital elevation model created from drone-captured aerial imagery describes outcrop slope, erosional potential, and pooling potential for each inventory square. In general, erosional potential increases with outcrop slope and pooling potential increases in flatter areas, but these attributes do not covary perfectly in our squares. We analyzed all (between 21 and 40) specimens per square, and observed that median specimen size, the distribution of specimen weathering stage, fracture type, roundedness, and precise anatomical identifiability were not related to outcrop slope. The flattest square was overrepresented in abraded and taxonomically identifiable specimens (superfamily or finer). The steepest square was overrepresented in exfoliated specimens. The moderately sloping square was underrepresented in exfoliated, abraded, and precisely identified taxonomic specimens. These results suggest that outcrop shape is not a megabiases that uniformly impacts assemblage formation, and that the complex relationship underlying fossil preservation, specimen identifiability, and outcrop shape warrants further attention.

Merriwether, D. Andrew [88] see Kennedy, Jennifer

Merwin, Daria (New York State Museum)

[148] *Discussant*

Messenger, Lewis (Hamline University)

[292] *Investigating Climatic Dimensions of the Archaeological Past with Undergraduates Using CADGAP (Climatic Analogs Data Gathering Project)*

Bryson and Murray's (1979) *Climates of Hunger* ignited my interest in climate change and human cultural discontinuities over time. Later, as a junior faculty in an undergraduate institution fostering collaborative research between faculty and students, I was encouraged to share my climate-related research methodology with my students. This led to development of a teaching strategy that integrates the study of climate change into the anthropology curriculum in two specific courses, one oriented toward the past (archaeology) and the other looking at future issues (cultural ecology). In these courses, students use weather data from specific sites in an assigned world region to do trend analyses to speculate on past or future climatic conditions. I developed the acronym CADGAP (Climatic Analogs Data Gathering Project) to indicate which classes would employ that strategy. This paper discusses the pedagogical methodologies involved in bringing CADGAP into the classroom over more than two decades. It also will address the increasing challenges encountered in accessing the data needed to successfully implement this active learning process.

[292] *Chair*

Messenger, Phyllis (University of Minnesota)

[292] *Tweeting the Flood: Student Social Media Fieldwork and Interactive Community Building*

This paper will discuss hands-on uses of social media to help students engage with climate change. A central case study is an interdisciplinary design course on the Mississippi River and the city, taught in spring 2011 by coauthor Patrick Nunnally in which students confronted historic floods on the Mississippi River in real time through a series of twitter assignments. The analysis will discuss how the assignments were set up and carried out, what happened, and what the outcomes were, in particular related to community building. The paper will address how such real-time observations can add up to data for long-term analysis. Tracked longitudinally, these data can be used to study climate change. The paper will also discuss other opportunities for use of social media and on-line resources for teaching and learning about issues of water, place, and community relevant to climate change.

[292] *Chair*

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Messer, Haley (Florida State University)**[102]** *The Function of Woodland Period Shell Rings as Seen at the Mound Field Site (8WA8)*

What purpose did Woodland period shell rings along the Gulf Coast of Florida hold? These unique architectural features have been explained as specific patterns of trash disposal, protection against flooding events, and as barriers from intruders, among other things, but no answers have stood to truly explain their proliferation and significance during the Woodland period. Recent excavations in 2015 by Dr. Mike Russo (National Park Service) and in 2016 by Dr. Tanya Peres (Florida State University) of areas of the shell ring at the Mound Field site (8WA8) in Wakulla County, Florida, revealed a striking number of features inside and outside of the ring. The frequency and variety of these features provide essential information for research questions regarding the purposes of Woodland period shell rings. This research analyzes particular features at Mound Field to interpret the function of the shell ring and the overall use of the site. These data are then compared with those from contemporaneous sites to examine the origin and purpose of Woodland period shell rings. The information gained from this study is valuable in the growing segment within southeastern archaeology of Woodland shell ring studies.

Messineo, Pablo [2] see Politis, Gustavo

Meta Robinson, Jennifer [222] see Thomas, Jayne-Leigh

Metz, Alexander [84] see Stevens, Karen

Meyer, Dominique (University of California, San Diego), Eric Lo (University of California San Diego), Danielle Mercure (University of California San Diego), Patricia A. Beddows (Northwestern University) and Dominique Rissolo (University of California San Diego)**[330]** *Thermal Identification of Groundwater Discharges within Saline Lagoons Surrounding Vista Alegre, Quintana Roo, Mexico*

The Maya port and site of Vista Alegre carried political and trade importance in the Terminal Classic to Early Postclassic periods. Located in the Laguna Yalahau of northern Quintana Roo, Mexico, the site is built on a small and low elevation island surrounded by mangrove. Inland from the site are freshwater wetlands (sabanas), while the near-shore waters of the restricted circulation lagoon are hypersaline. A significant research question is how the inhabitants of Vista Alegre accessed potable fresh water. We investigate this question by exploring the existence of freshwater offshore sinkholes, locally called Ojos de Agua in the surrounding area of Vista Alegre. Through the benchmarking of an aerial UAV based thermal image analysis and calibration at known ojos, we were able to successfully derive salinity variations due to point freshwater discharges in that area of the lagoon. We explain the methodology used to address correct radiometric measurements, thermal image stitching and identification of fresh-water discharge points. While it is still unclear whether such ojos were used for fresh water sources for the ancient Maya, understanding their geology and distribution provides indispensable information for the hydro-geological evolution of the area, and related coastal sites.

Meyer, Jack [84] see Kajankoski, Philip

Meyer, Kelton (Colorado State University) and Jason LaBelle (Colorado State University)**[127]** *Kill, Camp, and Repeat: A Return to the Lindenmeier Folsom Site of Northern Colorado*

Paleoindians of the Great Plains are often generalized as highly mobile bison hunters that moved in response to migrating bison. This view is certainly shaped by many well-known single component bison kills which form the basis for the argument. The Lindenmeier (5LR13) Folsom site of northern Colorado might be a notable exception to the high mobility model, as it contains hundreds of Folsom tools, animal bone, chipping debris, and decorated artifacts spread over 800 meters of buried deposits. Approximately 9 to 12 dense artifact concentrations are documented across the site, and questions remain as to what these clusters represent—discrete living floors, middens, or palimpsests? Resolving the nature of these deposits is key to integrating Lindenmeier into broader land use models. This presentation summarizes the poorly known locales in the eastern portion of the site. The first discoveries were made here in the 1920s, and the Smithsonian excavated a bison bone bed nearby shortly thereafter. Backed by 10 years of recent systematic artifact mapping, our paper examines what these eastern clusters represent in terms of function, and how these particular occupations mirrored or were instead quite different from the many other Folsom visits to the site.

Meyer, William (Villa Maria College)**[220]** *Chair*

Meyers, Maureen [255] see Schubert, Ashley

Michael, Amy [215] see Bengtson, Jennifer

Michael, Tyler (Harvard University)**[325]** *Resistance and Revitalization in the Native American Southeast*

Revitalization movements have been a topic of particular interest to anthropologists concerned with culture contact and colonialism. As a cultural practice that is present in many historical periods, it stands to reason that revitalization was undertaken in the deep past as well. Archaeology has proven useful in exploring the aftermath of the Pueblo Revolt of 1680 from a Native American perspective in the American Southwest, and recently, scholars have begun to look for potential revitalization movements in the American Southeast. In this paper, I develop a model for assessing revitalization movements on the archaeological record, drawing on scholarship on the Pueblo Revolt and emerging scholarship about a protohistoric revitalization movement in the Mississippian Southeast. I use this model to analyze responses to Spanish colonialism in the sixteenth and seventeenth centuries at the Berry Site, the site of the Native American town of Joara and the Spanish Fort San Juan in modern western North Carolina, and at Mission San Luis de Apalachee, a mission settlement in modern-day Tallahassee, Florida. I then offer tentative conclusions about the nature of response to Spanish colonialism in both case studies.

Michelaki, Kostalena (School of Human Evolution and Social Change, ASU) and John Robb (University of Cambridge)**[54]** *Two Thousand Years of Pot-Making: Exploring Neolithic Ceramic Traditions in SW Calabria, Italy*

This poster will examine the degree to which the task of pot-making changed from the Early/Middle (ca. 5700–5000 BCE) to the Late Neolithic (ca. 5000–4000 BCE) periods in SW Calabria, Italy. We will present the manufacturing sequences of all Neolithic wares, based on the results of more than a decade of stylistic, mineralogical, and physico-chemical analyses of ceramics from the sites of Umbro Neolithic and Penitenzeria, as well as the results of laboratory and replicative experiments using local clays. By comparing continuities and changes in technological decision-making we will explore how the learning and practicing contexts changed.

[246] *Discussant***Michelet, Dominique (CNRS/Université de PARIS 1)****[169]** *Discussant*

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Michelet, Dominique [254] see Dussol, Lydie

Micheletti, George J. (University of Central Florida)

[256] *Creating a Case for a Classic Period Provincial Polity at Pacbitun, Belize*

The Late Classic period (AD 550–800) at Pacbitun, Belize brought about heightened prosperity evinced in a surge of architectural development and an increase in precious exotic materials. However, despite continued growth, by the close of the Late Classic Pacbitun's affluence appears to have diminished considerably. To the north, settlements of the Belize River Valley also seemingly undergo a concomitant florescence and economic decline. Research suggests the pecuniary instability of the Belize Valley was the result of a semiautonomous existence where interactions with neighboring dominant centers led to episodic subjugation. Thus, an early Late Classic reprieve is thought to have led to a period of independence in the Belize Valley giving rise to florescence. At Pacbitun however, alterations to the site's social, economic, and political institutions may actually support a foreign influence. After reviewing the different incorporation strategies used by paramount centers to control smaller polities, I will detail the Late Classic events at Pacbitun and explain how each institution was effected. Aside from the introduction and intensification of craft and agricultural production, it is my belief that the physical and functional modifications to the site's E Group may be the key to substantiating Pacbitun as provincial polity.

[256] *Chair*

Micheletti, George J. [256] see Powis, Terry

Michell, Samantha (University of Central Florida), Jennifer Marla Toyne (University of Central Florida, Orlando, Florida, U), Alfredo Narvaez (Museo de Túcume, Túcume, Lambayeque, Peru) and Victor Vasquez (ARQUEOBIOS, Trujillo, La Libertad, Peru)

[7] *Ancient Human-Animal Interactions in Chachapoyas Region: Isotopic Analysis of Zooarchaeological Remains from Kuelap, Peru*

This study uses isotopic analysis of fauna remains as a proxy for reconstructing the ancient Chachapoya environment of the northeastern highlands in Peru. Large middens have been excavated at the monumental center of Kuelap (900–1535 CE), yet there is little previous research focused on the fauna remains at this or other archaeological contexts in the region. The goal of this project was to reconstruct animal resource exploitation and provide insight into dietary variation and environment at 3000 masl. This study models animal diets using $\delta^{13}C$ and $\delta^{15}N$ values from bone collagen of various local species including camelids, deer, guinea pigs, viscacha, rabbits, birds, canids, river otter, and puma to investigate the range of isotopic variation within and between animals with different dietary regimes. These faunal isotope values support local expectations for foodweb research and fall into distinct niches in the foodscape of the environment. Differences in diet between domesticated and wild animals (specifically llama and deer) were not identified, suggesting no provisioning from possible domestic crops (maize, C4) by humans. These are the first isotopic data for the eastern montane region and serve as an important baseline in the evaluation of human subsistence strategies and animal husbandry.

Micklin, Destiny [129] see Freiwald, Carolyn

Mieli, Gianfranco [29] see Colantoni, Elizabeth

Mielke, Genevieve (The University of Montana)

[88] *The Battle of the Little Bighorn Gunshot Trauma Analysis: Suicide Prevalence among the Soldiers of the 7th Cavalry*

The Battle of the Little Bighorn cost the U.S. army 268 men, which accounted for just over one percent of its entirety. Many of the men were killed during battle by Native American firearms and bow and arrows (Scott et. al, 2002, pg. 12). It is possible that some men perished by their own hand or by friendly fire. Through osteological data provided by the State Historic Preservation Office of Montana as well as historical documentation, this presentation will provide an analysis of gunshot wound trauma sustained by the soldiers. I will also examine the possibility of suicide among the U.S. 7th cavalrymen. To do so I will compare calibers of firearms used during the battle and the type of wounds sustained by firearms through an extensive literature review of the weapons from this time period. In addition, an analysis of military recruitment and procedures for admittance into the 7th Cavalry will be done to assess mental preparedness for battle. A review of ballistic analysis and typical locations of trauma caused by suicide in a forensic context will also be included. Using historical documents combined with forensic methods will illuminate the possible causes of death for the US 7th cavalrymen.

Mielke, Genevieve [88] see Jackson, Katherine

Mierswa, Emily (University of New Hampshire), Crystina Friese (University of New Hampshire) and Meghan Howey (University of New Hampshire)

[239] *Graves in the Forest: Mapping Lost Colonial Cemeteries in the Oyster River Watershed*

The Oyster River watershed in New Hampshire was home to some of the earliest English colonial occupation outside of Boston with settlements starting in the early 1630s. This early colonial occupation as well as subsequent historic settlement of the area has left an extensive array of archaeological features in the landscape. Currently, however, this landscape is heavily forested making identification of even remnant built sites difficult. The forested setting makes it particularly hard to find and correctly identify the extent of early cemeteries given graves were marked only with simple, unengraved fieldstones easily obscured by even slight brush. This poster presents the results of an intensive field survey and mapping program we conducted on one now overgrown early colonial family cemetery used from the mid-1600s to the early 1800s. We contextualize the results of our work with available archival records from the period. By contrasting our results with previous maps of the cemetery, we demonstrate how important the intensive field survey and digital mapping approach developed here is for creating full understandings of these important early sites.

Mietes, Ester [13] see Napolitano, Matthew

Mijal, Samuel [66] see Fletcher, Brittany

Millard, Andrew [87] see King, Charlotte

Miller, Bryan (University of Oxford)

[181] *Objects of Action and the Practice of Empire in Xiongnu Inner Asia*

Material remains of communities and peoples enmeshed in imperial regimes are most often assessed as representations of incorporation into empires. Yet many of the objects in consideration were not so much passive material declarations as they were tools for active demonstrations. Authority, regional and local, derived from membership in exclusive imperial echelons; membership that required more than mere badges of identity but performances of imperially-derived authority. This paper addresses the ways in which locals enacted empire as well as what they sought to gain from doing so. It analyses particular accoutrements of feasting and drinking wielded by steppe peoples of Inner Asia in formalized social interactions aimed

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at legitimizing authority via participation in the Xiongnu imperial regime. Even though they were often heavily imbued with imperial aesthetics, it was not the cups and bowls alone but rather the practices of drinking ceremonies and eating rituals, afforded by the imperially-imbued objects and the people that wielded them, which bestowed power and authority. The steppe empire was thus constituted through the practices of locally (re)producing the regime, practices that were afforded by assemblies of particular peoples and objects.

Miller, D. Shane (Mississippi State University)

[182] *The Swag Site (38AL137): Yet Another Paleoindian Site at the Allendale Quarries in South Carolina*

The Swag Site (38AL137) was recorded during the initial survey of the Allendale chert quarries by Albert Goodyear and Tommy Charles in 1984. While subsequent work focused on the Topper and Big Pine Tree sites, the Swag site was overlooked until a systematic survey conducted in 2015 identified several localities with buried archaeological deposits. In May 2016 and March 2017, further excavations at the Swag Site produced artifacts that are comparable to Clovis components at Topper, Carson-Conn-Short in Tennessee, and the Adams site in Kentucky. This paper presents the results of mass, refit, and spatial analyses of the lithic debitage in order to assess the impact of post-depositional processes on the archaeological deposits at the site.

[127] *Discussant*

Miller, G. Logan (Illinois State University)

[74] *Dating the Emergence and Decline of Middle Woodland Blade Technology*

Prepared core and blade industries emerge in various times and places throughout the prehistory of North America. One of these is in association with the Hopewell phenomenon of the Eastern Woodlands. As such, they are often recognized as a Middle Woodland “index fossil” and a key materialized indication of Hopewell ceremonialism. However, few formal tests of their occurrence across space and time exist. Drawing on published reports, as well as an extensive review of the unpublished gray literature, I present a Bayesian analysis of radiocarbon dated, bladelet-bearing features from across Ohio. Results are not crystal clear but do provide insight into previously unrecognized temporal variation in this element of Hopewell material culture. The most likely current scenario indicates that bladelets occur earliest in southern and central Ohio before subsequently spreading north to the Lake Erie region. There is strong evidence that interactions between groups in Ohio and the Illinois River Valley served as a catalyst for the spread of blades and potentially further elements of Hopewell ceremonialism.

Miller, Heather (University of Toronto) and Gregory L. Braun (University of Toronto)

[121] *Unexpected Expertise: Archaeological Science and the Creative Skills of Indus Craftspeople*

Wright’s doctoral and subsequent work brilliantly employed archaeological science to show how relatively simple technological tools (single-chamber kilns) were used by skilled craftspeople in clever ways to create surprisingly technologically complex objects (black-on-grey pottery, resulting from several different cycles of atmospheric conditions during firing), objects which also provided information about patterns of social boundaries and technological style. In homage to this work, we will present recent petrographic work by Dr. Greg Braun on Mature Harappan technological debris from Harappa, wasters from the firing of faience and/or steatite objects. As in Wright’s research, archaeological science methods show that simple refractory materials thought to be insulating, non-stick firing structures or containers for relatively simple objects, in fact seem to be remains of containers designed to transfer heat, used as ‘crucible’ containers for frits for the production of more complex fritted faiences, with bone fragments deliberately added as fluxes or perhaps even opacifiers. Fritted faience has been identified in the Indus by Vandiver and McCarthy, but this debris implies this complex production method was more common than previously expected, and may be representative of an Indus style of faience production.

Miller, Jacquelyn (The University of Maine, Orono, ME)

[84] *Ground-Penetrating Radar as a Rapid Cultural Resource Management Technique for Shell Midden Delineation*

The analysis of shell midden extent and thickness typically requires expensive and time-consuming excavation. Additionally, widely spaced test units provide limited and discontinuous stratigraphic information. Ground-penetrating radar (GPR) survey, in combination with stratigraphic information from limited excavation, can serve as a powerful tool for making rapid cultural resource management decisions. Although processing and correlating the data requires several days of additional time, this technique allows for quick and efficient data collection, is nondestructive, requires minimal staff, and provides a continuous record of vertical profiles across the site. The contrasting electrical properties of shell-rich horizons and associated sediments allow the identification of midden layers on the GPR records. When used with ground-truth, provided by stratigraphic information from limited excavation (photographs, hand-drawn wall profiles, and/or cores), the interpreter can extrapolate stratigraphic details across a site. While individual artifacts cannot be resolved in GPR records, accumulations of rocks, soil layers, and potential house floors may be identified. Although GPR cannot entirely replace a detailed excavation, an initial GPR survey of a shell midden site can provide information regarding site extent and vertical shell distribution. When combined with limited testing, GPR survey provides important data for decisions regarding excavation and site conservation.

[84] *Chair*

Miller, Mary

[209] *How Tlaloc Got His Groove*

One of the distinctive features of one of the principal Maya solar deities, the Jaguar God of the Underworld, is the twisted cord—nicknamed “culler” for the German doughnut over 100 years ago by Eduard Seler—that loops under the eyes (with their characteristic inward curl for pupils) and twists between them, sometimes ending under the deity’s jaguar ears. This feature, perhaps to be associated with fire and burning, takes up its place on the nose of a different deity, Tlaloc, in Central Mexico, in the Late Postclassic. How is it that Tlaloc took on this attribute, and what did it mean in the context of the Mexica? No image of Tlaloc from Tula features the culler: in all likelihood the culler takes on its role in the mid-15th century, during the period of Mexica expansion.

In this study, the iconography meaning of the twisted cord will be examined, its meaning in both Maya and Central Mexican contexts, and a possible motivation for transmission. The study will revisit the fundamental union of fire and water at the heart of Tenochtitlan, in the twinned temple of Tlaloc and Huizilopochtli.

Miller, Melanie (University of Otago, Dunedin, New Zealand), Sabrina Agarwal (University of California, Berkeley) and Carl Langebaek (Universidad de los Andes, Bogotá, Colombia)

[66] *Gender Divisions in Eating and Working: A Bioarchaeological Analysis of an Ancient Muisca Community (Sabana de Bogotá, Colombia, 1000–1400AD)*

The Muisca inhabited a large territory in Northern South America (within present-day Colombia) and are often presented as a “classic chiefdom society.” The roots of these interpretations can be traced back to European historical documents discussing Muisca socio-political life, which emphasized the role of social status and hierarchy within Muisca culture. The Muisca in particular have been held captive by the recordings of historical authors, and social structures observed through a European gaze have colored our interpretations of Muisca culture. New data from archaeological

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studies of Muisca sites are forcing a reevaluation of chiefdom models. This bioarchaeological study of diet and physical activity, based on 199 human burials from the site of Tibanica (Soacha, Colombia 1000–1400AD), will serve as a case study that focuses on the daily relationships that marked people along divisions between the sexes. Stable isotope analysis of tooth and bone samples indicate consumption of particular foods were tied to one's age and sex. Cross-sectional geometry measures of long bones demonstrate a patterned, gendered division of labor. These divisions in diet and labor indicate that for the Muisca, gender was a very important social variable that united and separated groups in daily spheres of activity.

Miller, Melanie [9] see Maline, Sophia

Miller, Myles (Versar)

[122] *Contexts of Ash Deposits in Jornada Mogollon Pithouse and Pueblo Settlements and Reflections on Their Meanings*

The archaeological identification of intentionally deposited layers of ash at Jornada pueblo and pithouse settlements is complicated by several factors and intentional ash deposits are seldom identified unless preserved in a sealed context or buried by a layer of impermeable natural sediment or cultural deposits. When clear evidence of intentional ash deposition is observed, it may be assumed that there was a significant meaning underlying the inclusion of ash in a special context or deposit. Ash is commonly found below adobe caps in sealed floor hearths and termination pits of Jornada pueblo rooms as well as thin layers spread over abandoned and sealed floors. Ash is also associated with layers of burned roof material as part of ritual termination of architecture. Intentional ash deposits have occasionally been found in pithouse floor hearths, and there is evidence of ash layers associated with deposits of ritual paraphernalia in certain caves. Contexts where ash deposits are not present, such as burials and dedicatory deposits, are of further interest because they allow for a comparative contextual analysis. Contexts where intentional ash deposition has and has not been documented will be reviewed and interpretations of the meaning of such deposits will be presented.

Miller, Sarah and Laura Clark (Florida Public Archaeology Network)

[168] *Assessment and Evaluation of Florida's Citizen-Science Program to Address Climate Change: Heritage Monitoring Scouts of Florida (HMS Florida)*

The Florida Public Archaeology Network (FPAN) launched the citizen science-based Heritage Monitoring Scout (HMS Florida) program statewide during the fall of 2016 in part to assist Florida's Division of Historical Resources, which currently does not have the budget or policy permissions in place for climate change concerned initiatives. During the first year, 233 volunteers signed up and submitted over 312 monitoring forms from across the state. This paper will provide affordances and constraints of the HMS Florida program to date, share overall patterns of data collected on site conditions and assessments, break down the demographics of site stewards, and share preliminary results of the second year. During the quantitative and qualitative assessments of the program discovered that many of the HMS Florida participants feel the program is making an important impact not only on the preservation of cultural resources, but also in their personal lives.

[236] *Moderator*

Miller, Stephanie (University of California, Riverside), Aline Magnoni (United States Agency for International Development), Traci Ardren (University of Miami) and Travis Stanton (University of California, Riverside)

[173] *Coba's Periphery and Rethinking Site Boundaries*

Time and again the application of new technologies has allowed archaeologists to rethink their understandings of ancient cultural landscapes. Lidar, in particular, is one technology that has rapidly transformed our analytical capabilities by simultaneously providing wide regional and finely localized views of archaeological sites. In this paper, we present new lidar data that is reshaping our understanding of the Northern Maya Lowland metropolis of Coba. In particular we discuss features on Coba's peripheries that alter previous understandings of Coba's site boundaries and also discuss the possible influence of roads in shaping Coba's site development. Finally, we evaluate earlier models of site boundaries and challenge the concept of a uniform or solitary border that defines a site.

Millhauser, John K. (North Carolina State University)

[170] *Financing the Domestic Economy: A Study of Craft Production and Technological Change in Central Mexico*

Studies of technological change often leave unasked how people finance their adoption of new technologies, focusing instead on concepts of risk and uncertainty. The means of finance—whether by surplus production, saving, assuming debt, sharing costs, or other mechanisms—depends on the particulars of the economy in question and can have systemic and long-term consequences for adopters. To show why finance matters in explanations of technological change and how archaeologists can study it, this paper presents a case of household saltmaking in the Basin of Mexico during the Aztec and Spanish empires. Saltmakers adopted several innovations in the manufacture of vessels they used to evaporate brine, but differences in how they financed these changes had divergent effects on the social relations of production. One set of innovations that reduced ceramic vessel production costs during the Late Postclassic correlates with a period of independence and stability among saltmaking households. However, Colonial-era saltmakers became dependent on wealthier investors for access to the means of production, most likely because they lacked the financial means to adopt an innovation involving metal cauldrons. This research shows the importance of considering finance in explanations of technological change as well as the study of domestic economies.

[170] *Chair*

Millhauser, John K. [222] see McGill, Dru

Millhouse, Amanda [189] see Hutson, Jarod

Milligan, Colleen (California State University, Chico), Eric Bartelink (California State University, Chico), Sarah Hall (Arizona State University), Maria Cox (California State University, Chico) and Alexandra Perrone (California State University, Chico)

[179] *Paleopathology and Dental Disease from Point San Jose*

Traditional studies of health and stress in archaeological samples use several categories of skeletal alterations: linear enamel hypoplasias (LEH), adult stature, scars of anemia, dental disease, osteoarthritis, trauma, and infection. Skeletal remains from a late 19th century military hospital at Point San Jose (PSJ), San Francisco, represent a commingled assemblage, complicating paleopathological observations on the bones. Unlike bony changes, dental pathologies are often studied by individual teeth. Consequently, observations of the PSJ dental remains are best interpreted using tooth counts. Dental disease and oral stress at PSJ include dental caries, dental wear, dental calculus, and LEH. Frequency data show that 32/165 teeth (19.4%) exhibit LEH. Most teeth display multiple defects, suggesting repeated early childhood stresses. Additionally, 19/160 teeth (11.9%) show carious lesions. Comparisons of PSJ with other historic samples indicate a similar caries prevalence as the Snake Hill Site (1812–1814) and Indian Wars sample (1870–1899), but a much lower rate than historic British, St. Peter's, Fort Laurens, and Civil War samples. The conclusions drawn from the PSJ dental remains are better indicators of the overall health of the individuals than studies based on bony changes.

Milligan, Colleen [179] see Broehl, Kristen

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Milliken, Ian [72] see Sezate, Adam

Mills, Barbara (University of Arizona)

[115] *Discussant*

[83] *Chair*

Mills, Josie (University College London)

[329] *Assessing the Potential for Raw Material Profiling Studies in Modelling Neanderthal Behavioural Complexity*

Raw material studies are becoming increasingly popular as the development of technical and methodological advances adds to the macroscopic and geological study of stone tools. In turn this improves our capability to create a link between a stone tool's archaeological context and geological area of origin. This connection is often discussed in terms of hominin behaviour, such as organisation of subsistence, adaptation to environment, and forward planning. However, the growing body of data provided by provenance research raises the need to critically assess how this information practically translates into proxies of hominin behaviour. This question is particularly prescient when considering the efficacy of raw material studies in exploring the lives of archaic *Homo*, in this case *Homo neanderthalensis*. Middle Palaeolithic foraging behaviour has historically been seen as 'non-curved', lacking a depth of planning and adaptive response to dynamic environments (e.g. Binford 1979; 1982). However, recent advances in our understanding of Neanderthals, suggest a species capable of complex subsistence behaviour, such as transport and curation. This paper discusses raw material acquisition strategies, and how profiles of raw material variability through time and space can contribute to developing models of Neanderthal behaviour.

Mills, Rebekah (Barnard College, Columbia University)

[98] *All in the Family: Using Archeology and Genealogy to Construct a Historical Narrative*

Excavations during 2017 for Ballintober Castle in Roscommon, Ireland have uncovered the base of a wall structure and curtain wall for the early fourteenth century castle. As excavations continue to deepen, the structure of the castle reveals a complicated occupational history with cobbled floor occupation levels along with what may be a wall structure appearing underneath this area. The castle excavations can show the Anglo-Norman and Irish ownership of the castle with each owner using different building techniques with different purposes for the castle. As the excavations continue to reveal the early construction of the castle, it is important to look at the historical record of the de Burgh and O'Connor families, the two ancestral owners of the land and castle. The Annals of Connacht reveal not only the conflict surrounding the ownership of the castle, but that the families were related through marriage. Looking at the historical narrative surrounding the early construction of the castle highlights the overlooked importance of women in showing not only the conflict over ownership, but that just as the Anglo Norman and Irish walls of the castles are built on top of one another, the competing families are interwoven together.

Mills, Rebekah [23] see Brody, Rachel

Milton, Emily, Kurt Rademaker (Northern Illinois University) and Peter Leach (University of Connecticut)

[328] *Are We Living in a Simulation? Digital Reconstructions of Early Sites in Coastal Peru*

Rapidly evolving modern technology has resulted in powerful tools for preserving and visualizing archaeological materials. Extensively recording a site with digital technologies enables new explorations of site discovery and recovery processes while concurrently providing a permanent, detailed record of the material. Here, Terminal Pleistocene and Early Holocene maritime sites in coastal Peru are reconstructed at various scales. Drone photography and GIS are utilized to collect high-resolution landscape imagery for basemap modeling, while approaches of photogrammetry and 3-D modeling are applied to investigate aspects of the sites at a micro scale. This work demonstrates the dynamic potential of digital curation in archaeology.

Minc, Leah [100] see Bray, Tamara

Miner, Michael [68] see Caporaso, Alicia

Minerbi, Joanne (California State University, Northridge) and Elisabeth Raeshide (University of California, Santa Barbara)

[94] *Making Stone Tools to Connect with Past People: A Case Study in Active Learning about Lithics with the Fernandefio Tataviam Band of Mission Indians*

Studies of embodied learning show that physical experiences which engage the sensory and motor processing parts of the brain enhance understanding and retention of concepts. Making an obsidian flake, rather than just seeing pictures of stone tools, is a memorable experience that can provide a tangible connection to the practices of past people. We present a case study in public outreach and pedagogy for the Fernandefio Tataviam Band of Mission Indians of Southern California. The original concept, created in a Lithics Analysis class at California State University, Northridge, was an in-service professional lithics program for the tribe's cultural monitors. The tribe expressed a desire for a presentation that would appeal to all tribal members, including children. Through a family-oriented program, using accessible language and format, workshop participants learned about the deep history of lithic technology, mechanics of working with stone, and what we can learn from this cultural material. During a flintknapping demonstration, participants saw tools being created, watched obsidian slice through leather, and had an opportunity to make their own flakes. After two family-oriented workshops, the Fernandefio Tataviam invited us to conduct a more in-depth, professional program for their archaeological monitors. We present our experiences and lessons learned.

Mink, Philip (University of Kentucky)

[164] *Eastern Virgin Hinterlands: Ancestral Puebloan Settlement in Grand Canyon National Park*

Margaret Lyneis, in her 1995 description of the Virgin Branch region, notes that three of the boundaries are quite distinct as they adjoin "non-Anasazi" societies. The eastern boundary is more diffuse, as the Virgin and Kayenta Puebloan traditions intersect in an area that is now part of Grand Canyon National Park. In this paper I will argue that Virgin settlement patterns in the western half of the Grand Canyon are distinct from the Kayenta and follow the upland/lowland pattern described for the Virgin heartland. I will also discuss preliminary findings that appear to push the Virgin boundary in Grand Canyon National Park eastward from the Kanab Plateau to the Walhalla Plateau, resulting in an increased overlap between the Virgin and Kayenta Puebloan traditions.

Minnis, Paul (University of Oklahoma)

[236] *Discussant*

Mintz, John [228] see Fitts, Mary

Mirazón Lahr, Marta [143] see Biers, Trisha

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Mires, Ann Marie
[62] *Discussant*

Mires, Ann Marie [204] see Moran, Kimberlee

Mirro, Michael and Jon Spenard (California State University, San Marcos)

[256] *Cataloging Cave Features in the Southern Pacbitun Regional Archaeological Project Using Virtual Reality and 3D Modeling*
Since 2010, a major focus of the Pacbitun Regional Archaeological project has been a regional ritual landscape survey surrounding. In 2016, Phase II of that subproject commenced, with significant efforts geared towards experimenting with digital mapping and documentation of surface archaeological features in four poorly understood caves, Crystal Palace, Slate Cave, Tzul's Cave, and Actun Tokbe. In this paper, we discuss our work and offer some results from our Phase II investigations. In 2016, our efforts were geared toward excavations, tape-and-compass mapping, and photogrammetry experimentation in Slate and Crystal Palace Caves. In the 2017 field season, we cataloged all surface features in Crystal Palace, explored and mapped a small sealed passage in Tzul's Cave, and mapped and cataloged a significant portion of Actun Tokbe, through the use of photogrammetry. Combining the photogrammetric and mapping data with a virtual reality model of the caves provides a robust visualization system allowing remote study of the environment. The resultant "Mapping Grade Models" allow for the rapid inventory, yet detailed mapping of the surface, freeing time for more fieldwork. Such digital documentation relies on careful data organization and backup, annotation of models via coding or other means, and significant time for post-processing data.

Mischke, Bryan [221] see Whitley, Thomas

Missal, Kele [304] see Melton, J. Anne

Mistretta, Brittany (University of Florida) and Jonathan Hanna (Penn State University)

[34] *Breadth of Fresh Air: A Continued Examination of the Reversed "Crab-Shell Dichotomy" in Grenada's Pre-History*
In a previous paper, we examined past faunal studies from Troumassoid period (AD 800–1600) sites in Grenada, concluding that an expansion of diet breadth likely occurred during this time. Our conclusion contradicted the traditional "crab-shell" dichotomy proposed by Rainey and Rouse, but confirmed findings from elsewhere in the Caribbean. Presented here is a continuation of this work, with new faunal analyses incorporated from recently excavated inland, western, and earlier (Saladoid) sites, as well as faunal data from a few past reports that were recently discovered. Currently, the data indicate differences between assemblages from the previously examined coastal Troumassoid sites and the recently included inland occupations. A difference was also identified between all Troumassoid sites and the earlier Saladoid settlements. Comparison of the faunal assemblages not only helps to enhance our understanding of Grenada's prehistoric environments, but also the communities that interacted with them. The differences between sites reveal local variations in subsistence strategies over time and further corroborate the transition to an expanded diet during the Troumassoid period.

[237] *Discussant*

Mitchell, Seth [85] see Libbon, Jonathan

Mitchell, William (Monmouth University)

[333] *Working with Scotty: Perspectives on A Peripheral Paper Designed for the Ayacucho-Huanta Archaeological-Botanical Project*
I was not involved directly with Scotty's Ayacucho project (1969–1975), but from 1965 to 1968 I worked in the town of Quinua, engaged in dissertation research. Its territory included part of the site of Huari. After completing my dissertation, I returned to continue work in 1973, 1974, and 1980, and later, focusing on its ecological system, especially irrigation. Scotty invited me to prepare a paper on the ways farmers used ecological zones. The research, while more detailed, complemented what I had already decided to do. Volumes 2 (Excavations and Chronology, 1981), 3 (Nonceramic Artifacts, 1980) and 4 (The Preceramic Way of Life, 1983) were published; volume 1, which was to include my paper, was scheduled to follow. China (where Scotty began work in 1975) and other work intervened. Volume 1 lay dormant. Many years later, Scotty said he was ready to publish it, but so much time had passed that I thought it necessary to revise. The paper, "Multizone Agriculture in an Andean Village: The Ecological Basis of Peasant Farming", never appeared. It now lies in the National Anthropology Archives. This presentation speculates why, and offers information on what my paper contains and why it is still relevant.

Mixter, David (Binghamton University)

[129] *Urban Reworking as Political Action at the Ancient Maya City of Actuncan, Belize*
This paper begins with a question: What does it mean to live amongst ruins? The literature on ancient Maya urbanism focuses to a large extent on how urban spaces are arranged and what this says about social and political organization. However, the long occupations of many Maya centers resulted in urban centers that reflect a palimpsest of decision-making over centuries rather than a single grand plan. Indeed, evidence at many Maya sites suggests that urban plans were reworked as buildings were built, destroyed, renovated, repurposed, and abandoned based on present needs. So-called "problematical deposits"—detritus left in and on abandoned spaces and buildings—provide evidence that the later Maya acknowledged the differentially utilized nature of their urban centers. Yet, modifications to the urban landscape result from decisions made by someone: households, communities, leaders, or conquerors. As such, palimpsest urbanism is both a way of life and a product of political action. Here, I draw on data from the Maya site of Actuncan, Belize to consider the ramifications of inhabiting and modifying a long-occupied center.

[129] *Chair*

Mixter, David [129] see Jamison, Thomas

Mixter, David [147] see Lawhon, Taylor

Mizoguchi, Koji (Kyushu University, Japan) and Junko Uchida (Academia Sinica)

[24] *A New Approach to the Anyang Hsi-Pei-Kang Late Shang Royal Cemetery: A Social Archaeological Perspective*
This presentation argues that the decision of the locations of the so-called royal tombs of the Anyang Hsi-Pei-Kang cemetery involved various social-strategic concerns. Although badly robbed, the excavations of the tombs yielded rich grave good assemblages, allowing archaeologists to approach to various elements of the theocratic authority of the late Shang kings. The reconstruction of the formation process of the cemetery has been attempted in the hope that the tombs can be assigned to the kings whose reigns are recorded in Shiji and in Zhúshū Jinián (the Bamboo annals). Drawing upon an original novel reconstruction of the relative chronology of the tombs, we examined spatial relationships between them at each phase of the formation process of the cemetery, particularly in terms of which pre-existing tombs the mourners were 'designed' to see and in what way, and have analytically revealed some distinct patterns. By comparing the timings of the implementations of those strategies with the genealogical relationships between the

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kings that were recorded in Shi-ji, we have investigated and reconstructed the social-strategic implications of the selections of those strategies in relation to their historical-contextual backgrounds.

Mlyniec, Michael (University of Sheffield), Roger Doonan (University of Sheffield), Duško Šljivar (National Museum Belgrade (retired)), Yvette Marks (University of Sheffield) and Sarah MacKinnon (New Era Archaeology Inc.)

[77] *Experimental Reconstructed Vinča Gradac Phase Copper Smelting*

Recent dating projects have determined the oldest known date for copper smelting to appear around, 5000 BCE, associated with Vinča (Gradac phase) sites in the Morava Valley, Serbia. Recent Studies of Vinča metallurgy (Radivojevic 2010) were directed towards the characterisation of slags and associated minerals, and their provenance. This body of work has had important implications for theories relating to the beginnings of metal-using communities.

Despite this important research, few studies have focused on the actual techniques and apparatus associated with copper production, resulting from of a lack of archaeological finds traditionally associated with metallurgical processes.

Some scholars (Šljivar 2006) have proposed the use of perforated and solid truncated conical vessels as primary smelting apparatus. On this basis, a series of experimental smelts coupled with a program of soil and material analysis were initiated to explore the potential for such vessels to be associated with copper smelting. This paper reports a number of experimental smelting campaigns and evaluates the potential for these early ceramic forms to be associated with the world's earliest pyrometallurgical tradition.

Moates, Jeffrey [78] see Scott-Ireton, Della

Modl, Daniel [140] see Brandl, Michael

Moe, Jeanne (Project Archaeology-BLM)

[168] *Discussant*

Moe, Jeanne [286] see Freeman, Mark

Mohlenhoff, Kathryn (University of Utah)

[10] *El Niño and Trans-Holocene Trends in Eastern Pacific Fishes: Preliminary Data from Abrigo de los Escorpiones, Baja California*

Many questions surround trends in prehistoric fisheries dynamics and fish use along the Pacific Coast of North America. Marine fish are particularly sensitive to changes in their environment, including variation in sea surface temperature that changes cyclically with the El Niño/Southern Oscillation.

Trans-Holocene paleontological or archaeological sites with large faunal assemblages are the ideal tool for use in reconstructing these paleoenvironmental records. Here, I report preliminary data from Abrigo de los Escorpiones, a well-dated and stratified trans-Holocene site from the Pacific Coast of Baja California. A wide variety of fish taxa were identified, including a large proportion of surfperch (Embiotocidae). Rockfish (*Sebastes* sp.), sharks and rays (Elasmobranchii), and California sheephead (*Semicossyphus pulcher*), were also identified in this assemblage. Richness and evenness values were calculated as they have the potential to reflect El Niño frequency; higher values through time could indicate an expanding diet breadth due to decreased encounter rates with the highest-ranked fishes. A significant increase in evenness values through time was revealed, which correlates with the increase in El Niño frequency in the late Holocene. This work has modern value; reconstructing an extended record of marine environmental change can inform on modern rehabilitation and conservation efforts.

Mohr, Katelyn

[92] *Late Pleistocene and Early Holocene Lake-Level Fluctuations in the Lahontan Basin, Nevada: An Expanded Approach*

In the Great Basin, most substantial Paleoindian sites are found on landforms associated with extinct lakes and wetlands, suggesting that early groups had a special affinity for lacustrine settings. The Lahontan Basin of western Nevada contains a rich record of Terminal Pleistocene and Early Holocene (TP/EH) lake-level fluctuation and an extensive record of Paleoindian occupation. In 2008, Ken Adams and colleagues compared the relationship between site location and lakeshores of known ages using a small number of Paleoindian sites in the Black Rock Desert and Winnemucca Lake basins. They argued that sites dating to between ~13,000 and 8,000 years ago should be concentrated at elevations between 1200 and 1235 m ASL. Their research relied on a small archaeological data set from a limited geographic area. To test their hypothesized relationship between site distribution and lakeshore elevation, I compiled site location data for the entire Lahontan Basin. My results shed additional light on the spatial-temporal relationship between Paleoindian sites and Pleistocene lakeshores and help evaluate the validity of their model at a much broader scale.

Mol, Angus A. A. [83] see Borck, Lewis

Molinar, Marissa (University of Florida)

[73] *Seeing Is Believing: The Documentation of Rock Art*

This presentation examines traditional, contemporary, and experimental methods of illustration and photography in rock art recording. Addressed accordingly are the processes and problems unique to pictographic (painted) and petrographic (pecked) parietal imagery, superimposition and dating. As a rock art researcher, photographer, and artist, many examples will be drawn from my fieldwork; specifically contemporary methods utilizing panoramic photography and an experimental photographic technique employing solarization filters. The presentation concludes with a discussion of how the act of hand-drawing rock art images creates a powerful scenario to intimately connect with the acts of past agents, as well as the potential opportunity to envision more dynamic interpretive frameworks in rock art studies.

Molloy, Paula

[291] *Fantastic Archaeology Revisited: Still Wild after All These Years*

In his 1991 classic, *Fantastic Archaeology: The Wild Side of North American Archaeology*, Stephen Williams set out to document the ways in which fraud has masqueraded as truth in North American prehistory. More than just a catalog of the improbable and unfalsifiable, *Fantastic Archaeology* also served as gateway to scientific archaeology for many in the general public. Smitten with a "weird tale," many in the Cambridge, MA area found their

way to Prof. Williams' Harvard University course upon which his book was based. Now more than ever, Williams' approach has relevance for those who seek to inculcate critical thinking as a foundational skill for members of a free society.

Monaghan, George (Indiana University)

[133] *Discussant*

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Monahan, Ellis (Cornell University)**[146]** *Enclosure and Surveillance: The Development of a Disciplinary Landscape in Bronze Age Cyprus*

Monumental architecture, specifically in the form of structures classified as "fortifications," emerged on Cyprus at the end of the Middle Bronze Age, but these massive constructions remained in use for only a brief period of time. This period, however, is of critical importance to the transformation of Cypriot society from a relatively egalitarian village-based society to the urban-focused, politically complex society of the Late Bronze Age. Using the cluster of fortresses in the Agios Sozomenos region in central Cyprus as a case study, and presenting the results of recent field work in this region, this paper considers not just what these structures are, but what they do and how they do it. This material agentive approach demonstrates that fortresses are efficacious actors within the political domain, shaping the human imagination and experience of the landscape, and thereby driving the apprehension of inequality and contributing to the restructuring of social relations.

Monnier, Gilliane (University of Minnesota)**[137]** *Lithic Residue Analysis in 2018: Prospects and Challenges*

Lithic residue analyses have produced exciting results in recent years: microscopic bits of plant and animal tissue adhering to stone tools tens of thousands of years old; the remains of hafting materials such as bitumen and birch-bark pitch; and fiber technology from the Paleolithic, to mention but a few. Yet, for many archaeologists these results seem 'too good to be true'. How can biological materials be preserved for thousands of years in temperate environments? How can they appear, under the microscope, almost intact after all of this time? And, how can we be sure that residues are ancient, and not modern contaminants? These questions are at the heart of recent research in the field of lithic residue analysis. In addition to blind tests and anti-contamination protocols, important advances have been made in the development of new analytical techniques designed to improve the characterization of residues. Scanning electron microscopy (SEM) provides high-resolution images with chemical compositional information. Fourier Transform Infrared Microspectroscopy (μ FTIR) is such a sensitive technique that it can document degraded proteins. This paper will discuss the role that the development of such techniques will play in helping tackle the problems of identification, contamination, and preservation mentioned above.

Monroe, Cara (University of Oklahoma- LMAMR), Paul Sandberg (Sam Noble Oklahoma Museum of Natural History), Rita Austin (University of Oklahoma- Laboratories of Molecular), Marc Levine (Sam Noble Oklahoma Museum of Natural History) and Cecil Lewis (University of Oklahoma- Laboratories of Molecular)**[143]** *Ancient DNA Analyses of Dental Calculus from Plains Village Collections*

More than a generation since the implementation of NAGPRA, many museums continue forward with the process of repatriation. This creates a unique opportunity for active and collaborative engagement of Native American communities in both the inception and implementation of scientific research. Biomolecular analyses of dental calculus can be an attractive research avenue because they address questions of mutual interest to tribes and scientists, and the sampling techniques are non-destructive to human tissue. In partnership with a tribe in Oklahoma, we present preliminary ancient DNA and bioarchaeological data from prehistoric dental calculus from three Washita River phase, Plains Village sites (500–700BP).

Monroe, Cara [14] see Wright, Sterling

Monroe, J. Cameron (University of California, Santa Cruz)**[337b]** *Towards an Archaeology of Black Atlantic Sovereignty: Materializing Political Agency in the Kingdoms of Dahomey and Haiti*

The Archaeology of the African Diaspora has long privileged the analysis of the everyday lives of enslaved Africans living on plantation sites in the New World. Notwithstanding the political and intellectual importance of this approach to our understanding of the emergence of the colonial world and its contemporary legacies, recent scholarship on both sides of the Atlantic has examined the new political entities that arose across the Black Atlantic World in dynamic tension with broader Atlantic political and economic forces. Such work has highlighted how political authority in emerging Black Atlantic states were materialized at multiple scales of analysis, and in complex relationships with colonial societies. In this paper, drawing from comparative archaeological research on the Kingdom of Dahomey (Bénin) and the Kingdom of Haiti (Haiti), I will explore the potential for an archaeology of sovereignty in the Black Atlantic World. Emphasizing the economic and symbolic nature of both architectural spaces and artifacts recovered from the homes of monarchs in these two polities, this paper reveals the complex ways sovereign states were articulated into the broader economic and political currents of the Atlantic World, casting new light on the problematic nature of political sovereignty in the Age of Revolutions.

Monroy-Rios, Emiliano [330] see Beddows, Patricia A.

Montero, Gabriela (University of Kentucky), Nathan Wilson (Universidad Nacional Autónoma de México) and Lourdes Budar (Universidad Veracruzana)**[285]** *Obsidian Exploitation and Access in the Eastern Sierra de los Tuxtlas, Veracruz, Mexico*

In this paper, we present the results of technological and visual sourcing analyses of over 1000 obsidian artifacts collected by the Proyecto Arqueológico Piedra Labrada (PiLab), directed by Dr. Lourdes Budar. The PiLab area of study, the eastern Sierra de los Tuxtlas, Veracruz, Mexico, includes the eastern flanks of the Sierra de Santa Marta and the adjacent coastal plain along the Gulf of Mexico, and has a long sequence of Prehispanic occupation. Despite this, and almost a decade of regional survey and targeted excavation by PiLab, relatively low quantities of obsidian artifacts have been recovered within the study area. In our analyses of obsidian exploitation, we focus on evaluating both the overall quantities of obsidian artifacts recovered and their specific uses. Our results suggest that access to imported obsidian was rather limited throughout most of the region of study.

Montgomery, Barbara [325] see Lyon, Jerry

Montgomery, Lindsay (University of Arizona)**[259]** *The Social Lives of Horses: Comanche Equestrianism in New Mexico*

Over the past century, a great deal of scholarly attention has been paid to Plains horse culture, particularly focusing on how horses transformed the economic practices of nomadic people and the ecology of the Great Plains. As one of the most iconic equestrian cultures of the eighteenth century, the Comanche have been a common subject of these anthropological and historical investigations. Recent studies of the Comanche have focused on the role of horses in facilitating their rise from small-scale hunter-gatherers into major economic and political players. Although the impact of horse on

Comanche culture was certainly profound, emphasizing the functional effects of horses glosses over other important elements of the human-animal relationship. Indigenous approaches to human-animal relations offer one alternative interpretive lens to these traditional lines of inquiry. Indigenous philosophy is holistic and places humans and animals on the same behavioral continuum, merging the distinction between nature and culture, the functional and the social. This paper draws on indigenous philosophy to interpret a growing body of Comanche rock art in the Northern Rio Grande region. Through a discussion of this material archive, I explore the social life of horses within Comanche culture and the material manifestations of this relationship.

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Montgomery, Rebekah (Binghamton University)

[17] *Ephemeral Objects: An Alternative Perspective on the Maquetas of San Jose de Moro*

This presentation examines the collection of unfired clay models, or maquetas, from the Moche site of San José de Moro, Peru, proposing an interpretation focused on their unique materiality and position within the artistic corpus at the site. A renewed focus on Moche architectural representation treats these three-dimensional models as miniaturized, mimetic sculptures of monumental buildings, often used to understand the function of ceremonial space in the past. As of 2012, fifty maquetas have been uncovered from twelve elite tombs at San José de Moro. These burials range from the Late Moche Period (AD 650–800) through the Transitional Period (AD 800–1100). Prior investigators argue that the models served as effigies of ceremonial structures significant to the life of the deceased. The ephemeral materiality and privileged appearance of maquetas remain constant over multiple centuries despite changes in their form and frequency within elite tombs. Maquetas are also represented in the Burial Theme found on multiple fineline vessels from San José de Moro, suggesting the importance of the maqueta in funerary process. I explore the agency of these transitional objects and consider the significance of architectural representation in the elite burials.

Montón-Subías, Sandra [275] see Moragas, Natalia

Mooney, Dawn Elise (Archaeological Museum, University of Stavanger)

[277] *Discussant*

Mooney, Doug (Philadelphia Archaeological Forum (PAF))

[204] *City of (Inconvenient) Cemeteries: A Brief Synopsis of the Disturbance of Historical Burial Grounds in Philadelphia*

Philadelphia's many unmarked cemeteries and burial grounds have been repeatedly disturbed by construction activities in a string of incidents that stretches back more than 200 years. Incredibly, despite the regular discovery of these unmarked graveyards, City officials and local government agencies still make no effort to proactively protect these resources, and profess a wide-eyed bewilderment each time another one is impacted. Likewise, those responsible for disturbing burial grounds invariably feign exasperation and ask, "How could we have known?!" This presentation provides an overview of Philadelphia's unmarked burial grounds and their history of being disturbed, examines how they become lost in the ever changing city scape, and addresses the reasons why they should be easy to anticipate and avoid.

[204] *Discussant*

Moore, Elizabeth

[328] *Fishing at the Beach: The Great Neck Site and an Examination of Subsistence Strategies on the Chesapeake Bay*

Excavations conducted in 2015–2016 at the Great Neck site (44VB7) in Virginia Beach yielded evidence of a Middle Woodland occupation dating to AD 400. Located on Wolfsnare Creek approximately one mile from the Chesapeake Bay, the site contained a postmold pattern from a small structure, many small and shallow basin-shaped features, and several large pit features. Two of the larger pit features exhibited excellent bone preservation and were densely filled with a mix of aquatic and terrestrial fauna including large amounts of oyster, clam, and fish remains. Many of these specimens can be identified using traditional methods (i.e., comparison with a reference collection). The results of flotation from these two features, however, yielded tens of thousands of small fish vertebrae not typically identifiable using morphological characteristics alone. The Virginia Museum of Natural History archaeology program has developed a small and relatively inexpensive molecular lab to determine the feasibility of extracting DNA to identify these vertebrae to expand our understanding of resource use at the site, seasonality of occupation, and fishing methods. DNA testing results will be presented along with their impact on our interpretation of the site and the examination of persistent subsistence strategies in the Chesapeake Bay area.

Moore, Elizabeth [53] see Means, Bernard

Moore, Jerry D. (CSU Dominguez Hills)

[165] *Making Andean Houses: A Comparative Case Study*

Dwellings occupy a unique space in human lives, places where multiple trajectories of 'Culture' and 'Nature' intersect. Not merely shelters, dwellings often incorporate subtle aspects of social life and world view while being literally structured by the capacities of raw materials and construction techniques. Rather than a passive reflection of human intention or social existence, dwellings result from making—to use Tim Ingold's notion, a perspective placing "the maker from the outset as participant in a world of active materials" in which the maker intervenes "in worldly processes that are already going on and which give rise to the forms of the living world." Methodologically, 'making' is "read longitudinally, as a confluence of forces and materials, rather than laterally, as a transposition from image to object." Further, the transformations of ancient dwellings into archaeological features and contexts engage with additional modes of 'making' as houses become sites. I apply these concepts to two different classes of late prehispanic dwellings in coastal Peru—casas de quincha in the Casma Valley and tabique dwellings in the Tumbes Valley—and discuss analytical challenges involved in a comparative study of Andean houses and households.

[82] *Discussant*

Moore, Mark (University of New England)

[227] *Experiments in Stone-Flaking Design Space and Implications for Social Learning Models*

Social learning by modern humans led to the repetition and persistence of stone tool forms we see in the recent archaeological record. The emergence of similar patterning in early hominin assemblages is often assumed to track the beginnings of social learning. Less clear is what was being socially transmitted during this early period. One possibility is that hominins learned how to make objects according to a shared 'mental template'. A second possibility is that specific sequences were learned, which led to repeated forms. Here we describe recent experiments that explored the interplay of stone-flaking intentions and the mechanical outcomes of fracture. By removing complex 'intent' from the experimental design, we demonstrated that repetitions in forms and sequences can occur by removing flakes in simple series, without complex goal-directed intentions, and that some of these forms mimic aspects of objects often assumed to reflect more complex cognitive processes. The emergence of repetitive form is possible through the transmission of simple stoneworking sets, or combinations of gestures, without an a priori conception of a manufacturing process or final goal, suggesting that complex forms of social transmission may not have been necessary until relatively late in evolutionary history.

Moore, Summer (College of William & Mary)

[20] *Continuity and Change in Early Colonial-Era Hawai'i: An Examination of Foreign Artifacts from Nu'alolo Kai, Kaua'i Island*

Archaeologists increasingly emphasize the role of social and cultural context in understanding how indigenous groups in colonial settings appropriated foreign goods. While documentary accounts of explorers, traders, and missionaries have long been used by Pacific historians to examine foreign trade in Hawaii's early colonial period, archaeological sites from this period have rarely been identified. As a result, we know little about how foreign goods acquired through such exchanges were actually used and understood by local Hawaiian communities. A legacy collection of foreign objects from Nu'alolo Kai, a deeply stratified residential site on Kaua'i Island occupied through the mid-nineteenth century, offers a unique source of information on this topic. Protected deposits at the base of a cliff preserved a remarkable assemblage of imported materials in the site's upper layers, which include

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copper, iron, glass, ceramics, cloth, and Bible pages printed in the Hawaiian language. While foreign goods at indigenous sites have often been taken as evidence for transformative change, more recent views highlight the ways that unfamiliar objects can be recontextualized in new settings. This paper argues that residents of Nu'alolo Kai appropriated foreign objects within a framework characterized not only by innovation but also by pervasive continuity.

Moots, Hannah (Stanford University)

[295] *Towards a Recursive Relationship between Archaeological and Evolutionary Theory*

In 1875, archaeologist Augustus Pitt-Rivers wrote, "History is but another term for evolution." This presentation will explore the development and trajectory of major schools of thought concerning the relevance (or lack thereof) of evolutionary theory to archaeology and examine the current debate about the nature of evolution occurring in the biological sciences. Lactase persistence, for example, has been intensively studied for nearly 30 years, yet new evidence is calling into question when and how lactase persistence emerged. New archaeological, biological and theoretical approaches are rewriting and refining our understanding of this history. Using this and other examples related to histories of food tolerance and intolerance, I will explore ways that archaeology can and should contribute to an evolutionary theory where research on human history and long-term social change play a foundational role.

Moragas, Natalia, Sandra Montón-Subías (ICREA/UPF) and James Bayman (University of Hawai'i Manōa)

[275] *Archaeology of Colonialism and Ethnogenesis in Guam and the Mariana Islands*

This paper presents a new archaeological project that we are co-directing in Umatac, Guam. Combining historical written sources and archaeological information, we seek to contribute a better understanding of the historical-archaeological legacy connected to colonial processes related to the Hispanic Monarchy in the western Pacific, and their role in resulting ethnogenesis.

Morales, Anthony (California State University, Los Angeles)

[155] *A Late Pleistocene-Early Holocene Site in the Western Great Basin: A Preliminary Study of the Rose Valley Site (CA-INY-1799)*

The Rose Valley site (CA-INY-1799) has considerable potential for providing a deeper understanding of Paleo-Indian adaptations in the Far West. For over 40 years, archaeologists have observed artifacts on the surface of the Rose Valley Site that suggest the presence of a terminal Pleistocene-early Holocene component. Recent analyses of existing collections by other researchers have revealed Paleoindian artifacts such as Clovis/Great Basin Concave Base points, Great Basin stemmed points, crescents, and debitage indicative of Clovis lithic technology. In 2017, California State University, Los Angeles, began a multi-year investigation that includes mapping, systematic recording, and test excavations at the site.

Morales, Jessica (California Coastal Archaeology Lab.; California State University, Los Angeles), Jelmer Eerkens (University of California, Davis), Jeffrey Rosenthal (Far Western Anthropological Research Group, Inc.) and Andrew Ugan (Far Western Anthropological Research Group, Inc.)

[44] *Using Faunal Stable Isotopes to Assess Past Hunting Practices and Landscape Modification along the Feather River, CA*

Isotopic studies of faunal remains provide an ecological framework from which to interpret human behavior, including diet, subsistence, settlement, and mobility. In this study, we present isotopic analysis of four well-dated sites that span a 3500-year record along the Feather River, the biggest tributary of the Sacramento River located in Northern Central California. Through carbon, nitrogen, and sulfur stable isotopes we explore the effects of human population growth on the type(s) of browse that was available for game, as a reflection of landscape modification and maintenance. As well, we hypothesize that as populations grew regionally, game came from a smaller territorial range, and use changes in intra-species isotope variation to evaluate this hypothesis.

Morales, Jessica [225] see Lopez, Escee

Morales, Ridel (Universidad Nacional Autónoma de Honduras, UNAH), Carmen Julia Fajardo (Universidad Nacional Autónoma de Honduras) and Blanca Fajardo (Universidad Nacional Autónoma de Honduras)

[299] *Aportes a la Interpretación Arqueológica de la Zona Sur en Honduras*

Los departamentos de Choluteca y El Paraíso al sur de Honduras cuentan con un escaso registro arqueológico de asentamientos prehispánicos y coloniales. El desconocimiento de su historia deriva constantes saqueos y destrucción arqueológica, alterando el patrimonio cultural y generando un vacío histórico a las comunidades aledañas a estos sitios arqueológicos, desvinculándolas con su pasado. El Proyecto Arqueológico El Paraíso y Choluteca (PAPCH) comienza en el año 2016 como parte de los procesos de formación de estudiantes de pre-grado en la Carrera de Antropología de la Universidad Nacional Autónoma de Honduras. Este tiene como propósito conocer y documentar la ocupación prehispánica en la zona sur delimitada en un polígono de aproximadamente 365 kilómetros cuadrados. A inicios del año 2017 se realizaron los primeros reconocimientos arqueológicos, identificándose más de quince sitios arqueológicos. La evidencia material registrada fue documentada, preclasificada y analizada y como resultado se muestran patrones relevantes para la comprensión de la zona sur en Honduras. Entendiéndose que las sociedades no son órganos aislados de su contexto general, se propone la posibilidad que las poblaciones en la región sur participaron en relaciones de largo alcance entre sociedades al norte y centro de Nicaragua así como al centro de Honduras.

Morales Contreras, Juan Julio [55] see Rangel, David

Morales Forte, Rubén (Universidad del Valle de Guatemala) and Maxime Lamoureux St-Hilaire (Tulane University)

[337] *The Architecture of the Classic Maya Regal Palace of La Corona, Guatemala*

The regal palace of La Corona flanks Plaza A to the west and is the largest construction at the site: a complex of structures sitting atop a sustaining platform extending over ca. 80 x 55m, and 7m in height. This paper describes the architecture of the two northern groups of the regal palace during their two last phases of construction, spanning roughly 750–850 A.D. While the Northeast Group comprised elaborately decorated corbel-vaulted buildings, the Northwest Group featured a mix of sturdy corbel-vaulted rooms and semi-perishable structures. This paper focuses on architectural designs, layout, and features, allowing to reconstruct the functions of the buildings, which include: residential, economic, administrative, ceremonial, and communicational functions. This functional study informs on what activities were performed in this ancient political institution and how those changed over the course of the last century of occupation of this ancient polity.

Morales-Aguilar, Carlos [18] see Paine, Richard

Morales-Arce, Ana [97] see Waller, Kyle

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Moran, Kimberlee (Rutgers University—Camden)**[204]** *The First Baptist Church of Philadelphia's Burial Ground: "moved" in 1860; "excavated" in 2017*

In November of 2016, the Philadelphia Inquirer published an article about bones found at a construction site at 218 Arch Street. As a private project, no city office would take charge of the human remains despite the fact that construction equipment was exposing and damaging them. The Mutter Institute, as a collaborative research organization associated with the study of historic human remains, approached the property developer with an interest to learn more about the bones found at the site. What ensued was a race-against-time excavation of a portion of the First Baptist Church of Philadelphia cemetery, supposedly moved in 1860. This presentation will provide an overview of the initial salvage excavation, what was discovered about the site during the early days of the project, and the recent work of our multi-disciplinary team as we attempt to harness research potential out of a less than ideal situation.

[62] *Moderator***[204]** *Chair*

Moran, Kimberlee [107] see Dhody, Anna

Morehart, Christopher (Arizona State University)**[230]** *Cosmologies of Ruins and Ruination: Infrastructures and the Anthropocene*

Scientists debate the Anthropocene as a geological epoch. But as a cultural phenomenon, the Anthropocene projects a cosmology across history. This paper specifically examines how this cosmology understands the materiality of infrastructures, the built substrate upon which networks of human and non-human worlds intersect and collide. I argue that this cosmology contrasts infrastructures of the recent past as dangerous and polluting against infrastructures of the distant past as sacred and pure. This paper approaches this matter via the analysis of archaeological, historical, and ethnographic data over the past 1000 years in the Basin of Mexico. This case is particularly relevant because this region's landscapes, places, and people both have defied and haven fallen within the limits of the Anthropocene cosmology. The development in infrastructures tied to varying institutional systems has always had to encounter—physically, socially, and culturally—the materiality of precedent, a trajectory that shows the Anthropocene is not simply geological or cultural but also is political. The need to project a cosmology of sustainability onto the present and into the future depends upon how the Anthropocene's ideal and contrasting categories are strategically deployed.

[230] *Chair*

Morehart, Christopher [101] see Mejía Ramón, Andrés

Morell-Hart, Shanti (McMaster University)**[163]** *Changing Plant Economies and Diverse Plant Practices at Piedras Negras*

Botanical residues recovered from the Piedras Negras kingdom have yielded rich information about activities and economies of ancient inhabitants. Data for this paper were derived from large-scale excavations targeting Classic Period craft production areas, defensive features, and dwellings. Evidence of agricultural practices as well as the collection of wild and fallow-dwelling plants has been revealed through charred seeds and other botanical residues. The recovered archaeobotanical remains indicate the use of several typical economic species, as well as a range of uncommon plants that may have been used for various purposes including medicine, ornament, and trade. Moreover, the distribution of species across the landscape informs our understandings of place-making in terms of distinctiveness or overlap in activities at individual loci. The diversity of practices represented by the botanical remains adds nuance to traditional paradigms of Classic Period ethnoecology and economy in the Usumacinta region.

[76] *Discussant***Morello Repetto, Flavia (Instituto de la Patagonia, Universidad de Magallanes), Marta Alfonso-Durruty (Universidad Alberto Hurtado, Departamento de Antro), Tom Amorosi (American Museum of Natural History, USA), Victor Sierpe (American Museum of Natural History, USA) and Manuel J. San Román (American Museum of Natural History, USA)****[155]** *Junius Bird Collections from Sites Rockshelter 1, 2 and 3 (Beagle Channel, Patagonia, Chile)*

Between 1933 and 1980 Junius Bird, researcher from the American Museum of Natural History (AMNH) New York, traveled through southern Chile where he carried a wide array of archaeological excavations and studies. Towards the beginning of this period, Bird conducted extensive excavations in three sites in the Southern most region of Fuego-Patagonia. Collections from these sites are currently housed at the Division of Anthropology AMNH, and were recently analyzed as part of the activities of Grant FONDECYT 1140939.

The sites are located in Tierra del Fuego and the Navarino islands (east and west of the Beagle channel respectively). These sites, Rockshelter 1, 2 and 3, are large shell middens associated with rock shelters. Lithic and bone technology information from the collections is presented and assessed. Data collected from the assemblages is compared to the records and the scarce information of these archaeological sites extant today. The results provide a general overview of archaeological marine hunter-gatherers, highlight the importance of raw materials among them, and further inform about their distinctive technological traits during the second half of the Late Holocene. Subsistence, stratigraphic and context information is based on the detailed record of Junius Bird's field notes.

Morello Repetto, Flavia [153] see Belmar, Carolina

Moreno Zapata, Paula Patricia [100] see Dalton, Jordan

Morer, Ignacio [146] see Lozano, Sergi

Morett Alatorre, Luis (Universidad Autónoma Chapingo) and Aleksander Borejsza (Universidad Autónoma de San Luis Potosí)**[59]** *El Sitio Arcaico Temprano de las Estacas (Morelos) y Su Tecnología de Hogares*

Se analizan y discuten las evidencias arqueológicas relativas a tres distintas modalidades de hogares del Arcaico, todos ellos documentados en una secuencia deposicional en el margen poniente del río Yautepec, diferenciados éstos por sus sistema constructivo, requerimientos de inversión de trabajo, potencial térmico y funcional, registrado uno en 2000 por el Proyecto Arqueobotánico Ticumán, y varios más en 2015 por el Proyecto

Arqueológico Las Estacas (municipio de Tlaltizapán, Morelos, México). La localidad se caracteriza por haber sido empleada como campamento estacional a lo largo de unos cuantos siglos cerca de 6000 a.C., según las dataciones por radiocarbono que se obtuvieron. El análisis y clasificación de las tres modalidades documentadas (hogueras, fogones y hornos), busca derivar posibles implicaciones sociales de cada uno de los sistemas, en la perspectiva de poder ser empleada como herramienta para la construcción de hipótesis de trabajo y el diseño de estrategias para la exploración extensiva en sitios del Arcaico regional, y eventualmente en otras del mismo horizonte cultural.

Morett Alatorre, Luis [59] see Joyce, Arthur

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Moretti, John (Museum of Texas Tech University) and Eileen Johnson (Museum of Texas Tech University)

[188] *The Late Pleistocene (Rancholabrean) Vertebrate Local Fauna from Zone 3 of Kincaid Rockshelter (41UV2), Uvalde County, Texas*
Kincaid Rockshelter (41UV2) is a stratified, multi-component archaeological site spanning the late Pleistocene-Holocene in Uvalde County along the Sabinal River in south-central Texas. Texas Memorial Museum investigations in 1948 produced a small but relatively diverse sample of late Pleistocene (Rancholabrean) vertebrates from the lacustrine Zone 3 depositional unit. Zone 3 material was examined as part of a review of American lion (*Panthera leo atrox*) remains from Texas. New qualitative and quantitative observations demonstrated the presence of two forms of extinct horse (*Equus mexicanus*, *E. francisi*), dire wolf (*Canis dirus*), American lion, yesterday's camel (*Camelops hesternus*), ancient bison (*Bison antiquus*), mammoth (*Mammuthus*), alligator (*Alligator mississippiensis*), softshell turtle (*Trionyx*), pond turtle (*Trachemys scripta*), and extinct box turtle (*Terrapene carolina putnami*). While the presence of American lion in Zone 3 was confirmed, reported jaguar (*Panthera onca*) remains were re-assigned to *Panthera leo atrox*. Zone 3 specimens placed the American lion in the Balcones Escarpment, a diverse modern ecotone between the rugged Edwards Plateau and the Gulf Coastal Plain. In combination, four confirmed records of *Panthera leo atrox* extended across Texas, from the Southern High Plains to the Gulf Coast, evincing the versatile ecology of this dominant Rancholabrean carnivore.

Moretti, John [182] see Johnson, Eileen

Moretti-Langholtz, Danielle (College of William & Mary) and Buck Woodard (American University)

[255] *An Evidence-Based Reinterpretation of the Brafferton Indian School*
The 1693 Charter establishing the College of William & Mary in Virginia, includes a mandate to educate the "Western Indians." After securing funding for the Indian school from the estate of the scientist Robert Boyle, a magnificent Georgian-style structure was built to house the "Indian boys." The received history about this endeavor maintains that the Indian school at William & Mary was unsuccessful. Documentary evidence from both sides of the Atlantic, as well as archaeological evidence, situates the Brafferton Indian School within the Atlantic World's network of trade, politics of church and state, and offers new insights into the legacy of the Brafferton Indian School among descendant communities with ties to the eighteenth-century school.

Morey, Darcy [212] see Jeger, Rujana

Morgan, Brooke (State Historical Society of North Dakota)

[124] *When Window Mesh Is Worth It: Assessing the Potential of Microrefuse in Spatial Analysis of Hunter-Gatherer Sites*
The smallest pieces of chipped stone flaking debris are often overlooked in the analysis of hunter-gatherer camps. Several factors account for this, including recovery methods, research focus, and time and cost allotted for a project. At shallowly-buried sites where features have been obliterated, concentrations of microrefuse have the potential to reveal in situ activity areas or secondary deposits formed by batch dumping. This paper presents a case study of the Mountaineer Folsom site near Gunnison, Colorado, to illustrate the interpretive value of flakes <2 mm in maximum dimension. Results indicate that, while time-consuming, performing spatial analyses at this resolution provides insight into human behaviors that would go otherwise undetected in the archaeological record. At Mountaineer in particular, small flakes reveal how hunter-gatherers perceived and used the space associated with a dwelling structure.

Morgan, Christopher (University of Nevada, Reno)

[174] *High Altitude Settlement as Evolutionary Process*
The peopling of high altitudes and altitude's ecological analog, high latitude, are critical to understanding worldwide human dispersals and the diversity of human adaptation but are still quite poorly understood. Within this context, this paper presents a model for the initiation, establishment, and maintenance of permanent high altitude settlements, especially in middle latitudes. This model takes into account the limiting factors found in such settings, the costs and benefits of different ways of coping with these limitations, and the contexts under which different behavioral strategies and physiological changes might be expected to be selected either for or against. The model is evaluated with archaeological data from the Rockies, Intermountain West and the Argentine Andes. This evaluation suggests that in most scenarios demographic packing triggers increasingly intensive high altitude use, that establishing semi-permanent or permanent settlements requires economic subsidization with lower-altitude resources and increasingly costly high altitude ones, and that maintenance of high altitude lifeways is tenuous and contingent upon both biological adaptation and/or articulation with larger regional economies.

Morgan, Michele (Peabody Museum, Harvard University)

[322] *Discussant*

Morgan, Robert (USDA Forest Service, Francis Marion National Forest)

[106] *Identifying Cultural Landscapes in Wilderness Areas on the Francis Marion National Forest*
Wilderness is often interpreted to mean areas of pristine nature lacking evidence of human activity. But how realistic is this view given the length of human occupation where many endeavored to mold the landscape to suit their needs? The Francis Marion National Forest is positioned at the northern end of the Sea Islands Coastal Region of the South Atlantic Slope and contains four designated wilderness areas. Given the size and condition of the two largest wilderness areas the Forest Service employed remote sensing techniques to quickly identify cultural landscapes within areas. The most expeditious technique was to use of the forest's hillshade images derived from digital elevation models. This provides a visual scene of what the bare earth looks like. Grayscale and color ramps are used to display the hillshaded elevation model revealing extensive landscape modification within the wilderness areas.

Morgan-Smith, Mary (University of North Carolina at Chapel Hill)

[170] *Ts'uul y Páalitsil: Considering the Role of Debt at Rancho Kiuc, Yucatán, México*
The accumulation of debt by Maya speaking laborers has long been understood as integral to Yucatán's hacienda system in the 19th century. Though the contexts and nature of creditor-debtor relationships are variable and contested, evidence for debt is consistently present in documents related to large, corporate estates. But what does indebtedness look like beyond the hacienda on small-scale estates? In the absence of historical documents, or evidence of a company store, can debt be observed materially? This paper examines the role of debt in the relationship between landowners and laborers at Rancho Kiuc (ca. 1760–1950); a small, privately-owned cattle ranching estate in the Puuc Hills of Yucatán, Mexico. Owned and worked by generations of Maya speakers, narratives of indebtedness to the Rancho's owners are woven throughout the oral history of the community. Inequalities evident in the site's household assemblages will be considered alongside the social memory of labor relations at the Rancho in exploring debt's role in sustaining the Rancho's laborer population.

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Moriarty, Ellen (Community College of Vermont) and Matthew Moriarty (Castleton University)

[168] *Kindling Curiosity: Assessing the Early Results of Educational Outreach and Archaeology in the South Lake Champlain Basin, Vermont*
Members of the general public often view local prehistory from an artifact-based perspective, with a limited or incomplete understanding of the people who made and used such items. This view of the past is often paired with misunderstandings about both the nature of ancient settlements and the need to protect them as vital cultural resources. Initiated in 2016, the South Champlain Historical Ecology Project (SCHEP) has two goals: to study patterns in human-environment interaction along the southern Vermont shore of Lake Champlain, and to increase local knowledge of the substantial cultural heritage resources within the project research area. The SCHEP study area is remarkable in terms of both its ecological diversity and tremendous time depth of human activity, providing an excellent platform from which to kindle curiosity, engagement, and increased protection within local populations. This paper discusses one major component of SCHEP's outreach activities: work with students in elementary, high school, and colleges in the study area. Using the results of surveys collected during a program of school and field visits, we consider the attitudes and impressions of youth and young adult participants towards local prehistory both before and after their work with SCHEP.

Moriarty, Matthew (Castleton University), Ellen Moriarty (Community College of Vermont), Rosy Kirk (University of Vermont) and Bryant Garrow (Castleton University)

[301] *At the Gateway to Vermont: Recent Investigations at the Galick Site, West Haven, VT*
In 2016, the South Champlain Historical Ecology Project (SCHEP) initiated investigations at the Galick Site as part of a regional study focusing on long-term human-environment interaction within the South Lake Champlain area. Situated at the confluence of long-distance trade routes and within an area of remarkable ecological diversity, the Galick Site constitutes a key setting for examining historical ecology at the southern end of Lake Champlain. To date, SCHEP has conducted two field seasons at the Galick Site, analyzed more than 1,000 artifacts collected by the site's previous landowner, and completed a range of spatial and technical analyses. These investigations have revealed the Galick Site to be a large, multicomponent campsite and settlement used extensively from the Late Paleoindian period up to the Historical era, with particularly heavy usage during the Middle to Late Woodland interval. These investigations also provide initial confirmation for earlier suppositions that the Galick Site served as an important central place for a wide range of economic and social activities occurring within the South Lake Champlain area.

Moriarty, Matthew [168] see Moriarty, Ellen

Moritz, Mark [283] see McCarriston, Joy

Moriya, Toru [18] see Tsukamoto, Kenichiro

Morris, Julia and Severin Fowles (Barnard College, Columbia University)

[259] *The Wolf under the Plaza: Pastoralism and Predation in Spanish New Mexico*
The nomadic tribes of the Plains—notably, the Comanche and Apache—are typically considered the main obstacles to the northern expansion of the Spanish empire in North America. But early Spanish settlers in New Mexico found themselves up against another formidable foe that has received far less attention in the literature: the wolf. Indeed, for an expanding pastoral society, the wolf posed perhaps the biggest threat to local economic welfare. In this paper, we report on the recent discovery of a double wolf burial dating to the 17th or early 18th century in the town of Dixon. Our analysis casts a spotlight on the threat these canids posed to early herders in the region and provides an opportunity to reevaluate the role of the wolf in Southwestern pastoral society more generally.

Morrison, Blythe (Northern Arizona University)

[187] *An Investigation of Ancient Turkeys near Houck, Arizona*
This research explores microscale patterns of human-avian interaction in the prehispanic Southwest by identifying evidence of *Meleagris gallopavo* (turkey) use at a series of multicomponent sites near Houck, Arizona. Using legacy field notes, maps, photos, and artifacts housed at the Museum of Northern Arizona, I provide information about the spatiotemporal contexts of turkey remains at the Houck site cluster. The area of focus was primarily occupied between AD 800–1250, before and during the transitional period when turkeys became nutritionally significant to local populations. The presence of Chacoan masonry at one of the larger habitations indicates linkage with a larger cultural phenomenon. When the sites were excavated during a highway expansion project in the early 1960s, turkey remains were found in a number of different archaeological contexts. Using spatial analysis, faunal evaluation, and ethnographic review, I identify trends in turkey presence over time. I analyze use patterns by engaging concepts of behavioral archaeology, domestication theory, and multispecies ethnography. This research provides innovative information on the range of relationships between Ancestral Pueblo people and turkeys in the ancient Puerco Valley and the implications that the Houck community provides within the larger picture of avian domestication in the American Southwest.

Morrison, Jerolyn E. [298] see Vitale, Salvatore

Morrison, Kathleen (University of Chicago)

[213] *6k Years of Land Use in South Asia: Sustainability, Power Relations, and Tropical Variability*
Tropical environments vary significantly in terms of rainfall and seasonality; these differences make a difference in the kinds of land use strategies that work over the long term. This paper reviews some of the opportunities and constraints of tropical environments in South Asia, considering the range of land use practices deployed over the last 6,000 years in this region. I argue that some practices which could be called sustainable also come at a high cost in terms of human dignity, particularly intensive farming associated with significant social inequity. Other land use practices support more egalitarian social forms, but under conditions of limited population density. We have much to learn from the historical experiences of the tropics—one of these is certainly the ambiguity of the notion of sustainability.

Morrisset, Sara (University of Cambridge), David Beresford-Jones (University of Cambridge) and George Chauca (National University of San Marcos)

[335] *Echoes in the Wake of Collapse: Cultural Connectivity during the Middle Horizon to Late Intermediate Period in the Lower Ica Valley, Peru*
This paper examines what happened to cultural connectivity on the south coast in the wake of Wari's collapse based on our ongoing investigations at the site of H-8 in the lower Ica Valley. We investigate in particular how the echoes of the Middle Horizon resonate in the genesis of the Late Intermediate Ica culture that emerged here thereafter. We present evidence that H-8 was first founded at this time (c. 1000CE), and operated as a caravanserai within an intensifying network of trade and exchange articulated by camelid caravans between a number of Ica Valley sites throughout the LIP. Lyon (1966) argues that the beginning of the LIP was marked by a revival of Middle Horizon iconography, suggesting particular cultural or political value of this period to the people of Ica. Moreover, the remote oracle/pilgrimage center of Pachacamac on the central coast appears to have exerted particularly powerful influence on Ica during the Middle Horizon, but also thereafter on the developing regional culture in Ica. This poorly understood relationship with the central coast may have had a pivotal role in the development and rise to power of the Ica people during the subsequent LIP period.

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Morrow, Juliet (Arkansas Archeological Survey), J. Christopher Gillam (Winthrop University) and Brandy Dacus[81] *Paleoindians of Arkansas: From the Mountains to the Mississippi of the Interior Southeast*

In the past two decades, advancing methodologies and the recovery of new cultural materials have expanded our knowledge of the earliest peopling of the Ozarks, Ouachita Mountains and Mississippi Valley of Arkansas. In the late 1990's, GIS analyses in the Mississippi Valley of northeastern Arkansas highlighted the significant association of early cultures to the lithic resources of the landscape and subsequent collaboration with PIDBA in the past decade has put this state-level record in continental context. Ongoing documentation of fluted-points and their geographic distributions continues to shed new light on these earliest cultures of the interior Southeast.

[120] *Discussant***Morrow, Sara (University of Notre Dame)**[296] *Consumption Practice and the Authenticity of "Irishness": Everyday Material Life on the Islands of Inishark and Inishbofin, Co. Galway, Ireland*

How were mass-produced consumer goods incorporated into everyday expressions of local and national identity in 19th and early 20th century Ireland? While archaeologists have explored the myriad ways that mass-produced goods circulated throughout the British Empire through networks of trade and exchange, less attention has been given to the way specifically British manufactured goods were incorporated into meaningful practices of material consumption within Irish communities. This project investigates how these industrially produced consumer products became woven into the social, religious, and cultural fabric of daily life in the Irish island communities of Inishark and Inishbofin from the late 18th century to the present day. Recent archaeological investigations by the Cultural Landscapes of the Irish Coast project on Inishark and Inishbofin, combined with the oral history of island residents, will further an understanding of the significant ways that mass-produced consumer goods were meaningfully incorporated into island life through the collection of delph (ceramics) on household dressers, and consumption of tobacco pipes in everyday life and during traditional Irish wakes.

[296] *Chair*

Morsink, Joost [140] see Hendryx, Greg

Morton, Shawn (Northern Arizona University) and Meaghan Peuramaki-Brown (Athabasca University)[82] *Spatial Structure and Ancient Neighbourhoods: A Re-evaluation of Methods and Interpretations at Teotihuacan, Mexico*

In a 2012 article exploring the spatial structure of post-Tlamilolpa phase Teotihuacan, Mexico, we invoked both a materialist body of method-theory known as space syntax and an interactional theory of community development. Through this framework, we discussed community structure and systems of authority expressed by the architectural masses and spaces of the city. In this paper, the authors revisit this approach, with fresh eyes and in the context of our growing knowledge of ancient urbanism. How might we modify our interpretations in the face of additional data, complementary/contradictory interpretation, and critiques of the methods employed? Does this approach still hold intellectual merit?

Morton, Shawn [37] see Peuramaki-Brown, Meaghan

Moses, Sharon (Northern Arizona University)[62] *Discussant***Moses, Victoria (University of Arizona)**[297] *Meat Production and Animal Sacrifice during the Urbanization of Archaic Rome*

During the Archaic period (8th-6th cent. BCE), Rome underwent rapid urbanization with concomitant social changes. This shift from modest settlement to urban center affected how animals were raised, distributed, and consumed. Namely, large-scale animal sacrifice rituals within the city acted as a new mechanism for distributing meat to the masses, provided by centralized authorities. The increased scale of animal sacrifice in the nascent city would have created new meanings to these rites and led to a new demand for meat in public spaces. While transhumance and larger herds had been used for meat production in central Italy before the Archaic Period, urbanization would have shifted the supply chain towards a reliance on animals raised outside the city. This paper uses zooarchaeological data to explore the supply chain of meat production and distribution from outside of the city and peripheral zones, urban husbandry, and civic identity in early Rome.

Moss, Emanuel (CUNY Graduate Center) and Christopher H. Roosevelt (Koç University)[130] *Digital Technology, Digital Practices: Incorporating Digital Techniques into Archaeological Excavation and Interpretation*

Digital methods in archaeology have led to new ways of recording, analyzing, and presenting archaeological sites and materials, but these new methods are adopted within the context of previously existing practices of archaeological work. Some digital recording methods in excavation build upon and sometimes displace long-standing analog methods with proven results. Digital representations of cultural materials present novel interpretive affordances compared to analog representations that, while they suggest new possibilities for analysis and scholarly communication, also challenge traditional framings through which such materials have been understood. This paper discusses these challenges in the context of implementing a 'born-digital' site-recording methodology at Kaymakçı, a Middle and Late Bronze Age site in western Anatolia, focusing on the effects of new digital techniques on concepts central to archaeological practice such as accuracy and precision, diligence and orthopraxy, as well as implications for working with digital representations of cultural materials in the lab and beyond.

Moss, Jessica (Georgia State University)[330] *Photogrammetry Reconstructions of the Excavation Process: An Animated Georeferenced Approach*

Photogrammetry can be used to reconstruct the excavation process in a way that aids in both interpretation and education. By peeling back the layers of each excavation level, three-dimensional documentation of the excavation process reveals both the archaeological materials and their context at various stages of excavation. This interdisciplinary tool can also be georeferenced with GIS and used within 3D modeling programs to extend its visualization applications into virtual or augmented reality platforms. This project examines both the methods and applications of this technique using data collected during excavations within Vista Alegre, Mexico. Units are reconstructed at regular intervals within a digital environment, creating a highly detailed animation that can be navigated and examined. Once georeferenced within ArcGIS, these collections are also used within an ongoing project to digitally reconstruct various phases of Vista Alegre for a Virtual Reality environment. Additionally, this project includes a discussion the potential educational uses of both Virtual Reality visualizations of this data and the interpretive possibilities of their use.

Moss, Julia [270] see McCheyne, Phil

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Motuzaitė Matuzevičiūtė, Giedrė (Lithuanian Institute of History)**[336]** *Geographical Margins as Key to Understanding Crop Dispersal Mechanisms in Prehistory: Case Study for Kyrgyzstan*

More than 8000 years ago, a variety of crop species began to spread across Eurasia, reaching its edges approximately 4000 years later. The chain of mountains that stretches across Central Asia constituted a geographical obstacle that slowed down the dispersal process. Special high altitude adaptive strategies were required not only by humans, but also by plants due to changes in the length of the growing season, climatic conditions, UV intensity, among other factors. Therefore, the mountain regions acted as geographical filters that influenced which plant species and their varieties got dispersed to more distant regions of Eurasia. The territory of Kyrgyzstan (almost 90% of the territory lies above 1900 amsl) therefore constitutes a key area for the study of crop and animal adaptation strategies, as it is in this area that the filtering effect on plant and animal selection by communities would have been the most distinctive. The archaeobotanical material presented in this talk comes from high altitude sites in Kyrgyzstan. Some elements of crop adaptation observed in the research contribute towards explaining the pattern of crop dispersal across Eurasia.

Mountjoy, Joseph (Universidad de Guadalajara, México)**[192]** *Discussant***Moyes, Holley (University of California, Merced)****[136]** *The Space of Liminality: Between Ritual and Theater in Late Classic Ancient Maya Cave Rites*

Performance theory recognizes that the boundaries between ritual and theatrical performances are often quite blurred, allowing shared methods of analysis between the two. While many have argued for a theater-state among the ancient Maya, few have ventured beyond the large ceremonies conducted in great plazas to consider the more esoteric nature of public, semi-public, and private rites taking place in the natural landscape. Ancient Maya caves were used exclusively as ritual spaces, yet there has been little consideration of the performance characteristics of these sites. The ritual performances conducted in and around caves create a space for thinking about these venues as “theaters” with audiences, performers, backdrops, and lighting. In this paper we analyze architectural modifications to caves found in the Chiquibul Forest Reserve in Western Belize. We argue that architecture structured space and determined the parameters of its use, illustrating how some features channeled movement; some restricted space, while others focused attention. Our study sheds new light not only on the performance characteristics of ritual cave use but on the nature of the participants as well.

[136] *Chair*

Moyes, Holley [134] see Ray, Erin

Mrozowski, Stephen (Fiske Center for Archaeological Research, University of Massachusetts Boston)**[327]** *Pragmatism and the Art of Collaborative Research*

This paper outlines the continuing development of the Hassanamesit Woods Project—a ten-year collaboration between the Fiske Center for Archaeological Research at the University of Massachusetts Boston and the Nipmuc Nation of Massachusetts and Connecticut. Drawing inspiration from the writings of pragmatic philosophers such as Fredrick Peirce, John Dewey, Henry James, Richard Rorty and Patrick Baert, this paper outlines the benefits of working collaboratively with indigenous groups such as the Nipmuc. The primary focus of the paper is the highly productive quality of the working relationship that has developed between the Fiske Center and the Nipmuc Nation that center on the ability of archaeology to document political continuity over the past 300 years. Research has helped in documenting community gatherings as well as the slow, but steady dispossession of Nipmuc land following King Philip’s War (1675–1676).

[327] *Chair*

Mrozowski, Stephen [247] see Wurst, LouAnn

Msimanga, Muzi [180] see Tomaskova, Silvia

Mt. Joy, Kristen (Texas Army National Guard)**[232]** *Moderator***Muller, Samantha (Rutgers University—Camden)****[204]** *An Overview of the History of LaGrange Cemetery and Some of Its Notable and Not So Notable Residents*

The First Baptist Church of Philadelphia was faced with something all churches confronted—the death of their parishioners. Their burying ground along with their church would evolve and change in both size and location over time. By mid-eighteenth century Lagrange Cemetery was in full use. Who occupied the First Baptist’s Lagrange Cemetery in early Philadelphia? Who were the notable and not so notable residents buried side by side? In exploring the history of over one hundred years of its operation beginning with the first burials on Arch Street to the believed removal of those interred to Mount Moriah, both pastor and parishioners are given their place in the cemeteries’ long history.

Mullin, John (Fort A.P. Hill, Virginia)**[281]** *Discussant***Mullins, Patrick (University of Pittsburgh)****[295]** *Frontier Landscapes in the Longue Durée: The Upper Moche Valley Chaupiyunga*

Physical landscapes shape, and are shaped by, human activity throughout prehistory, creating a palimpsest of anthropogenic and natural landscape features that archaeologists wrestle with to understand past human behavior. Located between the Andean highlands and the arid coastline, the Upper Moche Valley chaupiyunga no doubt would represent a geological and ecological frontier in the absence of human occupation. However, over two millennia of human activity are inscribed upon this landscape and make it an excellent case-study for understanding the construction of a frontier landscape over the longue durée. Is it inevitable that the region’s geological and ecological characteristics precluded its characterization as a demographic, cultural, and political frontier? At what points may the anthropogenic landscape depart from the natural in being identified as a “frontier”? What processes may affect such departures? These questions are addressed using GIS analyses of settlement patterns, landscape use, visibility, and movement applied to data collected during a full-coverage pedestrian survey of the Upper Moche Valley chaupiyunga by the author. Taking a diachronic approach to analyze two millennia of human occupation, this paper focuses on reconstructing the built landscape in order to test the effect of deeper landscape histories on subsequent occupations on the regional level.

Mullins, Patrick [68] see Hoover, Corey

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Mundt, Jessica (VCP Alexandria) and Jasmine Heckman (VCP)**[326]** *The Veterans Curation Program: Unintended Public Archaeology*

The Veterans Curation Program was created with the mission to rehabilitate U.S. Army Corps of Engineers (USACE) archaeological collections while providing temporary employment and vocational training to veterans. In the nine years that the VCP has been in operation, it has evolved into a dynamic public archaeology effort that engages non-archaeologists in the field of archaeology on a daily basis. This paper explores the varied approaches to public archaeology within the Program, as well as the intended and unintended outcomes.

Munger, Tressa (Augustana University), Caitlyn Stellmach, Laura Peck (Augustana University), KC Carlson (Augustana University) and Lee Bement (Oklahoma University)**[223]** *The Butchering Patterns Present at the Bull Creek Camp: A Late Paleoindian Site in Oklahoma*

Bull Creek, located in the panhandle of Oklahoma, is a rare late Paleoindian camp on the Southern Plains. Two separate occupation levels apparent at the camp indicate two seasons of habitation. The lower camp, dominated by bison bone, is the focus of this analysis. Bone tools and distinct butcher marks provide evidence of butchering behavior 9,000 years ago on the Southern Plains of Oklahoma. This poster describes the findings of butchering processes at the site. Large sections of bison are apparent at the camp as well as articulated leg elements broken into tools. The evidence provided in this poster indicates that the kill site is likely not far away and that bone tools were frequently used during this occupation of the site.

Munkittrick, Jessica (Memorial University of Newfoundland) and Vaughan Grimes (Memorial University of Newfoundland)**[88]** *Exploring Childhood Health through Lead Trace Element and Isotope Analyses: A Case Study of Historic Populations in Newfoundland, Canada*

Lead was ubiquitous throughout the cultural environments of the Atlantic World during the 18th and 19th centuries and can be toxic to humans, particularly children. There is a long history of examining human lead exposure using trace element and isotope data in archaeological remains, but most studies have sampled bone tissue, which is prone to diagenetic alteration. More recently, researchers are sampling tooth enamel, which is more likely to retain a biogenic record of lead exposure. Since teeth form during childhood and lead exposure reflects individuals' interactions with their physical and cultural environments, this tissue presents an intriguing means to examine childhood health. However, archaeological research often overlooks children as meaningful cultural actors. The consideration of childhood social theory can help to illuminate methodological and theoretical opportunities to produce better lead trace element and isotope data that can be more clearly incorporated into understanding the Child's World. By examining the lead trace element and isotope values of tooth enamel produced using ICP-MS and MC-ICP-MS from individuals of historic Newfoundland populations, this paper will outline these considerations through a case study of childhood lead exposure in 18th and early 19th century Newfoundland.

Munoz, Cynthia [153] see Mauldin, Raymond

Munson, Jessica (Lycoming College), Jonathan Scholnick (Lycoming College) and Lorena Paiz Aragon (Altar de Sacrificios Archaeological Project)**[302]** *Quality of Life Changes in an Ancient Maya Community: Longitudinal Perspectives from Altar de Sacrificios, Guatemala*

Inequality is a prominent and persistent feature of all large-scale human societies that has significant impacts on everyday life. Variation in material wealth and social capital as well as differential access to specialized knowledge and other resources directly impacts household quality of life (QOL) within ancient and contemporary communities. For the ancient Maya, the establishment of political institutions centered on divine rulership significantly contributed to QOL changes during the Preclassic and Classic periods (ca. 950 BCE—950 CE). However, tracking these variations and measuring their effects pose specific challenges for archaeology. Well-documented settlements with an extensive and long-term occupation like Altar de Sacrificios provide important contexts to investigate the rapid transformations associated with the emergence of institutionalized inequality and concomitant changes in QOL across diverse domestic settings. This poster presents the results of ongoing analysis of ritual deposits excavated by the Altar de Sacrificios Archaeological Project (2016-present) and previous investigations conducted by Harvard University (1958–1963) to gain a better understanding of the wealth variations and distribution of specialized knowledge within this ancient Maya community over a span of about 2000 years.

Munson, Jessica [101] see Mejía Ramón, Andrés

Muntz, Alice (Southern Illinois University Carbondale)**[81]** *Understanding Manifestations of Public Ritual in Late Mississippian Pottery: A Comparison of Millstone Bluff and Dillow's Ridge Ceramic Assemblages*

This research entails the thorough analysis and comparison of two ceramic assemblages to understand whether and how ritual manifests in pottery of the Late Mississippian Southeast. The study focuses on ritual phenomena exhibited at two Late Mississippian Period (ca. late 1200s A.D. to A.D. 1500) settlements in southern Illinois, the Millstone Bluff site in Pope County (11Pp3) and the Dillow's Ridge site in Union County (11U635). Millstone Bluff has been interpreted as a site of public ritual and unusual symbolic importance evidenced by its general location and topography, spatial organization, and distinctive rock art. Though Dillow's Ridge was the locale for an inordinate level of chert tool production, in other ways the site is understood to be typical of Mississippian villages for this region and time. The sites serve, respectively, as proxies for high and low levels of public ritual phenomena. As a case study of the Late Mississippian cultures of the Ohio River Valley, this comparison of the Millstone Bluff and Dillow's Ridge sites provides an opportunity to evaluate the efficacy of current ceramic analysis methods for identifying ritual and understanding the social motivators that underlie ritualized activity.

Murakami, Tatsuya (Tulane University)**[262]** *Changing Urban Networks in Formative Central Mexico: A View from Tlalancaleca, Puebla*

It is likely that Formative urban centers and their interactions with one another provided cultural and historical settings for the creation of Central Mexican urban traditions during later periods. Yet their urbanization process remains poorly understood. Our research over the last six field seasons indicates that some residential groups were settled at Tlalancaleca towards 800 BC and the settlement was urbanized with a significant population growth during the later Middle Formative period (ca. 650–500 BC); the city experienced large-scale urban transformations during the Late Formative (ca. 500–100 BC) and a subsequent and final urban expansion during the Terminal Formative (ca. 100 BC–AD 250). Tlalancaleca's long occupational history overlaps with that of Chalcatzingo as well as Teotihuacan and, thus, provides a unique opportunity to address long-term social transformations during the Formative period. Based on preliminary results of our research at Tlalancaleca, we will reconsider the trajectory of urban transformations in Central Mexico over 1000 years from the Middle Formative to the Terminal Formative/Early Classic periods and discuss its implications for understanding parallel and divergent trajectories of social transformation in later Formative Mesoamerica.

[152] *Discussant***[262]** *Chair*

Murakami, Tatsuya [262] see Taxis, Ariel

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Murphy, Beau (University of New Mexico), Adesbah Foguth (University of New Mexico) and Hannah Mattson (University of New Mexico)
[190] *A Case Study in the Use of 3D Modeling for Hypothesis Generation and General Archaeological Illustration*

Three-dimensional modeling has become increasingly common within the field of archaeology as relevant software has become more accessible and digital media more prevalent. Despite this increase in use, the ultimate utility of the method is often debated, even by its practitioners. This poster explores the practical applications of 3D modeling along two avenues: as a process for developing hypotheses and expectations during the excavation of architectural contexts, and as a tool for use alongside conventional archaeological illustration. The excavation of a Pueblo IV field house, commenced in 2017 by the University of New Mexico field school, is used as a case study. The process of building a 3D model based upon partial excavation and comparative research is described, and the outcomes of the study in terms of enhancing learning and hypothesis construction are reviewed. Presentation of resulting models produced in the digital software program Blender are then juxtaposed with traditional archaeological illustration and the benefits and drawbacks of employing each method for this purpose are discussed.

Murphy, RPA, Larry (SCRC)

[193] *Discussant*

Murphy, Melissa (University of Wyoming)

[100] *Colonial Demography and Bioarchaeology*

A growing body of bioarchaeological research into the biocultural effects of Spanish colonialism on native Andean communities shows that traditional and popular narratives emphasizing the roles of epidemic disease and Spanish military superiority in the conquest of the Inca Empire are oversimplified. In this poster, I synthesize recent bioarchaeological research from different sites in Peru that has interrogated the intricacies and etiologies of native mortality and depopulation, differential fertility, migration, and population recovery, as well as successful native adaptation and mortuary practices. New scholarship has yielded some compelling results about the entangled lives of Andeans, Spaniards, and Africans under colonial rule. These new works confirm the truism that bioarchaeological interpretation is much richer when the bioarchaeological lines of evidence are complemented and accompanied by other lines of archaeological data. The florescence of research in historical archaeology in the Central Andes holds promise for future bioarchaeological research and in this poster I also detail some directions and avenues for future research

Murphy, Melissa [169] see Garcia-Putnam, Alex

Murphy, Nell (American Museum of Natural History)

[322] *Moderator*

Murphy, Shaun (University of Toronto), Peter Bikoulis (University of Toronto) and Sally Stewart (University of Toronto; Archaeology Centre)
[303] *Landscapes of Acquisition and Mobility: Sourcing Raw Lithic Materials and Their Distribution in Central Cyprus*

Making use of several long-term survey projects in central Cyprus, the connection between chert sources, find spots and sites are analyzed using chemical and spatial analyses to examine the relationship between mobility and community structure. The Neutron Activation Analysis (NAA) of some 150 samples shows that distinct types of chert were preferred, primarily Lefkara transluents. Spatial analyses investigate the associations between particular chert outcrops, small lithic scatters and larger settlements based on this chemical analysis. Results demonstrate clear links between chert sources, lithic scatters and sites highlighting how early settlers used resources as they settled new landscapes. We see that people were willing to travel greater distances to access desired cherts. It is likely that other activities were embedded in these journeys, which would provide not only access to preferred cherts but to a hinterland rich in animals, edible plants, fuel and water. Based on the hierarchy of site sizes, ranging from isolated finds, small scatters and up to sites of several hectares, we may also be seeing a range of site use, from casual discard to seasonal resource exploitation and longer term habitation.

Murphy, Timothy (Vandenberg Air Force Base—Contractor)

[38] *A GIS Analysis of Ancient Human Trails, Human Behavioral Ecology, and Agency in the Mojave and Colorado Desert*

Desert environments pose challenging conditions to human travel in the form of exposure to intense weather and access to important water sources. Environmental constraints of the desert can explain people's decisions to consider energy-efficient modes of travel through the framework of Human Behavioral Ecology. Culture, however, does not always follow the model of Human Behavioral Ecology, even in environments posing challenges that require efficient ways of living. Cultural knowledge, beliefs, and values are shared through generations, transforming an environment from constraining to familiar. By exploring the relationship between environmental constraints and route selections of ancient humans, we can support Human Behavioral Ecology as a baseline explanation for ancient trails in the desert. Although people do not always follow the most energy efficient routes, shifting their focus from efficiency to a different value. Perhaps we can further understand how people selected routes within a certain environment by measuring and comparing the most energy efficient routes on a cultural landscape to actual trails on the same cultural landscape. GIS may help us see patterns of past human decisions to follow efficient routes, as understood through Human Behavioral Ecology, and routes that deviate from the norm of efficiency, potentially indicating Agency.

[38] *Chair*

Murray, Brendon (University of North Carolina at Chapel Hill), Patrick Mullins (University of Pittsburg) and Brian Billman (University of North Carolina at Chapel Hill)

[240] *GIS Analysis of Monumental Structures at the Late Moche Site of Galindo*

The site of Galindo was a major center of the Southern Moche Region during the Late Moche Period (600–900 A.D.) and represents an important temporal transition between Moche-style polities and the Chimú Empire in the Moche Valley. During Galindo's occupation, monumental construction shifted from adobe mound complexes to walled administrative centers known as cercaduras, suggesting a possibly larger socio-political change in how political power was being negotiated by elites. Working off of the concept of "architecture as artifact", this project aims to examine architectural investment in monumentality during the last years of the waning Moche political tradition. To do this, a 3D map was created using aerial photographs taken with a quadcopter drone and photogrammetry software. The various structures at Galindo were then identified and analyzed using GIS software to attain the necessary data on volume and form to create informed site reconstructions. Site reconstructions were then utilized to understand changes in labor investment, elite access to labor pools, and the form of monumentality through the site's occupation.

Murray, Emily Jane and Sarah Miller (Florida Public Archaeology Network)

[84] *Engaging the Public at Shell Middens to Address Climate Change Impacts: Heritage Monitoring Scouts (HMS Florida) at Shell Bluff Landing (8SJ32)*

Shell Bluff Landing (8SJ32) is a dense coastal shell midden with occupation spanning 6,000 years, located in the Guana Tolomato Matanzas National Estuarine Research Reserve in Ponte Vedra Beach, Florida. The site is threatened by climate change impacts and coastal dynamics that include salt water intrusion, flooding, and, most notably, erosion exacerbated by wave action from the Intracoastal Waterway. Since Shell Bluff Landing was acquired by the State of Florida in the 1980s, land managers employed numerous strategies to manage and track the erosion at the site. However,

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these efforts have proven largely unsuccessful. In 2016, the Florida Public Archaeology Network partnered with the Reserve to monitor and record changes at the site through the Heritage Monitoring Scouts (HMS Florida) program. The site serves as a training venue for engaging the public in citizen science monitoring and climate change impacts. Monitoring efforts have documented changes to the site including meters of shoreline loss following Hurricane Matthew.

Murray, John (Arizona State University), Jacob Harris (Arizona State University), Simen Oestmo (Arizona State University) and Curtis Marean (Arizona State University)

[89] *Using Surface Roughness to Identify Heat Treatment in Lithic Technology*

The heat treatment of stone to enhance flaking attributes was an important advancement in the adaptive toolkit of early humans. The earliest evidence for this is the heat treatment of silcrete 164 ka at the Middle Stone Age site Pinnacle Point 13B in South Africa. Heating stone prior to knapping alters the physical and chemical composition of the stone, and it has long been recognized that flaked heat-treated stone has a glossier surface. We expect this glossiness to result from a smoother flaked surface. Thus, we investigated whether surface roughness, as measured by a 3D microscope, can be used as a proxy to identify the presence of heat treatment in the archaeological record. The results of our unpublished pilot study suggested roughness parameters differ significantly between untreated and treated silcrete. In the present study, we record values for multiple surface texture parameters on a sample of experimentally created stone tools from paired heat-treated and untreated silcrete nodules. A Bayesian probability model, trained on the experimental sample, was then used to evaluate the probability individual artifacts have undergone heat treatment. This research provides a novel, probabilistic, cheap, and non-invasive technique for identifying heat treatment.

Murray, Matthew (University of Mississippi)

[196] *"Our Past is Not the Other"—Anthropological Archaeology and Academic Peripheries in Central Europe*

As an archaeologist who practices and teaches holistic anthropology and has long been fascinated by the rich prehistory of Central Europe, I am shy about sharing my anthropological tendencies with German colleagues. When I do, I am often greeted with surprise, confusion, and a polite suggestion that I should be in Papua New Guinea or other places where German anthropologists engage with people who are perceived as different from contemporary Europeans. In Central Europe, archaeology is traditionally tied to history and the people of its past are often assumed to be just like "us." Interpretive frameworks to explain the Iron Age, have long been derived from European medieval history, such as the concept of the Fürstentum ("princely seat") of the early Iron Age, or from the European Classics, such as the notion that ubiquitous late Iron Age rectilinear enclosures (Viereckschanzen) are functionally similar to Greek temples. While a new generation of German scholars embraces critical history and social theory, the idea that the later European past is a familiar place is persistent. As an outsider, both geographically and disciplinarily, I have challenged this perspective and sometimes received an illuminating rebuke from the European archaeology establishment.

Murrell, Monica [268] see Heilen, Michael

Murtha, Timothy (University of Florida)

[80] *Livelihoods and Opportunities: Household, Land Use and Landscape Change at Tikal*

Sometimes described as a mosaic, regional land use and landscape in the Maya lowlands offer a unique opportunity to investigate the spatial and temporal dimensions and the socio-ecological dynamics of a variety of cultural systems, settlement patterns, and the environment. Unfortunately, the majority of urban theory applied to the lowlands focuses exclusively on urban authority and power for the provisioning of resources. Such approaches offer useful discussion and debate about the scale and intensity of these systems, but provide little comparative anthropological information about the complex interactions among households, landscape, and ecology. Building on early regional archaeological science at Tikal, this paper describes and analyzes regional spatial and temporal variation of the distribution of households, land use, and resources in the region. Particular attention is paid to recent regional soil surveys as compared to what is known about settlement patterns. Emphasizing livelihoods and opportunities, the key purpose of the paper is to shift discussions in the Maya lowlands from generalized theory of urbanization, including obsolete urban and rural dichotomies, to household provisioning of food, resources, and ecosystem services. In this context, landscape and planning are spatially heterogeneous household centered responses best described as a lowland Maya mosaic.

Musser-Lopez, Ruth (River AHA (Archaeological Heritage Association))

[73] *Virgin Puebloan and Fremont Rock Art at Petroglyph Corral*

Though routine interaction may not have been the case, the Fremont were a part of the iconic world of the Virgin (Anasazi) Puebloan people who occupied southeastern Nevada north of Las Vegas in Evergreen Flats, 75 miles northwest the Lower Colorado River's north end bend. Within that region is Petroglyph Corral visually demonstrating Puebloan people at a Fremont fringe area where the two cultures may have competed, collided or even collapsed into one another and the more recent Numic tribes. Clearly a favored place that inspired recurrent cycles of symbolic affirmation, the contrasting motifs on vertical panels and porphyry slabs at Petroglyph Corral indicate definite breaks in continuity of heritage and world view over the centuries as rock art accumulated there. Along with the research of excavated archaeological deposits below the panels as a part of the Evergreen Flat Project (Horne & Musser-Lopez 2017), the repatinated art, buried art, faded art, layers of art, obfuscated art and replenished art tell a story of time and change spanning 3000 years from present day Numic speakers, back to the Puebloan and Fremont, with rare traces of Hohokam and Mojavean, the archaic people who came before.

Myers, Josh [5] see Herrmann, Edward

Myster, James, Brian Hoffman (Hamline University), Rikka Bakken (Hamline University), Steve Goranson (Minnesota Historical Society) and Camille Warnacutt (Hamline University)

[39] *Porte des Morts Lighthouse Ruins Excavation: The Study of a Mid-19th Century Lighthouse Site on the Great Lakes*

A historic maritime ruins site located on Plum Island off the tip of Wisconsin's Door Peninsula was acquired by the U.S. Fish and Wildlife Service in 2007. The Porte des Morts Lighthouse (47DR497) operated briefly from 1849 to 1858 until replaced by a more substantial lighthouse on nearby Pilot Island. In partnership with Hamline University, excavations took place between 2013–2015 to uncover evidence as to both the architecture of the building and domestic life on the maritime frontier. Spotty historical evidence suggested that the building was not constructed to contract specifications and island life was challenging for Lighthouse keeper William Riggins and his wife Phebe and their growing family. Excavations uncovered intriguing evidence of desperate attempts by the family to stabilize crumbling walls and keep the light beacon functioning. In addition, the recovery of a robust assemblage of nearly 16,000 artifacts and faunal remains paints a picture of their daily lives from teaching writing skills to their children, feeding the family dog, and revealing Phebe's love of "Romantic Scenery" dishes.

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Nabity, Samantha (Utah State University), Jacopo Baggio (Utah State University) and Jacob Freeman (Utah State University)

[105] *Does Increasing Social Complexity Buffer Energy Consumption from the Effects of High Frequency Climate Variation? A Western European Case Study*

Humans, like any other organism, must continuously adapt to or modify their surrounding environment to maximize their fitness. One of the main sources of environmental variation that humans must cope with is climate variation. Adjustment to climate variation may include increasing investments in infrastructure (social, technological, cognitive), which acts as a buffer, filtering out the effects of higher frequency climate variation on the ability of individuals and populations to consume energy, and thus maximize an individual's fitness or the mean fitness of a population. As investments in infrastructure increase, social complexity increases, and higher frequency climate signals (such as annual temperature or precipitation) should become increasingly more out of phase with annual energy consumption (representing a social output). Using energy consumption levels and climate data from Western Europe over the last 400 years, we evaluate this idea that increases in infrastructure increasingly buffered the energy consumption dynamics of populations from high frequency climate variations. The results of our analysis are important for developing a general theory of human responses to climate change that can be applied to archaeological case studies.

Nakhai, Beth Alpert (The University of Arizona)

[338] *Gender-Based Violence and Discrimination in Middle Eastern and North African Fieldwork*

In 2014, inspired by the work on gender-based violence in field settings done by anthropologists Clancy, Nelson, Rutherford, and Hinde, I began investigating field safety for archaeologists working in the Middle East and North Africa, the region in which I work. At that time, I was a trustee of the American Schools of Oriental Research—and I chair its Initiative on the Status of Women. I began by quantifying problems (Survey on Field Safety: Middle East, North Africa, and The Mediterranean Basin: 2014, 2015), looking at gender-based violence and discrimination in field assignments and in post-field research and publication.

My goals are to: determine factors contributing to safe/unsafe fieldwork environments; determine best practices and effective ways to implement them; develop standards, policies, protocols and trainings to educate excavators about relevant ethics and laws for field and research projects; and, under ASOR's auspices, provide all excavators with much-needed information. At The University of Arizona, I work with the offices of Title IX, Global Initiatives (Study Abroad), and the Dean of Students, and I am involved with the new Center for the Study and Prevention of Gender-Based Violence. This presentation discusses the various components of this project.

Namirski, Cezary [136] see Skeates, Robin

Napolitano, Matthew (University of Oregon), Robert J. DiNapoli (University of Oregon), Geoffrey Clark (Australian National University), Ester Mietes (D7 Archeologie) and Lauren Pratt (University of Michigan)

[13] *Modeling the Early Settlement of Yap, Western Caroline Islands*

In recent decades, increased research on the early human settlement of islands in western Micronesia (northwest tropical Pacific) has resulted in a relatively clear picture of the Palau and the Mariana Islands being settled between ca. 3200–2800 years cal BP. Despite an increased understanding of when the two major archipelagos were settled, human arrival in Yap, a group of four small islands situated between the two other islands groups, remains unclear. New radiocarbon dates from the southern site of Pemrang suggest settlement as early as ca. 2400 cal BP, yet paleoenvironmental and linguistic data suggest settlement could be as early as ca. 3200–3000 cal BP. Clarifying these conflicting lines of evidence is critical to our understanding of human settlement in the region, yet is hampered by a lack of paleoenvironmental and archaeological research. This paper presents the results of a systematic auger survey at Pemrang and uses the location of shell and Calcareous Sand Tempered pottery to model the extent of early settlement in southern Yap.

Napolitano, Matthew [13] see Kingrey, Haden

Napora, Katharine (University of Georgia), Victor Thompson (University of Georgia), Jeff Speakman (University of Georgia) and Alexander Cherkinsky (University of Georgia)

[35] *Establishing a Multimillennial Dendrochronological Sequence in the Atlantic Southeast, USA*

This paper discusses advances in the development of a multi-millennial ring-width chronology based on bald cypress (*Taxodium distichum*) from the mouth of the Altamaha River in Georgia. New insights into the environmental history of coastal Georgia are discussed, including the archaeological implications of major climatic and ecological events visible in the ancient cypress rings. Finally, we focus on environmental conditions before, during, and after the transition from the Late Archaic (ca. 4500–3100 B.P.) to the Early Woodland (ca. 3100–2400 B.P.), comparing the timelines of change indicated by tree-ring proxies to events occurring in the region and around the world in this period of global cultural and climatic upheaval.

Narvaez, Alfredo [7] see Michell, Samantha

Narvaez, Jose

[64] *Archaeological Investigations in El Paraíso. A Late Pre-ceramic Architectural Complex in Lima—Peru*

El Paraíso architectonic complex is located in the lower section of the Chillón River Valley, less than 2 km from the Pacific Ocean, in Lima, the capital city of Peru. It is composed by 14 structures, or huacas, distributed in an area of 47 hectares, in a rural place named Chuquitanta. The site is recognized as one of the earliest expressions of monumental architecture and social complexity in Peru since the works of Frédéric Engel in the 1960's and Jeffrey Quilter in the 1980's. Since 2015, the Peruvian Ministry of Culture is developing a project of investigation, conservation and restoration of the site. This presentation explains the results of the first two years of the project. So far, we developed excavations in architectonics I, III, IV, VI, and IX, defining the constructive phases of those buildings, and recovering evidences of an economy based on agriculture production complemented with the exploitations for marine and riverine resources. Also, offerings chambers were discovered with especial artifacts like slings, lithic clubs, digging sticks, a cactus, and the burial of a young women. Other burials of the Late Intermediate and Late Horizon Periods are giving important information about the Colli occupation of the site.

Nash, Brendan [59] see Joyce, Arthur

Nash, Carole (Geographic Science, James Madison University)

[328] *Soundscape and Place: Acoustic Archaeology in the Mountains of the Middle Atlantic*

As permanent landmarks, waterfalls and associated plunge pools are documented among traditional peoples as liminal and sacred spaces. A review of ethnographic and archaeological literature identifies these features as sources of life and transition, requiring proper preparation in advance of approach. The symbolic and experiential character of waterfalls may be in evidence in the Virginia Blue Ridge, where a small number of Middle and Late Woodland sites near named waterfalls are outside the topographic parameters of modeled site locations. Found on north-facing, steep slopes, these small ceramic-bearing sites have been documented in the several well-known falls settings in the Blue Ridge Mountains. Decibel readings and

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sound mapping with ArcGIS demonstrate the correspondence of archaeological site locations to areas where waterfall sound is most highly magnified by stream hollow walls. An example of Feld's 'acoustemology,' which takes into consideration sensory experience and memory as central to place identity, these Blue Ridge sites may represent locations where Native peoples paused to prepare themselves prior to approaching spaces requiring reverence.

[328] *Chair*

Nash, Donna (UNCG)

[82] *Cerro Mejía: A Wari Community Divided?*

The Wari-affiliated community on Cerro Mejía is divided by large walls that cut the slopes into vertical strips. These segments of the site may represent divisions of the settlement that the occupants recognized, agreed with, and maintained or these groupings may have been imposed by Wari officials. In this paper, I describe the features of Cerro Mejía and consider this important question. In light of overt differences between houses with regards to form and construction techniques I suggest that barrio walls divided colonists from different regions, who arrived sometime in the seventh or eighth century CE. Also, despite several generations of co-occupation at Cerro Mejía it appears some elements of quotidian life were maintained as distinctive between these groups when the site was abandoned and smaller communities were founded in the early Late Intermediate Period (ca. 1250 CE).

[165] *Discussant*

Nathan, Smiti [121] see Buffington, Abigail

Nation, Humberto, Leah Minc (OSU), Holley Moyes (UC Merced), Polly Peterson and James Brady (CSU Los Angeles)

[134] *Analysis of Culturally Derived Speleothem by INAA: An Analytic Approach to Sourcing*

Recent investigations in various surface and underground cave sites indicate the existence of extensive political, economic, religious and military exchanges between polities in the Maya lowlands of Belize.

The occurrence of "foreign" materials at surface and cave sites have become an increasingly well-documented phenomenon (Brady et al. 1997) and are indicative of transport of speleothems during ancient Maya cave visitations. This phenomenon has raised several questions such as the spatial and temporal extent of these interactions, practices, and specifically the relationship between Maya polities and proximal or distant caves.

Geochemical analysis of samples by Instrumental Neutron Activation Analyses (INAA) is a very common and reliable practice. In this study we analyzed (71) samples comprised of various types of speleothems (Stalactites, stalagmites, flowstones, cave pearls) collected in various locales in Belize (Macal, Barton Creek, Pine Ridge, Roaring Creek, Cave's Branch and Sibun Valley). Our samples were from two separate expeditions, the Belize Valley Speleothem Project and provided by Dr. Holley Moyes (U.C. Merced), and Xibun Archaeological Research Project provided by Dr. Polly A Peterson. Our results elucidates the use of INAA as a viable method of sourcing lithic materials, differentiating samples within the same cave and between different caves.

Nauman, Alissa [186] see Hull, Emily

Nautiyal, Vinod [3] see Gupta, Amita

Navarro Castillo, Marx [18] see Paling, Jason

Navarro-Farr, Olivia (The College of Wooster)

[292] *Teaching Scientific Anthropology in the Age of Trump: Towards a Pedagogy of Science Literacy and Advocacy*

The year 2017 was one of extraordinary science activism. Scientists took to the streets as the overwhelming empirical evidence demonstrating humanity's role in ushering in global warming continued to be ignored. Politicization of climate change, and science itself, has fostered a dangerous rejection of scientific knowledge prompting numerous conspiracy theories involving everything from so-called flat-earthers to anti-vaxxers, intelligent design proponents and climate deniers. Such perilous and unfounded claims thrive due to repeated efforts from faith-based organizations paired with the far right to frame science as leftist elitism at best and incompatible with faith at worst. Insufficient emphasis on effective science pedagogy darkens this picture. Within the curricular confines of anthropology courses, pedagogical strategies aimed at defining science while illustrating its uses within the discipline is critical. Learning goals aimed at 1) understanding science as process 2) critical thinking, and 3) competence in science literacy prepare undergraduates for engaging effectively in discussions about climate change, the Anthropocene, and its implications. In our age of unprecedented information access, an informed community of science advocates is a major defense against the myriad unfounded arguments, assertions of fake news, and spin.

[129] *Discussant*

Navarro-Farr, Olivia [98] see Goodrich, Arabella

Navarro-Farr, Olivia [242] see Varlan, Abigail

Nayak, Ayushi (Max Planck Institute for the Science of Human History), Michael Petraglia (Max Planck Institute for the Science of Human History), Nicole Boivin (Max Planck Institute for the Science of Human History) and Patrick Roberts (Max Planck Institute for the Science of Human History)

[310] *Domesticating the Mosaic: Stable Isotope Approaches to Agroecologies in South Asia*

The origin of agriculture is a long-standing and pivotal point of archaeological research. The focus, however, has predominantly been on the earliest instances of crop domestication, whereas less is known about the nature of early farming. South Asia with its mosaic of environments and early farming strategies demonstrates the need for nuanced attention to aspects of early agro-ecologies such as manuring, water management strategies, and animal husbandry. Stable isotope analysis of botanical, faunal, and human remains has increasingly emerged as a powerful tool for reconstructing local farming practices, including crop growing conditions, herding and foddering, and dietary reliance on different types of food. Here, I discuss how these methodologies are aiding in the development of a more detailed understanding of early agricultural strategies in the diverse eco-geographical zones of the Indian subcontinent. I argue that these datasets allow us to link subsistence observations to changes and differentiation in social organisation and to anthropogenic landscape use and perception.

Ndiema, Emmanuel [99] see Curley, Angelina

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Neeley, Michael (Montana State University) and Craig Lee (Metcalf Archaeological Consultants and Montana Sta)**[155]** *Assessing Cortex at the Beaucoup Site (24PH188/189) in Northern Montana*

Although archaeological analyses of lithic assemblages generate large quantities of data, it can be difficult to equate the observations with past behaviors. One variable state regularly recorded is that of cortex. The presence/absence of cortex is often linked to reduction intensity with variable cortical frequencies linked to early or late stage reduction and potentially reflective of residential mobility. However, we lack reliable markers or values to support our interpretations. Recently, Harold Dibble (and others) have proposed a method for evaluating assemblage cortex by comparing observed and expected frequencies. These values serve as a baseline for interpreting and understanding assemblage variability along the lines of forager mobility. This paper applies the method developed by Dibble and others to the lithic assemblage from the Beaucoup site (24PH188/189) in northern Montana, a Late Prehistoric site with spatially distinct kill, processing, and residential areas. The lithic raw materials found in the assemblage (particularly quartzites) occur on-site and, as a result raw material size, shape, and origins are known. Our preliminary examination of cortex patterns indicates spatial differences between the areas of the site which may reflect variations in residential mobility.

Neff, Linda, Ted Neff (Coconino National Forest), Peter Pilles (Coconino National Forest) and Ronald Krug (Verde Valley Chapter of the Arizona Archaeological)**[48]** *A Settlement Pattern Analysis of Yavapai and Apache Archaeological Sites in the Verde Valley Area, Central Arizona*

Ethnohistoric accounts, historic records, and the archaeological record indicate the Yavapai and Northern Tonto Apache lived a mobile lifestyle during Protohistoric time (approximately A.D. 1300—1850) across the diverse environment of the Verde Valley area of Central Arizona, just south of the Colorado Plateau. Due to their subtle, portable, perishable, expedient, and reused material traces across the landscape, archaeologists struggle to merely identify protohistoric sites much less distinguish between the Yavapai and Apache with their partially overlapping territories and similar lifestyles. Yet limited site recordation and excavation by archaeologists with a keen eye have revealed that diagnostic archaeological signatures such as rock clearings, rock rings, modified Puebloan masonry, roasting pits, rockshelters, rock art, utilitarian pottery wares, projectile points, and ground stone are present that indicate continuous occupation in the Verde Valley area during the Protohistoric period. Our poster presents the results of a settlement pattern analysis focused on Verde Valley area terrain within the Red Rock Ranger District of the Coconino National Forest. Using the Forest's archaeological databases and other data sources, we explore the Yavapai and Apache settlement pattern in relation to major drainages, environmental zones, Puebloan archaeological sites, and trails.

Neff, Hector (California State University-Long Beach)**[176]** *Cash Potting in Soconusco: The Case of Tohil Plumbate*

Tohil Plumbate, defined by distinctive technology and distinctive decorative style, is found throughout Mesoamerica, with peak frequencies in the central and western highlands of Guatemala and strong representation at Terminal Classic Maya centers like Chichen Itza. INAA-based source determination and recent fieldwork link the technology to the Pacific coastal zone of eastern Soconusco, near the Chiapas-Guatemala border. Curiously, however, key stylistic features, especially effigies and fancy, curvilinear incising, are almost absent from the production zone. The closest places where these stylistic elements appear in any frequency is at the piedmont centers of Izapa and Takalik Abaj and at Tajumulco, at an elevation of over 2500 meters in the western highlands of Guatemala. At these and other western-highland sites, Tohil Plumbate is found most commonly as whole vessels in burials and other offerings. These archaeological patterns suggest that fancy Tohil-style vessels were produced for consumption who resided outside the production region, hence it is an example of "cash potting" analogous to production of bananas, coffee, and other cash crops for export markets today.

Neff, Ted [48] see Neff, Linda

Negrino, Fabio [219] see Pothier Bouchard, Genevieve

Neill, Oscar (Arqueólogo)**[299]** *Entre Mesoamérica y el Área Intermedia, Patrón de Asentamiento Arqueológico en la Costa Nororiental de Honduras*

La zona nororiental de Honduras en la época prehispánica, y su interacción con Mesoamérica al oeste, ha sido poco abordada. El patrón de asentamiento regional así como interno de cada sitio es igual poco conocido y muchas veces confundido con el área vecina al este. Los reconocimientos de superficie en esta década nos han brindado resultados preliminares sobre el patrón de asentamiento regional y de sitio de la costa nororiental, concretamente en la Cuenca del Río Cangrejal, el Bajo Aguan en el Valle del mismo nombre, y la llanura costera entre Tela y Trujillo. Esto nos brinda una aproximación concreta al tipo de patrón de asentamiento en esta zona, así como el registro y mapeo de los sitios y la clasificación de estos como medio comparativo con los sitios Mesoamericanos y los del Área Intermedia, siendo el primer paso la identificación de posibles patrones culturales e interacción entre áreas culturales.

Neiman, Fraser (Monticello), Lindsay Bloch (Florida Museum of Natural History, UF), Jillian Galle (Digital Archaeological Archive of Comparative Slav) and Jeffrey R. Ferguson (University of Missouri Research Reactor)**[51]** *Developing Reproducible Methods for Defining and Evaluating Ceramic Compositional Groups Derived from NAA and LA-ICP-MS*

The Digital Archaeological Archive of Comparative Slavery (DAACS), in collaboration with MURR and UNC Research Laboratories of Archaeology, has analyzed the elemental composition of nearly 400 coarse earthenware sherds from eighteenth and early nineteenth century plantation contexts from Jamaica. All of the sherds were analyzed using Neutron Activation Analysis (NAA), while nearly forty percent of these same sherds were analyzed via laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). We develop a transparent workflow in R for identifying trial compositional groups and then evaluating them. We apply this workflow to elemental datasets generated by the two methods and compare the results, highlighting differences in the number of groups and relationships among sherd assignments to those groups. Finally, we assess the agreement among methods for evaluating our ideas about ceramic and manufacturing networks in early Jamaica.

Neiman, Fraser [51] see Galle, Jillian

Neitzel, Jill (University of Delaware)**[325]** *Color by Design on Hohokam Pottery*

This paper investigates whether hatched designs on Hohokam red-on-buff ceramics symbolized colors other than the red that was used to paint them. This idea is an extension of previous research done on Ancestral Pueblo and Mogollon black-on-white pottery. J.J. Brody initiated these investigations with his suggestion that hachure on Chaco ceramics from northwest New Mexico represented the color blue-green. Stephen Plog subsequently confirmed this hypothesis by comparing the colors and designs on other kinds of Chaco artifacts. More recently, Will Russell and colleagues applied Plog's analytical approach to Mimbres pottery from southwest New Mexico with somewhat different results. While they too found that hatched designs symbolized color, the color in this case was yellow rather than blue-green. Extending this research to the Hohokam may be severely constrained by the poor preservation of painted non-ceramic artifacts, but the results could provide new insights into cosmology, regional interaction, and cultural continuity throughout the late prehistoric Southwest.

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Neller, Angela (Wanapum Heritage Center, Grant County PUD) and Lourdes Henebry-DeLeon (Central Washington University)**[253]** *The Best Defense Is a Good Offense: Culturally Affiliating the Ancient One by Following the Law*

The 20 year journey to repatriation of the Ancient One was long, arduous, frustrating, eye opening, and an education in the NAGPRA law. Over the years we have discovered how poorly understood the law can be. In the case of the Ancient One, the ownership or control of his remains falls under Section 3 of NAGPRA for inadvertent discoveries on federal lands after 1990. An overview of the evidentiary standard applicable to cultural affiliation determinations under NAGPRA will be presented. All available, population specific data for the Columbia Plateau was used. Scientific certainty is not required but rather a preponderance of the evidence standard, or belief that the existence of a cultural affiliation is more probable than its nonexistence. The claimant tribes followed the requirements set forth in the NAGPRA law and regulations to establish a relationship of shared group identity that can be reasonably traced between the Ancient One and themselves.

[280] *Discussant*

Neller, Angela [253] see Valdez, Velma

Nelson, Erin (University of South Alabama)**[122]** *Ash Deposition and Community Building in the Mississippian World: A Case Study from the Yazoo Basin*

Ethnographic sources indicate that fire and its alternate forms—smoke and ash—are powerfully symbolic substances for many historic period southeastern Indian groups. The remains of fire are frequently deposited in ways that amplify its power, or alternatively, attempt to neutralize it. This paper examines ash deposition at Parchman Place, a late Mississippian period (AD 1300–1541) site located in the northern Yazoo Basin. Here, and elsewhere in the Southeast, Mississippian people incorporated ash and other substances with cultural significance into earthworks of differing scales and types. Drawing on ethnohistoric and ethnographic accounts regarding the importance of fire and the disposal of its remains, I argue that people called upon the various powers of fire by depositing ash in specific ways and at key transitional moments. In doing so, Mississippian people attempted to negotiate differing views regarding leadership, relations among community members, and the importance of maintaining their place within the Mississippian cosmos.

Nelson, Gil**[149]** *Discussant*

Nelson, Kit [147] see Petrozza, Michael

Nelson, Matt**[334]** *Comparing Two Archaeological Geographic Information Systems (GIS) Predictive Models: The Greater Yellowstone Ecosystem versus the Pinelands, New Jersey*

This paper compares two new predictive models of prehistoric archaeological site locations to better understand modelling successes and complications. For my recent M.A. thesis project, I created one model for Yellowstone National Park to predict Paleoindian site locations within the Greater Yellowstone Ecosystem of the northwestern Great Plains and Rocky Mountains. I created the second model for the Pinelands region of central New Jersey for the United States Air National Guard, Warren Grove Gunnery Range. Both regions—Yellowstone and the Pinelands—have enough previous archaeological data to propose a Geographic Information Systems (GIS) predictive model of prehistoric site locations. While construction of the models varied for a variety of reasons, I used generally similar modelling methodologies for both. However, these two models were developed from very dissimilar site locational data and from completely different regional landscapes. On one hand, the Yellowstone model was developed specifically for Paleoindian archaeological site locations over a large and diverse mixture of landscapes in the Great Plains and Rockies. In contrast, the Warren Grove Pinelands model was developed using a relatively low number of sites, by comparison, within a fairly homogenous landscape.

Nelson, Peter (Assistant Professor, American Indian Studies, San Diego State University)**[272]** *Indigenous Refusals of Settler Territoriality: A Case from the Tolay Valley in Central California*

Spanish, Mexican and American waves of colonialism in Central California changed the lives of California Indian peoples in very drastic ways. California Indians were removed from their homes, forced to perform labor, and were moved into poor living conditions that contributed to declines in health and the loss of many California Indian lives. The physical removal of California Indians from their homes was also an attempt by Spanish missionaries and soldiers to re-imagine the indigenous world. Under Mexican rule, California Indians were transferred to ranchos to perform labor in similarly poor conditions. And during the early years of California statehood in the 1860s, so-called “vagrant” laws enabled white settlers to enslave California Indians who were found “idle” on their lands. Despite these hardships necessitating great change in traditional lifeways, California Indians remained immersed in and connected to a broader Indigenous world in which colonial places and institutions were only one part. That is, California Indians refused to wholly accept settler boundaries, ownership, and ways of using traditional lands by trespassing on settler-designated private property to hold ceremonies and collect traditional resources. A case from the Tolay Valley in Southern Sonoma County, California, during the nineteenth century will be presented.

[272] *Chair***Nelson, Ricky, Valda Black (Washington State University) and Danielle Kurin (University of California Santa Barbara)****[270]** *A Traditional Approach to Analyzing Stunted Femoral Growth in Peruvian Highlands*

Minimal research has been done on observing whether there have been incidences of stunted growth in populations, in times of environmental stress and social turmoil. One such example are the populations found during the Late Intermediate Period (~AD 1000–1400, LIP) in the South-Central Peruvian highlands. Utilizing Buikstra and Ubelaker’s Standards, nine measurements were taken on the femora of 37 individuals (N=37) from the sites of Sonhuayo, Masumachay, and Mina Cachihuancaray in the Andahuaylas region of the South-Central Peruvian highlands during the LIP. Measurements were used to calculate individual, population heights, and sex to compare within and between population variation and the possibility of stunted growth. The results showed an average of maximum length of 39.46cm within the population. The 7males (N=7) have an average maximum length of 41.33cm, with a minimum and maximum of 38.2cm and 44cm. The 30 females(N=30) have an average maximum length of 38.99cm, with a minimum and maximum of 33.2cm and 43cm Stunted individuals were determined by finding those who fell one or two standard deviations below the mean. Out of all three sites, five female individuals fell below this range, which can aid in questions pertaining to further research.

Nelson, Shaun (Utah National Guard)**[232]** *Discussant***Nelson, Theresa (Univ of Sheffield, Grantham Centre for Sustainable Futures, Dept of Archaeology)****[318]** *Moderator***[318]** *Discussant*

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Neme, Gustavo [9] see Salgán, Laura

Nenova, Denitsa [130] see Wallrodt, John

Nesbitt, Jason (Tulane University)

[178] *Late Initial Period (1100–800 B.C.) Interaction between the Highlands and Ceja de Selva of North-Central Peru: A Case Study from Canchas Uckro, Eastern Ancash*

This presentation will discuss the results of recent archaeological research at the late Initial Period (ca. 1100–800 B.C.) site of Canchas Uckro. Located in the Puccha Valley, Canchas Uckro is positioned approximately 25 km to the north of Chavín de Huántar and 40 km from the upper Marañón river. Analysis of the pottery assemblage from Canchas Uckro suggest strong parallels with the Urabarriu Phase of Chavín de Huántar. However, a considerable proportion of the pottery also exhibits formal and decorative attributes, such as zone-hatching, which are characteristic of contemporary assemblages from the Marañón, Huallaga and Ucayali drainages. The presence of pottery from these regions suggest that Canchas Uckro was involved in a widespread interaction sphere with cultural groups in the Upper Amazon. The findings from Canchas Uckro have implications for conceptualizing long-standing debates about the role of the ceja de selva during the formative stages of Chavín de Huántar and surrounding regions.

Nesbitt, Jason [6] see Schroll, Andrew

Netherly, Patricia (Vanderbilt University)

[273] *Why the Chimú State of the Northern Coast of Peru Failed: Rapid Expansion Is Not Always Enough*

In the last 1000 years before the arrival of the Spanish in 1532, the expansionist states of the Andean region of Peru—like those of the Old World—appear to have grown incrementally, flourished briefly, and disappeared. Despite intensive study in the 1970's and since, the inner structure and dynamics of Chimor have eluded archaeologists because there is limited information from European observers and because there are many questions archaeologists have not yet addressed. At its maximum, Chimor extended some 1200 km. from Carabayllo north of Lima to the Zarumilla River at the modern frontier with Ecuador. It had conquered and administered polities which spoke different languages: Quingam, the Muchic-speaking heartland of Lambayeque and Jequetepeque, and the valleys of the far north where Tallan and Sec were spoken. South of the Santa River, Quechua may have been a common language. In this region the economic structure differed. A study of new data and a reexamination of old evidence suggest that Chimor's successes arose from its social and political structure, much like those of its predecessors, the Moche and Lambayeque. However, the seeds of its defeat by the Inka lay in these same institutions.

Neuhoff-Malorzo, Patricia

[299] *Agriculture and Resource Procurement for the Castro Settlements of NW Iberia: Examination of Floatation Samples for the Castro Site of Bagunte*

Collection and examination of botanical remains has led to evidence of the development of agriculture in conjunction with the collection or procurement of wild resources at a number of Castro sites across the NW of Portugal and Galicia. Evidence procured to date from a number of such sites stretching from the Galician Region of Spain to the site of Monte Mozinho near the municipality of Penafiel in Portugal covers a span of time from Early Bronze Age to Roman Period and exhibits a combination of crops produced for human consumption, fodder produced for pastoral practices, and wild resource procurement for diet supplementation. The location of Bagunte lends itself advantageously to both agricultural production and resource procurement for diet supplementation and fuel resources. This presentation will focus on the use of wood for fuel resources, obtained through examination of carbonized wood collected through floatation of soil samples amassed through excavation and the seed samples gathered during previous field seasons.

Neusius, Sarah (Indiana University of PA)

[43] *Animal Use among the Monongahela: Insights from the Analysis of the Johnston Site Faunal Assemblage*

Excavations at the Johnston site (36IN2), a Middle Monongahela village located in western Pennsylvania, have generated a large, generally well-preserved assemblage of faunal remains. Between excavations in the 1950s and those conducted since 2005 by IUP, a significant portion of this large ring village has been sampled. Thus, this assemblage provides a rare opportunity to document the use of animals by the Monongahela. Initial faunal analysis was undertaken by John Guilday of the Carnegie Museum in the mid-1950s. More recently several preliminary studies of the composition and spatial distribution of this assemblage as well as of contrasts between assemblages collected during various excavations have been undertaken over the last decade. It is now possible to synthesize these studies and develop a more definitive statement of this assemblage's implications for reconstructing various aspects of Monongahela life including subsistence, butchering, bone tools, use of space, refuse disposal practices, and social interactions. This paper presents key inferences and makes clear that zooarchaeological analyses contribute significantly to regional perspectives on the Late Prehistoric period in western Pennsylvania.

[316] *Discussant*

Neuzil, Anna (Environmental Planning Group, LLC)

[151] *Moderator*

[151] *Discussant*

Neves, Eduardo (University of São Paulo)

[213] *The Role of Lowland Tropics as Centers of Landscape Domestication during the Middle Holocene in South America*

The archaeological record of the Middle Holocene is lacking in many areas of lowland South America. The reasons for such hiatuses are yet not clear, but there is an emerging pattern showing that the areas where one finds complete records of human occupation that span most of the Holocene are typically located on estuaries, extensive floodplains or other wetlands normally placed at ecotones. On the other hand, mounting paleoecological data shows that the climatic conditions of the Middle Holocene were probably dryer than today. This paper argues that wetlands and ecotonal areas played a major role as places for landscape domestication and cultural innovation in the tropical lowlands during the Middle Holocene and that such innovations spread through other areas after the establishment of climatic conditions similar as of today starting ca. 3,000 years BP.

Neves, Eduardo [69] see Pugliese, Francisco

Newbold, Josie (Brigham Young University)

[224] *A Structural Geological Study of the Tombs of Nabataean Petra*

Many studies have discussed the first century BC to first century AD Nabataean rock-cut monuments in the Nabataean city of Petra, Jordan. These surveys provide information about proposed chronologies for the façade tombs and limited data about burial customs of the Nabataeans themselves. One neglected topic is the Nabataean tomb placement in relation to the structural geology of the Petra region. During the 2014 field season of the BYU

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Ad-Deir Monument and Plateau project, it was discovered that the Ad-Deir Monument was built between geologic faults and fractures, suggesting that the Nabataeans used these features to carve the façade. In order to study the Nabataean knowledge of geology and the landscape used in the placement of their tombs, I have been working on a survey of the Petra façade tombs, with an emphasis on their relationship to the local and regional faults and fractures. This poster will showcase some of my findings.

Newhard, James (James Newhard)
[112] *Discussant*

Newlander, Khori (Department of Anthropology & Sociology, Kutztown University)
[92] *Using Lithic Conveyance to Reconstruct Paleoindian Cultural Landscapes in the Great Basin*

Archaeologists commonly use the geographic patterning of sourced artifacts to understand how prehistoric cultures used their landscapes, yet exactly what this patterning indicates remains unclear. The Paleoindian literature reflects a tendency to assume that toolstone conveyance reflects direct acquisition (i.e., mobility) motivated by subsistence and technological concerns, rather than acquisition (i.e., exchange) motivated by social concerns. Yet the challenge of actually distinguishing between mobility and exchange persists. Here, I offer some ideas that might help us make headway on the linkage problem we confront when attempting to infer mode of acquisition from patterns of toolstone conveyance, focusing on the North American Great Basin. I imagine a Paleoindian cultural landscape defined, not just by the distribution of food and non-food resources, but also other people, to propose that both mobility and exchange, perhaps operating at different scales in relation to subsistence, technological, and social motivations, contributed to the patterns of obsidian, fine-grained volcanic, and chert conveyance that we see.

[160] *Moderator*

Newman, Sarah [163] see Schnell, Joshua

Newman, Tiffany (CEMML-CSU/Ft Lee DPW-EMD Cultural), Elizabeth E. Bell (CEMML-CSU/Ft Lee DPW-EMD Cultural) and Seth VanDam (CEMML-CSU/Ft Lee DPW-EMD Cultural)

[268] *Management of WWI Training Trenches in Light of Current Military Training*

More than nine miles of World War I training trenches have been identified on USAG Fort Lee (Fort Lee) in Prince George County, Virginia. Constructed by the 80th Division at what was then "Camp Lee" beginning in the fall of 1917, these trenches represent a significant historic resource associated with the Great War. Fort Lee is also one of only a few locations where such trenches survive in the United States. However, the trenches also pose a significant challenge in balancing mission and training needs with the responsibility of all federal agencies to consider effects on historic properties while meeting the Army's mission. The most pressing need is the development of a long-term management plan, which includes ground-truthing trench segments identified via LiDAR, detailed topographic survey of current trench conditions, and archival research regarding trench construction and use. In 2017, a small portion of the trenches was surveyed to assess feasibility of the proposed work in support of the future management plan.

Newsom, Bonnie (UNIVERSITY OF MAINE) and Julie Woods (University of Massachusetts Amherst)

[255] *Motivations of Indigenous New England Potters and Researchers: Technical Choice, Social Context, and Identity Construction*

Archaeological research on aboriginal ceramics in New England has been limited in content and scope since its beginnings in the late 19th century. Few studies have attempted to connect aboriginal ceramics research with contemporary Native peoples, either through past-to-present identity connections or through Indigenous community engagement. Additionally, there have been few efforts to integrate research across New England's contemporary geopolitical boundaries. Recognizing these deficiencies in regional scholarship, this paper discusses two ceramics studies from New England—each exploring concepts of identity. One study centers on potters living in the Penobscot River Valley in Maine during the Ceramic Period (3050–450 B.P.), and the other focuses on the Late Woodland period (1300–1600 AD) through 17th century potters in the Connecticut River Valley in Massachusetts. Each study applied Indigenous archaeologies and technological choice strategies to an archaeological problem. However, the motivations behind the studies and the social contexts of the researchers influenced the research process and interpretations. This paper reviews these studies and the challenge of using ceramics as a central element in constructing or assigning identity while contemplating the range of factors that influence how researchers make connections between past and present peoples in the geopolitical landscape of New England.

Newsom, Lee [35] see Marquardt, William

Neyland, Robert
[232] *Discussant*

Nez, Nanebah
[72] *Oak Flat as a Traditional Cultural Property / Future Copper Mine*

On January 25, 2012, the Forest Service sought assistance from the San Carlos Apache Tribe in evaluating Chi'chil bildagoteel (Oak Flat) as a Traditional Cultural Property (TCP). This request was motivated by a land exchange proposed to congress which would transfer Oak Flat, Forest Service managed land, to Resolution Copper Mine for purposes of ore extraction. Four years later on March 4, 2016 the Keeper of the National Register of Historic Places officially designated Oak Flat a Traditional Cultural Property (TCP).

The interim four years would test the fortitude of both the Forest Service and the Tribe, as Resolution Copper and other mining supporters would work creatively and persistently to prevent the formal recognition of Oak Flat as a TCP. Politicians, organizations, and even local tribal members rallied to testify to the falsity of Oak Flat's validity as a TCP. Hundreds of letters of objection to the nomination would cause the Forest Service and the Keeper to weigh the cost versus benefits of recognizing the cultural paradigms of the Apache people. In this paper, I will examine the nomination process of this highly contested TCP, the interference, the perseverance, and the outcome.

Ng, Chuenyan

[153] *Subsistence Economies among Bronze Age Steppe Communities in the Southeastern Ural Mountains Region, Russia*

The long-standing subsistence model for Bronze Age Steppe Communities in the Southeastern Ural Mountains Region has been defined as a sedentary agro-pastoral strategy with dominant use of livestock. However, based on recent studies, the nature and variability of the subsistence economy, especially wild plant resource exploitation for both humans and livestock, are not well understood. As sedentary pastoral communities, the relationship between increasing livestock productivity and decreasing risk associated with resource sustainability is a continuous process. It is achieved only through control of land for grazing, regulating the composition and size of herds, and the establishment of seasonal herding strategies including foddering. This research undertakes a systematic archaeobotanical and phytogeographical study of subsistence patterns among late prehistoric pastoralist communities during the Middle Bronze Age of north central Eurasia. The multi-disciplinary approach draws productively from ethnographic, anthropological and archaeological evidence, to examine relationships between ancient settlements, local site catchments, and the emergence of new forms of livestock herding that integrated with earlier traditions of hunting, gathering and fishing during the Middle Bronze Age in the Southeastern

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Urals region of Russia. A combination of detailed macro-botanical study and experimental archaeology will produce a new model for understanding early traditions of multi-resource pastoralism.

Nicewinter, Jeanette (American University)

[17] *Abbreviated Imagery on Cajamarca Cursive Ceramics*

Paintings on fineware ceramic vessels and spoons by the pre-Hispanic Cajamarca culture of the north highlands of present-day Peru emphasize an abstracted and expressionistic aesthetic unlike their north coast neighbors, the Transitional Moche culture, and their contemporaries, the Wari state. During the Middle Horizon (c. 600—1000 CE), the Cajamarca culture's paintings developed a greater emphasis on human and animal imagery while maintaining an abstraction of forms. The figures are reduced to brief combinations of lines and are placed within compositions that are tightly filled with dots, spirals and waves. The compression of space and expressionistic handling of paint emblemizes the Cajamarca Cursive style. While the compulsion to fill space has been previously thought of as a motif or filler, the lines accentuate figures and create movement within the image. The proliferation of a small corpus of representational imagery on a variety of Cajamarca bowls, spoons and jars indicates that the image held cultural and social value and was an abbreviated version of a vast body of esoteric knowledge. The identification of key figures and actions is a portion of a larger project to extrapolate the key features of the Cajamarca culture's ideologies.

Nicholas, George (Simon Fraser University)

[166] *"Made Radical By My Own": Acknowledging the Debt Owed to Larry Zimmerman in Radicalizing Me*

All archaeology is ultimately autobiographical; our interests and intentions are intimately shaped by both people and circumstances, which sometimes are not recognized until later. An unexpected change in my own career path in the 1990s brought me into Larry Zimmerman's orbit. His work with and for marginalized peoples, his activism, and his strong ethical stance have grounded me ever since. In this presentation I take a personal approach to discussing Larry's influence on Archaeology in general and on (some) archaeologists in particular, I also discuss the value of understanding the biographical dimensions of the discipline and to what constitutes good practice in working with and for descendant communities.

[114] *Discussant*

Nicholas, Linda M. [43] see Lapham, Heather

Nichols, Deborah (Dartmouth College) and Wesley Stoner (University of Arkansas)

[262] *Village to City: Formative Period Political Evolution in Central Mexico*

Current research has prompted rethinking about the early development of sedentism, agricultural economies, and complex societies in Central Mexico. We discuss new evidence of significant interconnected changes ca. 1000 BC that through multiple trajectories involved intensified maize production, expansion of sedentary villages, expanded interaction networks, and increased social complexity. With the establishment of the first cities, the Late Formative saw corporate political economy strategies gain in importance while the preceding exclusive networks of prestige exchange that united distant parts of Mesoamerica diminished.

[293] *Discussant*

Nichols, Deborah [262] see Stoner, Wesley

Nichols, Kerry (Tennessee Valley Authority)

[75] *Late Woodland Cultural Adaptations in the Lower Missouri River Valley: Archery, Warfare, and the Rise of Complexity*

The introduction of the bow and arrow into prehistoric Missouri during the Late Woodland Period possibly changed the Middle Woodland social dynamic and settlement pattern arrangement such that there was a major increase in social cooperation between settlements tied closely to defensive settlement strategies. Small villages faced the possibility of effective, long-range attacks that could potentially lead to the quick application of overwhelming force on unprepared villages. To address this potential, settlements moved to less productive upland locations with inter-visible settlement clusters that provided for mutual defense through defense in layers. As agriculture became better established, this pattern of defense again changed as people nucleated into larger sites in highly productive, lowland areas. Defense was still a significant consideration as reflected in both the selection of defensible topographic settings and the apparent creation of a borderland along the river. The larger number of people in each village provided safety in numbers and decreased the likelihood of overwhelming attacks. The influence of archery and the selection for effective defensive strategies in the face of archery-based warfare could help explain the rapid shift to inter-visible, upland sites during the Late Woodland Period and the subsequent rise of large nucleated settlements.

Nicolas, Richard (University of Wisconsin- Madison)

[8] *Using Sacred Landscape Model of Indigenous Cave Use in the Philippines*

Caves are natural spaces, but like other natural settings, they can be perceived by people through highly variable cultural lenses. Caves are not generally used as utilitarian spaces, but are more often sacred spaces where rituals are performed. The material record of these subterranean features can provide insights for how past peoples connected to the symbolic landscapes of caves, thus affording opportunities to assess behaviors. Research on the ritual uses of caves is fairly new in the Philippines, but cross-cultural comparison holds much promise. For instance, much research has already been conducted in the ritual use of caves in Maya contexts of Mesoamerica, which can be used as a foundation for approaches in other countries. Using best practices from cross-cultural contexts, this poster provides a preliminary analysis of certain cave sites in the Philippines. The research is based on a combination of recent field surveys and secondary sources, and offers a framework for identifying cave sites as sacred landscapes in order to contribute to ongoing studies of indigenous rituals in the Philippines.

Nicolay, Scott (University of California, Merced)

[136] *Offerings in the Mogollon Underworld: Big-Eyed Beings and Birds*

Three Classic Mimbres vessels depict similar ceremonial processions in which individuals carry effigies of animals and/or goggle-eyed beings. The goggle-eyed effigies are versions of a figure common in both Mimbres and Jornada Mogollon rock art that may represent the Mesoamerican rain deity Tlaloc. Similar effigies have been recovered from five cave shrines in southern New Mexico and Arizona: two wooden goggle-eyed figures and one of stone, and two wooden birds. However, modern Pueblo informants recognize neither this ceremony nor its apparatus. Together these effigies and their depictions represent a once-widespread but now extinct tradition related to rainmaking and the underworld.

Nielsen, Axel (CONICET Argentina)

[181] *Chullpas and the Political Relations with the Inside-World in the Inka Empire*

Previous research has interpreted chullpas as open sepulchers, altars, and landmarks which participated in political projects mainly by helping to reproduce corporate identities through ancestor worship and by inscribing power hierarchies and territorial claims on the landscape. This paper builds on the premise that chullpas were not just things with a certain function, but non-human persons (wak'as) capable of acting in different ways, given the affordances of their corporeality as towers or chambers. This idea raises new possibilities for thinking about the political work of chullpas in the Andean

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highlands. The formalized opening that characterizes these structures, for example, allowed them to mediate between the world of people (akapacha in Aymara) and the inside-world (ukhupacha), where powerful agencies lived. Combining historical information and archaeological data from the South Andean highlands, I discuss the role that chullpas played in the Inka political machine as mediators with the non-human members of society who belonged to the ukhupacha.

Nielsen, Jesper (University of Copenhagen), Christophe Helmke (University of Copenhagen) and Fiorella Fenoglio (Centro INAH, Querétaro)
[209] *A Dark Horse of the Early Postclassic: The Site of El Cerrito (Querétaro, Mexico) and Its Relationship to Chichen Itza and Tula*

Ever since the first attempts to explain the close correspondences (in iconography, architecture, and writing) between Chichen Itza and Tula in the Early Postclassic it has been assumed that it was mainly between these two cities, sometimes even called "twin Tollans", that the extended and intense contact between Northern Yucatan and central Mexico took place. A tendency among Mesoamericanists not to look further to the north and west, to present states such as Guanajuato and Querétaro, have thus led to the surprising oversight of the major site of El Cerrito in Querétaro. A thriving and important player of the period, El Cerrito displays iconography, sculpture and writing that is essentially indistinguishable from what is known from Tula and Chichen Itza, and the site's largest structure, the "Basamento Piramidal" (25 m in height), is a perfect example of a radial pyramid, similar to the Temple of K'uk'ulkan at Chichen Itza. In this paper, we briefly review current knowledge about El Cerrito and present our preliminary thoughts on its possible role in the Early Postclassic networks of trade, political alliances and intense cultural exchange. From this it follows that the architectural template for these three sites are to be found elsewhere.

Nielsen, Michael [15] see Fleischer, Malu

Nielsen-Grimm, Glenna

[138] *Solutions for Stabilizing and Caring for Organic Archaeological Collections*

Care of archaeological materials should begin in the field. Care and stabilizing of objects, if started in the field, will greatly increase the objects research and exhibit potential when it finally finds a home in a museum. How do you identify problems and then what do you do? Proper care and stabilization of objects can and should be a priority for all object users—excavators, lab analysts, museum staff, and researchers. In this paper, object care, conservation environments and stabilizing techniques will be discussed for organic archaeological objects.

Nightingale, Sheila (City University of New York, Graduate Center), Jessica Thompson (Emory University), Jacob Davis, Flora Schilt (Institute for Archaeological Sciences, Tübingen) and Jeong-Heon Choi (Geochronology Group, Korean Basic Science Institute)

[200] *Evaluating the Effects of Human Disturbance on Middle Stone Age Surface Finds from Northern Malawi*

Abundant surface scatters of Middle Stone Age artifacts are found throughout northern Malawi, eroding from remnant alluvial fan deposits (Chitimwe Beds). Surface surveys documenting these areas have guided the emplacement of 50+ archaeological test pits and excavations, many of which have yielded in situ MSA sites. However, the surficial evidence itself has been subject to less discussion and merits closer attention. At the Bruce site, surface artifacts were identified as part of an assemblage originally excavated in 1965, but which has since undergone significant disturbance from local development. Recent excavation and surface collecting by archaeologists has had an additional impact on the site. Bruce contrasts with localities like the similarly aged White Whale, ~40km to the south, where surface finds evidence a well-preserved knapping surface exposed by erosion near a cliff edge, that nevertheless retains spatial integrity. We use these case studies to discuss assumptions associated with surface finds, the role and influence of archaeological research on the integrity of surface and subsurface assemblages, and the relative stability of archaeological landscapes. Finally, we examine the potential for assessing landscapes modified by agrarianism—which may obscure or erase surficial archaeological materials—using declassified CORONA satellite imagery collected from 1959 to 1972.

Niinimäki, Sirpa [9] see Lipkin, Sanna

Nikulin, Alex [156] see Frazer, William

Nims, Reno (University of Auckland)

[20] *Little Ice Age Impacts on Traditional Māori Fisheries: Preliminary Results from North Island, New Zealand*

Numerous paleoclimate proxies indicate the Little Ice Age caused marked declines in New Zealand's atmospheric and sea surface temperatures for much of the period between 1450 C.E. and the end of the nineteenth century. These trends could have keenly affected the productivity of marine fisheries, which have always been critically important to Māori, the indigenous peoples of New Zealand. Considering the close connections that continue to exist between traditional fisheries and Māori economic, social, and spiritual life, it is likely that any changes in fish populations would have had wide-ranging effects on people's lives in the past. In this paper, I explore the ways that studying the top-down effects of climate change on traditional Māori fisheries shed light on developments in pre-colonial Māori history, and present preliminary results for the analysis of archaeological fishbone assemblages from the northern North Island, New Zealand.

Nimura, Courtney (Griffith University)

[113] *Considering Seascapes, Waterscapes and the Relational*

This paper introduces some key themes for this session, and considers how seascapes and waterscapes relate to the many and varied people, things, and places with which humans live. While many aspects of the archaeological record can be interpreted as referencing the watery realm through association (e.g. shell middens) or visual cues (e.g. rock art), our goal with this session is not to focus on simply identifying these connections, but to interrogate the nature of these relationships—to consider how water acts as a relational presence, and one that is informed by epistemologies and ontologies. Writing in the context of maritime people in Australia, McNiven (2008, 149) identifies a 'relational nexus between people, spirits, and the sea'—a useful observation that orients our thinking about the various elements that can be used to explore the water/people relationship. We will introduce some of our thoughts on the complex relational aspects between people, things, and water as a way of better understanding the social/cultural networks in which they are embedded, and the myriad ways people construct, maintain and express their identity. We draw on archaeological, ethnographic and historical resources to introduce the relational through the lens of the watery realm.

[113] *Chair*

Niquette, Richard M. [186] see Williams, Justin

Nishimura, Yoko (University of Pennsylvania)

[70] *Japanese Archaeological Artifacts in the U.S. Museums: A Case Study from the World's Columbian Exposition of 1893*

There are thousands of Japanese archaeological artifacts stored in the major arts and archaeology museums of the United States. Many of the collections came to this country during the late 19th and the first half of the 20th centuries. In those days, archaeological objects left their home countries more readily than today and reached at the foreign museums through expeditions, inter-institutional exchanges, purchases from private art

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galleries, and gifts from wealthy art collectors. Unfortunately, only a portion of these objects are currently on display in these museums, due primarily to the lack of proper investigation on these artifacts. I have been collaboratively working on a compilation of a catalogue of these artifacts for publication. Not only will it shed important light on the movement of such valued artifacts from Japan to the United States during the past 150 years; but it will also make the collections available for research and education across this country. A Japanese archaeological collection in the Penn Museum that was displayed at the World's Columbian Exposition of 1893 in Chicago exemplifies the movement of such collections to this country. A proper investigation will make this collection a valuable asset for research within this country.

Nishizawa, Hideyuki**[300] *What Does the "Cruz Pata" Style Look Like?: Redefining an Enigmatic EIP Ceramic Style of the Ayacucho Valley***

Dramatic culture change occurred in the Central Andes at the onset of the Middle Horizon (MH) (AD 500–1000). During this period, a state society emerged in the Ayacucho Valley and expanded across Peru. Even before the emergence of this state, however, culture contact of the Ayacucho heartland had already started with some remote regions in the late part of the Early Intermediate Period (EIP). This far-reaching contact would have gradually been intensified toward the beginning of the MH. Indeed, such cultural influence can be seen in Ayacucho ceramics during this transition. One good example is an EIP Ayacucho ceramic style known as "Cruz Pata." It has been pointed out that this particular style bears the first indication of south coast influence of the Nasca culture. Despite being important, the Cruz Pata style has been poorly defined in the literature, and it has yet to be investigated more fully so that we can better understand the arrival of Nasca influence and its ensuing impact upon the emergence of the Huari state. This paper characterizes the Cruz Pata style by examining the ceramic assemblages recovered at the site of Huari in 2017, and redefines it in relation to other Ayacucho styles.

Nissen, Zachary (Northwestern University)**[28] *A Monumental Afterlife: Reconfiguration and Reuse at Aventura, Belize***

Previous research suggests that the ancient Maya city of Aventura, Belize thrived during the Terminal Classic to Early Postclassic periods (800–1100 CE). During this period, occupants of the city constructed up to 27 buildings within the confines of the site's A plaza. This paper presents the results of the 2017 test excavations of a sample of the A plaza buildings. Maya plazas are typically conceived of as large open places for ritual and political performance. However, these excavation findings suggest that this period was not static, and city occupants reworked their relationships to the monumental site core by reconfiguring the layout of the main plaza and reusing materials from earlier buildings. These practices of reconfiguration and reuse likely even continue into the later part of the Postclassic period. This paper considers how this transitional period at the site fits in with trends of reuse and reconfiguration throughout northern Belize and parts of Mexico's Yucatan Peninsula during a period of instability and change across the Maya lowlands. Finally, it will theorize the impacts these actions and activities may have had on the daily lives of the city's inhabitants.

Noack Myers, Kelsey, Joshua J. Wells (Indiana University South Bend), Stephen Yerka (University of Tennessee Knoxville), Sarah Whitcher Kansa (Alexandria Archive Institute) and David Anderson (University of Tennessee Knoxville)**[53] *Making Archaeological Data Publicly Accessible through the Digital Index of North American Archaeology***

Scientific research conducted during the process of environmental review has been publicly and openly criticized by governmental officials in recent months. Not only does this represent an official contestation of the value of this research in the public eye, it seeks to undermine the credibility and legitimacy of science as a discipline. The research in question is federally mandated, and in the case of Section 106/Title 54, exists to avoid unnecessary harm to historic properties. If we seek to maintain an accurate record of American heritage, inclusive of all parts and parties of our history throughout human existence on the North American continent, it is vital that this work continues. However, the reporting mechanism for this information faces the risk of ending with seemingly useless binders of paper if not made publicly and openly available for re-use and analysis by researchers, officials, students, and the general public. This poster demonstrates the power of the Digital Index of North American Archaeology (DINAA) to make this information relevant, valuable, and visible to those who are skeptical about the value of compliance work.

Nolan, Kevin (AAL, Ball State University), Mark Seeman (Kent State University) and Mark Hill (Ball State University)**[74] *Time, Scale, and Community: Hopewell Unzzyotic Social Systems***

Timing of Hopewellian developments plays a critical role in developing an understanding of how Hopewell came to be, and what it was. Focusing on the Scioto Hopewell sites studied by the Scale and Community in Hopewell Networks (SCHON), we present the results of 40 new radiocarbon dates obtained from 15 sites including both habitation and earthwork sites. We also undertake an evaluation of previous dates from these sites to come to a more robust understanding of the timing of key Hopewellian events. Previous models are based on cross-dating inference derived from assays that have never been previously subjected to quality assessment. We provide the first dates on many sites, and the most carefully selected suite of dates for all of the included sites. Our results call into question some of the narratives advanced by previous investigators for the region, and for specific sites.

Nolan, William and Jerald Ek (WWU)**[302] *Shellfish Harvesting, Subsistence Strategies, and Human/Environmental Interactions in the Río Champotón Drainage, Campeche, Mexico***

With regional occupational continuity from the Middle Formative through Postclassic Periods, the Río Champotón drainage provides an ideal case study to examine long-term change in ancient Maya subsistence strategies and human/environmental interactions during two and a half millennia of human occupation. This poster presents the results of analysis of an assemblage of over 13,000 shell artifacts generated by the Champotón Regional Settlement Survey during seven seasons of research in the Río Champotón drainage and the adjacent central coast of Campeche, Mexico. Patterns of shellfish exploitation documented in the region were embedded within broader changes in regional subsistence systems. The results of this study indicate that the long-term sustainability of sedentary communities in the region was due to two factors: the availability of diverse food resources; and adaptability, defined as the ability of communities to alter subsistence practices in the face of changing ecological, political, and social conditions. This is particularly notable during the Late and Terminal Classic Periods, which witnessed the decline and demographic collapse of urban centers across many regions of the Maya Lowlands. The central role of adaptability provides an important long-term case study in sustainability and resilience with broad relevance in the social and environmental sciences.

Noldner, Lara (University of Iowa Office of the State Archaeologist) and Jennifer Mack (University of Iowa Office of the State Archaeologist)**[88] *Oneota Burial Practices: A Case Study from the Dixon Site (13WD8)***

Past populations that are associated with the Oneota archaeological tradition appear to have practiced a variety of burial practices. This paper serves as a presentation of another case study that contributes to our knowledge base of Oneota burial practices. Contexts for human skeletal remains recovered from Oneota sites range from scattered isolated elements to primary burials (both extended and flexed) oriented in various directions, both within constructed mounds and other non-mound features. This paper summarizes the human skeletal remains recovered through 2016–2017 archaeological excavations at the Dixon Site (13WD8), as well as remains that were exposed in past years by both controlled excavations and stream bank erosion. The site is an extensive Oneota village site that was initially exposed by re-routing of the Little Sioux River in 1913. Recent archaeological investigations were necessary for the much needed stabilization of the river bank.

[322] *Discussant*

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Nolen, David S. [189] see Peacock, Evan

Nondédéo, Philippe (CNRS France), Eva Lemonnier (Université de Paris 1 Panthéon-Sorbonne), Julien Hiquet (Université de Paris 1 Panthéon-Sorbonne), Louise Purdue (CNRS CEPAM) and Cyril Castanet (CNRS-LGP)

[80] *Settlement Pattern and Land Use Dynamics at Naachtun: Shaping an Agrarian Maya Town*

The classic Maya site of Naachtun is actually composed by a monumental and public core zone of 35 hectares surrounded by an extensive residential area of about 175 hectares. The study of its settlement pattern along with geoarchaeological works focused on agrarian strategies specifically have shown the role of vacant spaces in shaping the settlement as an agrarian town. Mainly dedicated to agriculture since the beginning of Naachtun's occupation in the Early Classic period and maintained until the abandonment, these vacant spaces can be used (with others parameters) to identify neighborhoods and evaluate the importance of the agrarian constraint in urbanization and spatial layout of this town. In this paper, we will first present the up-to-date analysis on inner-city neighborhoods dynamics during all the Classic period. Then, we will compare the residential density, composition and spatial organization of these neighborhoods with the first data observed, at a larger scale, in the Naachtun hinterland on the basis of the 140 km² LiDAR survey.

Nondédéo, Philippe [254] see Dussol, Lydie

Noneman, Heidi, Todd VanPool and Christine VanPool

[154] *A Geochemical Look at Obsidian Procurement and Exchange in the Medio Period World: A Case Study 76 Draw (LA 156980)*

Geochemical provenance analysis of obsidian is a productive avenue for studying social interaction and lithic raw material procurement strategies in the U.S. Southwest. Here the results of the analysis of 180 obsidian artifacts recovered from 76 Draw, a Medio period (A.D. 1200 to 1450) settlement in New Mexico are presented. The combined assemblage reflects local geochemical sources, as well as obsidian from more distant geochemical sources often seen in assemblages associated with the Ancestral Pueblo (Anasazi), the Salado people, and the Casas Grandes phenomenon during the mid-1300s. This assemblage was compared to lithic assemblages from the nearby Black Mountain site in southern New Mexico and Casas Grandes settlements in the Medio period core around Paquimé, Chihuahua, Mexico. Obsidian from sites in the Medio period core area geochemically matches sources in northern Chihuahua and northeastern Sonora, whereas the Black Mountain obsidian reflects greater reliance on the northern Mule Creek obsidian and other nearby sources. While inhabitants at 76 Draw likely had access to Mule Creek obsidian and associated sources through contact with bordering cultures, they maintained an active partnership in the Southern Network of procurement and exchange centered around obsidian sources from northern Chihuahua and the boot heel of New Mexico.

Nordin, Petra [23] see Bramstang Plura, Carina

Norman, Scotti (Vanderbilt University)

[117] *Revitalizing Native Practices in the Face of Colonialism: Taki Onqoy and Entanglement in the 16th Century (Ayacucho, Peru)*

In the 16th century Andes (1532–1570s), conquest was not a rapid event, but rather an asymmetrical process in which Spanish authorities negotiated governance and conversion with indigenous and Inka established orders. New Spanish dictates were initially met with a variety of responses from local groups: alliance, manipulation of Spanish policies, and even violent rebellion by Inka holdouts. In the central highlands of Peru, local groups developed and participated in a revitalization movement which preached the rejection of Spanish goods, culture, and religion, in favor of a return to huaca (local deity) worship. Known as Taki Onqoy (quechua: dancing sickness), individual practitioners transformed their local beliefs, renouncing new Spanish rites and instead adopting the behaviors of a perceived idyllic (nativist) past. Excavations at the site of Igleiachayoc (Ayacucho, Peru), a known Taki Onqoy center, demonstrate a varied response to Spanish conversion—while some appear to have fully committed to the movement, others were caught between Spanish authorities and local takiongos, and strove to placate both sides. Although ostensibly a purely “native” movement, aspects of Taki Onqoy were hybridized with Spanish Christian religion, leading to a form of religious resistance which was entangled with the very religion it was designed to oppose.

North, Chris (PaleoWest Archaeology) and Scott Courtright (PaleoWest Archaeology)

[268] *Urban Archaeology at the Hohokam Village of Pueblo Grande*

PaleoWest Archaeology recently completed two data recovery projects at the east and west ends of the seminal Hohokam village of Pueblo Grande in Phoenix, Arizona. The two projects were in the last two undeveloped parcels of Pueblo Grande, which was the largest and most influential Hohokam village in the lower Salt River Valley. Despite more than a century of historic use of these parcels, which included residential and commercial developments, substantial prehistoric archaeological deposits remained intact. The purpose of this poster is twofold: 1) to present the archaeological data from these projects and how they compare to previous archaeological work at Pueblo Grande and 2) to demonstrate how significant subsurface deposits can remain intact, even in areas of intense historic disturbance.

Norton, Brandy

[111] *What's for Dinner: An Examination of Animal Resources Utilized in the Okeechobee Basin Area of Florida*

In order to gain a better understanding of the faunal diet composition of Native Americans in south-central Florida, an examination was conducted to determine which types of animals appeared most frequently within tree island assemblages. Of the 19,149 bones examined from a 2016 excavation, all were identified to at least an animal's taxonomic order, although identification to the species level was usually not possible due to the fragmentary nature of the sample. This information was compared with radiocarbon data to determine changes to diet through time as well as with oral histories from Seminole community members in order to compare stated dietary preferences with prehistoric evidence. The study determined that the three most prominent animal types present are turtle, fish, and snake, and that there were fluctuations in animal composition present throughout time which may indicate a changing environment and differential resource availability and exploitation. There is strong evidence that climatic changes, specifically the Little Ice Age, had an impact on the diets of tree island inhabitants. Understanding the environmental changes through time and their impacts on subsistence patterns indicate the ways in which tree island inhabitants reacted to these environmental changes.

Norton, Holly (History Colorado)

[289] *Discussant*

Norton, Mark [127] see Jones, J. Scott

Novotny, Anna (Texas Tech University)

[110] *Is It Christmas Yet? Teaching Evolution to a Resistant Public*

As an anthropologist I pride myself on seeing the value of diverse worldviews. However, as a biological anthropologist I continue to struggle to communicate effectively with students whose worldview denies the authority of science and the theory of evolution. In this paper I present a case study,

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an ongoing negotiation between myself and a student in my introductory class who insists on a formal in-class debate between evolution and creationism. That many scientists do not find religious beliefs and evolution mutually exclusive so far falls on deaf ears. I refuse to place creationist concepts at the same level as evolutionary theory, particularly in a science class. I argue that the core of this conflict is as much about intellectual authority as it is evolution. Our mutual refusal to accept the other's point of view is a microcosm of the contemporary political climate. Still, I feel professionally and personally compelled to communicate with and educate this student. How do we teach to a public that insists that core principles of the discipline are still debatable?

Novotny, Claire (Kenyon College)**[110]** *Between Government and Grassroots: Archaeologists and Social Justice in International Contexts*

Working at the community level is a crucial component of an engaged, socially just discipline. Advancing archaeology towards greater inclusivity is an increasingly common conversation within the discipline. The majority of literature on this topic focuses on grassroots efforts to include marginalized descendant communities or other stakeholders in research design, implementation, knowledge dissemination and curation. An ever present and often unanalyzed aspect of research (especially abroad), are the required negotiations with government officials, who are political stakeholders invested in maintaining the status quo. These negotiations can be source of friction among research goals, community commitments and governmental regulations. My research in the Toledo District, Belize, shows that dealing with political realities while staying committed to social justice and engagement is an uncomfortable but vital balance to be struck. I argue that archaeologists can work as advocates to keep open lines of communication with governments as well as local people; we hold a privileged though awkward position that can be carefully and strategically leveraged for social justice aims. Anthropological archaeology has much to offer if we use it as a tool for greater inclusivity and social justice, within our borders or abroad.

[110] *Chair*

Novotny, Claire [157] see Kilgore, Gertrude

Nowak, Jesse (University of Oklahoma)**[40]** *Fort Walton Formations: Examining Geospatial Trends in Artifacts and Architecture at the Lake Jackson Site in Florida*

Located in Northwest Florida, Lake Jackson is a Fort Walton (Mississippian) period site with seven mounds, borrow pits, wall-trench architecture, and mortuary objects suggesting interregional interaction. This work examines geospatial relations between artifact distributions, known structural remains, and mound alignments in relation to the landscape. New excavation data from previously unexplored areas and digital presentations of associated artifact densities allows for new views of occupation patterns. These data suggests that the creators of Lake Jackson developed coordinated alignments of features and continuity in community patterns.

Nowell, April (Univ of Victoria-Dept of Anth)**[87]** *Life and Death of the Pleistocene Child: Children's Burials in Gravettian Europe*

The Gravettian (ca. 28,000–21,000 BP), has been referred to as the "Golden Age" of the European Upper Paleolithic. Innovations in technology, increased sedentism and the development of larger regional centers, the oldest known ceramics, some of the earliest evidence for loom-woven textiles, and the emergence of so-called "Venus" figurines all characteristic of this period. The Gravettian is also well known for its often spectacular single, double and triple burials of sub-adults including infants. This paper brings together data from sub-adult burials in Germany, Portugal, Italy, Russia, and the Czech Republic and highlights regional similarities and differences in burial location, body placement and engagement between interred individuals, known pathologies, associated artifacts and evidence of ritual. In the context of the increasing social and technological complexity of this period, inferences are made concerning the lived lives of sub-adults in the late European Pleistocene.

Nowell, April [41] see Chang, Melanie

Nowell, Sarah (University of Georgia)**[36]** *Inferring Continuity and Growth from Household Expansion at the Xwisten Bridge River Site in British Columbia*

The processes that drive socioeconomic and demographic growth over the course of generational occupations can be better understood by examining the variation in spatial organization at the household level. This study draws from the ethnographic record, ethnoarchaeological studies, and household archaeology to compare features from Housepit 54 at the Xwisten village, or Bridge River site in the interior of British Columbia. This site has been previously classified as a winter village and contains over 80 structures, or semi-subterranean pithouses. Housepit 54 was excavated between 2012 and 2016 and contains a sequence of 17 intact anthropogenic floors. Past research implies that changes in quantity and types of features associated with storage activities indicate varying strategies. When combined with lithic data related to hunting activities during times of ecological stress, I suggest that over the course of generational occupations, residents of Housepit 54 engaged in community feasting or other activities in order to increase the social standing of the household within the village.

[338] *Chair***Ntinou, Maria (Aristotle University of Thessaloniki) and Sultana-Maria Valamoti (Aristotle University of Thessaloniki, Department o****[298]** *Trees and Tree Cultivation in the Prehistoric Aegean: A Synthesis of Archaeobotanical Data*

Our presentation, based on an overview of archaeobotanical data from the Aegean from the Neolithic to the Late Bronze Age, attempts a synthetic approach to the cultivation of trees. This work is part of the PLANTCULT research project funded by the European Council Research (ERC Consolidator Grant, GA 682529). As archaeobotanical data we consider the macro-remains of fruits/seeds and burnt wood from archaeological sites. In addition, we use palynological information when available. Our goals are: A) to investigate the characteristics of the natural local vegetation around the Neolithic and Bronze Age sites in the study area, B) to investigate the presence/absence and frequency of occurrence of trees that became incorporated in the diet, economy and trade of the prehistoric Aegean, and C) to comment on the cases of the almond tree and the olive. More specifically for the olive tree, based on mapping the presence of the plant in the archaeobotanical record, the beginnings of olive cultivation and the factors that led to it are discussed.

Nuevo Delaunay, Amalia (Centro de Investigación en Ecosistemas de la Patagonia), Juan Belardi (Universidad Nacional de la Patagonia Austral, Unid) and Flavia Carballo Marina (Universidad Nacional de la Patagonia Austral, Unid)**[155]** *Post-contact Times in Southern Patagonia*

The history of the different indigenous hunter-gatherer groups that inhabited Patagonia since the Pleistocene was profoundly affected by the arrival of Europeans during the sixteenth century. This resulted in significant changes in various aspects of their lifeways, both archaeologically and ethnographically recorded. We integrate the available archaeological data of the post-contact period in southern Patagonia, along with ethnographic and historical data; showing the heterogeneous and complex scenario that characterized the region even until the XXI century.

Nuevo Delaunay, Amalia [74] see Méndez, César

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Núñez, Claudia (PUCP)

[257] *Vinculos (in)visibles: Relationships of Power in the Colesuyo during the Inca Empire*

It has been suggested that Inca colonization strengthened kin bonds between ayllu members while at the same time requested tribute by means of establishing "fictive" kin affiliations. Therefore, subjugated populations response to Inca imperialism caused the consolidation of local and regional identities. However, what occurred in the Colesuyo? Colesuyo region of southern Peru, inhabited by multi-ethnic small-scale groups—the Cochunas from the upper Moquegua Valley and the Coles and Camanchacas from the coastal area; archaeological evidence suggests that although the Cochunas were incorporated into the empire through institutions and kin bonds, the latter, on the other hand, did not create any kinship alliances with other coastal or marginal groups. It suggests, instead, that altiplano elites formed kin relations with coastal groups that in fact formed part of the Inca sphere of influence. In this presentation we analyze the intricate ways in which local groups were portrayed in the historical records and how discourses were built to give an account of the colonial narratives and the Inca dynamics themselves; and try to build a different one that visibilizes alternative social dynamics evidenced in overlooked archeological data.

[216] *Discussant*

Núñez Aparcana, Bryan (Universidad Nacional Mayor de San Marcos) and Nina Castillo (Proyecto Qhapaq Ñan)

[153] *The Paleoethnobotanical Remains of the Archaeological Site of Cerro Azul, Cañete (Lima, Peru): Changes through Occupation*

The archaeological site of Cerro Azul is located near the sea in the Cañete valley, Central Coast of Perú. This site is related with the Late Intermediate ethnic group called "Huarcos", that lasted through the Inca influence during the Late Horizon.

This study presents a preliminary analysis of the botanical remains based on the presence, diversification and amount of certain species such as maize, roots, fruits and legumes in relation with the changes through the occupation of this archaeological site.

Nunnally, Patrick [292] see Messenger, Phyllis

Nupuf, Tina [155] see Ripley, Kevin

Nyers, Alexander (Owner and Program Director), Loren Davis (Oregon State University) and Danial Bean (Oregon State University)

[101] *How Good Are My Scans? A Quick Primer on 3D Scan Quality Control and Metadata Recordation*

Over the past few years 3D scanning technologies have become a more common tool for archaeologists. These technologies allow for the rapid collection of large datasets that hold the potential to be used not only for display purposes, but also for sophisticated morphological analyses. In order to leverage 3D scan data for anything more than general viewing however, we as archaeologists must become fluent not only in the recording of metadata associated with model creation, but also in evaluating 3D scan data for possible errors. In this poster, we focus on some of the commonly seen problems in 3D scan data, why they occur, and how to avoid them when collecting your own data. We also discuss the recordation of metadata for 3D scans.

Nyers, Alexander [79] see Davis, Loren

Nystrom, Kenneth (State University of New York at New Paltz)

[179] *Discussant*

Oas, Sarah (Arizona State University)

[287] *Feeding and Consuming: Ceramic Vessels and Cibola Foodways*

To examine relationships between social transformations and household and communal foodways, this paper draws on detailed vessel form, surface treatment, size, and deposition data from multiple settlements over a period of rapid aggregation, migration, and social change in the Cibola/Zuni region in the 13–14th centuries A.D. Foodways—the ways we produce, prepare, and consume foods—are an important part of human society and culture, and play a vital role in making and maintaining social relationships. In the US Southwest, ceramic vessels were essential tools in nearly every task associated with the production, preparation, and consumption of food, making them an ideal source of data for understanding changes in food practices at multiple scales. Different uses of similar ceramic forms between contemporaneous settlements suggest persistent diversity in certain cuisine practices, while cross-cutting shifts in the sizes of ceramic bowl and jar forms hint at the widespread social and political importance of food in communal life in these periods.

[237] *Discussant*

[287] *Chair*

O'Briant, Kevin M. (University of Montana Osher Lifelong Learning Institute) and Clay Jenkinson (Theodore Roosevelt Presidential Library and Museum)

[36] *Trailing Lewis & Clark: Inventorying Prehistory at the Point of Contact*

During their 1803–05 westward journey, the Lewis and Clark Expedition described the presence of native graves, mounds, abandoned villages, and rock art. Previous archaeological research, centered around the 2005 Bicentennial, focused on the verification of campsites used by the members of the Corps of Discovery. Public interpretation of their Trail has likewise focused on the explorers themselves, neglecting both the Native context in which they traveled as well as the deeper history of their chosen route. This inventory re-examines the antiquities noted by the expedition through the lens of current archaeological research, to examine the rivers and trails utilized by the Expedition as long-distance trade routes, migratory pathways, and sacred spaces for the people who lived along them. Highlighting this deeper Native history and contextualizing the Euro-American observations provides a pathway to decolonizing public interpretations of the Lewis and Clark Trail.

O'Brien, Colleen (University of Cincinnati), Sheldon Smith (University of Texas at Austin) and Nicole DeFrancisco (University of California Riverside)

[157] *Bench Please: A Comparative Analysis of Bench Features in Mesoamerica*

Archaeologists have argued for numerous functions of the bench features found throughout the Maya world ranging from utilitarian to ritual. During the 2017 field season at the Late Classic site of La Obra, excavations of a centrally-located structure revealed a bench standing approximately 50 centimeters from the structure floor and extending out approximately 150 centimeters from its northern wall. La Obra is a hilltop production site located approximately one kilometer northwest of the central plaza of the site of La Milpa in the Programme for Belize perimeter. No other residential structures have yet been identified among those known and the existence of the well-preserved bench and plaster floors presents a conundrum given the site's characteristically poor preservation. The goals of this study are to provide comparative data on the form and function of benches throughout the Maya world from which to better interpret the context of the bench found in Structure NW-1 and its role at the site of La Obra given a relative lack of associated diagnostic artifacts.

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O'Brien, Matthew, Todd Surovell (University of Wyoming) and Randy Haas (University of California, Davis)**[124]** *Using Ethnoarchaeology to Identify Spatial Patterns of Behavior in Domestic Dogs*

Domestic dogs (*Canis familiaris*) are a common presence in nomadic cultures, but archaeology still struggles to identify them in the absence of their faunal remains. What we lack is a means to identify behaviors that manifest themselves in the archaeological record that are in clear association with domestic dogs. One avenue is carnivore modified bone. What experimental studies indicate is that we can isolate patterns of feeding associated with particular carnivores, but what has not been demonstrated is whether we see differences between domestic and wild canids. We propose that one solution is to move beyond the marks on the bone and look at where they are found in campsites. Through our ongoing ethnoarchaeological study of the Dukha reindeer herders of north-central Mongolia, we use GPS tracking, photogrammetry, and mapping of canids and modified bone to isolate spatial patterning of domestic dog behavior. The spatial signatures of dog behavior may serve to distinguish occupational bone modification by domestics from post-occupational scavenging behaviors by wild canids.

O'Brien, Matthew [124] see Haas, Randy

O'Brien, Melanie (National NAGPRA Program, NPS)**[322]** *Discussant***O'Brien, Michael (Texas A&M—San Antonio)****[120]** *Contemporary Views on Clovis Learning and Colonization*

The timing of the earliest colonization of North America is debatable, but what is not at issue is the point of origin of the early colonists: Humans entered the continent from Beringia and then made their way south along or near the Pacific Coast and/or through a corridor that ran between the Cordilleran and Laurentide ice sheets in western North America. At some point they abandoned their arctic-based tool complex for one more adapted to an entirely different environment. The dispersal of that new techno-complex—Clovis—allows us to examine, at a fine scale, how colonization processes played out across a vast continent that at the time had at best a very small resident population. Clovis has figured prominently in American archaeology since the first Clovis points were identified in eastern New Mexico in the 1930s, but the successful marriage of learning models grounded in evolutionary theory and modern analytical methods that began roughly a decade ago has begun to pay significant dividends in terms of what we know about the rapid spread of human groups across the last sizeable landmass to witness human occupation.

Ochoa Castillo, Patricia**[262]** *Dinámica cultural durante el Formativo Inferior y Medio en la Cuenca de México: Tlatilco y Tlapacoya*

Dos de los sitios más relevantes en el Centro de México durante el Formativo Inferior y Medio fueron Tlatilco y Tlapacoya, los que presentan una gran riqueza cultural. Sin embargo, la relación entre ellos y la función que tuvieron en su época son grandes interrogantes que aún persisten; esta revaloración será abordada a través de la revisión y comparación de sus materiales arqueológicos (cerámica y figurillas), incluyendo los de otros sitios ubicados tanto dentro, como fuera de la Cuenca de México.

Ochoa-Winemiller, Virginia [40] see Winemiller, Terance

O'Connell, Tamsin (University of Cambridge)**[137]** *Isotopic Analysis for Palaeodiet and Geolocation*

Isotopic analysis as a method of assessing diet or geographical origin is now ubiquitous in archaeology, to the point where seemingly no project is complete without it. The relative ease of sample preparation and increasing prevalence of isotope mass specs has contributed to its rapid growth. Yet despite its ease of execution, it is not a cut-and-dried technique, and data interpretation can be complex. The greater use by specialists and non-specialists has resulted in studies that range from excellent to dubious, from groundbreaking to mundane, even banal. Such a situation has also arisen in other areas of the archaeological sciences, making them victims of their own success. Only greater understanding of the strengths and limitations of such analyses can improve the overall quality of work in this field.

This paper outlines the principles of carbon, nitrogen, oxygen and strontium isotopic analyses. It illustrates the technique's scope, identifies some key assumptions as well as pitfalls and problems, and covers some of the common misconceptions in how the method is applied. Whilst I hope not to be prescriptive, I aim to offer some guidance in how such work should be approached, from the perspective of both practitioner and consumer.

O'Connor, Sue [125] see Hawkins, Stuart

Odegaard, Nancy**[138]** *Collections Care and Preventive Conservation in the Archaeological Repository*

The scale and diversity of objects held in archaeological repositories is enormous. Collectively, the actions taken to prevent or delay deterioration of these objects and their associated documents and sample collections are referred to as collections care. Preventive conservation identifies the short and long term priorities for collections care. This paper will explore current trends and topics in archaeological collections care including: object stabilization through storage packaging; labelling techniques; recognizing treatment methods used in the past; awareness of pesticide residue contamination; and how to identify and control the agents of deterioration in the repository.

Odegaard, Nancy [218] see Hedquist, Saul

Odess, Daniel (National Park Service)**[193]** *Discussant***ODonnabhain, Barra (University College Cork, Ireland) and Jonny Geber (University of Otago)****[296]** *Irishness and the Bodies of the Poor in the 19th Century*

Mid-19th century Irish identities divided along lines of class, religion and gender but it could be argued that all were constructed in an atmosphere of the negative characterization of the island and its inhabitants by the British elite. Race and low "moral character" were blamed for the endemic poverty of the island. The Irish poor were portrayed as a "race apart" whose inherent failings were at least partly to blame for the mortality they suffered during the Great Famine of 1845–1852. Recent excavations at Kilkenny workhouse and Spike Island convict prison have produced skeletal assemblages from this critical period. These collections have enabled bioarchaeological analysis of parameters mentioned by the Victorians as indicative of the distinctiveness of the Irish poor: stature, interpersonal violence, and tobacco-use. We argue that the differences between Irish and British populations in stature and risk of violence were exaggerated. Such characterizations, we suggest, were part of a strategy of "othering" that served to legitimize colonial domination. This exertion of power did not go uncontested, and we argue that aspects of both the material culture and the skeletal evidence may be indicative of forms of passive resistance.

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O'Donnell, Alexis [306] see Marquardt, William

Oehler, Casey [167] see Bigelow, Gerald F.

Oertle, Annette (University of Wollongong)

[20] *Thermal Processes on Tropical Archaeological Shell: An Experimental Study*

Tropical archaeological shell middens throughout Australasia provide valuable information about subsistence practices, environmental changes, and human occupation. One of the major anthropic processes that can occur in any midden site is burning or heating of the shell, either from cooking or heat-treating shell for working.

Thermal influences on marine shell are poorly understood across all disciplines, including archaeology. Burning or heating may not always show any visual signs and rather can only be identified through erroneous results when dating or chemical analyses have been undertaken. Recent studies have begun to explore changes in structural and chemical aspects between varying burning/heating methods and durations, however, these studies only focus on a few shell species from the Mediterranean and fail to factor in overall microstructural differences between shell species.

Therefore, to better understand the processes of burning/heating on shell in tropical sites of Australasia an experimental study was undertaken. Six tropical marine shell species with varying microstructures were chosen to undergo three methods of burning/heating. These samples were then examined under Dinolite, SEM as well as under-going XRD analysis. Results show distinct differences between the various microstructures, both visually and chemically.

Oestmo, Simen [89] see Murray, John

Ogaz, Andrea (California State University, Los Angeles), Samantha Lorenz and Toni Gonzalez (University of California, Santa Barbara)

[134] *Revisiting the Mortuary Function of Chultunes*

Excavations at Mul Ch'en Witz uncovered a series of chultunes just below the escarpment on which the ceremonial core of La Milpa is located. Of the six chultunes identified during the 2017 field season, Chultun 3 has produced the most cultural material. In addition to several complete vessels excavated, human bone fragments were recovered. The remains, found next to the chultun capstone, revive questions surrounding the mortuary function of chultunes. Dennis Puleston, among others, considered the mortuary use to be both secondary and infrequent. Thus, the presence of burials in chultunes was consigned to a marginal position in the attempt to understand chultun function. While the mortuary use of chultunes is indeed secondary, recent work has found it to occur far more frequently than acknowledged. If human burials in chultunes occur regularly, there must be a logical link between the primary and secondary uses. This presentation explores that relationship.

Ogburn, Dennis (University of North Carolina at Charlotte)

[257] *Inca Views of the Native Groups of Southern Ecuador*

Over time, the Incas created varying narratives surrounding the native groups of southern Ecuador, including the Paltas, Cañaris, and coastal groups, such as the Punaes. I examine these narratives through historical accounts from both northern sources and Cusco-centric writers, which serve as our primary sources of information, and compare these to archaeological data, which are mainly limited to the Cañari region. These narratives are the product of the history of Inca interactions from initial contact and conquest through the subsequent impacts of colonization, Inca civil war, and Spanish conquest, and they present attitudes toward those groups that range from indifference (Paltas) or scorn (Punaes) to respect (Cañaris). How the Incas treated these groups had impacts on how their ethnic identities were transformed or maintained during the Inca and Spanish Colonial eras, and show a pattern of consolidation of numerous smaller, related groups. Overall, the Cañaris fared best, and there are even documents revealing aspects of their own narratives of who they were during the Inca era. In contrast, the Paltas and the coastal groups were less favored by the Incas, and we have little of their own voices preserved in the historical record.

Ogilvie, Astrid [167] see Hicks, Megan

Ogle, Kiona [103] see Harris, Jacob

O'Gorman, Jodie (Michigan State University)

[215] *Migration, Ritual, and the Dead*

Migration of human populations is an ancient and persistent part of the history of humankind. In the past, as in the present, migration continues to be a solution to human problems that carries with it some degree of increased risk and challenges for group and individual security and identity. Vulnerability resulting from migration choices, and practices to mitigate risks of that vulnerability, vary between historically situated populations and within groups by age, gender, and other elements of identity. In this paper, cross cultural practices of mitigating risk associated with migration are examined with particular attention to the use of ritual practices. Ritual practices of the Oneota tradition (ca. 1000–1600 CE) involving the dead and the spatial aspect of those practices within the context of migration events are examined.

[215] *Chair*

O'Hara, Nolan (Binghamton University), Tiffany Raymond (Binghamton University), Carl P. Lipo (Binghamton University) and Hannah Elliott (Binghamton University)

[265] *Thermal Properties of Prehistoric Ceramic Vessels of the American Southeast*

A common class of prehistoric ceramic vessels are those that share attributes related to the processing, cooking, storage and serving of food resources. Depending on the specifics of the use contexts, attributes will vary systematically and depend on the range of activities, the details of the food resources, and the heating technology in which the vessels are used. Thus, we can expect that many technological traits of vessels such as temper, wall thickness, porosity, firing temperature, and manufacturing techniques will be systematically shaped by local performance conditions. One key dimension of variability that is directly associated with the performance of vessels to cook food is thermal conductivity: the rate at which heat is transferred from one side of the vessel wall to the other. The physical properties of ceramic vessels are key to understanding how an object insulates, conducts, or withstands temperature change. In this study, we examine variability in thermal conductivity of prehistoric ceramic samples from the American Southeast and explore the compromises made by prehistoric peoples in terms of vessel performance, energy expenditure, and cooking techniques.

Ohman, Alexis (College of William and Mary) and Jennifer Kahn (College of William and Mary)

[189] *Ichthyoarchaeological Analysis of ScMo-350 on Mo'orea, French Polynesia*

ScMo-350 is located on Mo'orea Island, northwest of Tahiti in French Polynesia. Our ichthyoarchaeological analyses assess which fish taxa were utilized by the pre-contact Ma'ohi, and how those taxa may have changed over time. Our diachronic approach investigates fishing activities over a c. 1,000 year period, between AD 900–1800. We broadly divided this beach ridge site into four excavation blocks to aid in spatial analyses of the recovered artifacts. Fish specimens were heavily concentrated in Blocks 2 and 3, correlating to areas of the site with high frequencies of fishhook

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manufacturing blanks. This demonstrates differential areas of activity across the site. The manufacture of fishing technology (fishhooks, trolling lures, etc.) was kept separate from fish butchery, and ethnographic evidence suggests that these activities were conducted along gendered divisions of labor with men fishing and women processing those fish. However, these binary categorizations are not as starkly defined as often presented. Mo'orea had seasonal shifts in marine resource availability prompting communal fishing, activities that complicate simplistic traditional narratives. Our poster focuses on the spatial and temporal analysis of fish specimens at ScMo-350 and situates these data compared to sites on nearby islands such as Maupiti in the Leeward Society Islands.

Ojeda Rodríguez, Elizabeth (Departamento de Antropología, Georgia State University) and Jeffrey B. Glover (Departamento de Antropología, Georgia State University)

[330] *Uses of Different Species of Animals from Vista Alegre: A Zooarchaeological Analysis*

Previous zooarchaeological research has focused on knowing the patterns of wildlife exploitation in the different archaeological sites of the Maya area. In this sense, the present work intends to approach the different uses of the different species of animals in activities carried out by the pre-Hispanic Maya people located at the site of Vista Alegre, Quintana Roo, Mexico. The simple has c. 23,000 remains of fauna, coming from three architectural constructions: Structure 9 (Operation 3A), Structure 18 (Operation 3B) and Structure 13 (Operation 1), in addition to 9 off-structure test excavations located along an east/west transect across the island. These remains are analyzed from three perspectives: identification of the taxonomic, osteological and taphonomic profiles. So far, preliminary results have shown that Vista Alegre coastal residents have patterns of faunal exploitation on the northern coast of the Yucatan Peninsula that focus heavily on the use of local species, particularly marine species, similar to the sites of Champoton, Cozumel and Xcambo. This research has also demonstrated that these coastal sites were also able to gain access to inland species.

Okumura, Mercedes (National Museum, Federal University of Rio de Janeiro, Brazil) and Rafael Suárez (Facultad de Humanidades y Ciencias de la Educación)

[2] *The First Record of Tigre and Pay Paso Paleoamerican Points in Southern Brazil: Implications for the Early Holocene Settlement of South America*

The early occupation of Southeastern South America (including Uruguay and Southern Brazil) is an issue that has generated interest in American archaeology. Recent research in Uruguay indicates to the presence of two different designs of projectile points manufactured during the early settlement: Tigre (ca. 12,000–11,100 cal BP) and Pay Paso (ca 11,080–10,200 cal BP), recovered in archaeological sites with chronological and stratigraphic control in the Uruguay River. Given the potential use of such points as chronological markers, as well as the importance of a greater integration of archaeological data from Uruguay and Southern Brazil, we aimed to identify the presence of these artifacts in the Brazilian territory using a database including measurements and photos of over 3,000 prehistoric points mainly from Southern and Southeastern Brazil. Pay Paso points were found only in the Southern states (Parana, Santa Catarina, and Rio Grande do Sul), while Tigre points seem to present a much wider distribution. This work is the first attempt to record the presence of such points in archaeological sites from Southern and Southeastern Brazil, in order to better understand questions related to the mobility of human groups during the Pleistocene- Holocene boundary in Southeastern South America.

Oland, Maxine (University of Massachusetts- Amherst)

[117] *Acting, Reacting, and Entangling at the Edge of the Spanish Colony: Maya Life at Progreso Lagoon, Belize in the Context of Colonization*

The Maya of northern Belize were located at the edge of the Spanish colony, far from the Spanish capital at Merida, and visited only occasionally by encomenderos and priests. How much of Maya life then was a reaction to Spanish colonization? The archaeological data from Progreso Lagoon, Belize suggest that most contact and colonial period material culture at the Maya community was shaped by ongoing Maya political and economic processes, rather than by Spanish intervention. In addition, Maya leaders used European artifacts in ways consistent with longstanding Maya uses of foreign objects, for Maya political and economic purposes. This paper argues that concepts such as reaction, resistance, and hybridization fail to acknowledge the depth of Maya history and the role of Maya worldviews in shaping the colonial experience at Progreso Lagoon. I suggest that the concept of entanglement may better encapsulate the way Maya people continued to act in Maya ways, along their own historical timeline, even within the context of colonization.

Olguin, Laura [34] see Flores-Fernandez, Carola

Oliveira, Diogo, Jeffrey Blomster (The George Washington University, Washington DC) and Michael D. Glascock (University of Missouri, Columbia, Missouri)

[288] *Importation, Distribution, and Crafting of Obsidian at Formative Etlatongo*

The nature of the utilization of obsidian throughout Mesoamerica has long been a focus of study and topic of debate for many anthropologists. The history of lithic analysis has produced many assumptions and interpretations regarding exchange, use and control of this extremely important material. Obsidian itself, as an imported resource, might have had otherworldly properties that held a special place in the cosmological construction of the world for villagers in the Valley of Oaxaca. The power of higher status community members may have been channeled through these distinct and imported materials, including obsidian. The recent excavations at Etlatongo, in the Mixteca Alta, have provided an opportunity to test these models and utilize new theoretical perspectives. Samples of obsidian excavated at Etlatongo, from both domestic and public space, demonstrate long distant relationships that the village, and specific households, may have developed in order to procure obsidian. We also explore the crafting of the material itself. Etlatongo also gives us the opportunity to systematically test distribution and frequency levels throughout the site, to determine if there was any control or redistribution over certain obsidian sources, which would be indicative of the economic and other-worldly importance of obsidian at Early Formative Etlatongo.

Oliver, Jose

[123] *Discussant*

Ollendorf, Amy (ALO Environmental Associates LLC), Chad Donnelly (ALO Environmental Associates LLC), Brady Woodard (Moore Engineering, Inc.) and Kyle Volk (Moore Engineering, Inc.)

[135] *Mitigation and Management in the Context of Climate Change at Three Historic Properties on the Great Plains, USA*

Under the terms of a Memorandum of Agreement, a professional archaeologist and land-survey crew annually visit 16 historic properties within the Area of Potential Effects of the Maple River Flood Control Dam to document site conditions. All are archaeological sites that could be subjected to seasonal temporary inundation during spring runoff and/or periodic non-winter storm events. Since the "dry dam" first became operational during spring melt in 2007, extreme flood events occurred in 2009 and 2011 resulting in slope failures and erosion at three of the sites. Mitigation measures were implemented at the 32CS0101 (Shea) and 32CS4478 (Sprunk) sites—both Plains Village Tradition hillforts listed on the National Register of Historic Places (NRHP)—and at a third site—32CS4499 (unnamed), a Woodland habitation eligible for NRHP listing. Corrective engineering actions focused on site slopes and their adjacent streambanks to reconstruct, stabilize, and revegetate the exposed and failing embankments. Initially, these mitigation measures were hampered by significant challenges within the context of climate change, namely, major spring floods in 2009 and 2011, and moderate-

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to-severe droughts in 2012 and 2013. In subsequent years, significant progress has been made as environmental conditions have been conducive to long-term embankment stabilization.

Olsen, John [24] see Ciolek-Torello, Richard

Olsen, Sandra

[180] *Enhancing Access to Arabian Rock Art Archives*

Petroglyphs and inscriptions have been investigated in the Arabian Peninsula at least since 1879, when Lady Anne and Wilfrid Blunt crossed the An Nafud desert and stopped at the now famous site of Jubba in northern Saudi Arabia. Since that time explorers from England, Belgium, Germany, the US, and the Saudi Department of Antiquities, have recorded images from north to south. Archival materials, including field notes, photographs and letters are available at various institutions, but there is no central repository or website that provides information on access to these sources. Since 2013, the Arabian Rock Art Heritage website (Saudi-Archaeology.org) has presented photographs and documentation based on recent exploration.

Now, an effort is being made to expand it with a complete catalogue of photographs from this project and a resource guide to archives at other institutions. The goal is to greatly expand access to archival records for archaeologists and epigraphers around the world to enhance and advance research.

Olson, Kyle (University of Pennsylvania)

[3] *Legacy Data and Ceramic Chronologies: The Case of the Gorgan Plain, Northeastern Iran*

After the passage of the Iranian Antiquities Law of 1930, the Gorgan Plain in northeastern Iran was seen as one of the most promising regions in the Old World for archaeological research. Despite decades of pioneering field and laboratory research, northeastern Iran still lacks a regionally integrated ceramic chronology for significant stretches of its archaeological history, particularly the 3rd millennium BCE. While individual sequences from important sites such as Tureng Tepe and Shah Tepe are well known, the precise nature of their relationships to each other and to other less-well known neighboring sites have remained unclear. This lacuna in our understanding of the culture history of the region presents a major obstacle to developing models of the social, political and economic history of the Gorgan. This paper, therefore, presents the results of research aimed at constructing a regionally integrated ceramic chronology for this region, in light of the potential anthropological significance of this dataset with respect to the emergence of regional community networks and the formation of archaic complex polities. In addition, this paper reflects on important issues related to the rehabilitation of legacy data and the methods by which it may be restructured for effective quantitative analysis.

O'Mansky, Matt (Youngstown State University)

[274] *Local Legacy, Local Legend: John White, Youngstown State University, and Fifty Years of Public Archaeology*

Dr. John White served as a member of the faculty at Youngstown State University from 1971 to 2005. Part of his legacy is nearly four decades of local, regional, and public archaeology. He shared his passion for the discipline with thousands of students and engaged hundreds of students and volunteers in fieldwork, both regionally and internationally. Upon John's retirement in 2005 I was hired to take his position. In this paper, I summarize my own work and collaborations with colleagues as we have sought to extend John's legacy of education and public outreach. Toward this end, we have worked with local parks and organizations, including the Boys and Girls Club of Youngstown and Boardman Park, on a variety of archaeology programs. We also continue to engage in both local and international projects with our students, traveling to work in Guatemala, the Bahamas, and elsewhere. While John White passed much too soon in 2009, his legacy—and legend—lives on.

Omar, Lubna (Binghamton University)

[56] *Running with the Mules: Integrating Zooarchaeological, Archaeological and Textual Evidence to Reconstruct the Exploitation of Equids in Southwest Asia*

The equid had a vital role in animal economy in Southwest Asia, whether as a wild animal providing primary/secondary products to prehistoric communities, or as a domestic source of energy which supported war affairs and trade during historic periods. Reconstructing the dynamics of humans and the four-equid species, which were present in the region, is a complicated endeavor due to the paucity of skeletal evidence in faunal assemblages; the difficulties in distinguishing morphological traits to separate between the closely related species and hybrids; and the perplexing morphometric approaches to identifying equid skeletal elements. Therefore, integrating archaeological and textual evidence from the historic periods in the Near East provides an exceptional opportunity to assess the distribution of equids, and their role on economic and cultural levels. This study aims to demonstrate the available evidence of equid exploitation strategies during the Bronze Age, using zooarchaeological analyses, while enhancing our knowledge about how domestic and wild equid species were incorporated in early urban entities, through archaeological and textual representations of these animals. Compiling different lines of evidence is expected to illustrate how complex societies maintained their provisioning networks and maximized the intake of animal products within early urban cities in southwest Asia.

[56] *Chair*

Omori, Takayuki [64] see Shoji, Kazuho

Omura, Sachihiro [71] see MacIntosh, Sarah

O'Neale, Dion [20] see Ladefoged, Thegn

O'Neil, Megan E. (Associate Curator, Art of the Ancient Americas, LACMA)

[206] *Collective Biographies: Ancient Maya Objects in Collections, Past and Present*

This paper explores the collecting, repositioning, and separating of ancient Maya objects, both in the ancient past and the twentieth century. Archaeological context provides evidence of ancient Maya aggregation of disparate objects in tombs, caches, or sculptural tableaux as well as evidence of repositioning or separating things. These changes are fundamental aspects of objects' life histories. Yet in the twentieth century, ancient monuments and object sets also have been divided—and new sets created—whether by national museums or research institutions seeking to trade duplicates or by players in the art market hoping to increase return by splitting paired or assembled objects. Such divisions are problematic, for new assemblages often frame modern understandings of them, and evidence for original assemblage may be difficult or impossible to reconstruct. This paper thus explores the importance of considering objects not just on their own but also in relation to other pieces to which they were connected. Thinking about biographies of objects—or collective biographies—in the past and present is a way to theorize both objects' individual trajectories and the connections and disconnections resulting from forming or splitting pairs, sets, or other groupings.

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Onken, Jill (University of Arizona)**[182]** *Chacoan Outlier Depopulation and 12th Century Arroyo Cutting near Zuni Salt Lake, New Mexico*

Depopulation of Chacoan outlier settlements in the Cibola culture area near Zuni Salt Lake ~AD 1130 has been attributed to the onset of a persistent 50-year drought. Prior alluvial stratigraphy studies concluded that arroyo formation near these settlements occurred two centuries after this exodus and therefore was not a contributing factor. The present study used a larger sample of radiocarbon dates, including short-lived, charred plant material from alluvial contexts and tree-rings from several deeply buried juniper trees preserved at the base of paleoarroyo fills, to refine the dating of late prehistoric channel entrenchment in the Zuni Salt Lake area. Bayesian age modeling that included juniper germination dates determined by radiocarbon wiggle matching facilitated construction of a high-resolution alluvial chronology. The revised chronology includes an arroyo-cutting episode constrained to the 60-year interval between AD 1106 and 1166. This finding suggests that terminal Pueblo II depopulation of the Zuni Salt Lake area ~AD1130 probably did in fact coincide with extensive arroyo formation. This landscape degradation greatly reduced the area's agricultural potential and arguably played a significant role in its mid-12th century depopulation.

Opishinski, Ana (UMASS Boston)**[104]** *The Zooarchaeology of LA 20,000*

Identity is a complex entity that is constantly being remade and altered, so to understand the development of the New Mexican identity in the 17th century, one must understand the various parts that make up an identity. This poster examines one of these parts: the foodways of New Mexico. Specifically, this project is examining the faunal deposits from LA 20,000, the largest Spanish estancia in early colonial New Mexico (1598–1680). The meat-component of the diet from a 17th century Spanish colonial site in New Mexico has never been analyzed in depth, so understanding how colonists and natives conceptualized, prepared, and consumed livestock and local foods can reveal much about identities and status, and how those were affected by food availability, traditional food practices, and interactions between different social and ethnic groups. Since 17th century New Mexican foodways have been understudied, this research represents an in-depth look at how Spanish colonists and local Native Americans cultures first came together through the medium of food and how these interactions helped to develop the foundation for the New Mexican identity. Understanding the development of foodways in early colonial New Mexico will open up possibilities to explore diachronic changes in food and identity.

Ordoñez, Maria, Tamara Landivar (Museo Pumapungo) and Lourdes Torres (USFQ)**[324]** *Putting Heads Together: A Multidisciplinary Approach to the Museum Archaeology of the National Tsantsa Collection at the Pumapungo Museum, Cuenca*

There are many collections of Tsantsas around the world. These shrunken heads were created by the Shuar and Achuar peoples of the Ecuadorian and Peruvian amazon until the mid-20th century. Though most of these museum collections have a known provenience, the individual histories and the authenticity of some of the heads has been contested. Similar questions have risen for Tsantsas held at the Pumapungo Ethnographic museum in the city of Cuenca, Ecuador. Using the approach of museum archaeologies, a multidisciplinary team including archaeologists, anthropologist and biologists has worked together with members of the Ecuadorian Shuar community to address these questions. During this talk some of the initial finds of the project will be presented, including medical digital images, and the viability of ancient DNA testing on this remains.

Ore Menendez, Gabriela (Vanderbilt University) and Steven A. Wernke (Vanderbilt University)**[65]** *Using Multispectral Drone Imagery for Identification of Prehispanic Agricultural Features*

In recent years, the use of multispectral satellite imagery has become an increasingly viable option for archaeological site detection and classification. Nevertheless, the high costs and relatively low resolution of multispectral data present challenges for local-scale archaeological feature detection. In this presentation, we will examine the advantages and limitations of using UAV aerial multispectral imagery as a means of local-scale feature detection. We compare results of remote sensing classification techniques on multispectral satellite imagery (at ~ 2m resolution) and results from drone-based multispectral imagery (at sub-decimeter resolution) of the same area. We map and classify the agricultural landscape (prehispanic and early colonial agricultural terraces, canals, and paths) in a 5 square kilometer area in the region of Huarochirí of the Peruvian highlands. We evaluate the potential to use the UAV-derived multispectral imagery as a "near ground truth" source for informing the execution and interpretation of satellite imagery-based classification schema and feature detection. We also explore the utility of the combined use of UAV- and satellite-based multispectral imagery for improving the efficacy of pedestrian survey, especially in areas of high topographic relief as in the highland Andes.

[235] *Moderator*

Orengo, Hector [121] see Petrie, Cameron

Orihuela, Johanset [57] see Hernandez-de-Lara, Odlanier

Orijemie, Emuobosa**[213]** *Plant Management, Resilience and Environmental Changes in the Wetlands of Nigeria*

Palaeoenvironmental data obtained from coastal areas (wetlands) of southern Nigeria reveal three main periods of climatic changes from the Mid Holocene-Present namely (i) very wet (ca. 6,000–5,000 BP), (ii) dry (ca. 4,500–2,500 BP) and (iii) humid periods (ca. 2,500-Present). This paper explores the dynamic ways in which the culture of plant management and plant food resources in these marginal lands has been expressed within the context of environmental change. The similarities in the management techniques, names and ritual practices associated with some indigenous plants (*Elaeis guineensis* (oil palm), *Cola acuminata* (kolanuts), *Dioscorea* spp. (yams) and *Raphia hookeri* (wine palm), among several peoples in the coastal areas of Nigeria reflect significance of prehistoric social contact, networks and trade relations. The culture of exploiting "famine" and wild crops during drier periods is reminiscent of human adaptation in periods of scarcity. Despite the effects of recent climate change, as well as the rise in exotic plants, the survival of certain indigenous plants as well as their undiminished value in socio-religious practices reflects the resilience of such cultures, a phenomenon characteristic of the human species.

O'Rourke, Makaela (Utah State University, University of Oregon) and Scott Thomas (Burns Bureau of Land Management, District Archaeol)**[265]** *Pottery at Skull Creek Dunes, OR and Its Implications for Pottery Tradition in Southeastern Oregon*

Prehistoric pottery is rare in Oregon, and the presence of pottery at the Skull Creek Dunes site in Catlow Valley of Southern Oregon is potentially important. This paper builds on the previous excavation and research by Scott Thomas of the Burns BLM and describes the pottery and work done on it since. These sherds represent one of the oldest pottery traditions in Oregon, and were likely made on site. Initial dating places the site around 1250 CE. In addition to the sherds, small possible gaming pieces and fired clay cones were also discovered at the site, as well as lithic and faunal components. A discussion of possible cultural origins of this pottery is included.

Orozco, Joseph (CSULA)**[134]** *Disregarded Ritual: A Critical Reassessment of North American Subterranean Features*

This paper critically reassesses the use of subterranean features among prehistoric Native Americans of North America. A survey of the archaeological and ethnographic literature suggests that pre-historic Native Americans used subterranean features in a ritual context, although the ritual component is

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rarely acknowledged directly. The significance of the features becomes apparent when the context, mainly construction and artifact deposition, is considered. Many of these subterranean features have been created naturally through geologic processes. However, it is significant that in areas devoid of natural subterranean features, pre-historic Native Americans constructed subterranean features to substitute for their natural counter parts. The archaeological and ethnographic literature document that ritual subterranean features are distributed throughout North America. Evidence includes ritually deposited cordage and sandals in the south and western portion of the United States, origin myths associated with Wind Cave in the Black Hills of South Dakota, and in New England where artificial subterranean features were created. When these data are compared to Mesoamerica, it becomes clear that subterranean features are an essential component of pre-historic Native American ritual practices. I propose that an Amerindian Subterranean Complex exists as part of a ritual circuit related to group origin myths.

Orrence, Karen [202] see Creveling, Marian

Orsini, Stephanie [155] see Alsgaard, Asia

Ort, Jennifer (SEARCH, Inc.)

[294] *Preserving the Ongoing Legacy of Northeast Pre-contact Archaeology*

The study of Northeast pre-contact archaeology is faced with many challenges including, but not limited to preservation and impacts on the archaeological record from centuries of development. Especially concerning is the decline in academic-based research and positions. University departments once populated with individuals dedicated to Northeastern pre-contact history have traditionally been the primary means for how practitioners of the region's archaeology reproduce themselves, now have little to offer would be students seeking graduate degrees. Given this reality, some feel the study of the pre-contact period in the Northeast is waning. Nevertheless, we argue that the ongoing legacy of Northeastern pre-contact archaeology is enduring even if no longer predominantly focused within academia. This is demonstrated by the continuing efforts by archaeologists from diverse backgrounds such as state agencies, cultural resource management, and other institutions as well as academics.

[294] *Chair*

Ortiz, Soledad [173] see Smith, J. Gregory

Ortiz, Agustín [248] see Blancas, Jorge

Ortiz Brito, Alberto (University of Kentucky)

[19] *Rediscovering the San Martín Pajapan Volcano in the Gulf Coast of México: An Analysis of Its Archaeological Context*

San Martín Pajapan is one of the most important and prominent volcanos that constitute Los Tuxtlas mountain system of the Gulf Coast of México. From the Prehispanic period to the present time the San Martín Pajapan volcano has been considered a natural place of the landscape with cultural significance, which is indicated by the presence of archaeological remains on its summit. The most remarkable archaeological element of this volcano is a monumental Olmec sculpture, which iconographic attributes suggest that it could have been carved during the Preclassic period. However, most of the ceramic materials found in association with the sculpture were dated by Alfonso Medellín Zenil to the Late Classic period. The temporal difference between the Olmec sculpture and the ceramic materials points out a problematic of the archaeological context. In this paper I'll present a revision of the archaeological remains of the San Martín Pajapan volcano to solve this problem. The results of this analysis indicate that, contrary to Medellín Zenil's idea, the ceramic materials associated with the sculpture correspond to the Epi-Olmec and Protoclassic period of the Gulf Coast region.

Ortiz Hernández, Jorge [293] see Carballo, David

Ortiz Ruiz, Soledad [177] see Seligson, Ken

Ortman, Scott G. (CU-Boulder), Laura Scheiber (University of Indiana-Bloomington) and Zachary Cooper (University of Colorado Boulder)

[124] *Scaling Analysis of Prehistoric Wyoming Camp Sites—Implications for Hunter-Gatherer Social Dynamics*

Recent studies suggest many properties of human settlements vary in predictable ways with population size. These studies have shown, for example, that more populous settlements are systematically denser on average than less populous settlements in a wide range of societies. In this presentation we examine this densification effect in mobile hunting and gathering societies by analyzing a database of information for prehistoric stone circle (tipi ring) sites in the plains and intermontane basins of Wyoming, USA. We examine the relationship between total camp area and the number of bison hide tipis (reflected by surface stone rings) present at these archaeological sites. We attempt to control for a variety of factors that might condition stone circle visibility and density, including palimpsest occupations, in establishing whether these camps became denser or less dense as the number of co-campers increased. We also compare our results to those observed in a global ethnographic dataset. The latter suggest mobile hunter-gatherer societies do not take advantage of the opportunities for energized crowding that characterize more sedentary societies. Our study represents an initial attempt to determine whether this de-densification effect is also apparent in the archaeological record of mobile hunter-gatherers.

Osborn, Jo (University of Michigan), Camille Weinberg (University of Texas at Austin) and Kelita Pérez Cubas (Pontificia Universidad Católica del Perú)

[46] *Revisiting Jahuay: An Early Horizon Maritime Site at the Topará Quebrada on the South Coast of Peru*

The littoral site of Jahuay is located at the mouth of the Topará Quebrada, between the Cañete and Chíncha Valleys on the South Coast of Peru. It is a key site for studying the Topará cultural tradition, which emerged on the South Coast during the late Early Horizon (EH)(250—1 BCE), and was the site where the Topará ceramic seriation was first documented by Edward Lanning in the mid-20th century. In 2017, we began our first season of excavations at Jahuay, with the goal of investigating EH coastal subsistence strategies as well as the sociopolitical role of the site within the larger Topará sphere. We recovered an array of materials, including ceramics, botanic remains, marine shell, faunal bone, and textile. Our initial results suggest the people occupying Jahuay during the EH primarily exploited maritime resources, but also had access to a wide array agricultural goods including squash, peanuts, beans, and cotton. Here we discuss these new results, including a reexamination of Lanning's Topará ceramic seriation, and consider their implications for future research.

Osborn, Jo [240] see Weinberg, Camille

Oscarson, Cody [182] see Miller, D. Shane

O'Shea, Colleen [66] see Bongers, Jacob

O'Shea, John (University of Michigan)

[244] *Discussant*

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Osores, Carlos and Bradley Parker (University of Utah)**[165]** *Comparing the Household Activities from Cerro la Guitarra (Zaña Valley, Peru)*

New insights from household archaeology on the north coast of Peru provide lines of evidence about the complex patterns of daily life. Also, few studies about the domestic life were carried out at the Zaña Valley. The first field season at Cerro la Guitarra, a fortified hill site with occupations from the Late Intermediate Period (1100–1400 AD) in the Zaña Valley, was very successful because it allows us to explore residential life using ceramics, architecture, and faunal analysis with the goal of explaining similarities and differences between spaces, constructive patterns, exchange, diet, and, more importantly, social differentiation. Since the comparisons inside the site, we hope to show how Cerro la Guitarra was a highly interactive community where intrinsic differences are important to understand the site as a whole.

Osores Mendives, Carlos [64] see Chen, Peiyu

Osorio, Ma Carmen [293] see Soler-Arechalde, Ana

Ossa, Alanna (SUNY Oswego)**[285]** *The Organization of Obsidian Exchange at Postclassic Sauce and Its Hinterland in Veracruz, Mexico*

I analyze residential inventories from the center of Sauce and its hinterland in combination with regional settlement data from Barbara Stark's Proyecto Arqueológico La Mixtequilla (PALM I, II) to describe the structure of exchange, production, and consumption of obsidian chipped stone during the Middle Postclassic period (AD 1200–1350) in south-central Veracruz, Mexico. Previous research on obsidian production found a spatial association with Sauce, which could support political administration of exchange, or alternatively, identify market exchange nearby. Reliance on spatially based models alone for identifying exchange mechanisms are flawed based on equifinality, in which different forms of exchange result in the same spatial pattern. Local chipped stone artifacts have further complications for interpretation: singular geological source, universal access, and potential specialized activities. No single model will identify all competing influences on residential inventories. To handle this complexity, I use the articulation of production combined with the spatial distribution and contextual information to distinguish between redistribution and market exchange. Results indicate that market exchange was the main mechanism. The largest concentrations of primary production indicators were found near Sauce, along with the highest quantities of blade parts, which suggests that political elites encouraged market exchange even if they did not direct it.

Ostahowski, Brian**[42]** *Coastal Land Loss and the Future of Louisiana's Archaeological Record*

This presentation examines the effects of land loss to the coastal archaeological record. Impacts observable at different scales (coast-wide, regional, and the individual archaeological site) demonstrate that our ability to understand Louisiana's past may be permanently altered. New directions for future research and community engagement are proposed.

Ostapkowicz, Joanna (University of Oxford)**[108]** *Mundus vult decipi: Caribbean Indigenous Art Past, Present, Future*

The 1990s, with quincenary 'celebrations' and two highly influential Taino art exhibits in Paris and New York (the epicentres of the pre-Columbian art market), heralded a seismic increase of indigenous Caribbean art forgeries. But these weren't the first indications of an emerging market: Caribbean forgeries had been circulating since at least the 1950s. The artistic heritage of the pre-Columbian Caribbean still remains largely understudied, with far smaller-scale production than seen in neighbouring regions like Mexico and Peru (with their own long-established, highly prolific forgers)—two of a number of factors that have led not only to site looting but entrepreneurial 'reinterpretations' of ancient artforms, both aimed at filling voids in private collections. These neo-artforms eventually enter museum collections, and are published in glossy catalogues as the genuine article, perpetuating the continuation of a particular forger's oeuvre, cementing it as an established, ancient 'style', and so skewing understanding of past artistic expressions and meanings. The forger's craft has become increasingly sophisticated, deceptive and profitable. This paper explores the issues of Caribbean forgeries in both private and museum collections, contrasting the covert enterprise with art openly produced by local artists taking the islands' ancient artistic heritage in new directions.

[108] *Chair*

Ostapkowicz, Joanna [139] see Knaf, Alice

Ostrich, Stephanie (CITiZAN / Museum of London Archaeology)**[34]** *CITiZAN's Digital Toolkit: Citizen Scientists Recording England's At-Risk Coastal Archaeology*

England's coastal and intertidal archaeology is increasingly at risk from winds, waves, rising sea levels and winter storms exacerbated by climate change and can be revealed suddenly and disappear just as suddenly. However there is no statutorily informed intervention for this heritage outside of the national planning framework for this at-risk archaeology and so no infrastructure in place to systematically record these freshly exposed sites before the next storm potentially washes them away. CITiZAN (the Coastal and Intertidal Zone Archaeological Network) is a community archaeology and citizen science project set up in direct response to these threats which raises awareness of at-risk archaeology across England. CITiZAN teaches local volunteers to identify, survey and monitor the long-term fate of their local coastal sites. This paper will discuss the rapid digital recording tools on which CITiZAN rely to not only engage with but also mobilise wider audiences, including 3D photogrammetry, an open-access interactive website and free smartphone app to record fragile coastal and intertidal heritage and monitor changes brought about by erosion and storm damage. This enables the public to 'take responsibility' for the archaeology in their local areas and explore the effects of global climate change at a local level.

[34] *Chair***O'Sullivan, Aidan****[23]** *Experimental Archaeology and Investigating Houses in the Past*

Experimental archaeology can be defined as the reconstruction of past buildings, technologies, objects and environmental contexts, their testing and use, so as to gain a better understanding of the role of material culture in people's lives in the past. We explore ideas of craft, materiality, knowledge, skills and the use of different materials to practically test how people made, used and discarded things in the past. This paper will investigate how early medieval houses in Europe can be understood in terms of construction, use and abandonment, using experimental archaeology, historical sources and archaeological sciences.

Otaola, Clara [249] see Franchetti, Fernando

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Otárola-Castillo, Erik R. (Purdue University)

[103] *Ghosts of Climates Past: Evaluating the Effects of Climate Change on the Foraging Ecology of Paleoindian Hunter-Gatherers in the North American Great Plains*

The environment has a strong influence on the evolutionary ecology of hunter-gatherer foraging. Studies of prehistoric hunter-gatherers have often made hypotheses regarding the effect of climate on foraging strategies, but have rarely tested those hypotheses. The absence of explicit hypothesis testing has been partly due to a dearth of operationalized paleoenvironmental variables. Although paleoenvironmental reconstructions have been abundant, particularly those based on pollen, they have mostly been qualitative descriptions. This study demonstrates the usefulness of modern paleoenvironmental reconstruction techniques to test evolutionary hypotheses about the magnitude and direction of climate on North American Paleoindian hunter-gatherers' foraging behavior. I used pollen assemblages from across the North American Great Plains and neighboring regions to reconstruct multiple paleoenvironmental variables—mean annual temperature, annual temperature seasonality, annual precipitation, and annual precipitation seasonality. Using spatio-temporal statistics, this study estimated paleoenvironmental variables during the Paleoindian period and in areas across the Great Plains. The results have important implications for the understanding of Paleoindian foraging and subsistence within the context of paleoclimatic and nutritional resource reconstruction. Specifically, this study reconciles current hypotheses regarding the influence of climate and ecological change on Paleoindian dietary strategies and discusses its potential as a mechanism driving micro-evolutionary consequences.

[103] *Chair*

Otárola-Castillo, Erik R. [103] see Rapes, John

Otárola-Castillo, Erik R. [103] see Shott, Michael

Otto, Raquel (Universidad Nacional Autónoma de Honduras) and Luke Stroth (University of California San Diego)

[299] *La Obsidiana del Sitio Guadalupe, Colón, Honduras*

El movimiento de obsidiana para el periodo Posclásico (1500- 1530d.C) en el noreste de Honduras, ha sido prácticamente desconocido para nosotros, por las pocas publicaciones científicas y naturaleza de los suelos en esta área del país, el hallazgo de este material puede considerarse poco probable, sin embargo existe un cambio marcado de la presencia de obsidiana para el periodo Posclásico. Mediante el estudio de las secuencias de producción lítica, tomando en consideración atributos tales como mediciones de filo, análisis de plataformas, y forma; podemos comenzar a comprender como este material fue utilizado en el sitio; y como se estaba desarrollando la industria de micro navajas con fuentes de procedencia del sur de Honduras.

Overholtzer, Lisa (McGill University)

[181] *Previous Material Entanglements and the Rise of the Aztec Empire*

Precisely dated household middens at the Aztec site of Xaltocan suggest that Aztec imperial matter—decorated serving vessels imported from Tenochtitlan and small spindle whorls used to produce tribute cloth, for example—often predates imperial formation and expansion by nearly a century. In this paper, I consider the analytical purchase we might get in explaining this puzzling finding by considering literature from the material turn; Khatchadourian, Bauer, Kosiba, and others have recently offered useful frameworks for the politics of nonhuman things and beings, for example. I attempt to move away from traditional understandings of the archaeological visibility of the Aztec empire, which present imperial things as passive and inert, and as consequences of imperialism, but not as consequential for it. Instead, I reconstruct the flows of matter that later came to be known as Aztec imperial, or rather, the Aztec empire's previous material entanglements. Acknowledging that objects, in their flows and in their presence, had effects that were not confined to the intentions of their makers and users, or to the moment of their production and use, I contemplate how these flows might have contributed to the later rise and rapid expansion of the Mexica.

Overholtzer, Lisa [248] see Blancas, Jorge

Owen, Ross (Indiana University of Pennsylvania)

[334] *PennDOT Highway Archaeological Survey Team: Providing Immersive CRM Work Experience to Students*

Despite there being more applicants with graduate degrees than there are jobs, the CRM industry suffers from the number of people holding graduate degrees but lacking experience conducting archaeological surveys for Section 106 compliance. Additionally, conducting archaeological surveys is cost-prohibitive and can be a burden on state agencies on projects where federal funds are not involved. These two issues in the field of compliance archaeology prompted the creation of the PennDOT Highway Archaeological Survey Team (PHAST). Through a partnership with Indiana University of Pennsylvania, each year PHAST gives 4 students an opportunity to work on and complete small Phase I and II surveys for the Pennsylvania Department of Transportation. The students gain experience in the field, and are employed in the lab to perform the necessary background research, GIS mapping, curation and documentation following the guidelines of the Pennsylvania Historical and Museum Commission. Much of this experience is outside the purview of most field technician positions. This paper will explore the successes and failures of the PHAST program from both a professional and financial point of view. How have the students benefitted from their experience within the program, and how has the state benefitted from the services provided?

Owlett, Tricia (Stanford University), Yu Itahashi (The University of Tokyo), Minoru Yoneda (The University of Tokyo), Leo Aoi Hosoya (Ochanomizu University) and Sun Zhouyong (Shaanxi Provincial Institute of Archaeology)

[24] *Late Neolithic and Early Bronze Age Agro-Pastoral Diets at Shimao, Northern Shaanxi Province, China: Stable Carbon and Nitrogen Isotope Analysis of Human and Faunal Remains*

The late Neolithic to early Bronze Age period (ca. 2800 BC–1900 BC) in the Ordos Region, Northern China was a transitional period, that included the adoption of agro-pastoralism, as well as increasing sociopolitical complexity. Subsistence economies were shaped by a variety of strategies that included a mixed agro-pastoral system focused on millet cultivation and herding of caprines and cattle, with limited contributions from hunting and gathering of wild plants. Here in this study we report the carbon ($\delta^{13}C$), nitrogen ($\delta^{15}N$), and nitrogen amino acid isotope analyses results for the dietary reconstruction of agro-pastoralists at the Shimao site in Shaanxi Province, China. Bone collagen carbon and nitrogen isotopic results of humans and animals are used as proxies of diet and local environment, and the local food web, that may also indicate differences in herding and management practices between different domesticated species. Results demonstrate that the majority of humans and domestic pigs were fed with substantial amounts of millets or their byproducts. The domestic herbivores, sheep and cattle, showed different dietary characteristics in that the former likely were foddered with C3 plants or grazed upon the local environment, while the latter species were fed with larger amounts of C4 products.

Oyuela-Caycedo, Augusto and Florencio Delgado Espinoza (Universidad San Francisco de Quito)

[177] *From Cooking to Smelting, the Social Technology of Pyrotechnology of Earth Ovens*

The effects of earth ovens on societies is a topic that has not been considered much, mainly because of the limitation of archaeological findings. Because our research has been mainly concentrated in floodplains environments, we have been successful in recovering a large sample that allows to propose explanations on the variability of them, and the relationship that features have in understanding some basic aspects of the social characteristic of the

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societies that created them. As a study case, we compare earth ovens from excavations conducted in lowlands Ecuador, and Colombia, that range from preceramic context, early ceramic societies like San Jacinto and Valdivia, to latter furnaces developed by the Jama Coaque and Manteño of Coastal Ecuador, and Colombia's lower Magdalena societies. Within this deep time perspective, we are proposing some basic model of the environmental and social relation of ancient Pyrotechnology.

Özbasaran, Mihriban [126] see Schumacher, Mara

Ozbun, Terry (AINW)

[140] *Estimating Orthoquartzite Quarry Production on the Llano Estacado*

Morrison Formation red orthoquartzite was procured, reduced, and exported as large percussion flake blanks from a late pre-contact quarry and workshop (LA21699) near Tucumcari, New Mexico. Experimental flintknapping replication of the orthoquartzite reduction technology represented at the aboriginal quarry/workshop site produced data on the average frequency of various technologically diagnostic flake types per reduction event. Comparing these experimental flake type frequencies with archaeological frequencies of the same diagnostic flake types allowed identification of large percussion flake blanks as the modal goal of workshop reduction and estimation of the number of percussion flake blanks produced at the site and the number exported. Approximately 1,700 of the 3,000 red orthoquartzite large percussion flake blanks produced were exported from LA21699 for further reduction and use elsewhere on the Llano Estacado. This replication approach to technological analysis of a quarry assemblage illustrates a method for identifying quarry production strategies and estimating the quantities of stone implements produced and exported.

Ozbun, Terry [140] see Fuld, Kristen

Pacheco, Veronica [264] see Zborover, Danny

Pacheco Arias, Leobardo (Proyecto Arqueológico Conjunto Monumental de Atzompá)

[158] *Modelo de co-participación para la infraestructura de investigación en Atzompá*

El Campamento de investigación del Conjunto Monumental de Atzompá, en Oaxaca, México, fue desarrollado con la participación de fondos federales y sectores privados como la Fundación Alfredo Harp Helú Oaxaca. Este espacio, que busca rescatar la arquitectura tradicional, ha permitido la práctica de estudios especializados del patrimonio arqueológico, el resguardo de objetos y el intercambio de conocimientos con los artesanos de Santa María Atzompá que han colaborado en el taller de restauración, montado en el mismo Campamento. Aquí se presentan algunos ejemplos de co-participación y alcances de investigación logrados hasta la fecha en la infraestructura que utiliza el Proyecto Arqueológico Conjunto Monumental de Atzompá.

Pacheco Silva, Monica (Freie Universität Berlin, Excellence Cluster Topoi)

[36] *Perception and Interpretation of the Landscape in the Lienzo of Coixtlahuaca/Seler II*

The Lienzo of Coixtlahuaca II, also named Seler II, was brought by the German mesoamericanist Eduard Seler to Berlin, Germany in 1897. The 375 x 425 cm document, made in the first half of the XVI century in the city of Coixtlahuaca located in the modern state of Oaxaca, Mexico, is made of eight cotton cloths sewn together to form an enormous Lienzo. The history of Coixtlahuaca's cacicazgo, its territory and lineages, is depicted alongside their mythical origins and migrations. The document portrays, in a prehispanic pictographic language, the history intertwined with landscape, showing the perception and close relation of it to the city-state settlement and the cosmological interaction between them. This presentation proposes an interpretation of the modern geographical landscape and its ties and perception to the mythical landscape and history portrayed in the Lienzo. By interpreting the modern geography, mythical places of origin and foundation like the Chicomoztoc and the Coatepec, could be found within it thus, the landscape would fulfill the cosmological aspects needed for a settlement. The cosmology, history and landscape should be considered an integral feature of the settlement itself.

Pacheco-Forés, Sofía (Arizona State University) and María García Velasco (Universidad Nacional Autónoma de México)

[282] *Mobility, Ethnicity, and Ritual Violence in the Epiclassic Basin of Mexico*

Within Mesoamerica, ritual violence and human sacrifice have long been topics of anthropological inquiry. In this study, we investigate how the perception of social difference contributed to the selection of victims of ritual violence at an Epiclassic (600–900 CE) shrine site in the Basin of Mexico. The Epiclassic was a period of dramatic political upheaval and social reorganization. In such a volatile geopolitical climate, aspects of individuals' social identities, such as their residential histories or ethnicity, could have acted as powerful indicators of social difference that culminated in violence. We present preliminary reconstructions of the residential histories of a sample of these individuals using stable oxygen isotope analysis of bioapatite carbonate (n=73). Additionally, we examine the ethnicity of sacrificed individuals through geometric morphometric analysis of the variation in cranial modification form and extent (n=61). These multiple lines of evidence contribute to an ongoing project examining how diverse categorical identities predisposed individuals to suffer ritual violence during a period of socio-political upheaval and reorganization.

Pacifico, David (Cardinal Stritch University) and Melissa Vogel (Clemson University)

[82] *Neighborhoods and Urban Political Organization at El Purgatorio, Peru ca. AD 700–1400*

El Purgatorio was the capital city of the Casma State, occupied from AD 700 to 1400. Neighborhoods at El Purgatorio were organized around social status, which was in turn related to a number of factors including occupation, access to and control over economic and ritual resources, and possibly length of tenure at the site. Neighborhoods were distinguished from one another by their architectural and topographical qualities, and exhibit both planned and organic elements. Neighborhoods also displayed some internal diversity. The interrelation of these neighborhoods' functions and the interdependence of their residents were key elements in the political economy of the capital city, and potentially in the Casma State. Research at El Purgatorio suggests that we need to be aware of the potential for multiple sociopolitical configurations among and between neighborhoods within the same city. Those contours can help us better understand the complexity and dynamism of settlements in the Prehispanic Andes. Moreover, the findings from El Purgatorio direct us to contemplate the relationship between urban core and hinterland neighborhoods in order to fully understand Prehispanic sociopolitical integration and dynamics.

Padgett, Antoinette [214] see Ryan, Christopher

Pagan-Jimenez, Jaime R. (Faculty of Archaeology, Universiteit Leiden)

[323] *Kitchen Affairs: First Insights into the Intimacies of Food Plant Preparation at El Flaco, Northern Dominican Republic (XII–XV Centuries)*

Ongoing investigations by the Nexus 1492 Synergy Project (Leiden University) at El Flaco archaeological site, has revealed the existence of an interesting Amerindian hamlet chronologically situated between XII and XV centuries. People who lived and died there, being carriers of the Meillacoid and Chicoid traditions, kept their kitchen areas extremely close to their houses, leaving noticeable remnants of their processing tools (shell scrapers, rudimentary grinding stones), cooking pots and griddles (made from stone and clay), serving implements (plates, bowls and ceramic bottles) and a key "crushing" tool used during food intake: human teeth. Residue samples from these plant-handling tools, recovered in one of the identified kitchens, has been subjected to ancient starch grain analysis aiming at knowing which were the main starchy plants prepared at these kitchens. Phytolith analysis

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was also done in soil samples from these areas to retrieve potentially important microbotanical remains from plants that are typically unnoticeable to other research techniques. This preliminary report present results from both analyses by discussing first some methodological issues on starch and phytolith studies in such contexts and offering later the first interpretations of the phytocultural dynamics attached to these spaces of identity expression.

[150] *Discussant*

Pageau, Hanna Marie (University at Albany)

[61] *Moderator*

[61] *Discussant*

Pahl, Barbara (National Trust for Historic Preservation)

[96] *Discussant*

Paige, Jonathan (Arizona State University, School of Human Evolution and Social Change) and Charles Perreault (Institute of Human Evolution, School of Human Evol)

[227] *Was Acheulean Technology Genetically Transmitted? Comparing Variation in Acheulean Tools to Variation in North American Bird Nests*
Acheulean large cutting tools were made across Africa and Eurasia for ~1.5 million years, and show surprisingly little variation for a technology so spatiotemporally vast. One explanation for this puzzling degree of conservatism is that Acheulean tools were not culturally transmitted but rather genetically determined. If this hypothesis is true, then Acheulean tools are more akin to animal technologies such as bird nests than to modern human tools. Here we examine the extent to which the variation in Acheulean tools compares to the variation among bird nests of North American passerines. We compare measurements of Acheulean tools (N = 3,526) to measurements among simulated, time-averaged nest assemblages derived from observations across North America (N = 2,544). We discuss the results, as well as the potential of natural experiments, such as the evolution of bird nests, in exploring difficult problems in lithic analysis.

Pailles, Matthew (University of Oklahoma)

[131] *What's Really Important in the Ethnohistory of Sonora?*

Analysis of Contact Era ethno-historical accounts has played an outsized role in the interpretation of protohistoric Sonora, Mexico. Controversy surrounds interpretations, owing to incongruities between archaeological and textual data as well as disagreements over how to weight the disparate observations made in these documents. Modern researchers variably evaluate the biases, motives, and the overall truthfulness of the authors of these documents. Another issue is the general subjectivity involved in fitting non-systematic observations into pre-existing anthropological models; usually some support can be found for almost any position. This presentation will attempt to address some of these issues by applying a formulaic approach to the weighting of document subject matter. While there is still subjectivity involved in the method, it provides a consistent and replicable means of evaluating the importance of different themes in a text. These themes can then be interpreted to infer both biases of the author and the relative significance of observations regarding Indigenous social organization. A trial attempt at this approach supports many pre-existing interpretations but also suggests some of the topics previously identified as paramount in the social organization of Contact era Sonora are of secondary importance.

[131] *Chair*

Paine, Richard (University of Utah), Richard Hansen (University of Utah), Carlos Morales-Aguilar (Université Paris 1 Panthéon-Sorbonne) and Kevin Johnston (Scholars Academic Editing)

[18] *Issues Reconstructing the Ancient Population of El Mirador, Guatemala*

El Mirador, in the northern Peten, has redefined our ideas about the Maya Preclassic. Its massive architecture and its complex system of sacbes compare to the largest Classic period centers. Unlike many of its smaller Preclassic neighbors, El Mirador collapsed at the dawn of the Classic. Understanding El Mirador's organization, economy, and relationship to its environment requires detailed knowledge of the site's population trajectory. Reconstructing El Mirador's population trajectory, we face a series of issues: definition of site boundaries, visibility of above-ground structures, identification and counting of residential groups, the presence of hidden or invisible structures, dating residential groups, and populating residential groups. LiDAR images are analyzed to identify groups and define the sample universe. A sample of residential groups is defined for ground truthing a testing in the field, based on ecological factors, local settlement patterns, and socioeconomic estimates based on surface remains. We discuss sampling issues, the use of LiDAR, issues of accounting for hidden structures, and the combined use of ethnographic analogues and modeling to populate ancient structures, and how each affects population estimates for El Mirador.

[18] *Chair*

Paiz Aragon, Lorena [302] see Munson, Jessica

Paja, László [245] see Parditka, Györgyi

Palacios, Horvey (University of Miami), Traci Ardren (University of Miami), Julie Wesp (American University) and Travis Stanton (University of California, Riverside)

[66] *Maya Ossuaries: Body Processing and Collective Memory in the Terminal Classic*

The allocation of space for the deceased is an integral component of understanding the relationship between a community and its mortuary practices. This paper explores how Maya ossuaries, or deposits with the commingled remains of multiple individuals, form a distinct body processing method that increases in frequency during the Terminal and Postclassic period in the Northern Maya lowlands. Data from salvage excavations of a Terminal Classic disturbed ossuary in the archaeological zone of Yaxuná in central Yucatan are compared with ossuary deposits at Chichén Itzá, 20km to the north. Along with population decline at Yaxuná during Chichén's rise to power came a number of new cultural practices associated with the larger mega-site. New funerary practices including an ossuary with numerous fragmented human remains as well as urn burials signal profound cultural changes during this time. This research illuminates how ossuaries are integral to the history of this region by providing spaces for collective memory and enhancing the relationship between space, the body, and community within Maya society.

Palacios-Fest, Manuel [84] see Kaijankoski, Philip

Palefsky, Gina (University of California, Merced), Thanik Lertcharnit (Silpakorn University) and Kelly J. Knudson (Arizona State University)

[282] *Iron Age Trade and Mobility: Assessing Migration at the Site of Ban Pong Manao, Central Thailand*

The archaeological site of Ban Pong Manao is located in the highlands of central Thailand with mortuary contexts dating to the late Iron Age (300–400 CE). Most individuals were buried with numerous grave goods, including intentionally broken ceramics and ritually bent metal implements, and some graves included imported metal, glass, stone, and shell artifacts. The presence of non-local artifacts implies interregional interaction and may indicate

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some degree of social inequality, but the scale, nature, and expression of these relationships remains unclear. This study uses radiogenic strontium isotope analysis to assess the migration histories of Iron Age inhabitants of Ban Pong Manao. First molar enamel samples from 32 adults were analyzed to distinguish between local and non-local individuals within the burial population. The results contribute to ongoing debates regarding the social significance of imported artifact inclusions in ancient Thai mortuary contexts—whether they signal high social status (prestige goods), the nonlocal origin of the deceased (reflection of social identity), or evidence communal aspects of memory and mourning. Results from this study further

contextualize the changing social, material, and lived experiences of Iron Age inhabitants at Ban Pong Manao through a clearer understanding of migration, social identity, inclusion, and belonging.

Paling, Jason (Plymouth State University), Marx Navarro Castillo (UNICACH) and Justin Lowry (SUNY- Plattsburgh)

[18] *Underwater Archaeological Survey of Freshwater Lagoons in the Lacanja Basin, Chiapas, Mexico*

The intrinsic relationship between human beings and bodies of water is unquestionable. Among the ancient Maya it has been observed that many of their agricultural cults were linked to existing bodies of water where they settled. In the Maya Northern Lowlands, multiple underwater archaeological studies of cenotes record this behavior as offerings of luxury items and human sacrifice are often recovered and noted. The Rancho Ojo de Agua archaeological project focuses on the basin of the Lacanja River. In the preliminary year of study, ethnographic evidence suggests that on May 3 every year, the current indigenous Maya groups of the region conduct pilgrimages to neighboring bodies of water to assure assistance for a prosperous agriculture season. Underwater archaeological surveys including dive-line and circular survey of three lagoons, Sanctuary of the Crocodiles, Laguna Ramón Cruz and Laguna Sibal, in the basin of Lacanja river in the Maya Southern Lowlands were conducted by the Rancho Ojo de Agua archaeological project to understand the relationship of these bodies of water to early Maya settlement. The initial discoveries made in three bodies of water will be presented.

Palka, Joel [167] see Hernandez, Christopher

Palmer, Carol [4] see Jenkins, Emma

Palmer, Jamie (Bureau of Land Management-Utah)

[261] *Addressing Today's Issues with Yesterday's Tools*

Dakota Access Pipeline. Ruby Pipeline. Ocotillo Wind Energy Facility. Topock Natural Gas Compressor Station. These are just a few examples of projects where the National Historic Preservation Act (NHPA) failed to protect cultural resources deemed significant by Native American tribes. In these instances, why did NHPA fail? Largely because NHPA does not consider impacts to the complete suite of cultural resources. It only addresses historic properties and historic properties "of traditional religious and cultural significance". This narrow focus makes NHPA a less-than-perfect tool to deal with cultural resources when it comes to today's current issues and concerns. Is there an alternative? For years, experts suggest that the National Environmental Policy Act (NEPA) is better equipped to protect a wider range of cultural resources. In this presentation, I highlight several court cases where NEPA has successfully protected cultural resources when NHPA has failed to do so under similar circumstances. This ultimately shows the broad strokes of NEPA are a stronger tool for preserving cultural resources today rather than the limiting paintbrush of NHPA.

Palomo, Yoly [37] see Plank, Shannon

Palonka, Radoslaw

[180] *Documentation, Methodology and Interpretation of Rock Art from Castle Rock Community, Canyons of the Ancients National Monument, Colorado*

Thirteenth century A.D. in the central Mesa Verde region was a time of socio-cultural transformations, climatic changes, and increasing conflicts and violence that took place shortly before the final depopulation of the region. Since 2011 the Sand Canyon-Castle Rock Community Archaeological Project is being conducted and it focuses on the analysis and reconstruction of the settlement and social structure in a community of forty Ancient Pueblo sites dated to the thirteenth century. The project research area encompasses several canyons of the Canyons of the Ancients National Monument, southwestern Colorado. This paper presents some results of the project work with a focus on the methodology of recording the rock art, both using traditional and modern techniques of documentation, such as photogrammetry and 3D scanning, as well as initial analysis and interpretations. It includes Ancient Pueblo or Fremont rock art showing anthropomorphic figures and later Pueblo petroglyphs connected, for example, with violence or possibly astronomy. The rock art from the project research area is also represented by huge panels with historic Ute and Navajo petroglyphs depicting clans' symbols, fighting warriors and hunting scenes, and also by "modern graffiti" or vandalism, like initials, names and dates from the nineteenth and early twentieth century.

Paludan-Müller, Carsten (NIKU, Norwegian Institute of Cultural Heritage Research)

[63] *Conflict and Heritage*

During recent years cultural heritage has moved into public awareness as part of contemporary conflicts. Destructions of sites and monuments in The Middle East and North Africa, and in the former Yugoslavia have given us blatant examples also of targeted destruction. However this is nothing new. Throughout history monuments and heritage have played their part in conflict between people. A recent conflict in the United States over monuments relating to the Civil War and its aftermath has further highlighted the importance of heritage as an active factor in how we understand ourselves and others in the stream of history.

But in order to fully appreciate what we are dealing with in the interplay of heritage and conflict, we need to understand that conflicts themselves are part of our cultural heritage. Conflicts that sometimes reach even far back into history is a living heritage with both tangible and intangible properties. They condition our contemporary interactions with "the other" and contemporary politics. The paper proposes approaches to understanding and dealing with the complex connections between heritage and conflict.

[319] *Discussant*

Palumbo, Scott (College of Lake County)

[260] *New Survey Results from the Bolas Region, Costa Rica*

The Bolas region presents one of the earliest steps toward the monumentality and complex social patterns that characterize later World Heritage sites in Greater Chiriquí. The forces and factors associated with these social changes remain incompletely understood. This paper shares the results from recent shovel test survey in the Bolas region and offers observations on broad social trends from the Formative period onward. Particular attention is paid to Mosca, another large and monumental site in close proximity to Bolas, and considers how social diversity may have shaped political change.

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Palus, Emily (Bureau of Land Management)

[261] *Severed from the Landscape: Wrangling Over 100 Years of Collections from the Public Lands and Coordinating Repatriation*
The Bureau of Land Management's (BLM) cultural resource responsibilities expand beyond the landscape, to the artifacts recovered from archaeological sites, and the associated records. These "gatherings" under the Antiquities Act and "archaeological resources" under the Archaeological Resources Protection Act (ARPA) were collected in the public interest to be preserved in museums for future generations. Some of these collections may also be sacred and sensitive to descendant communities, and the Native American Graves Protection and Repatriation Act (NAGPRA) directs a pathway to return ancestors and cultural property to Indian tribes. Over a century of collecting from the public lands, some under a permit, some without, has left a legacy for the BLM to "manage" millions of items that were dispersed to more than 150 museums and universities. The well-intentioned goals of the Antiquities Act, National Historic Preservation Act, and ARPA place important responsibilities on Federal agencies to be stewards of this heritage, and under NAGPRA, to be agents to uphold tribal rights and facilitate repatriation. This paper illustrates through recent examples the complex challenges in implementing these statutes, navigating occasionally absurd scenarios, and the critical need for partnership with repositories and engagement within the discipline to care for this shared legacy.

Pan, Yan (Department of Cultural Heritage and Museology, Fudan University)

[284] *A New Hypothetical Framework of Understanding the Evolution of Agriculture in the Lower Yangzi Region*
Although a number of studies in recent years have contributed fresh knowledge to our understanding of the origins and development of agriculture in the Lower Yangzi, updated data have made this issue even more complicated. The empirical evidence shows very little information about any hunter-gatherers who might have lived in this area and indicates that, 10,000 years ago, humans first appeared here as successful resource managers or niche constructors. The human ecosystem characterized by wetland management had already become quite stable by 8,000 BP. How did such a system form? And where did it come from? Is the Kuahuqiao Culture truly the descendant of Shangshan or an independent culture that had come from the continental shelf that is submerged by the ocean now? Are the similarities in the subsistence patterns of Kuahuqiao and Hemudu caused by direct heritage or coincidental cultural choice? Here I intend to propose a new hypothetical framework that differs from the Chinese traditional cultural evolutionary view to explore these issues in light of cultural niche construction theory.

Panahipour, Mitra (University of Arkansas)

[71] *Patterns of Land-Use and Political Administration beyond the Core Areas of the Sasanian Empire*
The landscapes of the Sasanian Empire have long been viewed as massive and state-sponsored development projects, in particular in politically and economically core zones. Despite these unparalleled understandings, our knowledge of peripheries and their connection with the sociopolitical organization of the time have still remained as some of the key gaps in the studies of late antiquity. To address these questions, I examine the settlement expansion, water management systems and agricultural intensification along the Sirwan/Diyala River in the Kurdistan Region. With the application of satellite images for landscape classification, GIS-based hydrological modeling, proxy records to reconstruct the climatic conditions, and combined with results of archaeological fieldwork, this paper offers that a bottom-up approach to intensification will shed new light on the role of local communities and the degree of their autonomy. It presents that large-scale projects and dependence on the centralized political authority were not always agriculturally required and a different intensification strategy with the integration of both irrigation and rain-fed practices could sustain a growing population. I further discuss the great potential of this research as a case study to unravel the role of peripheries in broader socio-political and economic transformations during the Sasanian period.

Panich, Lee (Santa Clara University) and Tsim Schneider (University of California, Santa Cruz)

[327] *Peopling the Post-contact Landscape in Central California: A Pragmatic Approach*
A cornerstone of recent pragmatic approaches to archaeology is the notion that our efforts can be judged by their practical outcomes. This may take the form of illuminating historical silences, and for those archaeologists working in post-contact or colonial contexts this often means working with indigenous groups seeking governmental or popular recognition. In this paper, we explore our collaborative efforts to discover and characterize archaeological sites dating to the early historic era in the territory of Coast Miwok and Southern Pomo people in central California. Approved by the Federated Indians of Graton Rancheria, this research is explicitly designed to counter prevailing misunderstandings about the impacts of the Spanish mission system and subsequent iterations of settler colonialism, which are usually viewed as projects that eliminated native landholdings and cultural knowledge. Through the use of historic documents, early maps, ethnographic data, and targeted archaeological fieldwork, we are illuminating a complex refugium along Tomales Bay that sustained native people during the first century after the arrival of Europeans to the region. We will discuss the challenges and opportunities of our research in light of the emerging concern for pragmatism in archaeology.

Pankowska, Anna [29] see Smejda, Ladislav

Pantoja, Luis, Iliana Ancona (Instituto Nacional de Antropología e Historia INAH), Maria Gomez (Instituto Nacional de Antropología e Historia INAH) and Claudia Gongora (Instituto Nacional de Antropología e Historia INAH)

[142] *Social Complexity of Peripheral Settlements on the Regional Capital of Ichkaantijoo*
In the last decade, research done by "Proyecto Arqueológico Region de Merida" (PARME) on peripheral settlements of the Ichkaantijoo area has had as a main objective to recognize and interpret the social organization of these ancient communities, that according to literature have been defined as rural settlements. Therefore, how is this area and the sites that constitute it characterized? What role did they play in the political and economic system? And, which cultural elements have witnessed them?
Multidisciplinary research, including the pattern of settlement, architecture, analysis of diverse cultural material and funerary context, lead to think that these Mayan communities were autonomously organized, showing their very complex and enduring politic, social and economic organization.

Pany-Kucera, Doris [87] see Salisbury, Roderick B.

Paquette, Jesseca [219] see Drapeau, Michelle

Paquin, Simon

[219] *Evaluating the Impact of Climatic and Environmental Conditions on AMH Initial Dispersal into Western Europe*
Paleoenvironmental reconstruction is an important tool for evaluating and understanding interactions between human populations and their environment during Prehistory. The downscaled global paleoclimatic models produced by the multidisciplinary efforts of the Hominins Dispersal Research Group allow for a fine-scale examination of climatic conditions in Paleolithic Europe. These models enable a spatial accuracy of 15 x 15 km and the consideration of inter-annual variability for different climatic variables. Using these data, an exploration of the MIS3 archaeological deposits and their environmental and climatic conditions is in progress. This project's goal is to evaluate the influence of climate change and variability on AMH spatial organization and test proposed routes of AMH dispersal into Western Europe. The ongoing creation of a database for early Aurignacian sites

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which is based on a critical analysis of archaeological dates will be presented. This database will be used to process paleoclimatic models and carry out micro-regional analysis within the putative paths of AMH dispersion.

[219] *Chair*

Parditka, Györgyi (University of Michigan), Paul R. Duffy (University of Toronto), Julia I. Giblin (Quinnipiac University) and László Paja (University of Szeged)

[245] *Peeling Back the 'Overburden': Collaborative Projects Studying Middle Bronze Age Societies in the Körös-Region, Southeast Hungary*

The transition to the Middle Bronze Age in the Carpathian Basin encompassed a broad range of changes in material culture, settlement and social organization. Upon first glance, the Körös-Region was no different from its neighbours. Tell sites emerged, population increased, farming intensified, and people engaged in long distance trade. The international Bronze Age Körös Off-Tell Archaeology (BAKOTA) project has studied this area through settlements and mortuary archaeology for over 11 years. Our research reveals that despite expectations, the Körös-Region followed a path quite different from its neighbours during the Middle Bronze Age: it did not experience the emergence of social inequality typical of societies just dozens of kilometers away. In this paper, we address how collaboration between North-American and European researchers shaped our questions, and how our project culture and language—"Hunglish"—have built on the successes and legacy of the Körös Regional Archaeological Project. We highlight our process of discovery, our continued interaction with KRAP, and the unexpected lessons to come from the deposits that superimpose the Copper Age layers.

Pargeter, Justin (Emory University) and Marika Low (University of Wollongong)

[41] *Lithic Miniaturization and Behavioral Variability in Southernmost Africa 18–11 kcal. BP*

Lithic miniaturization, the systematic production of small stone artifacts by controlled fracture, was a pervasive feature of late Pleistocene lithic technology. Smaller toolkits enabled humans to exploit raw materials more efficiently, to produce composite tools more effectively, to reduce a wider range of rocks, and to increase mobility by lightening toolkits. These benefits allowed humans to occupy a wider range of ecological niches. Archaeologists working in southern Africa have long acknowledged lithic miniaturization's importance in framing the region's late Pleistocene prehistory. However, to date archaeologists have conducted very little inter-region comparative research on the topic. This paper presents the results of a comparative lithic technological study between Klipfonteinrand and Sehonghong- two large rock-shelters located in southern Africa's winter and summer rainfall zones respectively. Evidence from these sites shows not only a comparative technological approach's effectiveness but also that lithic miniaturization expresses itself differently in different regions. Patterned variability of this nature fits a model of strategic behavioral variability. To gauge variability in prehistoric lithic miniaturization, archaeologists need to adopt more contextual and comparative methods of stone tool analysis.

Pargeter, Justin [227] see Stout, Dietrich

Parish, Ryan (University of Memphis) and Brad Koldehoff (Illinois Department of Transportation)

[140] *Documenting the Crescent Hills Quarry Complex, Missouri*

Presently, no detailed distribution map of the full scope of prehistoric procurement activities in the Crescent Hills area exists. The Crescent Hills area near St. Louis, Missouri is synonymous with high-quality Burlington chert. This paper presents data gathered from a preliminary survey of procurement activity preserved in the Tyson Research Center. The spatial data within a Geographic Information System allows researchers to study the relationship between geologic context, occurrence, and prehistoric industry. Future research will build upon the initial survey data by investigating adjacent potential procurement areas. Additional studies will assess the spectral variation of the deposits and examining synchronic and diachronic use of Burlington chert at associated workshop sites.

Parker, Ashley, Lisa Johnson (University of Utah), Kate Magargal (University of Utah), Marianna Di Paolo (University of Utah) and Brian Coddling (University of Utah)

[36] *When Is a Horse Not a Horse? It Depends on Your Local Ecology*

The (re)introduction of the horse to North America brought dramatic changes to American Indians. However, not all populations were affected equally; the horse became central to some societies, but had seemingly little effect on others. This variation is seen across Great Basin ethnographic groups, where some populations adopted the horse for transportation and hunting, while others ignored or even ate the horse. Some argue that this variation is the result of environmental constraints: where the local ecology could support horses, people adopted them; where horses could not survive, people did not. Here, we propose a novel ecological hypothesis based on the costs and benefits of riding versus eating the horse. We review the historical and linguistic evidence for variation in the adoption of the horse throughout the Great Basin, and then test the proposed environmental and ecological hypotheses.

Parker, Bradley (University of Utah) and Gabriel Prieto (Universidad Nacional de Trujillo)

[165] *Microartifact Analysis: An Application at Pampa La Cruz, Huanchaco, Peru*

For decades archaeologists have been trying to develop methodologies that will help them determine what activities took place in and around ancient structures. Since people tend to clean activity areas, especially those that are used repeatedly, visible artifacts are rarely discovered in the context where they were originally used. Microartifact analysis focuses on the tiny fragments (<1 cm) of ceramics, bone, lithics, shell and other microartifacts that are produced as a result of human action. These tiny fragments are much more likely to remain in or near the context where they were originally produced because they are too small to be easily gathered and are often trampled into the soil matrixes of ancient surfaces. This study applies microartifactual sampling, processing and analytical techniques to characterize and compare the activities that took place on ancient surfaces at the site of Pampa la Cruz in Huanchaco, Peru. By examining the ubiquity of various microartifact categories per liter of excavated surface matrix, we isolate loci of food production, suggest which types of local and non-local foods were consumed, theorize about cooking practice and waste disposal, and examine traffic patterns in and around two Gallinazo structures.

Parker, Bradley [165] see Osoros, Carlos

Parker, David

[274] *Beer, Bologna, and Beaux-Esprits: A Legacy of John R. White*

This paper discusses the public engagement of the late Dr. John R White through stories, observations, and news media. White, who passed away in 2009, had been an archaeologist at Youngstown State University, where he led excavations, gave interviews, and presented the past since 1971. For many residents of the Mahoning Valley, White was a fixture, often teaching archaeology to his students, then later their children, and finally the grandchildren over the course of four decades. Not content to teach only in the classroom, White led excavations from early spring until the late autumn to tell a variety of histories throughout the Mahoning Valley. Additionally, White organized trips to many of the region's important archaeological sites, such as the earthworks of the Ohio Valley, blast furnaces of Western Pennsylvania, and several international destinations. Moreover, this paper

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focuses on the many newspaper, radio, and television reports to demonstrate the passion White had for informing the public about the recent and distant past. Finally, this paper discusses the lasting legacy of White's long-term public engagement.

Parker, Evan (Tulane University)

[162] *Middle Preclassic Greenstone Caches from Paso del Macho, Yucatan*

Complex ritual deposits dating to the Middle Preclassic period are rarely encountered in Yucatan, and typically have only been recovered from disturbed contexts. Excavations along the center axes in the plaza of the Middle Preclassic village of Paso del Macho in the Puuc region of Yucatan

have yielded a series of offerings spanning from the early Middle Preclassic to the cusp of the Late Preclassic. Three different floor sequences were each associated with several offerings. The forms of the nine pottery vessels recovered from the cache are quite unique compared to types normally encountered in Middle Preclassic contexts from the Puuc region. These include a bucket, miniature bowls and dishes, and cacao serving vessels. Several of these vessels contained large greenstone axes and basalt, while another contained a perforated greenstone plaque. Upon reaching sterile soil, a massive pile of basalt fragments was found, under which three large east-oriented greenstone axes were recovered. This greenstone cache bears strong resemblance to other Middle Preclassic place-making deposits from the Maya lowlands, including Ceibal, Cahal Pech, and Cival. Its presence indicates the Northern Lowlands were embedded in the same expansive Mesoamerican trade networks as elsewhere in the Maya world.

[162] *Chair*

Parker, Megan (University of Kentucky) and Jon Spenard (California State University, San Marcos)

[256] *Sacred Landscapes, Spaces, and Ritual Offerings as the Materialization of Environmental Narratives at the Site of Pacbitun, Belize*

Material culture studies allow archaeologists to examine the social implications of the physical world in which people are embedded. Sacred landscapes, for example, inspire social narratives regarding how people should interact with the environment. Components of those landscapes, such as caves and mountains, become active participants in the establishment, maintenance, and mobilization of environmental narratives. They serve as hegemonic tools for conveying morality and proper behavior, and as such they are prone to appropriation by those in power. Using archaeological data from the Maya site of Pacbitun, this paper seeks to understand how materialized narratives are part of broader networks of power used to reinforce and challenge dominant hegemony. The presence of elite-sponsored constructions near caves act as overt manifestations of environmental narratives seeking to situate the community as a unified whole. Yet, studying ritually deposited offerings in Pacbitun's caves reveals differences in ceremonial practice. These deposits inform about the day to day concerns of individuals, their socioeconomic status and differential access to power.

Parker Pearson, Mike [29] see Schauer, Peter

Parker Pearson, Mike [126] see Shillito, Lisa-Marie

Parkinson, William (Field Museum of Natural History)

[245] *The Körös Regional Archaeological Project, 20 Years of (Mostly Successful) Collaboration*

The Körös Regional Archaeological Project was established in 1998 as a collaborative, multidisciplinary, research project focused on the later prehistory of the Körös region on the Great Hungarian Plain in the Carpathian Basin. Over the last two decades, the project has attempted to build upon the success of previous ambitious projects in the region by emphasizing not only the collaborative nature of the research endeavor but also by incorporating a robust training component into the project. In this paper, we attempt to review, critically, our research at Neolithic and Copper Age sites in the region, with an eye towards what has been successful and what could have been improved. We also discuss our current research, which attempts an explicit comparison of the trajectories toward settlement nucleation and tell formation during the Neolithic and the Bronze Age.

[245] *Chair*

Parkinson, William [245] see Gyucha, Attila

Parkour, Sepideh [126] see Sistiaga, Ainara

Parris, Caroline (Tulane University)

[337] *Middens, Caches, and Burials: Contextualizing the Ceramic Assemblage of La Corona*

Mundane utilitarian ware, finely decorated polychromes, fine paste and epigraphic imports, and plates bearing idiosyncratic local designs characterize La Corona's ceramic assemblage. The ceramic chronology of La Corona is presented with emphasis on construction phases, middens, caches, burials, and special deposits in an effort to reconcile the ceramic assemblage and the political history of the site. Polychromes bearing place names highlight La Corona's elite regional relationships while the prevalence of Lowland utilitarian ceramic types regionally contextualizes the nonelite. This paper seeks to situate the ceramic assemblage of La Corona within its chronological, regional, political, and social contexts.

Parrish, Allison [329] see Riel-Salvatore, Julien

Parrish, Deborah (Western Kentucky University), Jean-Luc Houle (Western Kentucky University), Jamsranjav Bayarsaikhan (National Museum of Mongolia) and Matthew Fuka (Purdue University)

[3] *Paleodietary Analysis of Xiongnu Individuals in Zuunkhangai, Mongolia*

The archaeology of the Xiongnu period has grown considerably over the last decade, yet debate still surrounds Xiongnu subsistence practices and the timing for the rise, expansion, and 'collapse' of the Xiongnu polity. The problem, in part, has to do with discrepancies between dates that come from the same sites. Some dates have been reported to be earlier when the samples came from human remains. These discrepancies have been attributed to the 'reservoir effect'. In order to investigate this, we analyzed and dated both human and animal remains from three Xiongnu period 'ring' burials in northwestern Mongolia—the so-called periphery of the Xiongnu Empire. Given this region has many lakes and that isotopically "heavy" $\delta^{13}\text{C}$ -values have been detected in cases from other regions of Mongolia, it is possible that fishing played a more important role than previously thought in the subsistence economy of some Xiongnu period pastoralists. Accordingly, paleodietary reconstructions based on dental pathology and stable carbon and nitrogen isotopic analyzes were also examined to evaluate how broad the dietary resources might have been and whether these individuals subsisted mainly on terrestrial animals or if fish made up an important enough source of food as to affect ^{14}C dates.

Parrott, Nathan (University of Calgary) and Carlos Peraza Lope (Centro INAH Yucatán)

[302] *An Analysis of Bark Beaters from the Postclassic Site of Mayapán*

This project examines an assemblage of 37 bark beaters from Northwest Yucatán, principally from the Postclassic Maya site of Mayapán. Bark beaters are stone tools used in the production of bark paper. In Mesoamerica, these tools were important in several specialized craft industries, including the manufacture of codices and clothing for religious and political ceremonies. There is still much that is unknown about pre-Columbian bark paper production, as bark paper rarely survives in the archaeological record, and bark beaters are often the only remaining physical evidence indicating that

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the production of bark paper took place at a site. Ethnohistoric sources suggest that the Postclassic Maya site of Mayapán was an important religious center that supplied priests from surrounding provincial capitals with codices made of bark paper. This study examines the degree of standardization of bark beaters, along with potential distinctions in use based on form and ethnohistorical information. The findings suggest that bark beaters were fabricated in a standardized manner, with two distinctly identifiable forms. In addition, bark beaters were also utilized for tasks other than the production of bark paper, such as smoothing plaster.

Parsons, Alexandra [111] see Hawthorne, Paige

Parsons, Timothy (Florida Division of Historical Resources)

[245] *Reinventing the Wheel: Discovering the Late Copper Age in Hungary, Again*

At about 3500 BC, a seemingly intrusive population of burial mound (kurgan) builders undertook a long-term series of migrations that resulted in the disruption of settlement patterns and social structures throughout eastern and central Europe. This phenomenon coincided with the emergence of the expansive and geographically homogeneous Baden material culture. From the 1960s to the 1990s, a series of archaeologists investigated the relationship between kurgan builders and Baden in the Carpathian Basin at various geographic scales. They questioned whether the Baden tradition was adopted by indigenous populations, if the tradition arrived with people via migration, and what role, if any, kurgan builders played in the emergence of Baden. The research presented in this paper is a reassessment and continuation of work done by researchers such as Maria Gimbutas and Andrew Sherratt, developed within the context of long-term, international, collaborative projects that address broad anthropological and archaeological issues related to social organization and hereditary inequality. Ultimately, I conclude that the shift in material cultural witnessed during the Late Copper Age on the Great Hungarian Plain is consistent with models of social change developed by other presenters in this session.

Pascual, Daniel [74] see Méndez, César

Pascual Soto, Arturo

[128] *Dioses y gobernantes en El Tajin del Epiclásico (ca. 800–1000 d.C.)*

Los gobernantes de El Tajin, aquellos pertenecientes al linaje de 13 Conejo, convirtieron al Conjunto Arquitectónico de el Edificio de las Columnas en la sede del poder político y religioso de la ciudad.

Su autoridad se dejó sentir en buena parte de la llanura costera y en las montañas de Puebla y Veracruz.

Tláloc se había convertido en númen de la clase política local y el culto al gobernante giraba en torno a esta deidad inmemorial.

La ponencia explora el papel que tuvieron las divinidades del Epiclásico y las maneras en que se articulaban en torno al culto a los ancestros.

Pastrana, Alejandro (INAH), Annick J. E. Daneels (IIA-UNAM) and Silvia Domínguez (DEA-INAH)

[285] *Obsidian Processing and Distribution in Classic Period Lower Cotaxtla Basin, Veracruz, México*

During the Classic period (1st mill. CE), South Central Veracruz was a mosaic of microstates in which obsidian was scarce but available to everyone. Semi-intensive systematic survey in 400 km² of the lower Cotaxtla basin showed occasional concentrations that led to propose two alternatives: state-controlled workshops obtaining and redistributing artifacts to resident population, or independent workshops servicing clients across borders, implying the existence of a market-based economy.

Chaîne opératoire analysis shows that, while obsidian sources (Zaragoza-Oyameles for prismatic blades and Pico de Orizaba for percussion flakes), core types and knapping techniques are identical across the survey region, there is a high incidence and a wide variety of knapping errors. The evidence reflects a well-established procurement system coupled to a low degree of specialization, which opens the possibility of a third alternative: state procurement of raw material (acquired using surplus of commercial staple like cotton, cacao, or rubber), with limited individual household access and production of artifacts.

Patania, Ilaria (Department of Anthropology, Harvard University), Susan Mentzer (Institute for Archaeological Sciences, University), Xiaohong Wu (Peking University), David Cohen (National Taiwan University) and Paul Goldberg (Department of Archaeology, Boston University)

[177] *Reconstruction of Pyrotechnology Connected with the Earliest Pottery. Micromorphology and -FTIR at Xianrendong and Yuchanyan, South China*

The sites of Xianrendong (Jiangxi) and Yuchanyan (Hunan), China, contain the earliest pottery yet discovered, dating respectively 20,000 cal BP and 18,600 cal BP. This pottery is found in otherwise Late Paleolithic, hunter-gatherer contexts. To understand human activities at these caves we employed micromorphology and -FTIR on the sediments. Here we present the results of analysis of the layers containing combustion episodes, which suggest low heating temperatures at both sites, and infer different kinds of activities in the caves. The low temperatures evident at Xianrendong raise new questions regarding cooking methods and pottery-making techniques. Thoroughly consumed wood fuel and presence of prepared clay surfaces at Yuchanyan indicate sophisticated pyrotechnological knowledge. These results are a first step in generating a high-resolution account of life in these two sites.

Patch, Shawn [286] see Lowry, Sarah

Patchen, Anna [156] see Hunt, Rebecca

Patel, Sneh

[121] *Ceramic Technological and Stylistic Boundaries on the Indus Frontier of Gujarat*

Rita Wright's pioneering work on the ceramic stylistic and technological traditions of the Indo-Iranian borderlands highlighted the potential of new theoretical approaches to our understanding of cultural boundaries within South Asia. This work highlighted the complex nature of technology and style boundaries within specific contexts of cultural interaction. This paper takes inspiration from Dr. Wright's work and applies this framework to another frontier of the Indus: the northwestern state of Gujarat. At the time of the Harappan occupation of this region (4th to 2nd millennia BCE), Gujarat was home to a number of localized ceramic traditions. Overtime, this area came to represent a mix of both traditional cultural expressions of Harappan stylistic norms as well as regional appropriations and adaptations of Harappan ceramic style and technology. This unique cultural landscape developed as a result of different forms of cultural processes, whether it be emulation, knowledge transfer, or shared aesthetics. By comparing the technology and styles of local ceramic traditions with that of the Harappans it is possible to trace one aspect of social interaction within this area.

[121] *Chair*

Patel, Sneh [121] see Green, Adam

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Patterson, Erin (Tulane University)**[337]** *The Bioarchaeology of La Corona, Guatemala*

Analysis of human skeletal remains has made significant contributions to the understanding of the history of La Corona and its interaction with the wider Maya world. The skeletal sample has now grown to include nearly thirty individuals, and includes single and multiples burials, non-burial deposits, and individuals from the site center and outlying sites. The study, one of the most comprehensive in northwest Peten, has focused on establishing demographic information and examining osteological indicators of diet and health, especially dental pathologies like caries, calculus, antemortem tooth loss, and linear enamel hypoplasia. Through the analysis of human bone, this paper will explore how factors like sex and social status are correlated with health and diet at La Corona. These data help situate La Corona within a broader regional context.

Patterson, Erin [337] see Ponce, Jocelyne

Patton, Katherine (University of Toronto), Susan Blair (University of New Brunswick) and Ramona Nicholas (University of New Brunswick)**[199]** *Recent Insights into Protohistoric Foodways in the Northern Quoddy Region of the Northeast*

Despite more than a century of archaeological research in the Quoddy Region of southwestern New Brunswick, in the Canadian Maritime Provinces, the protohistoric and early contact periods in this area have remained obscure. However, recent research at several sites has begun to illuminate this period, and like many of the precedent Woodland period sites (prior to 500 BP), many of these newly studied protohistoric sites have produced shell-bearing components, and contain a wealth of information on the integration of foodways and settlement, including site intensity and season of habitation. In this paper, we report on recent research at one of these sites, BgDs25, located along the northern mainland of the Quoddy Region, integrating an analysis of faunal remains as a means of gaining insight into Pestomakati food and lifeways, and to add to a growing body of primary research.

Paul Schann, Denise [116] see Rebellato, Lilian

Paulsen, Paige (University of Central Florida)**[71]** *Geospatial Analysis of Tumuli in the North Central Anatolian Plateau*

The tumulus fields—landscapes heavily modified by monumental burial mounds—of Central Anatolia provide an opening to investigate how the tumuli reflect and create places of collective memory, territorial identity, and the social order. This project takes the Iron Age tumuli of the Kanak Su Basin in Yozgat, Turkey as a case study and uses a GIS approach based on available evidence: their location from archaeological surveys, and a small number of excavated mounds. This paper investigates the relationship between the settlement pattern and the burial mounds along axes of proximity, visibility, and accessibility using spatial statistics, viewsheds, and least cost pathways.

Paulson, Marta [223] see Boyd, Charles

Pavlik, Bruce [86] see Louderback, Lisbeth

Pawlowicz, Matthew (Virginia Commonwealth University)**[210]** *Capturing People on the Move: Spatial Analysis and Remote Sensing in the Bantu Mobility Project, Basanga, Zambia*

From its inception in 2014, the Bantu Mobility Project has sought to recover the various mobilities that made up peoples' experience of the Bantu Expansions, the spread of over 500 related languages across nearly half the African continent. We have sought to refocus research on the Bantu Expansions away from the macro-scale and onto the specific movements of people, animals, and material goods at various spatial and temporal scales. From an archaeological standpoint this effort necessitates careful study of the spatial contexts of recovered artifacts—and of the human activities that left them behind—to capture different forms of mobility. Analysis of spatial data from archaeological and geoarchaeological surveys using GIS has already illustrated important relationships between different kinds of sites in the region around Basanga, Zambia, with implications for the kinds of daily, seasonal, and long-term movements that connected the people living and working in those places. Similarly, using GIS to combine such data with that available from satellite imagery has enabled the creation of a predictive model for the location of other sites, and which concerns from a mobile, Bantu-speaking community might have driven those selections, that can be evaluated through remote sensing and further survey.

Pay, Nicholas (Bureau of Land Management), C. Cliff Creger (Nevada Department of Transportation) and Beth P. Smith (Nevada Department of Transportation)**[261]** *The Long and Winding Road: Documenting Historic Transportation Routes*

One tough issue facing federal agencies in the United States and their archaeologists is how to document historic era transportation routes. In Nevada alone, there are nearly 6,000 miles of roads managed by the Nevada Department of Transportation (NDOT) most of which follow, cross or parallel historic routes. The Bureau of Land Management (BLM) manages nearly 48 million acres (~75,000 sq miles) of land in the state of Nevada with several thousands of miles of historic routes. This being the case, the questions always arise, how do we document these linear features and how do we remain consistent with recordation, context, significance and integrity beyond our lands? Many agencies are dealing with this using formal historic contexts or Multiple Property Documentation Forms as outlined by the United States National Park Service, while others are using exemptions and categorical exclusions in formal agreement documents. Archaeologists from BLM and NDOT will explore the advantages and disadvantages of the documentation methods that are currently being used to work towards a standard for this type of work in the state of Nevada.

Payntar, Nicole, Julia Earle (University of Texas at Austin), Camille Weinberg (University of Texas at Austin) and R. Alan Covey (University of Texas at Austin)**[100]** *Foreign Travel and the Development of Inca Archaeology in Cuzco, Peru*

The roots of Inca archaeology lie in reports and memoirs of 19th century travel, which culminated in Hiram Bingham's 1911 Yale Peruvian Expedition. These accounts traced routes that brought international attention to architectural remains of Inca royal estates and religious monuments, providing an early "guide" to would-be travelers and framing the formative years of Inca archaeology. As research proliferated in the past 50 years, some archaeologists have promoted the remains of royal estates as the materialization of the Inca dynasty, whereas others have advocated a more dynamic approach. Today, the articulation of a well-defined tourist circuit that connects Cuzco to Inca monuments in nearby areas perpetuates the historicist interpretation of the dynasty, promoting a sense of imperial timelessness. This poster uses GIS analysis to frame the historical development of the Cuzco tourist circuit in the broader archaeological context that has developed alongside it.

Pazmiño, Estanislao**[178]** *Entre los Andes y la Selva: Una aproximación al desarrollo prehispánico en el valle del Alto Upano, Ecuador*

Localizado en la alta amazonía ecuatoriana el entorno geográfico del valle del río Upano acoge una amplia diversidad ecológica y de suelos que, sin duda, resultaron atractivos para los diferentes grupos humanos que se asentaron en la región durante la época prehispánica. Por otra parte la ubicación estratégica hizo que el valle sin duda constituya un nodo importante en la interacción cultural entre los altos valles andinos y las tierras bajas

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amazónicas. Ambas situaciones fueron favorables para el establecimiento de sociedades con expresiones culturales particulares y diferentes formas de organización sociopolítica. Sus distintas respuestas culturales a un mismo entorno geográfico resultan de gran interés para comprender los procesos de interacción humana en una región que usualmente ha sido catalogada como zona de tránsito entre los Andes y la Amazonía.

Pazmiño, Estanislao [132] see Lippi, Ronald

Peacock, Evan (Mississippi State University), Sheeji Kathuria (Mississippi State University) and David S. Nolen

[189] *Talking to Our Selves? An Applied Zooarchaeology Citation Analysis*

Applied zooarchaeology has been on an apparent upward swing, gaining practitioners and seeing an increasing number of publications in natural science journals. Whether the intended consumers (conservation biologists, land managers) are receiving the message remains uncertain. We used a two-phase process to survey the literature pertaining to applied zooarchaeology: 1) keyword searching for highly cited applied zooarchaeology publications in Google Scholar; and 2) tracking of specific articles reflecting different scales of applied zooarchaeological research (species, community, ecosystem). For each source type, we organized bibliographic information in Excel and collected Library of Congress Subject Headings (LCSH) for the publication source to characterize the overall type of discipline(s) citing this work, whether archaeology, conservation biology, or related fields. We then assigned subject categories to each source by using the Library of Congress Linked Data Service to identify broader, discipline-level terms under which related LCSH could be grouped, allowing analysis of which publications were primarily within the boundaries of anthropology/archaeology, which were overall more closely associated with specific disciplines beyond anthropology/archaeology, and which were more interdisciplinary in nature. Preliminary results indicate a significant concentration of citing sources in the disciplines of anthropology and archaeology, suggesting that the product remains to be adequately marketed.

Peacock, Taylor (University of Victoria)

[305] *Names, Lineages, and Document Archaeology: Examining Traditions and Cultural Shifts in Jewish Personal Names*

While artifacts and grave goods remain an archaeologist's primary tools for gathering information on past populations, document and historical archaeology increasingly look to census records, obituaries, and family records, not just to confirm information about recovered artifacts, but as artifacts themselves. This study analyzed census data, birth records, and obituaries associated with three missing individuals assumed to be buried in Victoria's Congregation Emanu-El Jewish cemetery to understand how personal names could be used in identification. The study determined that shifts in personal naming traditions in a family can indicate religious conversion, as was found across four generations of the Sylvester family, preventing burial in the cemetery. The study also examined name shifts across a single individual: first, how those who create records impact the data they collect, as was the case of Huldah who became Hilda across three decades of census, and second, how individuals themselves may change names between documents, highlighting how personal choices impact identification, as was the case of Solomon, also Simon. In examining three different forms of naming as case studies, the results emphasized how crucial documents can be to identifying individuals and families, but in doing so, we must consider social and cultural contexts.

Pearsall, Deborah [323] see Berman, Mary Jane

Peasley, Ariel (California State University, Chico) and Georgia Fox (California State University, Chico)

[70] *Digging the Dockyard: An Analysis of Curation Practices in Antigua*

Museums and their exhibitions are representations of archaeological research. Archaeological excavations, associated objects, and subsequent interpretations frequently end up in museums and are often the only access the general public has to this knowledge. How objects are acquired, cared for, and presented ultimately affect what people learn about them in a museum setting. It is crucial for museums and museum professionals to maintain standard practices and care for these objects to the best of their ability with the resources they have available.

Our work at the Dockyard Museum in Antigua focuses on the difficulties and the potential for proper curation and care of unique archaeological artifacts while keeping a narrative the public is attracted to. Our project focused on rejuvenating the museum's displays, but through this process we realized the necessity for professional archaeologists to understand how curation and narrative at a museum have lasting implications on the archaeological record. This presentation highlights the history and current state of the Dockyard Museum while addressing how the care and display of archaeological materials affects the interpretation and preservation of the archaeological record.

Pecci, Alessandra (University of Barcelona)

[315] *Discussant*

Peck, Laura [223] see Munger, Tressa

Peckham, Moira (University of California, Berkeley) and Annie Danis (Department of Anthropology, University of California)

[239] *Community- Engaged Archaeology with Abiquiú, New Mexico*

This poster presents how the Berkeley Abiquiú Collaborative Archaeology project integrates oral histories conducted with community members with spatial and material data to support a more robust dialogue between the contemporary and the historic that is thoroughly grounded in community perspectives. At Abiquiú, the community's perspectives on water management as presented through the interviews and, subsequently, the material and spatial data are intimately connected to not only identity, but also historic and contemporary tensions between local and state water- managing entities.

Pederson, Joel [305] see Cannon, Molly

Pedro Black, Marielle and Connie Reid (Kaibab National Forest, USFS)

[106] *Saddle Mountain Wilderness, North Kaibab Ranger District, Kaibab National Forest*

The Kaibab National Forest has a long history of completing site inventory, recordation, and research within wilderness areas with the help of assorted volunteers. Recent work on the North Kaibab Ranger District of the Kaibab National Forest in the Saddle Mountain Wilderness has been the result of the Wildcat and Fuller fires. Archaeological involvement during the fire planning process helps to proactively identify and protect heritage resources ahead of fire spread. Working with fire crews, archaeologists are able to prep, discover, and avoid/protect sites. Sites located in fire planning or burned areas are highly visible for easy recordation, and require resource damage assessments to evaluate and treat sites susceptible to erosion and other disturbances. The occurrence of fires in wilderness offer an opportunity to learn more about sites that may not otherwise be achieved except during directed research activities carried out with the help of volunteers. Exposed sites are ideal for research regarding fire effects and spatial and temporal land use studies, as well as gaining a more comprehensive view of features and artifacts within and among sites.

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Peebles, Matt (Arizona State University), Barbara Mills (University of Arizona) and Jeffery Clark (Archaeology Southwest)**[83]** *The Risks and Rewards of Network Position in the Chaco World*

In a previous study Peebles and Haas (2013) compared brokerage (intermediate) positions in networks of ceramic similarity to measures of settlement growth and longevity for the late pre-Hispanic western U.S. Southwest (A.D. 1200–1500). Counter to expectations from many contemporary network studies where brokerage positions are associated with long-term advantage, this work instead suggested that broker settlements tended to be small, short-lived, and that brokerage was temporary. This example suggests that the outcomes associated with network position are not strictly determined but that culturally and historically contingent factors can influence how the risks and rewards of network position play out. In this study we take this investigation further by exploring the changing outcomes associated with brokerage positions across a major cultural/historical transition in the northern Southwest. Specifically, we track the relationship between brokerage and settlement trajectories across the rise and fall of the Chaco World (A.D. 800–1250). Initial results suggest that brokerage positions may have conferred advantage that did result in settlement growth and longevity during the height of the Chaco system, but not before or after. In light of this finding, we explore the role that political organizational complexity may play in how network ties are valued.

Peebles, Matt [287] see Dungan, Katherine

Peixotto, Becca (American University)**[239]** *Paths of Connection in the Great Dismal Swamp: Wetland Watercourses as Indigenous and Maroon Landscape Features*

Speckled with mesic islands and peat hummocks, the soggy lowlands and standing water of the Great Dismal Swamp in Virginia and North Carolina (USA) were home to thousands of African and African American Maroons ca. 1608–1863 and were a significant feature of the landscape of Indigenous Americans for many centuries prior. The Great Dismal Swamp Landscape Study and the Swampscape project archaeologically investigate the landscape of resistance created by Maroons. The Dismal is far from a homogenous morass and surrounded by seemingly impenetrable vegetation deep in the Swamp's interior, one may be tempted to view the small dry landforms on which Maroons, Indigenous people and others built structures, had fires, and engaged in other activities of daily life as isolated locales. Recent LiDAR studies and exploration has revealed a significant topographic similarity amongst the sites and potential sites identified to date in this varied wetlands: their proximity to a stream or watercourse. This poster examines the watercourses and what they may have meant for travel, community connections, and contact with the world beyond the Swamp.

Peláez Ballestas, Ingris [55] see Gastelum-Strozzi, Alfonso

Peláez Castellanos, Yolanda (Universidad de las Américas Puebla), Nawa Sugiyama (Department of Sociology and Anthropology, GMU) and Agustín Ortíz (Laboratorio de Prospección Arqueológica, IIA, UNAM)**[293]** *An Approximation towards the Function of Candeleros in the Plaza of the Columns Complex, Teotihuacan*

Candeleros are ceramic artifacts that are almost exclusively found at Teotihuacan and appear in the archaeological record during the Late Tlamimilolpa, Xolalpan and Metepec phases. Their unconventional shape led scholars to propose different hypotheses regarding their specific function (i.e. "candle holders", incense burners, lighting devices, domestic ritual paraphernalia). This paper studies 368 candeleros (fragments and complete pieces) recovered from the 2015 and 2016 excavations carried out at the Plaza of the Columns Complex, a civic-administrative complex in the ceremonial core of Teotihuacan. The spatial distribution of candeleros, as well as spot tests identifying the presence of residues within them (n=105), are utilized to understand their possible use(s). Preliminary results will be presented and compared to data from other parts of the city that exist to date.

Peliska, Charles [39] see Mann, Rob

Pellegri, Evan [106] see Dillingham, Frederic

Pelton, Spencer (University of Wyoming)**[58]** *A Thermoregulatory Perspective on the Folsom Archaeological Record*

Human cold intolerance unambiguously suggests that mid to high latitude prehistoric foragers used thermoregulatory technologies, such as clothing and housing, to cope with the environment, even if archaeologists rarely find them in the record. Others have recognized this, but none have developed a formal means of expressing variation in thermal technologies in the archaeological record over widespread temperature clines. I draw from observations collected during ethnoarchaeological fieldwork with the Mongolian Dukha reindeer herders to understand the material correlates for thermal technologies. I then present an analysis of 53 published Folsom archaeological assemblages to test the notion that phenomena associated with thermoregulation, such as end scrapers and houses, become more abundant in colder environments. I make the case that my results have widespread implications for understanding variation in forager archaeological sites independent of and complementary to subsistence-based interpretive frameworks.

Pelton, Spencer R. [105] see Robinson, Erick

Peña, Jose**[65]** *Casma Domestic Life at the El Campanario Site, Huarmey Valley—Peru*

Households are the most important social unit in every society. The production and consumption of resources within the household can provide information on how resources were obtained, stored and distributed within the Household or the community. Recent archaeological research has provided significant information about the Casma polity, which occupied the northern coast of Peru between 700–1400 A.D. The Casma society is viewed as a centralized polity that controlled several coastal valleys. Although certain aspects of the Casma society are still unknown, the research conducted at El Campanario was oriented towards understanding the domestic life of the Casma people. The excavations within the households at El Campanario has provided baseline information that will aid in reconstructing the domestic activities related to food preparation and consumption as well as craft production. The craft activities identified at the site include pottery manufacture, textile production, maize beer preparation, and fishing.

Peña, Jose [153] see Eche Vega, J. Eduardo

Penfil, Rachael (University of Illinois at Chicago) and Kelita Pérez Cubas**[240]** *Control, Visibility, and Storage at Monte Sierpe, a Late Horizon Site in the Pisco Valley, Peru*

The Pisco Valley was an important node for the Inka empire's control of what is now the southern coast of Peru, as evidenced by the presence of the large Inka administrative center of Tambo Colorado. This valley additionally would have been a strategic location for sociopolitical and economic exchanges between the Inka empire and the Chincha kingdom, whose capital is located just to the north in the Chincha Valley. This preliminary research utilizes survey data and GIS analyses to examine access routes, visibility, and storage distribution at the Monte Sierpe complex, located in the Pisco Valley, to better understand the relationship between the Chincha kingdom and the Inka empire during the Late Horizon. I argue that the

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Monte Sierpe complex—which includes the Band of Holes, located just 1km down the valley from the main site—was a Late Horizon administrative center utilized by the elites of both polities to exert control over the valley's inhabitants. The data additionally suggest that the Inka incorporation of the Chincha kingdom into the Inka empire was not as peaceful as previously thought, as evidenced by the construction of defensive walls in various areas of the site.

Penfil, Rachael [240] see Weinberg, Camille

Peniche May, Nancy (Universidad Autónoma de Yucatán—Facultad de Arquitectura) and Lilia Fernandez Souza (Universidad Autónoma de Yucatán—Facultad de Cien)

[162] *The Ch'ulel of Architecture of Power: Preclassic Ritual Behavior in the Northern Maya Lowlands*

How does a building become architecture of power? How can this power be release or lost? There are many ways in which a building can be imbued with certain attributes that allow expressing and regulating unequal power relations. Along with the form and style of buildings, ritual is perhaps one of the most important means. Through ritual performance, actors imbue the building with the ch'ulel, ensouling and animating it; obliged the ch'ulel to leave the building, killing the animate construction, and make it possible for the ch'ulel to reborn, favoring it to become more powerful. In the lowlands, the performance of rituals that had as purpose to animate, kill or make reborn buildings is a long-standing tradition that dates back to the Middle Preclassic period. This paper focuses on Structure 1714-Asub of Xaman Susula, a public building interpreted as architecture of power, precursor of the Classic palaces that had administrative and ritual functions but lacked domestic functions of palaces. During the archaeological explorations, we found material remains of ritual behavior that indicates that Structure 1714-Asub was alive and powerful. This building was likely manipulated by actors to wield power over other members of their community.

Penny, Dan (The University of Sydney) and Tegan Hall (The University of Sydney)

[175] *Urban-Palaeoecology of Cambodia's 'Middle Period'*

The transition from the sprawling Angkor kingdom with its vast, low-density urban forms, to a constellation of smaller cities on the Mekong River was accompanied by profound changes to urban ecology and to landscapes—both in the failing low-density cities, and in the burgeoning trade-based centres that replaced them. Here, we present a paleo record of urban ecology that responds, in part, to changing population dynamics across Cambodia during the 15th to 19th centuries C.E. Implications for current models of 'urban diaspora' following profound social transformation will be discussed.

Pentney, Sandra (Atkins) and Stephen Bourne (Atkins)

[135] *Using the City Simulator Tool to Aid in Preservation during Resiliency Planning*

The SAA has held sessions on how climate change is affecting cultural resources for several years now. We began with characterizing the impacts and concerns on how to preserve or mitigate. We have discussed ongoing studies, and strategies to engage the public and local government in conservation and recordation initiatives. This year, Atkins will be presenting a newly developed tool to help planning organizations visualize physical impacts to built environment, traditional cultural properties, and archaeological resources. The 'City Simulator Tool' will be presented as a method to understand climate change impacts at the community level, with particular emphasis on looking at impacts to all forms of cultural resources. By using this tool, we can help agencies see the effects of different resiliency plans on historic planning efforts and help agencies evaluate which plans represent the least impact to resources.

Perales, Manuel

[273] *To walk in order to remember... and to dominate: Inca Roads and Hegemonic Processes in Jauja, Central Highlands of Peru*

Previous research on the Inca road system have generally developed functionalist perspectives on their associated characteristics and infrastructure, inherited in several cases from processualist approaches that focused primarily on their economic and military role. However, more recent studies on the nature of the Inca state have varied substantially, granting an outstanding importance to ideology and religion as mechanisms of domination. Based on these considerations, this paper presents an approach to the role that would have been played by the roads in the strategies of domination and hegemonic processes established by the Incas in the region of Jauja in the central highlands of Peru. Based on a set of data obtained by the Qhapaq Ñan Project in that territory, I propose that the road system was thought of as a kind of technology of power in the Foucauldian sense of the term.

Peralta, Eva (CONICET/IANIGLA-UTN FRSR, Argentina), Leandro Luna (CONICET/IMHICIHU. UBA. Buenos Aires, Argentina.), Claudia Aranda (Faculty of Odontology, University of Buenos Aires,) and Adolfo Gil (CONICET/IANIGLA-UTN FRSR, Argentina)

[105] *Human Demography and Ecosystems: Comparative Approach of Human Age-at-Death Profiles from Northpatagonia (Southern Mendoza, Argentina)*

The aim of this presentation is to provide information about human age-at-death profiles in order to understand the environmental/demographic dynamics of pre-Hispanic people from Southern Mendoza. Burials from 20 archaeological sites are included in age-at-death profiles, which are compared to discern regional particularities. This is a transitional area between hunter-gatherers groups and farming populations. The presentation evaluates if the introduction of domesticated resources in the diet and the new agricultural subsistence patterns altered the hunter-gatherer demographic dynamics, and specifically if human demography declined during the Little Ice Age (LIA).

Peraza Lope, Carlos [302] see Parrott, Nathan

Perdikaris, Sophia (Human Ecodynamics Research Center CUNY)

[237] *Discussant*

Pereira, Gregory [43] see Manin, Aurelie

Peres, Tanya (Florida State University)

[217] *Shell Heaps as Indicators of Resource Management*

The Neolithic Revolution of the 9th millennium BC marks the period when forager groups independently experimented with the management and, in some instances, the domestication of terrestrial plants and animals. However, global evidence for human consumption and management of gastropods predates the Neolithic Revolution, indicating that terrestrial and aquatic snails were an important resource for human societies during the Holocene. Abundant deposits of aquatic snails are reported from archaeological sites in Mesoamerica, Japan, and China, while the consumption of land snails is well-documented in the Iberian Peninsula, the circum-Mediterranean area, Africa, and North and South America. These studies show the temporal depth and spatial breadth of human's knowledge of, and interaction with, gastropods. Along the interior waterways of the American Southeast, accumulations of freshwater gastropods appear in archaeological sites during the pan-regional culture phase of the Shell Mound Archaic, from approximately 7000 to 1000 cal BC. Using data from zooarchaeology, geoarchaeology, invertebrate zoology, and taphonomy, we show that the

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anthropogenically induced freshwater gastropod deposits along the Cumberland River in the American Southeast comprise the oldest documented occurrence of freshwater aquaculture in the Americas, ca. 5300 cal BC.

[102] *Chair*

Peres, Tanya [102] see Brady, Ashley

Peresolak, Katherine (McCormick Taylor)

[334] *Partnerships for Heritage Stewardship*

The objective of my Master's thesis was to formulate a history of the Carroll Cabin and farm, a historic log house located in Fayette County, Pennsylvania on Department of Conservation and Natural Resources (DCNR) land. My research focused on how archaeological and historical records could be used to answer questions about the farm's extant home and the property's history. In Pennsylvania and other states (and at the federal level) multi-use public land managers are responsible for similar structures and the associated archaeological sites. These resources are often located in remote areas with little or no associated primary records, which means there is no construction date available to assist with resource management and a significance assessment. Dendrochronology, or tree-ring dating, is an affordable and effective methodology that has the potential to date log buildings or structures whether primary records exist or not. Partnership research using such technology is not only beneficial to the story of Pennsylvania and the region, it is also important for promoting heritage stewardship on public land.

Perez, Daniel and Karen Harry (University of Nevada, Las Vegas)

[164] *House 47: A Case Study of Abandonment and Trade in the Lowland Virgin Branch Puebloan Region*

Considerations of chronology, chronometry, and systemic contexts of archaeological sites in the American Southwest have primarily focused among the larger prehistoric cultural centers (e.g., Hohokam) throughout the history of archaeological research in this region. Research pursuits beyond the southern and eastern regions of the American Southwest—particularly within the Virgin Branch Puebloan cultural region—have not been pursued accordingly for various reasons. Seminal work by Margaret Lyneis (University of Nevada, Las Vegas) in the lowland Virgin Branch Puebloan (VBP) region, among other scholars, provide the context for the present study in which a fuller understanding of the prehistory of the VBP region is sought. House 47, an archaeological site in the lowland VBP dating to the early Pueblo III period, likely represents one of the final occupations prior to abandonment of the lowland region. This paper considers both the unusually large size of House 47 (comprising more than 100 houses) and what recent excavations at the site suggest regarding abandonment of the region and related impacts on trade networks during the Pueblo III period.

Perez, Erina, Thomas Banghart (University of Santa Cruz), Hope Loiselle (University of Maryland) and Kevin Gibbons (University of Maryland)

[195] *At the Intersection of Academia and Activism: Using the Historical Ecology Framework toward the Conservation and Restoration of Natural and Cultural Heritage*

Historical ecology has become one of the most relevant research paradigms in understanding the long-term relationships between humans and their environments. Its multidisciplinary approach dissolves the boundaries between the social and natural sciences to bring together disciplines such as archaeology, ecology, biology, anthropology, ethnohistory, and geography toward the conservation and restoration of natural and cultural heritage. This paper specifically explores archaeology's unique position within the framework of historical ecology and raises questions regarding its role in contemporary public policy discussions. Archaeological data are invaluable assets in addressing current environmental issues, establishing baselines for natural resource management strategies, and providing insight into long-term human-environment interactions. Concurrently, scholars and academics, traditionally avowedly apolitical, are increasingly redefining the intersection of being an academic and an activist. We bring attention to the community of scholars who engage with historical ecology and present the case for a historical ecology interest group within the Society for American Archaeology. To do this, we present case studies that explore how the historical ecology framework is being used in various contexts to inform and influence management of both natural and cultural heritage.

Pérez, Jan (University of Puerto Rico, Rio Piedras Campus) and Paola Schiappacasse (University of Puerto Rico, Rio Piedras Campus)

[57] *Recreating the Late 19th Century Urban Landscape of Puerta de Tierra, San Juan, Puerto Rico*

Throughout the 19th century, the Spanish colonial capital of Puerto Rico, San Juan underwent an urban expansion outside its city walls. Puerta de Tierra, a neighborhood located east of the walls, registered a steady growth between the 1870s and 1890s. Through the use of primary documents such as maps, construction permit requests, blue prints, and historical photographs it is possible to reconstruct part of this urban landscape. This information in combination with census records can also help to identify the characteristics of this working class sector of the city of San Juan, as well as the material culture that could be found if archaeological excavations were to be conducted in these houses.

Pérez Antonio, Mariela [293] see Fash, William

Pérez Calderón, Ismael (Universidad Nacional de San Cristóbal de Huamanga)

[300] *Lluvias que ocurrieron en el pasado prehistórico del valle de Huamanga en Ayacucho, Perú*

El registro arqueológico muestra que durante el pasado prehistórico en el valle de Ayacucho, ocurrieron diferentes lluvias que no solo inundaron y sepultaron aldeas, templos, pueblos y otros monumentos, sino que testimonian los cambios drásticos sucedidos en el desarrollo de las culturas. Como en el caso de la Costa, se vieron afectadas por el fenómeno "El Niño" o ENSO, y lluvias torrenciales que produjeron huaycos y sequías en la región interandina y en otras partes del mundo. Desde los lo menos el precerámico tardío, con mayor énfasis en entre los 1500 a.C. a 1200 d.C, tal como indican la sedimentación y restos culturales asociados a pisos y rellenos en la estratigrafía de los sitios arqueológicos de Waychaupampa, La Compañía, Conchopata, Muyo Orqo y la misma ciudad de Huari como parte del factor natural que debió influir en la remodelación y modificaciones de algunos edificios, y posible abandono de asentamientos en la cuenca del río Huarpa, Sierra sur de los Andes centrales.

Pérez Calderón, Ismael [300] see Isbell, William

Pérez Cubas, Kelita [46] see Osborn, Jo

Pérez Cubas, Kelita [240] see Penfil, Rachael

Pérez Robles, Edwin [163] see Doyle, James

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Perez Rodriguez, Veronica (University at Albany, SUNY) and Corina Kellner (Northern Arizona University)

[25] *Infancy and Breastfeeding at Cerro Jazmín: Isotopic Data from a Late-Terminal Formative Population in the Mixteca Alta, Oaxaca*
 We present isotopic results from 25 adults and children from Cerro Jazmín. Bone collagen (n= 17) and bone and enamel apatite (n=21) isotopic data provide C, N, and O values describing diet and breastfeeding patterns. Carbon values suggest a narrow diet heavily based on maize and little animal protein. Individuals between 0–3 years of age had significantly higher nitrogen and oxygen values than adults, suggesting that these infants may have still been breastfeeding at the time of death. Weaning likely occurred between 3–6 years of age when C3 foods, perhaps squash, were introduced in the weaning diet. By 6 years of age isotopic values matched those of adults. Alternatively, since the subadults in the sample are those who did not survive into adulthood, their elevated nitrogen and more negative carbon values may be attributed to severe stress prior to death. Therefore, we also consider the proportion of adults versus subadults recovered from different periods of occupation at Cerro Jazmín as well as pathological and traumatic lesions to discuss broader patterns of infant health and mortality.

Perez Zambrano, Enrique [230] see Halperin, Christina

Perez-Juez, Amalia (Boston University), Ricardo Elia (Boston University) and Meredith Langlitz (Archaeological Institute of America and Boston Uni)

[222] *Students Discover Heritage: Lessons from the Field Boston University Field School in Archaeological Heritage Management (Menorca-Spain)*

Boston University's field school in Menorca, Spain, started 17 years ago as a traditional field school experience. Over the years, we incorporated the study of archaeological heritage management—both theoretical and practical—as an integral part of the curriculum. In the last decade, the increasing number of students interested in cultural heritage management inspired us to move to a heritage management-only field school. This poster will present the results of our first season. Menorca is a UNESCO biosphere reserve and candidate for World Heritage status. Menorca preserves archaeological and cultural sites from every period of its history, ranging from megalithic Bronze/Iron Age settlements to the remains of the Spanish Civil War. The island's rich cultural legacy, together with its impressive and diverse natural settings, makes it an outstanding laboratory for studying heritage management. During the field school we introduced students to the principles and practice of archaeological stewardship: preservation, interpretation, management, and public outreach. There is nothing more eye-opening than learning this in situ: at sites, museums, and throughout the landscape. A student project researched links between the US and Menorca. From Admiral Farragut to the Second World War, students discovered a fascinating common past worth safeguarding for the future.

Perkins, Leslie and Travis Stanton (University of California Riverside)

[238] *Light Detection and Ranging (LiDAR) of San Gervasio, Isla Cozumel, Quintana Roo, Mexico*

The use of Light Detection and Ranging (LiDAR) in Mesoamerican archaeological research has been steadily increasing. Building on this knowledge, LiDAR was conducted during the summer of 2017 over a 6km² area of the prehispanic site of San Gervasio, Isla Cozumel, Quintana Roo, Yucatan, Mexico. This was part of a larger survey and mapping project conducted by the Proyecto de Interacción Política del Centro de Yucatán (PIPICY) spearheaded by Dr. Travis Stanton.

The proposed poster will discuss LiDAR imagery of San Gervasio, Cozumel along with overlays of excavations done during the Spring of 2017, which focused primarily on ossuary structures located just outside of the site center. Here I will be presenting preliminary findings of the mapping project at San Gervasio and discussing how the newly acquired LiDAR matches with what has been ground truthed through traditional survey methods, and what future research is on the horizon with the aid of this new data.

Perkins, Stephen M. [268] see Trabert, Sarah

Perla-Barrera, Divina [80] see Hiquet, Julien

Peros, Matthew (Bishop's University)

[171] *Hurricanes as Agents of Cultural Change: Integrating Paleotempestology and the Archaeological Record*

Hurricanes are major climatological events with significant impacts in tropical and extra-tropical regions worldwide. Despite this, little research has been undertaken on the effects of hurricanes and other intense storms on prehistoric societies. New evidence from the field of paleotempestology—the study of past hurricane activity using geological proxy techniques, such as lagoon sediments and speleothems—is shedding light on how hurricanes varied over the Holocene in terms of frequency, geographic distribution, and magnitude. This information, in conjunction with archaeological data from coastal locations, may provide a means for helping us better understand mechanisms for human adaptation and resilience in the face of abrupt, high-magnitude climatic events. The purpose of this paper is twofold: 1) to summarize the current state of knowledge of Holocene hurricane variability in a key region—the Caribbean—where recent findings have identified a number of centennial-scale periods of hurricane “hyperactivity”; and 2), to identify and evaluate the ways that human responses to hurricane activity can be identified in the archaeological record at different spatial and temporal scales, including house and dwelling architecture, to the planning of settlements in protected areas, to regional-scale migration and demographic change.

Perreault, Charles [227] see Paige, Jonathan

Perrelli, Douglas [22] see Snyder, Daniel

Perri, Angela (Max Planck Institute for Evolutionary Anthropology)

[212] *New Evidence of the Earliest Domestic Dogs in the Americas*

While the arrival of domesticated dogs with an initial human migration has been the most reasonable explanation for their presence in the Americas, evidence for Paleoindian dogs has proven elusive. Here, we present the identification and direct radiocarbon dating of an isolated dog burial from Stilwell II, an Early Archaic site in the Lower Illinois River Valley. We also present new direct radiocarbon dates for two dogs from the nearby Archaic Koster site. These dates confirm that the Stilwell II and Koster dogs represent the earliest directly-dated evidence for domesticated dogs in the Americas and the oldest intentional burials of individual dogs known in the worldwide archaeological record. The appearance of the earliest domesticated dogs in the Midwest around 10,000 years ago presents a conundrum both temporally and spatially. If dogs arrived with the first migrating human groups, the earliest dog remains should appear in northern and western North America during the Paleoindian period.

[212] *Chair*

Perri, Angela [212] see Larson, Greger

Perrone, Alexandra [179] see Milligan, Colleen

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Perrotti, Angelina (Texas A&M University)**[290]** *Non-pollen Palynomorphs Reveal Environmental Fluctuations in the Terminal Pleistocene Southeastern United States*

Paleobotanists and palynologists must be able to identify various types of plant remains from archaeological sites. Because of the difficulty of becoming familiar with the vast array of microfossils found in a typical pollen sample, non-pollen palynomorphs (such as fungal spores) are often overlooked in traditional palynological analyses. However, they can be indicators of various environmental changes such as fluctuations in plant and animal communities, erosion and fire events. This paper demonstrates the utility of fungal spores as paleoenvironmental proxies at two submerged sites in the Southeastern United States: Page-Ladson, Florida and White Pond, South Carolina. Non-pollen palynomorph assemblages at these sites provide evidence of considerable disturbances to vegetation, including fires, grazing and browsing regimes, and periods of erosion. Of particular interest are the coprophilous fungal spores, which indicate a decline in megaherbivores at both sites by ~12,600 cal BP. The information provided by non-pollen palynomorphs can enhance other paleoenvironmental data to further contextualize cultural adaptations of Terminal Pleistocene peoples.

[290] *Chair***Perry, Laureen (U.S. Bureau of Reclamation)****[164]** *Margaret Weide Lyneis—Archaeologist, Professor, Mentor, Student, and Friend*

Dr. Margaret Lyneis had a long career as an archaeological researcher, preservationist, and scholar, starting with field research in the 1960s when few women were in the field and as a professor at the University of Nevada, Las Vegas. Early research was in the Warner Valley of Oregon, in California, and in the Great Basin. As she focused her research on Far Western Puebloans, Dr. Lyneis became the expert on their early occupation of southern Nevada and the Virgin Region. Her influence on the world of archaeology extends far beyond that research as her students and colleagues continue applying her approaches, professionalism, and passion to other archaeological topics, careers, and advocacy. This symposium barely touches the extent of Margaret Lyneis' influence on archaeology.

Person, Dylan (University of Nevada, Las Vegas)**[186]** *Rocky Refuse or Useful Utensil?*

What is the value of an expedient lithic tool? By what standard is its performance judged? Analysis of lithic debitage has long focused on morphological characteristics of flakes to determine fracture mechanics and other technological aspects of the flintknapping process. As such, most lithic flake termination types are seen as the result of misdirected force as opposed to techniques producing a mechanistically ideal flake type. What does this mean for past humans who did not follow the analytical approach employed by contemporary archaeologists? Could these flakes have been useful for reasons not apparent from study of fracture mechanics? Though archaeologists have long been aware of the dangers of applying current knowledge to past contexts, does this mean that there is no way to infer human activity involving these non-ideal flakes? Behavioral archaeology offers a method to explore this issue through analysis of the performance characteristics of flake termination types in common daily activities known from the archaeological record. This allows comparative analysis between termination types to use as a basis for archaeological inference. Combined with an experimental approach, this study utilizes performance characteristic modeling to identify behavioral contexts for the use of non-ideal flake types in past activities.

Persons, A. Brooke [63] see Gordon, Falcia

Pestle, William [323] see Laffoon, Jason

Peter, Damgaard [143] see Lynnerup, Niels

Peters, Ann (University of Pennsylvania Museum)**[141]** *Cultivation and Herding Practices, Fiber Colors and Textile Styles in the Paracas-Nasca Transition*

Improving documentation of artifact assemblages in the funerary contexts of the Necropolis of Wari Kayan (Paracas site, south coast of the Central Andes) leads to identification of multiple contemporary textile styles as well as their transformation over the period of cemetery use (c. 250 BCE to 250 CE). While artifact variability in the region has largely been organized in hypothetical phases, expanded data on garment design and production details, as well as imagery, is most usefully organized and correlated using a formal typology. While social diversity may account for a larger percentage of formal variation than has been considered under the phase model, hypothetical temporal sequences among garment styles imply processes of adoption and syncretism. While to date we cannot document the geographic loci of garment production, correlations between characteristics of plant and animal fibers, natural and dyed colors and particular style groups suggest a vertical organization of production and exchange that ranged from agricultural selection and herd management practices to the contribution of a finished textile to a particular mortuary rite. Artifact forms and component materials support a model of sociopolitical relationships linking diverse communities of practice, whose presence, prominence and self-definitions change over time.

[141] *Chair***Peters, Mallory (California State University, Chico), Jessica Curry (California State University, Chico) and Eric Bartelink (California State University, Chico)****[179]** *Analysis of Anatomical Dissection at Point San Jose Hospital, Fort Mason, San Francisco*

During a 2010 National Park Service project to remove lead contaminated soils from behind a historic hospital at Point San Jose (now Fort Mason), San Francisco, a medical waste pit containing commingled human and faunal remains was discovered. From 1864–1903, several military surgeons were posted at the Point San Jose Hospital to treat military personnel.

Analysis of the human remains revealed evidence of anatomical dissection indicated by numerous incised cut marks, saw cut marks, and other postmortem modifications. The incised cut marks and saw cut marks have significant implications for interpreting the purpose of the Point San Jose skeletal material. The presence of saw marks through many skeletal elements signified that the remains were likely used for a variety of purposes. Possible indicators that the skeletons were used for autopsies include saw marks through the skull and sternum. The presence of both incised cut marks and saw marks on other elements suggested removal of soft tissue and were indications of dissection or prosection performed during anatomical teaching, training, or research.

Peterson, John (University of Guam)**[145]** *World Heritage Listings, Changing Climate, and the Salalah Doctrine: Archaeological Heritage Management at Nan Madol Monument, Pohnpei, FSM*

Nan Madol monument in Pohnpei in the Federated States of Micronesia was inscribed on the World Heritage list in July 2016. The same day it was listed on the Endangered List for World Heritage sites by the Committee. The designation was meant to insist on the seriousness of conservation and

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management planning and it has had a profound impact. A Conservation Plan has been launched, supported in part by UNESCO, and fine-grained monitoring with geocontrols, 3-D mapping, UAV structure-in-motion models, Synthetic Aperture Radar imaging, and detailed descriptions and monitoring for each islet have been initiated. Governance policy in the FSM, Pohnpei, and the Nahnmwarki of Madolenihmw is being reviewed for sustainable preservation and management. Monitoring for site impacts also supports observations of sea level rise, storm surge, erosion and siltation, and subsidence around the site. Nan Madol's conservation management is a watch on the effects of climate change as well as ongoing environmental observations for the site.

[145] *Chair*

Peterson, Polly [134] see Nation, Humberto

Petraglia, Michael

[329] *Acheulean Hominins and Out of Africa Dispersals: Challenges and Advances*

The dispersal of Acheulean hominins outside of Africa is one of the most important research areas in human evolutionary studies, having been the topic of paleoanthropologists and archaeologists for many decades. Yet, precise knowledge about the timing and geographic movement of archaic hominins across Eurasia is still in its infancy. The aim of this presentation is to discuss what we currently know about the distribution of Acheulean hominins, and to report on new field work findings in southern Asia, particularly in the Indian subcontinent and the Arabian peninsula. We examine technological trends and present new information on the dating of archaeological sites. We examine the role that climate change plays in the demographic history of Acheulean hominins and whether there is temporal overlap of archaic species and advancing groups of *Homo sapiens* populations. We address long-standing questions about whether Acheulean tool-making hominins moved into Eastern Asia, and the implications of this information with respect to our evolutionary history.

Petraglia, Michael [310] see Nayak, Ayushi

Petrie, Cameron (University of Cambridge), Adam Green (University of Cambridge), Hector Orengo (University of Cambridge) and Ravindra Singh (Banaras Hindu University)

[121] *Hidden in Plain Sight: Reconstructing Landscapes of Urbanism in Northwest India*

Archaeologists cannot understand the urban process based on investigations at urban centers alone. In the Beas River Landscape and Settlement Survey, Wright contributed greatly to understanding of landscapes in South Asia's Indus civilization (2600–1900 B.C.), revealing necessity and value of integrating settlement data into broader analyses of urbanism. Research on the Indus civilization's settlement distributions highlights the presence of an array of archaeological sites spread across a diverse range of environments. This is particularly true in northwest India, a dense locus of settlement before Indus cities emerged and after they declined. It is not clear, however, whether our current knowledge is representative of past settlement distributions or an artifact the early methods and previous assumptions. Fieldwork that combines the analysis of historic maps with remote sensing site detection methods is highlighting large numbers of archaeological sites, some of which may have been documented in the late 19th and early 20th centuries. These sites, never included in the analysis of archaeological landscapes, have the potential to revolutionize our understanding of Indus, Early Historic and Medieval urbanism throughout the subcontinent.

Petrozza, Michael (The University of Texas at San Antonio), Jason Yaeger (The University of Texas at San Antonio), M. Kathryn Brown (The University of Texas at San Antonio), Kit Nelson (New Orleans Center for Creative Arts) and Rachel Horowitz (Tulane University)

[147] *De Facto Refuse, Termination Deposits, and Abandonment Processes: Contextualizing the "Problematical"*

Archaeologists working in the Maya area frequently find dense deposits of artifacts that are classified 'terminal deposits,' 'final deposits,' or 'problematical deposits'. These classifications may accurately reflect a deposit's stratigraphic placement, but ultimately mask or even misrepresent the diverse social behaviors which led to the creation of such deposits. Excavations in the courtyard in front of Structure B-6 at Xunantunich, Belize, exposed a dense deposit of artifacts. Through detailed analysis and recovery of the artifacts and ecofacts and an emphasis on both recording and analyzing the microstratigraphy, we argue that this deposit was de facto refuse left by people who occupied the group after a period of abandonment. Our analysis more broadly underlines the importance of careful excavation and contextual analysis of these deposits in order to understand the behaviors associated with each one. Such analyses form the basis for the creation of behaviorally distinct categories of final deposits.

Pettitt, Alisa (George Mason University and Fairfax County Park Authority) and Sven Fuhrmann (George Mason University)

[331] *Educational AR and VR Applications for the Interpretation of Archaeological Sites in Northern Virginia*

Virtual reality (VR) and augmented reality (AR) applications can influence the user's perception of the world. In regards to archaeological sites these technologies can be used as educational tools to recreate past environments and offer interpretive perspectives on history. This research examines several archaeological sites in the Northern Virginia region and investigates how educational VR and AR applications developed through accessible, user-friendly platforms can aid in reconstructing and interpreting cultural resources.

Pettitt, Paul (Durham University, UK)

[136] *Neanderthal Activities in Caves: Was There a Ritual Dimension?*

We know that Neanderthals used the mouths of caves for habitation, and on occasion buried their dead in such contexts. The behavioural repertoire was recently extended to include the assembly of a circle of stones deep in a cave in France. But can any evidence be taken to imply specifically 'ritual' behaviour? I build here on ongoing collaborative research on the emergence of art, and on wider Neanderthal activities in caves and their environs to address the question as to whether 'ritual' use of caves was specific to *Homo sapiens*, or shared with our closest sister clade.

Peuramaki-Brown, Meaghan (Athabasca University) and Shawn Morton (Northern Arizona University)

[37] *Maya Monumental 'Boom': Spatial Development, Rank Ordering, and Planning Considerations at Alabama, East-Central Belize*

In the 1980s, archaeological investigations by the Point Placencia Archaeological Project (PPAP) noted the rapid, single-phase development of monumental construction at the Maya site of Alabama in the Stann Creek District. Though never fully investigated by PPAP, this rapid, 'boom-like' development during the late facet of the Late Classic to Terminal Classic periods is being pursued in current investigations by the Stann Creek Regional Archaeology Project (SCRAP). This presentation, by directors of the SCRAP project, discusses ongoing research at Alabama, particularly the spatial, rank order, and planning analyses being considered as part of epicentre investigations, which we hope will shed additional light on the interesting development processes we believe are occurring in this understudied material culture sub-region of the eastern Maya lowlands known as East-Central Belize.

Peuramaki-Brown, Meaghan [82] see Morton, Shawn

Pevny, Charlotte [81] see Jones, Katherine

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Pezzarossi, Guido (Syracuse University) and Kelton Sheridan (UMass-Boston)

[176] *Overlapping and Shifting Networks: Comales, Spouses and Other Social/Material Interactions between/within Highlands and Coast in Colonial Guatemala*

Ceramic assemblages of Postclassic and Colonial Maya sites in highland and coastal Guatemala are dominated by comales: griddle-like cooking vessels indicative of a maize tortilla diet. Given that some archaeologists have interpreted the appearance of the nixtamal/tortilla/comal complex in Guatemala as evidence of the "Mexicanization" of the Maya region, the Pacific coastal region of Guatemala -and its Central Mexican diasporic populations- is seen as the likely source of comales. As a result, comales are useful for tracking the degree/nature of entanglements between coastal and highland populations. Whatever the origin of comales, by the Colonial period, their presence is ubiquitous, despite the fact that documentary sources speak to strained interactions and severed social and economic networks between coastal Pipil and highland Kaqchikel communities. This paper explores coastal and highland interactions prior to and after colonization through the comparative Instrumental Neutron Activation Analysis (INAA) of comales at the Pacific piedmont Kaqchikel Maya site of San Pedro Aguacatepeque and Guatemalan coastal sites. We also draw on Colonial censuses, other archival sources and ethnoarchaeological research as additional lines of evidence that help reconstruct the dynamic, varied and overlapping social and material networks between and within coast and highlands in Postclassic and Colonial Guatemala.

Pfau, Justin (University of Montana), Scott Gajewski (GAI Consultants-Assistant Field Director), Matt Nelson (University of Montana-Field Director), Cathy Jo Beecher (University of Montana-Crew Chief) and Douglas MacDonald (University of Montana-Professor/Primary Investigator)

[334] *Archaeology at Warren Grove Gunnery Range, Pine Barrens, Burlington County, New Jersey*

In the winter of 2015–2016 and the spring of 2017, the University of Montana-Center for Integrated Research on the Environment and GAI Consultants (UM-GAI) conducted an archaeological survey and evaluation project at the New Jersey Air National Guard's Warren Grove Gunnery Range. The project was funded by the Air National Guard through a cooperative agreement with the United States Army Corps of Engineers (Omaha District) and the UM. UM-GAI completed archaeological survey of ca. 9,911 acres of the range. The survey identified and evaluated nine historic/modern sites and one of three previously-reported prehistoric sites. Two sites are recommended NRHP eligible as part of a historic charcoal production complex: UMWG-1 is a probable late 19th century collier's hut with ceramics and associated charcoal production features, and UMWG-9 is a nearby set of at least eight charcoal kilns and possible associated transportation features. UM-GAI is participating in public outreach programs including schools and conferences as well as updating the GIS archaeological predictive models for the range and region.

Pfeiffer, John [217] see Sharpe, Ashley

Phelps, Danielle (University of Arizona)

[40] *Escaping from the Tomb: A Spatial Analysis of Possible Escape Routes in the Valley of the Kings, Egypt*

Howard Carter discovered the relatively intact tomb of Tutankhamun (KV 62), one of the last kings of the Eighteenth Dynasty of Egypt, in the Valley of the Kings in 1922. Prior to the discovery, Carter discovered several small artifacts in the cliffs above the valley's floor, which he proclaimed were indicators of a possible escape route of the ancient tomb raiders from the Valley of the Kings. During the excavation of the tomb, Carter also claimed to have identified two distinct robberies that most likely occurred with a few years of the initial interment. Other scholars have debated this assertion. A spatial analysis of the Valley the Kings will provide insight into this debate. This paper will investigate the possible routes ancient robbers may have taken while escaping from the tomb of Tutankhamun through the utilization of Geographical Information System (GIS) analyses including viewshed and least cost pathways. The most efficient route out of the valley will determine if Carter's initial claim of finding dropped artifacts from the tomb was in correct or not.

Phillips, Emily (University of Cincinnati), Jonathan Reeves (George Washington University), Matthew Douglass (University of Nebraska-Lincoln) and David Braun (George Washington University)

[99] *Taphonomic Comparisons of Stone Tool Transport: Surface vs. Excavated Collections*

It has been argued that surface assemblages may provide insights into questions regarding large scale patterns of human behavior such as mobility and stone tool transport. However, excavated material is often preferred over surface assemblages due to concerns of potential biases introduced by the process of exposure. Here, we examine this claim by comparing measures of stone tool transport between surface and excavated assemblages. Surface and excavated lithic assemblages were collected from the similar locations in East Turkana, Kenya. Size distributions of each assemblage were compared to determine differences that may be introduced by taphonomic bias. Measures of cortex, volume, and stone tool reduction were then applied to each assemblage to determine influence of lateral displacement on proxies of stone tool transport. Preliminary results suggest that, despite gross differences in size distributions between the two assemblages, signatures of stone tool transport preserved in excavated assemblages are also reflected in surface assemblages. This is dependent on the measures of transport that are investigated. A discussion of the preliminary results and the efficacy of various measures of stone tool transport is reviewed.

Phillips, Laura

[253] *Repository Reflections: Where's the Humanity?*

As the neutral repository appointed by the court, the Burke Museum has played a unique and often frustrating role as temporary caretaker of the Ancient One/Kennewick Man. Decisions on overall curation, research and access resided with the US Army Corps of Engineers, yet the Burke provided the environment, security, and safety. Museum standards of access and care are not straightforward, and staff tried to balance ideas of neutrality and bioethics with real people and their needs. The Ancient One lived thousands of years in the past, yet he is now deeply rooted in the present. His journey has highlighted some key bioethical issues of our time—in particular, how we understand what constitutes a human being, and how that understanding shapes the tracking of research and analysis.

Phillips, Lori (Washington State University), Erin Thornton (Washington State University) and Eleanor Harrison-Buck (University of New Hampshire)

[7] *Understanding Animal Use at the Wetland Maya Site of Chulub*

Reconstructions of ancient Maya animal use often emphasize the importance of terrestrial species, such as deer, to the overall diet. While these species played an important role, much less attention has been paid to the use of aquatic resources despite the presence of resource rich perennial wetlands in the Maya lowlands. To further understand this crucial area of the Maya-environment relationship, we investigated the site of Chulub located in the Western Lagoon Wetlands of Belize. This site dates to the Classic-Postclassic transition (ca. AD 800–1200) and contains only one formal plaza, but it includes numerous outlying structures associated with a series of artificial pond and canal features. During the 2017 season, we tested one of these structures and performed a series of test pits targeting midden deposits in the main plaza. The preliminary zooarchaeological results presented here suggest terrestrial and aquatic species, particularly freshwater turtles, were important components in the overall subsistence of Chulub inhabitants. The presence of ceramic net weights further corroborates the importance of aquatic species, possibly raised and farmed in the nearby ponds. These preliminary results highlight the importance of aquatic resources within Maya subsistence and support the need for further research within this understudied area.

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Phon, Kaseka [175] see Hendrickson, Mitch

Phyo Kyaw, Pyiet [56] see Iannone, Giles

Picard, Taylor (Humboldt State University) and Evan Giomi (Archaeology Southwest)

[91] *Analysis of Settlement Patterns near the Big Burro Mountains*

This poster presents the results of an archaeological survey of Pitchfork Ranch, located near the Big Burro Mountains in southeastern New Mexico. The survey was conducted by staff and students of the Archaeology Southwest Upper Gila Preservation Archaeology (UGPA) field school from 2015 to 2017. There is evidence on the ranch of human activity ranging from possible Paleolithic and early Archaic sites up to 20th century sites. Using GIS and geospatial data collected during this survey it is possible to examine the extent of human occupation on the ranch and analyze changes over time in settlement patterns and land use in the region. The Pitchfork Ranch is the location of the Burro Creek Cienaga, and the data from this survey is useful for understanding human use of this rare environment and hydrological resource. Additionally, the survey data could help develop a better understanding of Mimbres-culture sites outside the Mimbres Valley and Upper Gila.

Picciuolo, Jon [214] see Ryan, Christopher

Pickett, Jordan (FSU Classics)

[171] *Earthquakes as Nonhuman Agents in the Roman—Late Antique Mediterranean*

Recent studies of the sociology of contemporary earthquakes have emphasized the generative physical spaces of potentiality created by these disasters: the destruction of earthquakes, while traumatic for survivors, also clears the way for large-scale infrastructural and architectural development programs that can re-shape aged urban environments to better reflect changing societal values and priorities. This paper offers a survey of earthquakes as non-human change agents in the Roman and Late Antique Mediterranean, with especial focus on the cities of Ephesus, Antioch, and Phrygian Hierapolis. While contemporary Roman sources tend to describe urban rebuilding after earthquakes in a symbolic manner with a generic picture of cities “rebuilt” (ἀνοικοδομήσθαι) or “restored” (ἀνεύθει) with state-directed support in coin or labor, these literary images rarely correspond with the archaeological evidence. Rather, earthquake events in Roman cities provided opportunities for adaptation and the implementation of new planning schemes.

Pierce, Daniel (University of Missouri Research Reactor), Patti Wright (University of Missouri—St. Louis) and Rachel S. Popelka-Filcoff (Flinders University)

[9] *Seeing Red: An Analysis of Archaeological Ochre in East Central Missouri*

The Truman Road Site (23SC924), St. Charles County, Missouri, features a diversity of material remains and a long periods of occupation mostly occurring during the Late Archaic (3000—2500 BC) and Middle Woodland (100 BC—AD 500). For this region of prehistoric Missouri, ceramics and chert constitute the main evidence for understanding trade and cultural dynamics. Despite its relative ubiquity among sites, ochre has rarely been considered in such studies. Recognizing that this material is a valuable component of material culture, we used NAA to analyze a collection of ochre from the Truman Road site (n=31) and seven specimens total from four other nearby sites. Results indicate no significant temporal or spatial patterning of ochre usage or acquisition in the total sample. Similarly, no correlation exists between the chemistry and artifact type. Finally, the assemblage is compositionally distinct from previously analyzed samples from elsewhere in region. Precise provenance has yet to be conclusively determined due to the dearth of comparative data in Missouri. Although these artifacts could not be linked to a single acquisition locale, the results remain an important addition to our understanding of the characterization and diversity of ochre and its usage in prehistoric Missouri.

Pierce, Daniel [31] see Xiuhtecutli, Nezahualcoyotl

Pierce, Karen (Pacbitun Regional Archaeological Project) and Mike Lawrence (Pacbitun Regional Archaeological Project)

[256] *Recent Building Excavations in the Triple-Courtyard “Palace” Group at the Ancient Maya Site of Pacbitun, Belize*

Adjacent to Plaza B at Pacbitun is a Classic Period “palace” complex consisting of three conjoined courtyards each ringed by elevated range structures, likely serving elite-residential and administrative functions. Previous excavations indicated initial construction in the Early Classic period with numerous modifications made in the Late Classic, and preliminary evidence of occupation or use into the Terminal Classic period. The Pacbitun Regional Archaeological Project has begun to explore this palace complex to gain a better understanding of its architectural chronology and function in order to broaden our knowledge regarding the sociopolitical and economic changes taking place at Pacbitun during the Late to Terminal Classic period. At Structure 23 (Courtyard 2), 2017 excavations built upon earlier work to further explore a slate workshop/storage area and modifications restricting courtyard access. At Structures 22 and 33 preliminary excavations exposed portions of two Late Classic buildings enclosing a small courtyard atop a platform situated above Courtyard 3. Here we discuss the results of our excavations within the broader framework of Late to Terminal Classic changes in the Maya Lowlands and touch upon numerous questions generated regarding chronology, workshops, production control, building function, access restriction, and the roles of the three different courtyard groups.

Pietrusewsky, Michael [20] see Ikehara-Quebral, Rona

Pigott, Michelle (Tulane University)

[255] *It's Not in the Ceramics: 18th Century Apalachee Cultural and Ethnic Identity*

Archaeologists have always made use of ever-abundant ceramic materials as markers for cultural and ethnic identity of past peoples. This works distinctly on the assumption that these identities and their linked ceramic traditions are stable and unchanging; ceramics that do not fit into the expected pattern are often explained away as trade items or the arrival of new ethnic groups. This paper instead argues that ceramics reflect the sequence of ceramic manufacture generated by individual potters whose behaviors reinforce a community of practice, open to change over time through innovation and interaction. A series of detailed ceramic analysis methods were developed to interpret data from four related 17th and 18th century sites, tracking the diaspora and culture change of the Apalachee, a Native American group originally from Northern Florida. In the case of examining the ceramics of post-diaspora Apalachee, these assemblages allow an in-depth study of ceramic practice with the unique advantage of also having substantial historic documents identifying the potters' ethnic identity. With this knowledge, this paper attempts to divorce the unchallenged connection between ceramics and ethnicity and instead encourage interpreting ceramics as a vehicle for culture change.

Pigott, Michelle [275] see Rodning, Christopher

Pike, Scott (Willamette University)

[298] *Sourcing Building Stones in the Ancient Mediterranean: A Review of 25 Years of Provenance Research at the Wiener Laboratory*

From its very inception, the Wiener Laboratory at the American School of Classical Studies in Athens has fostered and supported the integration of geological techniques and methodologies into archaeological research programs in the eastern Mediterranean Basin. One such area of focus includes

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provenance studies of rocks used in architectural and sculptural programs spanning from the prehistoric to Late Antiquity. By tracing the source quarries of ancient artifacts and features, archaeologists gain insights into the economics of trade of a valuable resource; changing aesthetic values; and the identification of modern forgeries, ancient copies and disassociated fragments. This summary paper will review just some of the archaeological contributions of rock provenance research sponsored by the Wiener Lab including a study of calcarenite quarries exploited in the Late Bronze Age of Minoan Crete, a study of oolitic limestone quarries within the archaeological complex of ancient Corinth, and a study that identifies the source quarries used to extract marble for the Parthenon and other monuments atop the Athenian acropolis.

Pilles, Peter [48] see Neff, Linda

Pillsbury, Joanne (The Metropolitan Museum of Art)

[206] *Aztecs in the Empire City: The Rise and Fall of Ancient American Art at The Metropolitan Museum of Art, 1877–1914*

With the return of peace after the dislocations of the US Civil War, The Metropolitan Museum of Art was founded in 1870 by businessmen, civic leaders, and artists in New York. Unlike its European counterparts, the institution had no royal collections on which to build. Its ancient American holdings grew through gifts and purchases from diplomats, philanthropists, and collectors. By 1900, with the acquisition of the Petich Collection of some 1500 “Aztec,” and “Toltec” works, The American Archaeologist hailed the Met’s holdings as second only to Mexico City. Yet by 1914, the Museum had turned away from American antiquities, redefining not only itself but also what was considered the appropriate aesthetic purview of an art museum for decades. This paper considers the civic, national, and scholarly currents affecting the collection of ancient American art in the Gilded Age.

Pimentel, Roberto [211] see Makowski, Krzysztof

Pinta, Elie (PhD Candidate—Université Paris 1 Panthéon-Sorbonne / UMR 8096)

[277] *Moderator*

Pintar, Elizabeth (Austin Comm. College) and María Fernanda Rodríguez (CONICET-INAPL)

[174] *12,500 Years of Altitude*

The earliest occupations in the Salt Puna—a high elevation desert in the Andes Mountains—date to the Pleistocene-Holocene boundary and are relevant to the discussion of the timing of the first exploration and colonization of South American elevations above 3500m, as well as the relationship between mountain environments and other ecological areas. The wooden shafts used in the extractive technologies of the earliest hunter-gatherers originated outside the Puna, in the eastern lowlands. However, the sources of obsidian used for manufacturing projectile points were located at high altitudes in the Puna, between 4000m and 4500m, revealing the existence of adaptations to very high elevations a few millennia after the initial peopling of South America. The implications of these data are broad, as they suggest that early hunter-gatherer groups inhabiting these very high elevations were using resources from far afield and had a good knowledge of the local and regional landscape that extended into adjacent ecological zones located several hundred kilometers away—a familiarity that would have taken several hundred to a few thousand years to develop and possibly enabled them to associate with and rely on neighbors in times of need.

Piperno, Dolores (Smithsonian National Museum of Natural History)

[137] *The Past (and Future?) of Our Crop Plants in Changing Global Environments*

The development of agricultural societies, one of the most transformative events in human and ecological history, began independently in a number of world regions including the American tropics during a period of profound environmental change at the Pleistocene-Holocene transition. Plant domestication is at its core an evolutionary process involving both natural and human selection for traits favorable for harvesting and consumption. Scientists from a number of disciplines have long sought to understand the process of crop plant evolution, but still must rely on imperfect morphological and genetic data based on characteristics of living representatives of crops and wild progenitors in the modern climate, and limited archaeobotanical evidence. Experimental research on living crops and their wild ancestors together with recently developed molecular applications are providing new understandings of, and mechanisms for, domestication and early agriculture. They include phenotypic (developmental) plasticity, a subject of rising importance in evolutionary biology and an oft-neglected concept in domestication research. This talk will discuss multi-year investigations of phenotypic, productivity, and gene expression changes in teosinte and maize when grown under atmospheric CO₂ and temperature conditions that characterized the Late Pleistocene and early Holocene periods, when teosinte was first collected, cultivated, and transformed into maize.

[290] *Discussant*

Piscitelli, Matthew (The Field Museum)

[64] *The Extraordinary Case of the Late Preceramic Norte Chico*

The Late Preceramic Period was a time of dramatic cultural transformations in the Central Andes. At the beginning of the 3rd millennium B.C., at least 30 large, sedentary agricultural settlements with monumental architecture appeared between the Huaura and Fortaleza river valleys in a region known locally as the “Norte Chico” (“Little North”). Since the publication of Moseley’s *The Foundations of Maritime Civilizations* (1975), the north central coast of Peru has been viewed as an exceptional case in global prehistory. Although this precocious development has been a subject of study since that time, research has focused almost exclusively at the site-level. Such a narrow focus has obscured the analytical value of the Norte Chico region as a regional phenomenon. By adopting a broader perspective, I will demonstrate what the Late Preceramic cultural landscape of the Norte Chico region can tell us about social interaction, power relations, and cultural complexity.

[283] *Chair*

Piscitelli, Matthew [100] see Bauer, Brian

Pitblado, Bonnie (University of Oklahoma)

[79] *Dr. Dennis J. Stanford: A Legacy of Research in Colorado Paleoindian Archaeology*

I began my graduate studies in 1990, knowing I wanted to learn about the earliest human use of the Colorado Rocky Mountains. It became immediately clear that two decades of work by Dennis Stanford, much conducted with his research- and life-partner Pegi Jodry, contributed myriad bricks to the platform upon which I would construct my own body of work. Stanford’s research at early sites in Colorado spanned the chronological spectrum, from potentially pre-Clovis (Lamb Spring, Dutton and Selby), to Clovis (the Drake Cache), to Folsom (in the San Luis Valley), to Hell Gap (Jones-Miller), to the late Paleoindian Cody Complex (Claypool, Frasca and Nelson). Even more crucially to me, in 1992 he and Jane Day co-edited “Ice Age Hunters of the Rockies,” which immediately became—and remains—my go-to reference for early human use of the Rocky Mountain landscape. Dennis published that book in part to honor the contributions of Marie Wormington and other Denver Museum of Natural History scholars to Paleoindian archaeology generally and Rocky Mountain Paleoindian archaeology specifically. My paper in turn honors the contributions of Dr. Dennis J. Stanford, without whom the research platform that has supported me for two decades would have been shaky indeed.

[174] *Discussant*

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Pitblado, Bonnie [222] see Stackelbeck, Kary

Pittman, Holly (University of Pennsylvania)

[121] *Textile Production in the Uruk Period: New Insights from Glyptic Imagery*

Production of textiles rose to an industrial level in the late Uruk period of southern Mesopotamia. Iconographic sources found in glyptic art provide a detailed visual description of aspects of this industry. Gender differentiation is clearly institutionalized, with women preparing the thread and skeins while males are engaged in the actual weaving. This paper presents a close analysis of a single motif in the glyptic iconography, offering an explanation of what has previously been identified as a "spider" motif. Rather than an abstract reference to the production of thread in nature, it is argued that the image is rather a device, a "machine" that was employed to store thread before it was deployed into skeins.

Pittman, Jacqueline [223] see Grant, Madison

Plank, Shannon (University of Kentucky), Rafael Burgos (INAH Yucatan), Scott Hutson (University of Kentucky), Yoly Palomo (INAH Yucatan) and Miguel Covarrubias

[37] *Uci and Izamal: Influence and Interaction in the Northern Maya Lowlands*

In the Late Preclassic and Classic periods, several sites in the center of the northern Maya lowlands constructed buildings with distinctive megaliths. Izamal was the largest of these sites by far, and connected itself to other important sites with stone causeways that stretched up to 30 km long. Uci, located approximately 35km to the northwest of Izamal, had its own long distance causeway which linked it to three smaller sites with monumental architecture. This paper combines data from two separate, long-running archaeology projects, one focused on Izamal, the other focused on Uci, in order to investigate political, economic, and chronological relations between the two sites. The paper compares Late Preclassic, Protoclassic, and Classic period ceramic assemblages from the two projects in order to document the degree of variation in pottery consumption. Such variation may help determine the extent of economic and political integration between Uci and Izamal, but could also be accounted for by differential access to resources, participation in divergent trade connections, or differences in chronologies of occupation. This paper uses additional lines of evidence to assess the strength of these explanations.

Plank, Shannon [162] see Kidder, Barry

Platz, Lorelei

[263] *Mobility and Pre-Columbian Censers*

Mobility, as it relates to censers, can be discussed on both large and small scales; it includes the movement of iconographic concepts, the physical objects, and the material or organics burned inside the censer. Censers styles fluctuate across pre-Columbian time due to a wide variety of reasons, though the purpose remains the same, which is to burn incense. The singular function of censers makes it an exemplary artefact class for the discussion of mobility across geographical and cultural regions. Here, I draw upon multiple regions to show the continuity of certain design elements across the different cultural regions and time periods. This discussion draws particular attention to the occurrences of the spiked vessel style of censers and the periods of use as they have the strongest iconographical botanical connections. Spiked vessel comparative studies are not new to Mesoamerica and the Maya region; here I continue the discussion further into southern Central America. It is hoped that the macro scale discussion will provide further understanding to the nuances of Potosí Applique from Greater Nicoya.

Plekhev, Daniel (Brown University)

[68] *Investigating the Reforestation of Anthropogenic Landscapes through Remote Sensing*

While New England is today a mostly forested landscape, up to 80% of this region was deforested during the eighteenth and nineteenth centuries for agricultural land-use. As the rural economy of New England shifted to a more urban and industrial one, much of this agricultural land was abandoned and subsequently reforested. The vestiges of this once rural landscape can now best be seen in LiDAR imagery, in which features such as stonewalls are particularly well discernible. Though the spatial and temporal dimensions of reforestation vary across the region, this paper investigates the extent to which the forest vegetation present today reflects the legacy of land-use evidenced by historical documents and LiDAR imagery. Using these data to precisely identify areas of prior deforestation and intensive land-use, the forest vegetation now present is analyzed through historic CORONA and modern high resolution multispectral satellite imagery to track the progress of reforestation as well as investigate spectral properties that are unique to such areas. In doing so, the legacy of deforestation and abandonment in New England can be better understood, and new tools provided for the study of this landscape in areas where stonewalls are not as frequent or well preserved.

Plesic, Carly [239] see Cannon, Danielle

Pluckhahn, Thomas (University South Florida), Kendal Jackson (University of South Florida) and C. Trevor Duke (University of Florida)

[84] *In Small Organisms Forgotten: Micro-fauna from Shell Middens at Crystal River (8C11) and Roberts Island (8C141) as Potential Proxies for Paleo-climate*

Crystal River (8C11) and Roberts Island (8C141) are neighboring mound and village complexes on the central Gulf Coast of Florida, occupied mainly sequentially across the first millennium AD. Stratigraphic excavations, coupled with extensive radiocarbon dating, permit relatively fine-grained observations regarding the prevalence of fauna over time. Oyster dominates faunal remains from all periods, but higher relative frequencies of small gastropods are evident in Midden Phases 2 and 4. Sponge spicules document a similar pattern. We associate these trends with intervals of warmer and wetter climate, specifically the Roman and Medieval Warm Periods, respectively, as revealed by local pollen samples as well as regional and global climate models. Habitats for small gastropods probably expanded during these intervals, leading to natural increases in species abundance in areas around human habitations, but we suspect the trend may also reflect increased targeting of particular local estuarine resources.

Pluckhahn, Thomas [94] see Gatenbee, Amy

Plumer, Hannah [302] see Justinvil, Delande

Plunket, Patricia [262] see Uruñuela, Gabriela

Podrug, Emil [310] see McClure, Sarah

Pohl, John M. D. [264] see Zborover, Danny

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Poister, Nicholas (University of California, Merced), Lilly Buckley Vargas and Holley Moyes

[134] *Fragmentary Ceramic Assemblages as a Record of Ritual Practice at Las Cuevas, Belize*

The most common artifacts found in Maya caves are unslipped and monochrome slipped ceramic sherds. The smashing of ceramic vessels as an element of ritual practice is recorded ethnographically among some twentieth-century Maya groups. Other Maya groups have been documented collecting sherds from domestic middens and depositing them at sacred sites. If caves were venues for the former type of behavior in antiquity, one would expect to find a high percentage of refitting sherds in their assemblages. A lack of consensus exists among scholars as to the prevalence of refitting sherds because these data are rarely provided in reports. The lack of refitting is most acute with unslipped ceramics because, while analysts might spend considerable time attempting to reconstruct a polychrome vessel, few would spend time working with unslipped material. This study seeks new pathways to the decipherment of the cultural processes which led to the formation of ceramic assemblages in Maya caves and is based upon the results of both quantitative and spatial analyses of recently collected data from the Las Cuevas region.

Politis, Gustavo (INCUAPA-CONICET, Argentina), Cristian Favier Dubois (INCUAPA-CONICET, Argentina) and Pablo Messineo (INCUAPA-CONICET, Argentina)

[2] *The Geoarchaeology of Megamammal Survival in the Argentine Pampas*

While most of the South American archaeological sites with extinct megamammals have produced Late Pleistocene ages (12,000 to 10,000 14C years BP), a few locations in the Pampas region have been dated well into the Early Holocene. Among these, Campo Laborde and La Moderna, two kill/scavenging and processing sites in the border of ancient swamps have provided 11 taxon dates (*Megatherium americanum* and *Doedicurus clavicaudatus*) which range between 9730 and 6550 14C years BP. Recent excavations in the Campo Laborde site, as well as detailed geoarchaeological studies and newly obtained amino acid radiocarbon dates, challenge the hypothesis of the Pleistocene megamammals' late survival in this region. In this presentation we will discuss new data considering the site formation processes of creek floodplains in the Pampas, in which the Holocene deposits are biased and the pedogenesis was intense. The studies in both locations suggest that the percolation of organic matter from upper layers would contaminate and rejuvenate the dates obtained from bone collagen.

Polk, Michael (Aspen Ridge Consultants)

[133] *Reflections of a Michigan State Graduate's Career in the American West*

I am primarily a western archaeologist and studied under Dr. William Lovis as a graduate student from 1976 to 1979. That was early in Bill's career. I had many mentors in my formative years as an undergraduate and graduate student, as well as early in my archaeology career. Bill was my last academic mentor and the most influential. My training at Michigan State University has influenced my approach to archaeological projects, analysis of site data, and conclusions about such projects. In this paper I describe several projects and experiences in my subsequent work in the Intermountain West as a professional archaeologist where my MSU training and influence was evident and, sometimes, key to decisions and conclusions made.

Pollack, David (Kentucky Archaeological Survey) and A. Gwynn Henderson (Kentucky Archaeological Survey)

[26] *The Middle Ohio Valley Fort Ancient Transformation as Viewed from Fox Farm*

Throughout the middle Ohio Valley, archaeologists have documented ca. A.D. 1400 region-wide changes in material culture and settlement patterns that they have characterized as the Madisonville Horizon. Established ca. A.D. 1300, the three hundred year continuous occupation of Fox Farm, located in northern Kentucky, spans the Fort Ancient transformation (A.D. 1375–1425). As the site grew in size during the fourteenth century, the settlement shifted from a circular to clustered arrangement of structures, to accommodate a larger population. This was accompanied by the development of a distinctive ceramic decorative tradition (deeply incised lines and punctations), coarsely serrated triangular points, chipped limestone discs, and decorated sandstone discoids. By the late fourteenth century house size had increased, shifting from single- to multi-family dwellings. Fox Farm's growth and its establishment as a central place within the Fort Ancient region represents a local response to the volatile cultural landscape of the late fourteenth/early fifteenth century. In this paper, we highlight changes in Fort Ancient material culture and settlement patterns that immediately predate the Madisonville Horizon and consider Fox Farm's role in the development of an emerging regional Fort Ancient social identity.

[26] *Chair*

Pollard, Helen (Michigan State University)

[169] *Discussant*

Pompeani, Katherine (University of Pittsburgh)

[25] *Reevaluating Early Bronze Age Masculinities: Skeletal and Mortuary Analysis of Transgenderism at Ostojićevo, Serbia*

The Early Bronze Age (EBA) is often characterized as a period of emerging social hierarchies dominated by high status warrior-males. Analysis of human skeletal remains in their mortuary context has the potential to challenge this assumption and inform more nuanced understandings of gender and social status. Individuals (n=285) at the EBA Maros cemetery at Ostojićevo, Serbia (ca. 1900–1500 B.C.E.) exhibit a strong correlation between biological sex and funerary treatment, specifically body orientation. Among the subset of adult (>18 years-at-death) biological males buried in a "female" orientation, several stand out for either their unique physical characteristics (e.g., tall stature, robusticity), or association with "female" prestige offerings (e.g., copper pins, beaded sashes). The relationship between "masculinity" and social status is further complicated by gendered differences in the social perception and embodiment of physical trauma. While there is an association between trauma, male orientation, and weaponry, most individuals with skeletal evidence of antemortem or perimortem trauma did not receive special funerary treatment. Through the examination of multiple lines of evidence, including grave goods, orientation, and evidence of trauma, this paper argues that transgenderism seems to have been as highly regarded as other elements of traditional "masculine" identities at Ostojićevo.

Pompei, Paz [9] see Salgán, Laura

Ponce, Jocelyne (Tulane University), Erin Patterson (Tulane University) and Clarissa Cagnato (Université Paris 1 Panthéon-Sorbonne)

[337] *From Ritual to Domestic in a Shifting Political Landscape: Excavations in the Coronitas Group at La Corona, Guatemala*

Archaeological and epigraphic evidence from the Coronitas Group at La Corona, Guatemala provides an opportunity to examine responses to changing sociopolitical conditions among the Classic Maya (AD 250–900). Architectural and material evidence suggests that the Coronitas Group was a locus of ritual and ceremonial activities by the royal court throughout the Classic period. Burials of important individuals and other ceremonial activities imply that it was a place of significant ancestral ties. At the end of the Classic period, however, material culture and paleoethnobotanical data indicate that this same area became used for subsistence activities for the first time. During this final phase of occupation, inhabitants of this group commemorated a historical narrative as a response to drastic sociopolitical changes.

Poniros, Sarah

[185] *The Bioarchaeology of Diversity: A Case Study in the Roman Empire*

This poster presents a new project to explore migration—the geographic movement of people—and diversity—the intersection of different types of people—in imperial Rome. In Bioanthropology, migration is often perceived in oversimplified terms. Researchers seek to determine if an individual or

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group migrated, and when in their lifetime this occurred. Furthermore, many scholars treat diversity in equally simplified terms. Traditionally, individuals are assigned to an ancestral population of "best fit," despite claims that this practice is unreliable. Migration and diversity are complex, intertwined elements of the human experience and must be approached in tandem using multidisciplinary methods.

This poster outlines the methods available to examine past migration and identifies ways to incorporate them with evidence of diversity. Scientific approaches, i.e. biodistance and isotopic analyses, will be combined with cultural approaches, i.e. the study of material goods and funerary accounts of diversity, and literary approaches, which document native Roman and migrant opinions. These methods will be applied to case studies from imperial Rome, which was characterized by diverse communities as a result of frequent conquest and large-scale population movements. The outcome will establish if this integrated approach allows for greater insight into the experiences of migrating and host communities.

Pontbriand, Kate [84] see Blackwood, Emily

Pool, Christopher (University of Kentucky)

[262] *Formative Communities of Practice and Disjunctures in Southern Gulf Lowland Interaction with Central Mexico*

Recently Stoner and Pool called for an "Archaeology of Disjuncture" to refocus attention on variation in intra- and interregional interaction, illustrating the approach with the case of the Classic period of the Tuxtla Mountains in southern Veracruz. In this paper I extend application of the disjunctive approach into the Formative Period of the southern Gulf lowlands, focusing primarily on interactions with Central Mexico, and incorporating a Communities of Practice perspective on the formation and disruption of attendant horizon styles. Prominent models of Formative highland-lowland interaction grounded in paradigms of Culture History and World Systems Theory tend to treat the Southern Gulf Lowlands as a unitary entity represented at any point in time by a single pre-eminent Olmec or Epi-Olmec site. Although temporal disruptions in regional settlement systems are widely recognized, economic, political, and stylistic or symbolic interactions are often modeled as a tightly bundled whole. Here I review evidence for significant variation among communities and institutions in the Southern Gulf lowlands with respect to their external relations as a step toward a refined model of interregional interaction in the Formative period.

[192] *Discussant*

Pool, Michael (Austin Community College)

[267] *Is There an Early Agricultural Period in the Uplands Mogollon?: Implications of the Chronology at the HO-Bar Site*

Obsidian Hydration and conventional radiocarbon dates at the HO-Bar Site range from 900 B.C. to A.D. 750, partially overlapping dates from nearby Mogollon Village. Perhaps more importantly, these dates are comparable to the Early Agricultural and Early Pithouse Period sites from Southwestern New Mexico. An Early Agricultural occupation has not been established in the Upland Mogollon area in the middle Mimbres River and San Francisco Rivers. The HO-Bar Site dates suggest that there is an Early Agricultural Period occupation in this area, comparable to documented dates in the Lowland Mogollon of southern New Mexico and southern Arizona and the Mountain Mogollon of west-central New Mexico and east-central Arizona. They also have implications for the diffusion of maize agriculture during this time period. Was the diffusion of maize agriculture through contact diffusion from Mesoamerica along a mountain corridor, was it contact diffusion from southern Arizona, or was there a migration of agricultural people from southern Arizona?

Pope, Carly [254] see Dedrick, Maia

Popelka-Filcoff, Rachel S. [9] see Pierce, Daniel

Popovici, Catherine (University of Texas at Austin)

[33] *Bricks and Mortar: The Concealed Politicization of Fired Clay Adobe at Comalcalco, Tabasco*

Comalcalco displays a radical departure from traditional Maya building materials in its brick and seashell mortar construction instead of the paradigmatic Maya limestone. Incised animal, architecture, hieroglyph, and human forms adorn the brick slabs of principal buildings of Comalcalco's ceremonial core. However, their inward-facing, or concealed, orientation rendered these markings invisible. Because monumental architecture benefited from the labor of non-elites, the purposeful placement of the incised designs strongly suggests a system of messaging in their invisibility. While Comalcalco occupied a strategic location near the Grijalva River, on the edge of Maya territory, its architectural vaulting resembles that of Palenque, indicating a close relationship between the two sites. In ancient Mesoamerica the invisible or concealed yields great power and consequence; at Comalcalco this lack of visibility may be inextricably tied to its peripheral placement within Palenque's socio-political orbit as well as the greater Maya region. This paper explores several possibilities, none mutually exclusive. Are the incised and concealed bricks of Comalcalco tangible evidence of resistance from those who formed them? From more dominant centers who may have had a role in guiding construction at Comalcalco? Or are they emblematic of a body politic, writ large, which was active within the site?

Porter, Benjamin (University of California, Berkeley), Christopher Hoffman (University of California, Berkeley) and Kea Johnston (University of California, Berkeley)

[172] *Object Photogrammetry at the Phoebe Hearst Museum of Anthropology: Opportunities and Challenges*

The growth in object photogrammetry standards and techniques offers new opportunities for university museums concerned with collections care, research, education, and public engagement. The Phoebe Hearst Museum's global collection of 3.8 million objects spanning two million years and six continents presents an ideal context in which to explore such opportunities and work through interesting challenges. This paper describes how UC Berkeley faculty, staff, and students are collaborating on projects to document key objects in the Hearst's collection. One case-study explores how several Egyptian sarcophagi were documented using structure-from-motion techniques. This work not only created much-needed digital images of these objects for the Museum's accession records, but also facilitated a careful scholarly study of the epigraphic evidence found on each object. These models are also available for use in Berkeley classes. These models as well as others built from the collection's African, South American, and North American collections can be experienced in the Museum's public gallery through the recently installed 3D CAVEkiosk. The paper will describe visitor feedback on the use of the CAVEkiosk and their impressions of the different object models. The paper concludes with a discussion of the opportunities and challenges of conducting photogrammetry work in complex museum collections.

Porter-Lupu, Jennifer (Northwestern University)

[251] *Performing a Queer Aesthetic in Early 20th Century Washington: Preliminary Findings from the Halcyon House Site*

Located in the Georgetown area of Washington, DC, the Halcyon House is one of the only archaeological sites with a documented queer inhabitant. Albert Adsit Clemons, who was purportedly a relation of Mark Twain, lived on the property with a male carpenter, and together the two filled the house with oddities and antiques. In this paper, I will analyze the way that Clemons performed a queer aesthetic through his household décor and personal adornments. Although the site was excavated in 1985, the project lost funding and was never completed. This paper will discuss preliminary findings from two feature deposits related to Clemons, as well as documentary sources. These data and my analysis will expand upon the limited corpus of knowledge about early 20th century queer life in Washington and, more generally, about the way that non-normative sexualities are performed through consumptive choices.

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Porth, Erik (Tennessee Valley Archaeological Research)**[81]** *A Re-evaluation of Moundville's Collapse*

The disruption of social traditions in ancient societies is often described as the collapse of complexity, but persisting or resilient practices are often ignored, limiting archaeological interpretations of social continuity and change. This paper addresses these historical processes during the terminal occupation of Moundville, a multiple mound Mississippian civic-ceremonial complex occupied from A.D. 1200–1550 and located in west-central Alabama. The collapse of ancient complex societies has been proposed as a process of rapid disintegration of established practices and the loss of vital resources or sociopolitical institutions that maintained social complexity. Sudden shifts in materiality and monumentality during the fifteenth century at Moundville have been proposed as evidence for the collapse of the political order. This paper reevaluates the timing of these changes through Bayesian modeling of radiocarbon dates from stratigraphic mound midden deposits and revisits changes in the production and consumption of symbolic art and monumental architecture. This paper demonstrates that while some ritual practices at Moundville changed, others were emphasized, supporting a reorganization of the social and political order around highly visible symbols and ritual objects. This newly observed persistence of materiality and monumentality has implications for shifts in the social reproduction observed in other late prehistoric Southeastern societies.

Portman, Katherine, Donna Glowacki (University of Notre Dame) and Kyle Bocinsky (Desert Research Institute)**[226]** *Water Management on the Mesa: The Horseshoe Ridge Reservoir Community and the Occupation of Park Mesa, Colorado*

Water management is a critical concern in the arid landscape of southwest Colorado, particularly for farmers. As such, significant developments in water supply systems—like the construction of reservoirs—reflect the social, political, and economic climates in a community. Three reservoirs are located on Park Mesa in Mesa Verde National Park. These were originally documented during surveys in the 1970s and revisited after the Chapin 5 fire in 1996, but none have been analyzed beyond basic description. In July 2017, two of the largest villages on Park Mesa were re-mapped as a part of the Community Center Reassessment Project, including one apparently centered around the Horseshoe Ridge Reservoir (HRR; 5MV03629). We examine the social and ecological contexts of the HRR community to understand more fully the development and organization of occupation on Park Mesa. We calculate least cost paths and viewsheds in order to help define the extent of the Horseshoe Ridge community and situate it within the broader social landscape. We also evaluate ecological setting, including potential sediment and surface hydrology, to assess the agricultural potential provided by this supposed water catchment feature. We compare the HRR community to other reservoir communities on the Mesa Verde cuesta.

Posadas, Lylliam (Autry Museum of the American West)**[191]** *Discussant***Pothier Bouchard, Genevieve (Université de Montréal), Fabio Negrino (Università degli Studi di Genova), Julien Riel-Salvatore (Université de Montréal) and Pascale Tremblay (Université de Montréal)****[219]** *Zooarchaeological Insights into Modern Human Mobility at Riparo Bombrini*

Human-environmental interactions can be discussed on different scales, and from diverse perspectives and specializations in archaeology. We propose to examine human mobility on the local scale of Riparo Bombrini, a key site in Northwest Italy to understand Anatomically Modern Human dispersals along the Mediterranean coast during the early Upper Paleolithic. Previous studies including spatial, lithic, and raw material data revealed distinct mobility signatures from the site's two Protoaurignacian levels, A1 being warmer and associated with residential mobility when the earliest level A2, directly preceding Heinrich event 4, is colder and associated with logistical mobility showed by a more expedient approach to lithic technology. From this portrait, we suggest that those signatures should be reflected in the faunal data by revealing distinct subsistence, animal acquisition, and carcass processing strategies from both stratigraphic levels. To assess this hypothesis, we present results from taphonomic and archeozoological analyses of faunal assemblages from both Protoaurignacian levels excavated at Riparo Bombrini between 2015 and 2017.

Potter, Ben (University of Alaska Fairbanks)**[127]** *Human Land Use Strategies and Responses to Risk during the Pleistocene–Holocene Transition in Eastern Beringia*

Recent investigations in central Alaska at multiple scales (macro-regional, watershed, site cluster, intrasite) have revealed robust patterning among technological, faunal, and feature datasets. These responses are explored in the context of both regional environmental change associated with climatic oscillations between the Bolling-Allerod, Younger Dryas, and early Holocene chronozones as well as systemic change incorporating more logistical organization, shifts in diet breadth, and changes in seasonal mobility and habitat use. I track system-wide changes in the development of communal hunting, increased storage dependence, and increased social interaction in the Holocene. However, resilience in the earlier system allowed for relatively minor changes to accommodate major climate shifts (and resulting resource variability).

Potter, Ben [182] see Reuther, Joshua

Pottier, Christophe (Ecole française d'Extrême-Orient (EFEO))**[175]** *The Challenge of the Grid: A Conceptual Frontier in Angkor?*

For a quarter of a century, the concepts of an open city and a low density urban megalopolis have largely broadened our understanding of Angkor (Cambodia), which was based on the morpho-chronological vision of a succession of perfectly geometric walled cities. As the researches progressed, the identification of the elements that make up the archaeological landscape of the Great Angkor has been developed, mixing temples, palaces, settlements, reservoirs, road networks, hydraulic systems and agricultural parcels. The texture of the urban fabric now appears in its complexity, and underlines the omnipresence of geometry and, in particular, of the grid as a vector of spatial planning and a tool of a centralized state power. The presentation will focus on exploring this theme based on the region of the western baray in Angkor where recent research revealed the remains of the first Angkorian capital in one of the last unexplored areas of Angkor.

Potts, Andrew [247] see Rockman, Marcy

Pouley, Cheryl [331] see Edwards, Briece

Poulos, Anastasia**[251]** *In the Face of the Flood: A County's Efforts to Mitigate the Potential for a Massive Loss of Cultural Resources*

Coastal erosion is impacting Anne Arundel County, Maryland in a way that is extreme and remarkable with a rate of sea level rise nearly twice the global average. Historic properties and archaeological sites are at risk of inundation on the County's shorelines. Anne Arundel County Trust for Preservation has received a cultural resources hazard mitigation grant through the National Park Service's Hurricane Sandy Disaster Relief Fund (administered by the Maryland Historical Trust) and is partnering with Anne Arundel County's Cultural Resources Division to identify, evaluate, and document imminently threatened archaeological and historic sites in the County that are in the high-risk flood zones in Pasadena, Jessup/Laurel/Maryland City, and Shady Side. This paper discusses the field and research methodology employed for assessing a massive number of historic resources and archaeological sites at high risk of inundation. This project demonstrates the value of a united team effort in facing the challenge of undertaking a large survey area, the benefits of developing a collaboration across disciplines, the use of a GIS database to prioritize cultural

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resources and the importance of both assessing and inventorying coastal sites endangered from natural hazards in order to mitigate the potential loss of these sites.

Powers, Robert [269] see Van Vlack, Hannah

Powis, Terry (Kennesaw State University), George J. Micheletti (University of Central Florida), Kaitlin Crow (New York University), Sheldon Skaggs (Bronx Community College, CUNY) and Peter Cherico (Bronx Community College, CUNY)

[256] *Buildings from the Ground Up: Early Maya Architectural and Settlement Practices at the Belize Valley Site of Pacbitun, Belize*
Archaeological research in the Upper Belize River Valley has recently produced information that dramatically improves our knowledge of the earliest Maya. Investigations, particularly at the site of Pacbitun, has revealed evidence of radiometrically and ceramically dated cultural stratigraphic deposits for the early and late Middle Preclassic subperiods (900–300 BC). Excavations were undertaken in the site core, principally Plazas A and B, to determine the nature and extent of these communities as well as to gather data on their spatial organization and population size. By combining settlement data with excavated architectural remains and ceramic assemblages, this paper will examine the timing and structure of initial occupation through increased social complexity by the 4th millennium BC. The excavation of several residential buildings, craft production areas, and a large ceremonial platform has provided significant new insights into the increasing diversification, complexity, and ceremonial/ritual importance of the buildings utilized by the residents of Pacbitun. A comparison of results with other valley sites and elsewhere in the central Maya lowlands will also be provided.

Powis, Terry [147] see Stanchly, Norbert

Poyet, Mathilde [126] see Sistiaga, Ainara

Pozorski, Shelia [17] see Pozorski, Thomas

Pozorski, Thomas (University of Texas-Rio Grande Valley), Shelia Pozorski (University of Texas-Rio Grande Valley) and Rosa Marin Jave (Marchan S.A.C., Paseo de la Republica No. 4527, Li)

[17] *Initial Period Friezes and Architecture at Taukachi-Konkan, Casma Valley, Peru*
Recent excavations at a number of intermediate-sized mounds of the Initial Period (2100–1000 B.C.) site of Taukachi-Konkán in the Casma Valley of Peru have uncovered surprising new evidence of clay friezes and architectural forms previously unknown for the Initial Period along the coast of Peru. One U-shaped mound complex has an associated sunken rectangular plaza that contains distinct friezes on all four of its sides. The content of the friezes includes two sea lions, a large feline and two possible avian beings that most likely reflect the cosmology of the builders of the site. The mound itself has an asymmetrical access pattern that is unique among Initial Period mounds that normally have symmetrical layouts and direct access routes. Architecture on the north wing structure housed ritual activities as well as living quarters for personnel who maintained the ritual mound complex.

Praet, Estelle (Estelle Praet ULB-MEARAP)

[190] *Early Monumental Architecture in Peru: Sunken Circular Plazas from the Late Archaic (5000–2600 B.C.) to the Final Formative (400–200 B.C.)*

We hereby focus on a feature of monumental architecture in north and central Peru from the Late Archaic (5000–2600 B.C.) to the Final Formative (400–200 B.C.) respectively illustrated by the sites of Sechín Bajo and Pallka both located in the Casma Valley. This specific feature is the sunken circular plaza (SCP), a public-oriented sunken space whose circular shape runs from 1,5 m to 80 m, as the most extreme examples. Through the record and description of 64 sites—some of them contained several SCP-, we intended to understand the characteristics of SCP. Indeed, those structures vary in terms of building materials, capacity, centrality and space syntax. Besides, sites patterns presenting SCP are very diverse, which led to the establishment of a typology. This record enabled us to approach SCP diffusion through time and space. While focusing on the most documented sites, we also attempted to pinpoint specific functions associated to processions, gatherings and ritual activities.

Pratt, Jordan (Texas A&M University) and Ted Goebel (Texas A&M University)

[155] *Exploring the Age of Western Stemmed Points at the Nials Site, Harney Basin, Oregon*

First American archaeologists are increasingly interested in the relationship between Western stemmed point technology (WST) and other Paleoindian lithic technologies, including Clovis. While there is some evidence of WST dating as early as 14,000 14C years before present, most sites lack reliable geoarchaeological and geochronological evidence. In the late 1990s and early 2000s the University of Nevada Reno excavated several stratified open-air WST sites in Oregon along the southern shoreline of Harney Lake, including the Weed Lake Ditch, Biting Fly, and Nials sites. The research presented here focuses on Nials (35HA2828), from which over 33,000 debitage pieces and 76 stone tools, including two crescents and five stemmed points, were recovered in situ. Initial attempts to radiocarbon date the cultural layer failed, therefore the Center for the Study of the First Americans returned to the site in 2017 with the goal of establishing its age, as well as describing and interpreting the geoarchaeological and lithic materials. This recent excavation recovered further lithic and faunal samples, as well as materials for both AMS Radiocarbon and optically stimulated luminescence dating. Additionally, lithic technological attributes and ArcGIS 3D Analyst were utilized in analysis, allowing us to more clearly understand WST in Oregon.

Pratt, Lauren [13] see Napolitano, Matthew

Pratt, William (Texas State University)

[324] *From the Ashes: Volcanic Construction Materials in Pre-Columbian Ecuador*

In many ways, volcanic eruptions define the pre-Columbian history of highland Ecuador: the shaping of the landscape, migration patterns, mythology, and ideology. Ecuador is one of the most volcanically active countries on earth, and it's impossible to examine the archaeology without considering both the direct and indirect impacts of volcanic eruptions. Through millennia, the imposing presence of the volcanos on the northern Ecuadorian landscape inspired fear and veneration, with the ever-present threat of disaster the price of life-giving sources of water. With a paucity of other hard stone, volcanic materials found in the region, ranging from fine powdery ignimbritic ash from Quilotoa volcano to dense cangahua, a consolidated volcanic ash, have been utilized for a variety of purposes in pre-Columbian cultures all over northern highland Ecuador. This paper examines some of the functional and ritual uses of volcanic materials at pre-Columbian sites from different periods across the northern highlands in order to better understand how ancient people conceptualized these destructive but life-giving forces of nature.

[324] *Chair*

Premo, Luke (Department of Anthropology, Washington State University)

[227] *Discussant*

[227] *Chair*

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Premo, Luke [227] see Tostevin, Gilbert

Prendergast, Mary [310] see Janzen, Anneke

Prentiss, Anna [97] see Super, Clare

Preucel, Robert (Haffenreffer Museum, Brown University)

[327] *The New Pragmatism: Archaeological Encounters and Entanglements*

In 2010, Steve Mrozowski and I proposed a "new pragmatism" as a way for archaeology to cut the Gordian knot of endless theory debates. We argued that this movement or spirit does not refer to the dominance of any one approach or theory, but rather to the more explicit integration of archeology and its social contact in ways that serve contemporary human needs. In my contribution, I example the relevance of some of the insights of Richard Rorty and Jurgen Habermas in developing a pragmatic archaeology.

Prevedorou, Eleanna (Wiener Laboratory ASCSA & Arizona State University)

[298] *Unwritten Histories: The People of the Phaleron Cemetery*

Ancient Athens is cited as the contentious caldron from which the western political tradition emerged. During the formative Archaic period (ca. 700–480 BC), Athenian history was marked by major political developments (e.g., early law codification, citizenship formalization), social stratification (e.g., classes), and conflict (e.g., tyrants). To date, such processes are known to us through texts, artistic representations, and elite-centered mortuary grounds. The collaborative Phaleron Bioarchaeological Project integrates a wide range of biological, mortuary, and historical data with scientific methodologies to elucidate the ancient lives of the commoners that remain unexplored or silenced. This project focuses upon the extensive necropolis excavated at the ancient Attic port of Phaleron (ca. 8th-4th centuries BC) by the Ephorate of Antiquities of Western Attica, Piraeus, and the Islands. The size, date, state-of-the-art excavation techniques, preservation, and mortuary variation of the cemetery including, among others, what appears to be non-elite strata, as well as mass graves and shackled individuals offer us with a previously undocumented view of the ancient Athenian past. Here, we discuss preliminary bioarchaeological results and we present a contextualized and synthesized approach to reconstruct life and death in Archaic Athens.

[298] *Chair*

Prevosti, Francisco Juan [7] see Martin, Fabiana María

Price, Karen [306] see Marquardt, William

Price, Max (Massachusetts Institute of Technology)

[103] *Tracking Morphological Changes in the Domestication of Sheep and Pigs: A Comparison*

How do animal morphologies change during domestication? How do different parts of the skeleton adapt to human management? In this poster, I take a quantitative approach to domestication by comparing biometrical data from two species of mammals that were domesticated in the Middle East around the same time (ca. 8000 BC): pigs (*Sus scrofa*) and sheep (*Ovis aries*). Both pigs and sheep were domesticated by Pre-Pottery Neolithic B communities in northern Syria/southern Anatolia, but these species likely followed different pathways to domestication as a result of their divergent behavioral and physiological properties. Using modern comparative biometrical data to guide the comparison, this poster tracks changes in cranial and postcranial measurements over time, covering the periods before and after domestication. By quantifying biometrical change across the skeletons of these two different species, this poster ultimately looks at mammal domestication as a process of unique adaptation to human cultural control.

[103] *Chair*

Price, Max [103] see Rapes, John

Price, Michael (Santa Fe Institute)

[74] *Bayesian Reconstruction of Past Demography*

I describe a novel, age-structured, Bayesian framework for reconstructing past demography. The framework is quite flexible and can incorporate and synthesize a wide range of data. I demonstrate its use with human burial data, where each observation can include an AMS radiocarbon measurement, an estimate of age-at-death, or both. Conceptually, the framework is useful because it addresses in a statistically principled way two vexing sources of equifinality in archaeological data: (1) the radiocarbon calibration curve and (2) the fact that even if demographic rates such as age-specific mortality, fertility, and migration are stable an infinite set of demographic histories can yield the same predicted growth rate and stable age distribution. Fortunately, not all demographic histories are equally likely and some are even impossible. I utilize theoretical and empirical knowledge from evolutionary demography and life history theory to parameterize and specify prior probabilities for alternative demographic histories. The radiocarbon and age-at-death data update these prior probabilities to give posterior probabilities, yielding a (hopefully) sensible and accurate reconstruction of past demography.

Price, Robyn (University of California, Los Angeles)

[309] *The Invisibility of Experience: Accessing Ancient Sensory Frameworks*

While archaeological analyses that focus on the experiential and sensorial past are becoming more common, scholars continue to discuss and dispute what knowledge of the past is accessible. Without moving beyond the material remains and into the realm of the self-reflexive researcher (Hamilakis 2013: 119), this paper will demonstrate that archaeologists do not need to stray too far from their traditional methods to uncover rich evidence of past sensory lives. By drawing from the field of art history and linguistics, the elaborate depictions of tomb scenes from Eighteenth dynasty Egypt might truly come to life as evidence for an ancient sensory framework. In addition, these tomb scenes were not designed for the dead, but also engaged with by the living. Though these scenes were augmented by their inclusion of deceased people and other such occurrences not commonly visible to the living, the activities depicted such as banqueting or hunting were those experienced by ancient Egyptians every day. How might the visible representations of invisible sensory experiences in these scenes be reconciled with the daily life of the ancient Egyptians? This paper seeks to understand this relationship with special emphasis on the visibility of the senses and the invisibility of experience.

[309] *Chair*

Price, Seth (University of Arkansas)

[71] *Abu Shusha: Integrating and Correlating Surface Features with Magnetic Susceptibility*

This research looks at Tel Abu Shusha in the Jezreel Valley of Israel, an understudied site in a strategically important Levantine area with potential evidence of Roman, Byzantine, and Ottoman settlements. Surface survey was completed in nine square kilometers around the Tel, resulting in ceramic density data as well as over 2,500 mapped surface features in GIS, such as quarries, wine presses, and architecture. Additionally, four magnetic susceptibility grids were taken in this area, each one measuring approximately 100 by 100 meters. These grids were intentionally completely in varying

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topography that often creates difficulty for geophysical survey: on top of a Tel, on a Tel slope, in a hilly forested area, and in a flatter forested area. This project, a Master's Thesis at the University of Arkansas, looks at settlement patterns and site formation processes through the integration of these two data sets and exploration of visual versus quantitative methods of display, as well as the relevance of maps derived from elevation. Global and local correlation as well as other spatial statistics were used to compare these data sets, particularly looking at how well certain feature types align with susceptibility values and what we can generalize from this.

Price Steinbrecher, Barry (Anthropological Research, LLC), Stewart B. Koyiyumptewa (Hopi Cultural Preservation Office) and Maren Hopkins (Anthropological Research, LLC)

[72] *Research Protocols for Documenting Hopi Traditional Properties*

Over millennia, Hopi people have established a rich landscape of significant places throughout the American Southwest and beyond. The significance of many of these places is rooted in Hopi traditional beliefs and practices and they are vital components to the cultural identity of the tribe. The Hopi Cultural Preservation Office (HCPO) and their research partners have established protocols for documenting Hopi traditional cultural places and incorporating this information into the regulatory framework of the National Historic Preservation Act. To this end, established protocols include: identifying appropriate research participants to help identify traditional cultural properties and their contexts of significance; completing place-based research to identify all contributing elements of the property; following best practices in documentation, review, and confidentiality of cultural information. Recent research conducted by the HCPO and Anthropological Research, LLC, identified Hopi traditional cultural properties within the Navajo Generating Station and Kayenta Mine Complex, centered on Black Mesa in northeastern Arizona. This research helped to refine established protocols and illuminate continued challenges associated with documenting Hopi traditional cultural properties.

Prieto, Gabriel

[165] *Continuities and Discontinuities in a Thousand Year Old Fishing Village on Huanchaco Bay, North Coast of Peru: The Pampa la Cruz Case*
Traditionally, Andean archaeologists label residential settlements as "Salinar" or "Moche" and automatically assumed they "belong" to a particular society/culture. Since 2010, I have been excavating multiple sites around Huanchaco bay, located in the littoral of the Moche Valley, North Coast of Peru. One particularity of this coastline is that there is still an active group of fishermen exploiting the sea resources using traditional technology. The continuity between the earliest occupation identified in this area (B.C. 1500–1200) and the present day fishermen is giving us a new perspective for exploring the social, economic and ideological trajectories of the Huanchaco community. In short, instead of framing archaeological occupations as Salinar or Moche, I propose a "Huanchaco identity" created over time by their economic and ideological relationship with the ocean. To explore this possibility, I present the case of Pampa la Cruz, first occupied around B.C. 350/300 and abandoned roughly at 650/700 A.D. This occupation lasted for more than one thousand years in which this domestic settlement experienced several changes but also continuities in spatial organization and material culture. This paper presents the history of a fishing community and their co-existence with major social, political and ideological movements through time.

Prieto, Gabriel [165] see Parker, Bradley

Prignano, Luce [146] see Lozano, Sergi

Prijatelj, Agni (Durham University, United Kingdom)

[136] *The Vital Force of Underground Places and Ritual Production in Caves and Rockshelters*

Caves are regularly portrayed as a blank stage upon which the social—including ritual activity—is enacted. This paper, however, takes the opposite approach: in discussing a number of selected Antique and Medieval ritual cave sites in Slovenia that are associated with Roman, Christian and Slavic religious systems, it demonstrates the vibrant, hybrid, participant and continuously-changing nature of underground places in which multiple symmetric and fluid connections exist between people, animals, plants, materials, things, places and landscapes. Most notably, these throbbing networks of various human and non-human agencies cooperate or are in conflict, and enhance or confound each other; yet, at the same time, also act as a whole with a vital force that is distinct from the sum of each materiality considered alone, and which can thus be understood not only as a distinct place-power, but also as the core essence of any ritual performance.

Primeau, Kristy (NYS DEC)

[148] *Discussant*

Primeau, Kristy [40] see Goodwin, Graham

Prince-Buitenhuys, Julia [179] see Hall, Sarah

Prociuk, Nadya (University of Texas at Austin)

[229] *Changing Times, Changing Ways? Evidence for Metallurgy at the Cividade de Bagunte*

The Iberian Peninsula has been a rich source of metallic ores for millennia, and the quest for control of those resources has profoundly impacted the history of the Peninsula. Iberia has followed a unique trajectory in the development of metallurgy, with a case for the independent invention of copper smelting in the southwest, and small-scale production of bronze and other metals across the Peninsula until Roman occupation. The advent of Roman imperial control of labour and mines constituted a sea change in the scale and intensity of metal exploitation in Iberia with the introduction of large-scale mining, smelting, and production operations. What did this change look like within communities? How did local people adopt, adapt, or reject these new technologies and practices? Among the last to be conquered, the people of the Castro Culture of northwest Iberia produced some of the most technologically complex and visually stunning examples of Iberian metalwork. However little is known about the nature of metallurgy practiced at Castro sites. The Cividade de Bagunte, at the height of its occupation during the Roman period, can provide valuable insight into the social and technological strategies used by Castro people to cope with this transition.

Prociuk, Nadya [21] see Bussiere, Lauren

Procopio, Noemi (The University of Manchester), Anna Williams (University of Huddersfield), Andrew Chamberlain (The University of Manchester) and Michael Buckley (The University of Manchester)

[88] *Post-mortem Interval and Age-at-Death Estimation through Forensic Proteomics*

The estimation of the post-mortem interval (PMI) and the age-at-death (AAD) are both important aspects of forensic anthropology for which numerous methods have been developed, each with different limitations.

As proteins represent biomolecules that carry out a wide range of functions, many of which structural to the tissues undergoing decomposition, and the collection of these (i.e., the proteome) is dynamic not only throughout life, but also post-mortem, proteomic methods have great potential in forensic

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archaeology.

Here we present the innovative use of proteomics to investigate AAD from pig bones of different biological ages collected from an experimental forensic scenario. Furthermore, we explored the proteome variability of bones extracted from pigs that have been buried for different PMIs, to better understand the leaching phenomena associated with taphonomic events as well as the decay of proteins post-mortem. Our results showed relationships between the abundance of particular serum proteins with AAD, and glutamine deamidation with PMI, revealing the suitability of proteomics to forensic contexts.

Proebsting, Eric (Thomas Jefferson's Poplar Forest) and Daniel Druckenbrod (Rider University)

[39] *Forest, Frost, and Agriculture: Measuring Three Centuries of Environmental Change at Thomas Jefferson's Poplar Forest*

This paper highlights ecological discoveries made during a survey of natural and cultural resources along a new 2.2 mile parkway at Thomas Jefferson's Poplar Forest. Poplar Forest is Thomas Jefferson's former retreat home and plantation located in Bedford County, Virginia. In addition to locating archaeological sites and mapping aboveground features, 10 forest plots were established within stands of increasing age adjacent to the proposed path of the parkway. By measuring tree diameter, identifying tree species, and using dendrochronology to sample trees from three different positions in the forest canopy, these plots are providing interpretations about how the present day landscape relates to past agricultural activities, landscape design, and processes of succession that have taken place over the past 250 years. Additional insights are gained by examining these plots in light of historic documents and maps as well as archaeological remains, including charcoal fragments recovered from the plantation's slave quarters and pollen profiles associated with the creation of both agricultural fields and Jefferson's retreat. Samples taken from plantation-era building timbers and tulip poplar trees associated with the ornamental landscape are also being used to extend our knowledge of significant climatic events and forest dynamics back to the decades before colonial settlement.

Prout, Michael (CSULA Anthropology Master of Arts)

[157] *Primary or Secondary Deposition: Midnight Terror Cave Operation V*

Two chambers in Midnight Terror Cave, Belize show undeniable evidence of Maya child sacrifice. Operation V and Operation VIII are the deepest darkest chambers of the cave where some of the most important of ancient Maya rites were performed including human sacrifice. In 2009 Ann Scott proposed that sacrifices occurred in Operation VIII and, during ritual cleaning of this public space in preparation for a new ceremony, the bones were taken from their primary deposition site and moved to Operation V. This paper analyzes the presence of small hand and foot bones in each chamber to determine primary or secondary deposition. The data agree with Scott's secondary deposition model.

Prufer, Keith M. (University of New Mexico), Mark Robinson (Exeter University) and Douglas J. Kennett (Pennsylvania State University)

[59] *Early Human Biology, Ecology, and Archaeology in the Lowland Tropics of Central America*

Renewed focus on Paleoamerican and archaic peoples across Mesoamerica have broadened our understanding of those time periods. However, few stratified sites have been documented. We present new data from two multi-component rockshelters located in the Bladen Nature Reserve in the Maya Mountains of Belize. We document persistent use of these rockshelters from the late Pleistocene through the Maya collapse and suggest these spaces were used for animal processing, tool reduction, and as cemeteries. These sites are very difficult to access and are located more than 40km from the nearest road. Their location, in a well-protected environmental preserve, has allowed us to excavate undisturbed contexts in dry shelters that have fostered remarkable preservation of organic materials. Here we present data from human biology, isotope ecology and material culture. The results contribute to our understanding of early human adaptations in the New World.

Prufer, Keith M. [77] see Dennehy, Timothy

Prunk, Andrew [223] see Graesch, Anthony

Przadka-Giersz, Patrycja (University of Warsaw)

[216] *Women's Power and Prestige in the Pre-Hispanic and Early Colonial Andes*

The second half of the first millennium A.D. witnessed some significant changes in gender roles and traditions in the Andes. The discovery of the first undisturbed burial context of fifty-eight noblewomen with hundreds of precious artifacts found at Castillo de Huarmey provides important evidence about women and their roles played in ancient society in the Wari Empire. The amount and the richness of the luxury and prestige items, which comprise hundreds of objects of the most diversified types, provide important data regarding the identity of elite women and their social and economic role during the Middle Horizon. Many of these ancient traditions have persisted in the early colonial period. That refers especially to the elite women's personal attire, as well as jewelry, ritual accessories and others objects of prestige collected during their lifetime. Early colonial documentation, particularly the wills of indigenous elite women, compared with archaeological evidence, confirms that both female attire and personal grave goods imitated the symbolic image of the queens and princesses of antiquity, just like those from the mausoleum of Castillo de Huarmey. The information collected up to date allows also to analyze different goods of indigenous origin through their strategic and economic value over time.

Przystupa, Paulina (University of New Mexico)

[313] *The Challenges of Co-authoring a Background Chapter for an Open Textbook*

As we move towards increasing open access to archaeological knowledge, textbooks are an integral part of that transition. Unfortunately, open access textbooks are not a well-established form of knowledge dissemination amongst archaeologists and currently do not hold as much credibility as traditionally published works such as peer reviewed journals or printed textbooks. In hopes of contributing a chapter to an open access textbook, what are the keys to making such a background chapter successful? What elements are necessary to prove that such a chapter has validity in the eyes of archaeologists but also leverages the benefits of an open source textbook? What traditional textbook themes are required and what others should be left aside to improve the way that textbooks can be used to pass on background knowledge to new students? This paper aims to discuss some of those specifics to create a solid foundation for co-authoring a chapter for an open source textbook. It will examine the necessities as well as discuss innovative ideas for working on a large collaborative project.

[61] *Moderator*

[61] *Discussant*

Ptacek, Crystal [241] see Sawyer, Elizabeth

Puckett, Neil (Texas A&M CSFA)

[244] *Revealing the Drowned Past: New Evidence for Buried Underwater Landforms in Walker Lake, NV*

Over the last 15,000 years, Walker Lake, NV has ranged in size from the southernmost branch of Pleistocene Lake Lahontan to a small alkali wetland. These conditions have provided valuable, but varied resources for local populations throughout human occupation. Sites identified during summer 2015 and 2016 illustrate the preservation of sites in environments where both submersion and drying have occurred. Investigations during summer 2017 revealed the presence of numerous landforms under the modern lake. Sub-Bottom survey showed preserved features including shorelines,

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buried channels, and possible rivulets. Underwater test excavations on these features demonstrated their preservation under more than 2 meters of sediment. Marker horizons and preserved organics provide valuable guides for future research such as depositional chronology, potential for preserved perishable materials, and ideal locations for extensive excavations. When combined with the new archaeological sites found north of Walker Lake, the results clearly demonstrate the value of underwater archaeological research in the Walker Lake Basin.

[244] *Chair*

Pugh, Timothy (Queens College and The Graduate Center)

[252] *New Data on City Planning at Nixtun-Ch'ich', Petén, Guatemala*

The site of Nixtun-Ch'ich' in Petén, Guatemala is the only known lowland Maya site with an urban grid. Such grids are composed of perpendicular streets forming quadrilateral city blocks. They are common elements of city planning as they increase the legibility of city space and the interconnectivity of occupants. The urban grid at Nixtun-Ch'ich' is the earliest known in the Americas (ca. 800–500 BCE) and was built when social complexity was emerging in the Maya region. Like many Preclassic period Maya sites, the planning at Nixtun-Ch'ich' also includes an east to west line of ceremonial buildings and reservoirs forming an axis urbis. Our latest survey has revealed that the axis urbis extends much further to the east and west than previously thought. Recent excavations and radiocarbon assays have refined the chronology of the grid construction as well as the axis urbis. The work has also illuminated Middle Preclassic period construction techniques.

Pugh, Timothy [252] see Shiratori, Yuko

Pugliese, Francisco (MAE/USP BRAZIL), Roberto Ventura Santos (Laboratory for Geochronology—Brasília University), Carlos Zimpel (Archaeology Department—Rondônia Federal University) and Eduardo Neves (Museum for Archaeology and Ethnology—USP)

[69] *Monte Castelo Shellmound and Early Ceramic Technologies in Amazon: A Perspective on Long-Term Landscape Management and the Origins of Pottery in the Americas*

Recent research has confirmed that some of the oldest ceramics of the Americas are associated with Amazonian shellmounds. Excavations at Monte Castelo site produced a representative assemblage of these early technologies, and has also demonstrated a long history of ceramic production and use, with significant changes during the Middle Holocene that accompany the intensification of landscape management and the emergence of several other cultural innovations in that period. In this presentation, we will bring the results of geochemical analyses carried out on pottery remains and sediments from different strata of the site as well as from off-site areas, correlating its chronology with the paleoenvironmental scenario of southwestern Amazonia. In an attempt to contribute to the discussions about the characteristics of the emergence and the adoption of ceramic technology, some indications of its relation with the early process of landscape management that are marked in the history of occupation of the region will be further presented.

[116] *Discussant*

Pulsifer, Peter [195] see Strawhacker, Colleen

Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia)

[169] *Tarascan Presence in Central South Michoacan. New Researches*

For the last five years the Instituto Nacional de Antropología e Historia set up an archaeological project in the central south portion of the state of Michoacan in the Zirahuén and Balsas river basins. A systematic survey had been made in a large area identifying dozens of sites never previously recorded, some of them with a clear Tarascan component. In spite of, in this paper we will present the results of the research made at the Tarascan sites in the limits of the highlands and the Tierra Caliente and the expansion of the Señorío Tarasco into the lowlands of the Balsas River. This particularly related to the Tarascan exploitation of the natural resources of the Tierra Caliente like cotton, colored stones and especially the copper mines.

[55] *Chair*

Punzo Díaz, José Luis [55] see Campos, Cinthia M.

Purcell, David (Museum of Northern Arizona)

[269] *The Wupatki Petroglyph Project*

The Museum of Northern Arizona and National Park Service, Flagstaff Area National Monuments conducted a cooperative baseline documentation and condition assessment of four sites in Wupatki National Monument 2014–2017: Crack-in-Rock (WS831), Middle Mesa (WS833), Horseshoe Mesa (WS834), and WS835. The fieldwork component of the project comprised high resolution film and digital photography of 374 petroglyph panels and 4,004 elements, completion of narrative and tabular data collection forms for all panels and elements, and evaluation of the geomorphological settings of the petroglyphs. Additionally, selected panels were documented with scaled drawings, gigapixel panoramas, timelapse digital photography and video. The project significantly expanded the number of recorded panels and elements, identified differences in the types of elements represented at each site, re-evaluated previous claims for solar imaging calendars, and revealed previously unknown or under-reported Archaic and Historic occupations of the sites.

Purdon, Donald [222] see Waggle, Tawnya

Purdue, Louise [80] see Nondédéo, Philippe

Puseman, Kathy [48] see Lee, Craig

Pustovoytov, Konstantin [283] see McCriston, Joy

Putsvage, Kathryn

[287] *Complicating the Religious/Secular Dichotomy through Object Biographies: An Investigation of Mesa Verde Style Mugs*

Scholars acknowledge that religious and secular rituals are difficult to distinguish. This is especially true in the archaeological record, where human beliefs and worldviews must be understood through material correlates. In order to make categories simpler to use, Western scholars have tended to dichotomize religious and secular. Exploring the role of Mesa Verde style mugs in the Ancestral Puebloan world, this paper takes an object biography approach and acknowledges that boundaries between religious and secular practices are not always clear cut. Researchers tend to consider Mesa Verde style mugs an object used primarily in religious ritual contexts. However, their investigations have assumed an unnecessary dichotomy between domestic/secular and religious/ceremonial uses. By using an object biography approach, I work to collapse the boundaries between religious and secular practices and show that mugs had multiple roles in the lives of Ancestral Puebloan people.

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Putt, Shelby [227] see Beney, Megan

Pyburn, Anne (Indiana University)

[110] *The Postclassic, the Postmodern, and the Problem of Alternative Facts*

Contemporary trends in mass media communication indicate serious confusion in the public consciousness about the nature of science and the status of evidential reasoning. Archaeologists, in an effort to make esoteric research programs interesting to the public have contributed to this problem by providing over-simplified stories and “lessons from the past” based on sketchy evidence and mystified analysis. We have allowed public intellectuals from other disciplines to speak for us, and we have failed to address the dangerous gap between what we were saying about the past from what the public was learning about the past. But the past has important implications for the future of archaeology as a discipline, especially if we continue to oversimplify what we know about the ramifications of sociopolitical change for the future of the planet.

[60] *Discussant*

Pye, Jeremy (Cultural Resource Analysts, Inc.)

[221] *Assessing Malaria Risk in 19th Century Tucson, Arizona*

Malaria is thought to have been brought to the Americas by early Spanish explorers. By the late 19th century, malaria had spread through human populations throughout tropical and temperate areas of the Americas, including the American Southwest. Historical documents, maps, and modern GIS data layers (e.g., DEM, soils, vegetation, land use, streams) from the area around Tucson, Arizona, were consulted and entered into ArcGIS (v.10) in order to produce a map of potential vector breeding locations based on a flood water accumulation model. The ArcGIS model and subsequent statistical analyses revealed that nearly the entire Tucson Basin would have been at high risk for malaria transmission, but historical records suggest that malaria differentially targeted certain demographics. Why? This research attempts to tell the story of how cultural and social practices interact with environmental patterns of climate and vector distribution to determine risk of malaria transmission in Tucson.

Pye, Mary E. [136] see Gutiérrez, Gerardo

Qi, Haiping [88] see France, Christine

Qian, Wei [137] see Liu, Siran

Qiu, Yijia (University of Pittsburgh), Julie Hoggarth (Baylor University), Claire Ebert (University of Pittsburgh) and John Walden (University of Pittsburgh)

[302] *Identifying Patterns of Ceramic Compositional Variability from Residential Contexts in Three Late Classic Maya Polities*

Archaeologists have had a long-standing interest in domestic economy because households are often considered to be the primary social unit of production, consumption, and reproduction in most agrarian societies and occupy an important place in the study of ancient state economies. A relatively novel avenue for exploring broader patterns in the domestic economies of ancient Maya polities involves compositional analysis of ceramics. Variability in the compositional makeup of the ceramics can show variability in clay source procurement, which could help identify manufacturing groups and the circulation of ceramics between households. A comparative perspective between different Classic Maya polities will provide a way of discerning concrete patterns of variability. With this in mind, this study explores the composition of Late Classic ceramics from three Maya polities in the Belize River Valley, Baking Pot, Cahal Pech and Lower Dover. These are among the largest Maya polities in the upper Belize River Valley and served as the capitals to small kingdoms in the Classic period (c. AD 250–900). The results will speak to inter-polity differences in ceramic production and distribution at the household level.

Quach, Tony [180] see Whitley, David

Quave, Kylie (Beloit College) and R. Alan Covey (The University of Texas at Austin)

[207] *Camelid Herding and Enduring Community Identities among the Ayarmacas (Cuzco, Peru)*

Indiscriminate invocation of the term ayllu constrains archaeological reconstructions of community organization in the pre-contact Andean highlands. Legacies of earlier generations of anthropological scholarship encourage researchers to assume particular traits of sociopolitical organization. Archaeological and ethnohistoric evidence from the Cuzco region of Peru demonstrates how such assumptions can be an obstacle to developing accurate representations of social organization. As Inca elites extended power in the Cuzco region (AD 1200–1400), they interacted with diverse societies that did not all resemble the monolithic Andean ayllu. One compelling case for reconsidering ayllu organization is Yunkaray, seat of the powerful Ayarmaca polity, located near Maras, 35 km northwest of Cuzco.

This paper uses ethnohistory, regional settlement patterns, and excavation results from Yunkaray to note divergences from classic ayllu attributes. We identify camelid herding as a potentially integrative force in pre-Inca community formation, and examine the public performance of community identity in relation to Yunkaray’s neighboring polities. We trace the enduring Yunkaray community through its sociopolitical apogee and the subsequent forced resettlement of its residents by the Incas. Finally, we consider how the imagined community of Ayarmacas relates to local ayllus that coalesced in the early Colonial period, especially through processes of Spanish resettlement.

Quave, Kylie [100] see Aland, Amanda

Quilter, Jeffrey (Peabody Museum, Harvard University)

[64] *Discussant*

Quinn, Colin (Hamilton College)

[40] *A New Method for Monitoring Socio-economic Changes through Settlement Placement*

There is a recursive relationship between socio-economic institutions and the environment. Decisions about where to place settlements in a landscape were informed by existing economic institutions, but placement of sites in turn effected how social and economic institutions were organized. In this paper, I present a new GIS-based method for quantifying socio-economic organization and change in prehistoric societies. Catchment analyses, as employed in this study, define the availability of economic resources for individual settlements. This approach then quantifies cultural preferences across settlement systems. As a case study, I monitor settlement systems throughout the Early and Middle Bronze Age in southwest Transylvania. Southwest Transylvania is a major metal producing region that underwent significant socio-economic changes as metal became commodified throughout the European Bronze Age. Using catchment analysis, I demonstrate that communities in metal-rich landscapes increasingly prioritized access to agricultural land and access to interregional trade routes over metal ore sources. This result challenges existing narratives for how increasingly complex societies emerged in late prehistoric Europe. The method presented in this paper is easily transferable to other regional contexts and can be an additional tool for archaeologists exploring socio-economic organization and change in the past.

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Quinn, Colin [29] see Beck, Jess

Quintana Ortiz, Luis

[57] *19th Century Factories, Warehouses and Workshops in La Puntilla, San Juan Puerto Rico*

La Puntilla-Marina is a small peninsula located south of the walled city of San Juan, Puerto Rico, and west of the docks. Through the 19th century a series of projects to develop the area, consisting on the construction of colonial government buildings such as the custom's house, armory and a military battery, as well as warehouses and dwellings, were completed. Unfortunately, part of this ward was demolished in in the mid-20th century to give way to the construction of residential units, a large plot of land was converted into a parking lot, and an US Coast Guard Base was established. This study concentrates on creating a chronological timeline of the development of the ward by identifying the factories, warehouses and workshops that were established in this peninsula in the 1800s. Documentary resources like maps, blueprints, photographs, commercial directories and newspaper ads were used to locate these properties and create a virtual map. The main goal is to identify potential archeological research areas for future studies

Quintela, Daniel

[186] *The Lithics of Late Coalition Period Tewa Pueblos: Negotiating Tewa Society in the Rio Chama Valley*

In Ohkay Owingeh's origin tradition the Tewa peoples emerged into this world from the north and traveled south as two separate groups—the Summer and Winter people—before coming together to create a new society in the Rio Chama valley of northern New Mexico. This history parallels our archaeological understanding of diverse peoples, likely migrants from the Mesa Verde region and indigenous Rio Grande populations, who settled the Chama in the thirteenth and fourteenth centuries. However, the origin and identities of these people, as well as how they interacted and negotiated Tewa society, remains poorly understood. I address this issue by comparing two contemporaneous ancestral Tewa pueblos: Palisade Ruin and Tsiping'uinge. Although located only 8 km apart and both built in A.D. 1312, these sites differ greatly in size and architecture and raise questions of the identities of their inhabitants and relationships with one another. I specifically examine the procurement of lithic artifacts. Based on frequencies of materials these villages had different access to local and imported stone, and may have participated in independent socioeconomic networks. This suggests an agreement between archaeological data and the Tewa's own history that Tewa society is an amalgamation of many diverse peoples.

Quintus, Seth (University of Hawaii at Manoa), Jennifer Huebert (International Archaeological Research Institute) and Kyungsoo Yoo (University of Minnesota)

[171] *Examining the Impacts of Non-human Animals on Sequences of Agricultural Change*

Historical sequences of agricultural change are influenced by several key factors. While much attention has been paid to the political context of agricultural production, as well as environmental changes brought about by certain techniques, less has been paid to the active manipulation of productive environments by non-human animals. Within the context of some recent theoretical advances in archaeology and ecology, it has become apparent that animals—intentionally or unintentionally introduced by humans—modify the context under which agricultural production occurs. These modified landscapes are inherited by subsequent generations of producers who are challenged to make minor, and sometimes major, adjustments based on changing landscapes. In this paper, we highlight these processes using case studies from historic North America (e.g., earthworms) and the pre-European Pacific (e.g., rats and birds). We demonstrate that the ecosystem modifications and services provided by animals created a particular kind of path dependency that had ramifications for past peoples, and continues to have consequences for present producers.

Quiroga, Diego [63] see Currie, Elizabeth

Rabinowitz, Adam (The University of Texas at Austin) and Iulian Birzescu (Institute of Archaeology "Vasile Pârvan")

[130] *Communicating in Three Dimensions: Questions of Audience and Reuse in 3D Excavation Documentation Practice*

After excavating the Praedia of Iulia Felix at Pompeii in 1755, architect Karl Weber published the building with an axonometric illustration that showed the remains in three-dimensional perspective. In doing so, Weber communicated additional information about the form of the building in a manner that was both accessible to a lay audience and sufficiently "scientific" for a scholarly one. By contrast, digital 3D documentation methods in current archaeological practice often reinforce a division between "scientific" models intended for internal consumption by the project that produces them, and public communication in the form of lower-quality online digital displays. Using recent fieldwork at the Greek colonial site of Histria in Romania as a case-study, this paper explores the space between high-quality 3D documentation used only by an internal audience and decontextualized 3D content designed for public consumption. In particular, we seek to determine whether high-quality, measurable 3D models derived from photogrammetrical capture are useful in communicating excavation results to other scholars—and if so, in what ways. We evaluate several scenarios for the role of high-quality 3D documentation in both formal and informal scholarly communication, and we discuss the potential for the reuse of such documentation to answer new research questions.

Raczek, Teresa (Kennesaw State University) and Namita Sugandhi (Hartwick College)

[121] *Women's Labor and Scholarship Production in Archaeology: Celebrating the Mentorship of Rita P. Wright*

Rita Wright's transformative work on gender and women's labor in West, Central, and South Asia provided an important framework for the archaeological study of craft production and the organization of labor. This interrogation of gendered practice was complemented by a parallel investigation of equity in academic archaeology, particularly through the work of the SAA's Committee on the Status of Women in Archaeology. In addition to her research and professional service, another significant contribution is Wright's mentorship and support of female students and junior scholars. Although this work is rarely rewarded or acknowledged, here we highlight examples of the guidance she has provided over the years as a way of recognizing and appreciating the tremendous impact she has had on the place of women in archaeology. We also discuss the influence of her work on recent projects in India.

Radding, Cynthia

[131] *Reading Cultural Landscapes in Time and Space: Ostimuri in Historical Archives and Archaeological Remains*

This paper discusses the historical construction of landscapes in the borderlands of northwestern Mexico, with a particular focus on the colonial Province of Ostimuri, bounded by the Yaqui, Mayo, and Fuerte rivers. In honor of Carroll Riley, the paper presents original research in historical archives, analyzed in the context of archaeological, ecological, and ethnographic literatures, to explain the formation of this space as a region and to explore both the vulnerabilities and the resilience of its peoples. Within this multi-disciplinary framework, the paper considers critically different methods of analysis and types of archival and non-textual evidence that contribute to the re-construction of historical processes of colonial encounter and cultural re-creation.

Rademaker, Kurt (Northern Illinois University)

[174] *An Interdisciplinary Approach to Investigate Early Andean Settlement Dynamics and Adaptation*

The Andean cordillera was one of the world's last mountain regions to be colonized by hunter-gatherers. To date, the empirical evidence indicates an initial appearance of humans in the high Andes (up to 4500 m above sea level) in the Terminal Pleistocene, about 12,500 years ago. Early forager sites

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of the Andes exhibit a spectrum of settlement and mobility configurations, which constitute responses to the structure of resources in their specific habitats. Intriguingly, some of the earliest and highest sites indicate thorough familiarity with highland resources, implying either considerable pre-existing cultural knowledge about mountains or very rapid landscape learning. Current debates center on the identification of explorations vs more permanent settlements, functional configurations of early highland sites with those in lower ecological zones, and the role of physiologic and genetic adaptations in the settlement process. Approaches relying solely on assemblages of artifacts and subsistence remains may be inadequate to resolve these issues. Bioarchaeological study of early Andean skeletons, situated within a well-established context of site- and region-scale archaeological settlement data, can provide key information on diet, provenance, mobility patterns, inter-zonal social connections, and the appearance of novel morphologic and genetic features.

[174] *Chair*

Rademaker, Kurt [2] see Haller Von Hallerstein, Sophia

Rafferty, Kevin

[164] *Virgin Anasazi Settlement Patterns in Valley of Fire, Clark County, Nevada*

Since 2003 the College of Southern Nevada (CSN) has conducted five field schools in Valley of Fire designed to teach students proper survey procedure and site recording techniques. Numerous sites (100+) from multiple time periods have been recorded through this work and, when combined with some earlier work from the area, have begun to yield results regarding our understanding of the settlement/subsistence patterns in the area. This paper looks at the settlement data from the Virgin Anasazi period (ca. 2000–850 B.P.), partially building on previous work in the region on the Virgin Anasazi by Margaret Lyneis. The data evaluated so far demonstrate that Valley of Fire is an archaeological region that holds the promise to enhance, or even change, many of our most cherished ideas about the prehistoric occupation of the southern Great Basin/northern Southwestern region.

Raharijaona, Victor [181] see Kus, Susan

Railey, Jim (SWCA—Albuquerque)

[325] *Lithic Assemblage Variability at the Regional Level: Raw Material Conditions, Time, and Site Function*

Several recent excavation projects by SWCA in far southeastern New Mexico have produced an immense dataset on lithic artifacts from 20 sites. This includes attribute data from thousands of individually analyzed lithic artifacts, mostly debitage. The excavated sites collectively cover a large swath across the region, and as such encompass appreciable variation in terms of local raw material conditions, as well as temporal affiliation and site function. Statistical analysis of the dataset was carried out to assess the relative effects of these variables in shaping assemblage patterning between these sites and local site clusters. The findings reveal that raw material conditions have a major influence on assemblage characteristics and variability. But temporal factors, including the changeover from the atlatl to the bow-and-arrow around A.D. 500, is also arguably an important factor behind the observed patterns. So too with site function, the influence of which is underscored by significant differences between selected certain sites. This includes a residential site where a variety of tasks were carried out, versus an adjacent site where activities were narrowly focused on lithic procurement, initial reduction, and perhaps practice knapping by beginners and novices.

Rainville, Charles (University of Oklahoma) and Asa Randall (University of Oklahoma)

[303] *Measuring Ancient Reuse of the Past: Archaic and Woodland Landscape Histories of the St. Johns River Valley, Florida*

The middle St. Johns River valley in northeast Florida was occupied more-or-less continuously beginning at least 9000 years ago. Regional inhabitation by hunter-gatherers involved extensive terraforming of the landscape, including the construction of earthen and shell mounds, in addition to many non-mounded places. Many locations were repeatedly occupied over the millennia, with successive generations modifying or otherwise interacting with existing, often ancient, places. Earlier research took these patterns as evidence for continuity in subsistence and settlement traditions. In this poster, we critically examine the trajectories of site reoccupation regionally in order to identify the context and conditions promoting site reuse through time. We compile site histories of mounded and non-mounded locations, drawing on nineteenth-century observations, twentieth-century salvage excavations, modern surveys, and aerial remote sensing including LIDAR and historic imagery. Our analysis identifies several pathways, including the maintenance of residential spaces and conversion to sacred space, that are tied to broader trends in environmental history, settlement, politics, and cosmology.

Raja, Mussa [221] see Gomes, Ana

Rakotomalala, Omega [168] see Stewart, Ashley

Ramirez, Manuel [262] see Lopez, Julieta

Ramón, Gabriel [333] see Chicoine, David

Ramon Celis, Pedro (Indiana University Bloomington)

[158] *Proyecto Cerro del Gallo, Monte Albán, Oaxaca, participación comunitaria dentro de un proyecto de investigación arqueológica*

El proyecto arqueológico "Cerro del Gallo", se desprende de los trabajos de investigación realizados en el Conjunto Monumental de Atzompa, dentro del sitio arqueológico de Monte Albán. La participación de diversos actores de la población civil, gubernamentales y de la iniciativa privada ha podido concatenarse de tal forma que, se ha podido construir de manera satisfactoria un ambicioso proyecto de investigación, que involucra además de un objetivo académico como lo es el discernir los procesos de crecimiento y decadencia internas de la ciudad arqueológica de Monte Albán, también promover el involucramiento de la población de Santa María Atzompa de su pasado.

[158] *Chair*

Ramsay, Jennifer (The College at Brockport, SUNY) and Noah Haber (The State University of New York Geneseo)

[12] *Examining the Concept of Hinterland in Antiquity in Arid Regions of the Levant Using Archaeobotanical Data and GIS Analysis*

Studies concerning the size of agricultural hinterlands in antiquity have generally been conducted on sites with favorable climates and have become the standard comparative tool. However, little has been examined relating to the size of a settlements hinterland in arid environments even when excellent archaeological evidence for extensive agricultural production, as can be seen in southern Jordan and Israel during the Roman and Byzantine periods. Likewise, a disproportionate focus has been placed upon urban settlements in archaeological research and as a result, the knowledge we possess of rural hinterlands and their contributions to the agrarian economy is largely unknown. Identifying the scale of agricultural productivity in arid environments between urban centers and their hinterlands can be examined using botanical remains overlaid with spatially variant environmental attributes that are deemed essential in the success of agrarian practices. The use of Geographic Information Systems (GIS) can make a complicated process of analyzing the nature and composition of botanicals according to environmental conditions readily possible. Preliminary results of this study

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provide an example of how GIS can aid in analyzing the relationship between settlements and hinterlands in antiquity by comparing plant communities and the corresponding essential environmental parameters they were located within.

Ramsey, Ann [90] see Schroedl, Gerald

Ramsey Ford, Dawn (HDR, Inc.) and Owen Ford (Adams State University)

[268] *Traditional Cultural Practices in America's Last Frontier: Conceptualizing Traditional Cultural Properties in Alaska*

Within the boundaries of the United States' largest state, 44 million acres of land are owned by Native corporations created under the Alaska Native Claims Settlement Act (ANCSA) of 1971. According to the U.S. Census Bureau, approximately one in seven people (15.2% in 2016) in the state of Alaska are Native Alaskan or American Indian. With a significant amount of the Native population managing and utilizing lands their families have occupied for multiple generations, how is the concept of Traditional Cultural Properties (TCP) currently being addressed? How do TCP designations, or lack thereof, affect these resources that may be impacted by proposed projects in the state? The following poster addresses some challenges with TCP designations in Alaska and how the resources are considered during Section 106 compliance activities.

Randall, Connie (University of Tennessee, Knoxville), Meagan Dennison (University of Tennessee, Knoxville), Jay Franklin (East Tennessee State University), Bruce Manzano (University of Kentucky) and Renee Walker (State University of New York at Oneonta)

[35] *Woodland Subsistence in Upper East Tennessee*

This paper describes the species diversity and taphonomic modifications of Woodland Period fauna from Upper East Tennessee. Fauna from both rock shelter and open-air locales from the Early Woodland (ca. 3000 years B.P.) to the Late Woodland (ca. 1000 years B.P.) period are used to characterize subsistence practices and site use in the region. In this paper, we present the MNI, NISP and measures of diversity, richness, and evenness of different animal species identified in the faunal assemblages of more than a dozen Woodland Period sites. We also use taphonomic modifications, such as burning, gnawing, and digestion of bone, to discuss site formation processes. Finally, several dog burials are described.

Randall, Asa (University of Oklahoma)

[295] *The Impersistence of Persistent Places on the St. Johns River, Florida*

"Persistent places"—natural or terraformed locations that draw repeated human action—are unique resources for archaeologists investigating deep-time phenomena. Not only do they allow us to track social and ecological changes anchored in space, the repeated tending to such places set in motion historical path dependencies for descendent communities. However, at the human scale persistence is never a taken for granted, but is produced by the projects of communities who incorporate places into daily, commemorative, and cosmological frameworks. Because places are multi-temporal and relational, they persist in their being enmeshed in associations between persons, ecologies, places, and historical narratives; the linkages between which are subject to transformations as communities attend to present concerns and try to assure futures. The hard work of keeping places from becoming impersistent is immanent in the genealogies of terraformed landscapes of the middle St. Johns River in northeast Florida. There, over the course of nine millennia, hunter-gatherer communities manipulated old places and created new locations for daily living and cosmological reverence. Using depositional histories at shell mounds throughout the region, I track attempts by communities to maintain or recreate continuities in the face of landscape-scale threats from sea level change and attendant ecological transformations.

Randall, Asa [122] see Sassaman, Kenneth

Ranere, Anthony (Temple University)

[260] *The Preceramic Occupation of Greater Chiriqui: An Assessment of Our Current Understanding*

The first substantial evidence of a preceramic occupation of Greater Chiriqui resulted from the 1970 excavations of upland rockshelters in the watershed of the Chiriqui River in Western Panama. Results from these excavations were reported in a 1972 dissertation and the 1980 publication *Adaptive Radiations in Prehistoric Panama*. Our current understanding of the preceramic period occupations in Greater Chiriqui owes more to subsequent innovations in research methods—phytolith and starch grain analyses and AMS dating foremost among them—and explorations of preceramic occupations beyond the boundaries of Greater Chiriqui than from any evidence from more recently discovered sites within the region. This presentation provides a reassessment of the preceramic evidence from Greater Chiriqui and an overview of what we should expect to find in the future.

Rangel, David (David Rangel), Juan Julio Morales Contreras and José Luis Punzo Díaz

[55] *Archeomagnetic Dating of Ceramic Potsherds of the Tingambato Archeological Site*

The archeological site of Tingambato, located in the municipality of the same name, is situated between the towns of Pátzcuaro and Uruapan, in the Mexican State of Michoacan. It is located at the south of the Tarascan plateau, at the boundary between the "tierra caliente" and the cold coniferous mountain land. In order to address the issue of occupational temporality of the site, we carried out absolute archeomagnetic dating of seven ceramic potsherds found at the site, taking advantage of the ability of magnetic minerals, contained within the ceramics, to record the direction and intensity of Earth's magnetic field at the time of its creation or last exposure to fire. This allows us to obtain the most probable age interval for these archaeological materials.

Rangel, Isaac [293] see Ruvalcaba, Jose Luis

Ranhorn, Kathryn (Harvard University)

[227] *Levallois, Learning, and Lithic Variation: Results from Porcelain Flintknapping Experiments*

The ability to transmit cultural information with high-fidelity across generations is a defining trait of modern humans. It is unclear, however, how and when this adaptation emerged in the human lineage. The earliest forms of human technology—stone artifacts—required knappers to understand raw material mechanics, as well as geometry (volume reduction, angles), and physics. Thus, it is often assumed that the spread of lithic technologies involved some degree of information transmission. However, archaeologists lack systematic methods to study the transmission of information from lithic palimpsests. A growing interest in this topic has emphasized design theory (Carr 1995), breaking down lithic technology into a series of independent domains of lithic production (Tostevin 2012) (e.g. core orientation, platform preparation). The research presented here used controlled knapping experiments to understand the influence of varied social learning conditions on these technological domains. The ultimate goal is to define attributes that can be used as proxies for information transmission in Paleolithic assemblages. We simulated two social learning conditions: emulation (lower-fidelity) and imitation (higher-fidelity) as novice knappers were taught Levallois technology. Results suggest that attributes associated with core orientation are more strongly correlated with degree of information transfer than attributes of toolkit morphology.

[227] *Chair*

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Ranslow, Mandy (Connecticut Department of Transportation)

[203] *Quinebaug River Prehistoric Archaeological District and New England Hebrew Farmers of the Emanuel Society Synagogue and Creamery Archaeological Site*

The Connecticut Department of Transportation is the steward of two Connecticut State Archaeological Preserves. This paper will highlight the Preserves and give an overview of how an agency, generally in the business of building roads and bridges, has contributed to the preservation of two significant archaeological districts. The Quinebaug River Prehistoric Archaeological District in Canterbury was listed as a Preserve in 2003. The 22 acre preserve includes five National Register-eligible pre-contact Native American sites ranging from 500 to 4000 years old. These sites were identified and preserved as part of a wetland mitigation site. The New England Hebrew Farmers of the Emanuel Society Synagogue and Creamery Archaeological Site in Chesterfield (Montville) was listed as a Preserve in 2007. It is the remnants of the late-19th/early-20th century Russian Jewish farming community. CTDOT is working with the descendant community to find ways to maintain fragile remains of a creamery building while leaving avenues open for roadway safety improvements. CTDOT and NEHFES are currently collaborating to execute a preservation easement in hopes of obtaining grant funding for the maintenance of this notable Jewish settlement. Working with the State Historic Preservation Office, CTDOT continues to support the protection of Connecticut's rich archaeological heritage.

Ransom, Jeff [195] see DeFelice, Matthew

Rapes, John (Purdue University), Jesse Wolfhagen (Stony Brook University), Max Price (Massachusetts Institute of Technology) and Erik R. Otárola-Castillo (Purdue University)

[103] *ZooaRchGUI: A User-Friendly Graphical User Interface with the R-Programming Language for Archaeologists*

Zooarchaeologists contribute valuable data to the exploration of archaeology's grand challenges. The scale and complexity of these problems requires zooarchaeologists to aggregate and analyze data using rigorous statistical methods while ensuring reproducibility and validity. Because assemblages can contain thousands of data points, conducting statistical analyses on all of the available data in a standardized fashion is difficult. ZooaRchGUI provides zooarchaeologists a free, user-friendly software that harnesses the power of the R programming language. It is currently available for download from the Comprehensive R Archive Network (CRAN). ZooaRchGUI provides a Graphical User Interface (GUI) that reduces direct interaction with R code, increasing accessibility while encouraging replicability and rigor. The program gives users the ability to import and modify data to suit their needs and easy-to-use functions to analyze data using statistical tools and visualize the results. The functionality of ZooaRchGUI is also continuously expanding; it is continuously updated to include innovative statistical tools providing a more stable, intuitive, and replicable user experience. Moreover, future versions of ZooaRchGUI will include broader techniques aimed at archaeologists across all sub-disciplines.

Rareshide, Elisabeth [94] see Minerbi, Joanne

Rasic, Jeffrey (National Park Service)

[50] *A New Radiocarbon Dated Record of Holocene Weapon Technology from the Trail Creek Cave Site, Seward Peninsula, Alaska*

The Trail Creek Caves site on the Seward Peninsula in western Alaska was excavated by Helge Larsen in 1949–1950, and is among the most important archaeological sites in central Beringia. It contains a lengthy, rich and well-preserved paleoecological and archaeological record dating to the late Pleistocene, and the largest collections of mid-Holocene age organic tools from the region. However, poor chronological and stratigraphic controls have hampered the interpretive value of the site. New analyses of the collections at the Danish National Museum were recently conducted to refine the site's age controls, validate Larsen's artifact typology, and evaluate the stratigraphic integrity of the site. Direct radiocarbon dating of two dozen antler and bone tools provide new insights into the evolution of weapon technology and toolkit design, particularly for the Paleonuit (Denbigh Flint Complex) period.

Rasmussen, Amanda

[334] *Fort Halifax Park: A Shared Heritage*

Fort Halifax Park, located in Dauphin County, Pennsylvania, contains archaeological potential for both prehistoric and historic resources alike. The local community is proud of its heritage but lacks the resources and expertise to properly care and manage the property. Future development, which once seemed only a dream for the community, is now a possibility through a joint partnership involving The Friends of Fort Halifax, the Indiana University of Pennsylvania, the Pennsylvania Historic and Museum Commission, DCNR, and Dauphin County. As part of this effort, numerous archaeological surveys have taken place on the Park Property, including a thesis conducted in 2013. The results of the excavation, and the efforts of the community and the partners, produced invaluable results.

Rautman, Alison (Michigan State University)

[205] *Violent Conflict and a Ritual of Memory in the Puebloan Southwest*

Among Puebloan groups of the American Southwest, oral traditions record mythical-historical stories of the often-catastrophic or violent ends of some of the pueblo ruins that dot the landscape (e.g., Hopi Ruin Legends, by Michael Lomatuway'ma, et al., 1993). In other cases, archaeological evidence points to the continued importance of ruins across centuries of time as repositories of meaning across the landscape (Snead 2008). One small feature from a burned pueblo from Central New Mexico records a once-hidden act of memory amid evidence of extensive destruction. Here, at LA-9032, people long ago carefully buried two new corrugated ceramic jars within a maize storage room. Deformed pollen grains in the jar indicate that the masonry walls and charred corn kernels still retaining heat from the fire. This poignant act of remembrance, while hidden from casual passers-by, forms part of the complex story of that particular place, reaches across the centuries, bearing witness again today to long-ago suffering

Raviele, Maria

[133] *Mentoring a Versatile PhD: From Archaeology to an AltAc Career*

The training and mentoring received by Bill's students reflects his dedication to four-field anthropology, as well as a recognition that students may work outside academia. This paper reflects on lessons learned from Bill's seminars, his mentorship, and a four-field anthropological approach to graduate training in the evolution of one student's career from archaeologist to organizational anthropologist and evaluator.

[133] *Chair*

Rawan, Atifa, Jamaludin Shable (Kabul University, Afghanistan), M. Hussain Ahmadzai (Kabul University, Afghanistan) and Jodi Reeves Eyre (University of Arizona)

[268] *The Afghanistan Cultural Heritage Education Program: A Collaborative, International Education Model*

The Afghanistan Cultural Heritage Education Program (ACHEP) is a collaborative project administered by the United States National Park Service and implemented by the Center for Middle Eastern Studies, University of Arizona and the Department of Anthropology and Archaeology, Kabul University. This international outreach effort engages Afghanistan's educators, students, and professionals in educational programs and activities to preserve and protect the country's rich cultural heritage and to enhance Afghanistan's capacity to protect heritage sites and better guard against looting and trafficking. In 2017 an introductory archaeology and anthropology course was co-delivered by instructors from the University of Arizona and Kabul

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University. This poster explores the development of that course, how the team approached technological, physical, cultural, and security challenges and language barriers, and plans to expand the program to include an illicit trafficking of antiquities and art objects course. This course will take into account lessons learned during the first, introductory course. It will be available to members of the Kabul community as well as Kabul University students and faculty. The next course will also be supplemented with local outreach events. The model being developed through ACHEP can be used to develop other cultural heritage education programs.

Rawski, Zoe (The University of Texas at San Antonio)**[30]** *Monumental Displays: Ritual Performance and Preclassic Architecture at Early Xunantunich, Belize*

The site of Early Xunantunich in modern day Belize provides the opportunity for a uniquely detailed case study in Preclassic Maya architecture. Thanks to a lack of Classic Period overburden, the Mopan Valley Preclassic Project has been able to conduct extensive excavations of early architecture at the site, documenting important ritual activities from this early time period which likely played a key role in the development of sociopolitical complexity in the region.

This paper focuses on the monumental flat-topped platform that forms the northern boundary of the ceremonial center of Early Xunantunich. In addition to the presence of decorative marine shell ornaments and greenstone effigies which have been interpreted as kingly adornments, recent discoveries of additional buried offerings such as a smashed whole vessel and an uncarved stone monument suggest that this platform was the locus of important ritual activities by at least the Late Preclassic period. These activities share linkages to nearby sites in the valley, and are likely indicative of larger regional sociopolitical processes. Furthermore, our increasing understanding of the structure's form and construction history shows that this platform required a massive investment of labor and materials, modifying the natural landscape in a truly monumental way.

[30] *Chair***Ray, Erin (University of New Mexico) and Holley Moyes (University of California, Merced)****[134]** *Investigations of Plastered Constructions at Las Cuevas, Belize*

The ancient Maya site of Las Cuevas, in Western Belize features a cave system that runs beneath the main plaza. Investigations by the Las Cuevas Archaeological Reconnaissance project suggest that the site functioned as a Late Classic ritual pilgrimage venue and that the cave was used for large public centrally-organized performances. The cathedral-like cave entrance contains monumental architecture consisting of at least 76 plastered platforms. I hypothesize that the level of managerial oversight should be correlated with the consistency of building materials employed in their construction.

Plasters from both cave and surface contexts were analyzed using geochemical methods including XRF (pXRF), XRD, SEM, EDS and FTIR to examine their chemical make-up. Results demonstrate considerable variation in plaster recipes in the cave and on the surface. This paper will discuss these findings and their implications.

Ray, Erin [136] see Moyes, Holley

Raymond, Tiffany (Binghamton University), Carl P. Lipo (Binghamton University), Matthew Sanger, Timothy de Smet and Anna Patchen (Binghamton University)**[156]** *Magnetometer Surveys and the Complex Prehistoric Landscape of Poverty Point, Louisiana*

Poverty Point, Louisiana, is well-known for its massive architecture that includes earthen mounds and six semi-circular ridges. Geophysical surveys conducted over the past decade have revealed that the subsurface of this deposit also contains a large, extensive and diverse set of artificially constructed features. In addition, remote sensing demonstrates that features that have been often described as singular constructions are actually a palimpsest of overlapping depositional events. Here, we discuss the results of our recent magnetometer surveys conducted across Poverty Point in areas of the ridges and near the Mound B field. Our results support recent findings that the prehistoric Archaic landscape of Poverty Point included massive features such as woodhenges, pits, and other types of architectural structures that are not visible on the surface. In specific, we show that the site once included the largest woodhenge known in the Americas, a circle of wood posts that covered roughly 60 hectares. These results support the growing understanding of Poverty Point as the remains of activities that integrated prehistoric communities through repeated episodic group-level activity.

Raymond, Tiffany [156] see Gilleland, Sarah

Razo, Mikaela B. [330] see Saenz Serdio, Martha Adriana

Reade, Hazel [219] see Stevens, Rhiannon

Ream, Randy (AUSA—WDKY)**[193]** *Discussant***Reamer, Justin (University of Pennsylvania- Department of Anthropology)****[85]** *Planting the Empty Spaces: Estimating Field Size from Storage Pits in the Upper Delaware Valley*

Landscapes are formed by diverse human actions and interactions with their surroundings through the performance of various tasks, or what Ingold referred to as the "taskscape." Recently archaeologists have turned their attentions to a previously neglected aspect of the landscape created through quotidian tasks, the agricultural field. These studies, however, tend to focus on preserved built structures still visible in the modern landscape. Direct study of agricultural fields in Eastern North America, however, has largely not been undertaken due to an absence of archaeological signatures marking the location of what were often ephemeral, extensive, and complex elements on the landscape. In the Upper Delaware River Valley, the historic Munsee and their ancestors lived on flood plain terraces where they practiced maize based agriculture. Although lacking direct evidence of fields, these people left behind large pits that based on paleoethnobotanical evidence contained maize and other agricultural crops. Using the excavated storage pits at the Shoemakers Ferry site, I estimate the total storage capacity for the site. This storage capacity will be combined with ethnohistorical data on planting practices for the Middle Atlantic and Northeast region to reconstruct the size and location of the agricultural field landscape associated with Shoemakers Ferry.

Reaux, Derek (University of Nevada, Reno) and Geoffrey Smith (University of Nevada, Reno)**[92]** *The Paleoindian Archaeology of Guano Valley, Oregon*

During the 2016 field season, the Great Basin Paleoindian Research Unit (GBPRU [University of Nevada, Reno]) began investigating Guano Valley, Oregon for evidence of Paleoindian occupations. Our initial work revealed a rich record of Terminal Pleistocene/Early Holocene (TP/EH) archaeology that appeared strongly associated with an extensive delta system that brought fresh water into Guano Lake from the south. This past field season, the GBPRU returned to Guano Valley and recorded numerous additional Paleoindian sites within the delta system. To date, we have recorded over 600

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diagnostic TP/EH artifacts, predominantly of the Western Stemmed Tradition, making this one of the largest concentrations of Paleoindian material in the entire Great Basin. This poster presents new Guano Valley archaeological and environmental data, as well as an XRF analysis.

Reaux, Derek [92] see Smith, Geoffrey

Rebay-Salisbury, Katharina [87] see Salisbury, Roderick B.

Rebellato, Lilian (Universidade Federal do Oeste do Pará), Denise Paul Schann (Universidade Federal do Pará (UFPA)), Wenceslau Gerales Teixeira (Pesquisador Doutor da Empresa Brasileira de Pesqui), Antônia Damasceno Barbosa (Universidade Federal do Pará (UFPA)) and William Woods (in memoriam)

[116] *The Earthworks at Western of Amazon, Brazil: A Geoarchaeological Perspective*

In this paper, we will bring a geoarchaeological perspective in order to identify settlement patterns in two geometric earthworks (geoglyphs) located in the eastern region of the state of Acre in the Brazilian Amazon. Physical and chemical soil analysis suggests how the past inhabitants on those sites affected the soils. The results show that the settlement pattern and the most important differences from the other regions we have looked at, for instance, in the várzea (floodplain) area. In opposition of the larger villages along the White Water Rivers (at the Amazon or Madeira rivers), in the uplands the dispersed pattern surely existed to make best use of the soils. Therefore, we propose that the geometric earthworks are statements of power within the regional societies, made by people with similar cultural understanding. Soil analysis will also indicate how the people in the past were using the areas and the methods used to build the geometric earthworks. This will help us to have a better understand of the meaning of the geographic earthwork for those societies.

Reber, Eleanor (UNC Wilmington)

[9] *From General to Specific: Targeting Freshwater Resources in Pottery Residues Using Compound-Specific Isotope Analysis*

Direct detection of resources processed in pottery by means of the chemical analysis of absorbed pottery residues is a valuable technique, but identifying specific resources in pottery residues is tricky and problematic. This is due to issues with resource mixing from multiple uses of pottery, as well as the relative rarity of biomarkers unique to specific resources. Advances in compound-specific isotope analysis permit identification of isotopically distinct resources in residues, such as C4 plants in a C3 environment or marine resources. Can compound-specific isotope analysis be applied to the identification of freshwater resources in pottery residues? This study investigates modern freshwater resources and experimentally produced residues to address this question.

Redmond, Brian (Cleveland Museum of Natural History)

[52] *Examining Ritualism in Late Archaic Domestic Contexts: Clay-Floored Shrines at the Burrell Orchard Site, Ohio*

Much past research on the development of Archaic ideological complexity in eastern North America has focused primarily on ritualism and ceremony related to mortuary behaviors. Less attention has been given to ritualism within what is commonly thought of as domestic contexts and without overt mortuary ceremonialism or monumental architecture. The recent discovery of puddled clay architecture (floors) and associated features at the Burrell Orchard site (33LN15) in northeast Ohio provides new evidence for the development of significant, non-mortuary ritualism within Late Archaic basecamp contexts. That such activity took place alongside normal seasonal subsistence tasks is revealed by thick midden deposits containing abundant burned rock, nutshell and deer bone. The several bone and stone tool deposits associated with the floors, along with the labor-intensive nature of the clay construction for what appears to have been individually short-term usage, support the interpretation of these features as shrines possibly associated with hunting ritualism.

Reed, Karen (SWCA Environmental Consultants), Jonathan Libbon (SWCA Environmental Consultants), Aidan McCarty (SWCA Environmental Consultants), Benjamin Demchak (SWCA Environmental Consultants) and Erica Birkner (SWCA Environmental Consultants)

[303] *A Creek in Time: Landscape Archaeology of the Conotton Creek Drainage of Eastern Ohio*

Starting in 2015, archaeological survey for a large natural gas pipeline project investigated large portions of the Conotton Creek Drainage in Eastern Ohio. Prehistoric site clusters, identified during the project and previous investigations along Conotton Creek, provide an opportunity to investigate the prehistoric utilization of the landscape. Analysis of the dataset generated suggests there is patterning in the temporal and spatial distribution of prehistoric sites along Conotton Creek. Expanding the dataset to include other previously recorded sites in the Conotton Creek drainage as well as comparisons between the prehistoric use of the Conotton Creek drainage and larger river drainages, such as the Tuscarora River and the Vermillion River allows for a better understanding of the role of minor drainages in the prehistoric landscape. This poster seeks to highlight the research conducted for the project within the Conotton Creek Drainage regarding how prehistoric groups utilized minor drainages along the margins of the Appalachian Plateau.

Reed, Karen [85] see Libbon, Jonathan

Reed, Paul (Archaeology Southwest) and Carolyn Heitman (University of Nebraska–Lincoln)

[15] *Making the Most of Salmon Pueblo's Enormous Dataset: The SPARC Project*

The ruins of Salmon Pueblo were excavated by Cynthia Irwin-Williams, her staff, and students in the 1970s. A huge archive of material culture, photographs, excavation records, and analytical data was produced documenting Salmon's Chacoan and post-Chacoan occupations. With support from the National Endowment for the Humanities, the Salmon Pueblo Archaeological Research Collection (SPARC) Project was created with the goal of making the enormous Salmon dataset available to scholars through an online portal. This project (due to launch in Spring 2018) will allow users to access more than 15,000 scanned images (photographs, maps, drawings), roughly 35,000 pages of scanned original Salmon field forms, and a relational database structure integrating over 250,000 lines of data from dozens of Salmon databases. When completed, SPARC will provide researchers with unprecedented online access to one of the most important Chaco Canyon Outliers. This poster will discuss the process by which SPARC is being created and preview some of its features.

Reeder-Myers, Leslie (Temple University) and Kathryn Cross (Southern Methodist University)

[84] *Scallop, Clam, and Oyster: 4500 Years of Shellfish Harvest on the Rappahannock River, Virginia*

Today, the Rappahannock River is known for having some of the best oysters on the east coast of North America, and people have been taking advantage of that resource for thousands of years. A large, multi-component shell midden site at Belle Isle State Park provides a glimpse into shellfish harvesting for the past 4500 years, and suggests that the estuary's ecosystem changed significantly over that time period. During Woodland and Colonial phases of occupation, oyster makes up between 98 and 100% of shellfish remains at the site, but represents less than half of the shellfish consumed during the Late Archaic occupation. We explore some of the reasons behind this change, including possible shifts in human settlement patterns based on isotopic analysis of shellfish. We conclude that the faster pace of sea level rise during the middle Holocene promoted the development of a very different ecosystem than the one we see today, with important implications for resource management in the 21st and 22nd centuries.

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Reents-Budet, Dorie (Smithsonian Institution), Ronald L. Bishop (Smithsonian Institution), Joseph Ball (San Diego State University) and Jennifer Taschek (San Diego State University)

[258] *Las Ruinas de Arenal and the Buenavista del Cayo Polity: Political Dynamics in the Western Belize River Valley*

The socio-political and economic interactions of Las Ruinas de Arenal, a small but architecturally rich center in the lower Mopan River Valley, are explored through a focused investigation of select Classic period (250–850 CE) pottery from general occupation and special deposits. The study combines ceramic typological data with evaluations of artistic style and paste chemical composition. Previous archaeological investigations by Taschek and Ball found scant evidence of foreign influence in Las Ruinas elite institutional behavior during the Middle and Late Classic periods in spite of the site being located only 5 kilometers south of Xunantunich, a major Late Classic center closely aligned with the powerful Naranjo polity to the west. This study scrutinizes the ceramic record from Las Ruinas to further assess the socio-political relations of Las Ruinas with local and “foreign” entities.

Reese, Kelsey (University of Notre Dame) and Brian Yaquinto (Bureau of Land Management)

[226] *Mind the Gap: The Mesa Verde North Escarpment*

Archaeologists are inherently limited in their understanding of the past by the quality and quantity of data available. In the US Southwest, we are fortunate to work in a region with a high degree of preservation and long history of archaeological inquiry. Because we work in a region with a dense and well-known archaeological record, we sometimes take what we know for granted and do not critically examine our assumptions. In the Mesa Verde region, extensive survey and excavation have revealed high population densities between AD 600 and 1300 both on and off the Mesa Verde cuesta. We have a knowledge gap, however, on the Mesa Verde North Escarpment. With limited habitation information, we assume the North Escarpment was less densely occupied than the immediately surrounding regions, but our assumptions are the product of missing data and not necessarily a reflection of settlement patterns and landscape use. This poster synthesizes what we currently know, what we do not, and employs a predictive model using the limited available data to help us better understand how the Mesa Verde North Escarpment may have been utilized from AD 600–1300.

Reese-Taylor, Kathryn, Atasta Flores Esquivel (Universidad Nacional Autonoma de Mexico), Nicholas Dunning (University of Cincinnati), Armando Anaya Hernandez (Universidad Autonoma de Campeche) and Debra Walker (University of Florida)

[252] *Monumentality and Horizontality in a Preclassic Cityscape*

During the Preclassic, the inhabitants of Yaxnohcah, Campeche, Mexico constructed more than 13 civic architectural complexes, each at least 20 m in height. These civic complexes were situated throughout roughly a 36 km² area in a carefully planned quadripartite arrangement. Alongside these imposing structures, the early Maya also built massive platforms for public gatherings, large centralized reservoirs, a radial network of inter- and intra-city roads, and extensive agricultural features. In this paper, we argue that the volume and arrangement of the civic architecture and the scale of the infrastructure reflected concepts of both monumentality and horizontality that created a uniquely Maya cityscape.

Reese-Taylor, Kathryn [258] see Walker, Debra

Reetz, Elizabeth (University of Iowa Office of the State Archaeologist)

[168] *Integrating Archaeology and Environmental Education to Strengthen a Place-Based Curriculum*

The practice of archaeology involves studying human adaptation to the natural world by using the environment as a vehicle for the development of knowledge. Archaeology education has strong parallels and intersections with the well-established field of Environmental Education (EE); yet, it is both widely acknowledged that cultural history is one of the weaker components of EE, and many archaeology educators are likewise unfamiliar with EE. In 2016, archaeologists from University of Iowa Office of the State Archaeologist partnered with staff from the University of Iowa School of the Wild, a week-long EE experience for area schools, to create a curricular unit that integrates archaeology and cultural history with EE. Pre- and post-test assessments during the pilot year yielded promising results for using EE as a tool to promote archaeological and environmental stewardship. Additionally, research on Significant Life Experiences in EE is explored in relation to the preservation of cultural resources.

[233] *Discussant*

[168] *Chair*

Reeves, James [14] see Wright, Sterling

Reeves, Jonathan (The George Washington University)

[200] *Landscape Evolution, Digital Terrain Analysis, and the Integrity of Surface Assemblages: A Case Study from the Koobi Fora Formation*

Lithic surface scatters comprise a large proportion of the archaeological record but their value for understanding human behavior is often doubted. Modern geomorphological processes often laterally displace and selectively bias surface assemblages of artifacts. The predictable effects of displacement on the condition, weathering and size distributions of lithic assemblages is better understood. While topography is known to play a role in this process, the degree to which topographic variables contribute to the taphonomy of surface assemblages is understudied. Understanding how topography influences the displacement and taphonomy of surface assemblages provides a potential avenue for assessing the extent to which surface assemblages reflect past human discard patterns. We use digital terrain analysis to investigate the influence of topography on the formation of surface lithic assemblages. The modern geomorphology and topography of the lithic landscapes from the Koobi Fora Formation (Kenya) are characterized by digital elevation models obtained from unmanned aerial systems. Spatial analysis is used to assess the relationship between the modern landscape and taphonomic attributes of surface assemblages. A discussion of the efficacy of this approach for assessing the integrity of surface assemblages is presented. This research was supported by the National Science Foundation, OISE awards 1358178 and 1358200.

[234] *Discussant*

[200] *Chair*

Reeves Eyre, Jodi

[138] *Resources, Goals, and Standards: The Basics of Digitizing Archaeological Collections and Legacy Materials*

Digitization, the conversion of an analog item and creation a digital surrogate, is an important collections management tool. Digitizing collection materials can provide engaging images for public outreach and education, improve knowledge of the collection and access. It also aids in the preservation of materials by creating digital surrogates of content. Digitizing material can rescue content from obsolete media, provide a way for researchers to view content while protecting fragile, physical items, and/or provide a digital version of the item that can be copied and preserved. Digitization can be daunting, though: it requires an investment in people, technology, and space; and an awareness of standards that can appear to be constantly changing. This practical presentation is designed for collections managers, curators, and conservators new to digitizing collections or who want to build on a nascent digitization program. It will also be helpful for archaeologists coping with legacy archaeology materials. The presentation will touch on how to evaluate current resources, short-term goals, and long-term goals. It will also cover the topic of archival standards for digitizing collections, where to find them, and how to select standards for your needs and goals.

Reeves Eyre, Jodi [268] see Rawan, Atifa

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Reger, Brandi [89] see Skowronek, Russell

Regnier, Amanda (University of Oklahoma), Scott Hammerstedt (University of Oklahoma) and Marc Levine (University of Oklahoma)

[248] *Geophysical Prospection of Monte Albán's Main Plaza: An Overview of Results*

During the summer of 2017, the Proyecto Geofísico de Monte Albán (PGMA) carried out a large-scale geophysical survey of the site's Main Plaza. The survey utilized three instruments, a gradiometer, an electrical resistance meter, and a ground-penetrating radar array and achieved nearly 100 percent coverage of the plaza. Covering more than 35,000 m², the PGMA represents the most extensive geophysical survey ever carried out in Oaxaca. This paper details the methods of the survey, examines which instruments were most effective, and presents results from all three technologies.

Regnier, Amanda [119] see Savage, Sheila

Rehren, Thilo [137] see Liu, Siran

Reid, Connie [106] see Pedro Black, Marielle

Reid, David (University of Illinois at Chicago) and William Ridge (University of Illinois at Chicago)

[6] *Obsidian Procurement and Exchange in Peru: A Social Network Analysis (SNA)*

Wider accessibility to analytical instruments has resulted in the rapid expansion of geochemical datasets useful to trace archaeological materials such as obsidian to their geologic source. While these findings are useful on a site-to-site basis, this paper utilizes Social Network Analysis (SNA) as an exploratory tool to investigate broad-scale patterns of obsidian procurement and exchange in prehistoric Peru. Alongside visualizations of this large dataset, centrality measurements allow us to identify key nodes in likely exchange networks, instigating new questions on prehistoric economies and inter-regional connections. The resulting analysis provides a diachronic comparison of obsidian use in the Central Andes with consideration to varying geographic and political scales that include the domestication of camelids, the development of urban and temple centers, and the first state-level economies.

Reid, LaMarise (William & Mary)

[233] *Discussant*

Reid, Rachel (Washington University in St. Louis) and Xinyi Liu (Washington University in St. Louis)

[336] *Meat or Grains: Compound Specific Carbon Isotope Analysis along the Northern Edge of the Tibetan Plateau*

Various foothills, oases and valleys along the north edge of the Tibetan Plateau played important roles in the process of food globalization in prehistory. These are the key corridors that brought southwest Asian animals along with the western grains into China and Chinese cereals to the West. Recent research demonstrates that broomcorn and foxtail millet (both C4 plants) were the key staple food in this region during the third and second millennium BC, but it remains unclear to what degree humans also relied on animal protein. Here we closely examine the dietary importance of grains and meat at several sites in western China from this period. We compare previous bulk collagen stable isotope results with compound specific carbon isotope analyses of individual amino acids extracted from human and animal bone collagen. Because essential and non-essential amino acids reflect different components of diet, compound specific carbon isotope analysis offers a means to isotopically distinguish between protein and non-protein dietary components, making it possible to determine to what degree humans were consuming meat directly versus consuming animals that were fed millet. Preliminary results for humans from Huoshaogou corroborate previous Bayesian mixing model estimates by suggesting that humans were consuming millet directly.

Reid, Sean

[210] *Satellite Remote Sensing and Archaeological Survey in Central and Western Regions, Ghana*

Humans have inhabited southern Ghanaian forest for millennia, and nearly everywhere there are traces of human activity in the deep past. This paper discusses my integration of satellite remote sensing with traditional archaeological field methods to study longue durée continuity and transformation in both West African societies and the landscape itself. I am consolidating previous survey data and expanding upon them using several methods of archaeological survey and remote sensing with the broader goal of tracing cultural patterns in the landscape using GIS. Specifically, my work has been testing the informed hypothesis that many sacred groves, hilltops, and low rises in the coastal hinterlands and forests of Ghana were the settlement sites of agricultural communities in the first and early second millennium A.D. To do this I used a combination of satellite imagery analysis, topographic information, and archaeological survey to predictively model and test where these sites will be located based on this hypothesis. I will also discuss some of the similarities, differences, successes, and limitations I have encountered while using remotely sensed satellite imagery for archaeological survey, in direct reference to my previous work identifying archaeological sites through vegetation patterns in Sierra Leone.

Reifschneider, Meredith (San Francisco State University)

[201] *Chair*

Reilly, Matthew (City College of New York) and Caree Banton (University of Arkansas)

[308] *Slavery and Freedom from the West Indies to West Africa*

"Freedom is what you do with what's been done to you" is a phrase attributed to Jean-Paul Sartre. While the French philosopher was concerned with political freedom rather than freedom in the context of slavery, Sartre's words offer lessons for analyzing a vast spectrum of how individuals experienced the conditions of slavery and freedom. This paper explores an ambitious project of freedom and future-making initiated by a group of Barbadians one generation after emancipation in the English Caribbean. In 1865, the Cora landed in Liberia in order for free Afro-Barbadians to assist in the "civilizing" process already underway in the nation. We offer some preliminary thoughts on the material signatures of slavery and freedom observed in Crozierville, the small town established by the Barbadians. The Barbadian settlement in Liberia came to exhibit some of the attributes of the colonial society of their homeland that had been dominated by slavery just 30 years earlier. While the "Love of Liberty" brought Barbadians to Liberian shores, semblances of slavery are still visible on the social and physical landscape, highlighting the fragility of freedom in addition to the complexities of freedom-making for Africans and people of African descent on both sides of the Atlantic.

Reimer, Paula [137] see Hunt, Chris

Reindel, Markus (German Archaeological Institute, Bonn, Germany) and Franziska Fecher (University of Zurich)

[299] *The Imbalanced Archaeology of Honduras: Challenges and Potentials*

This paper presents a brief overview over past and current trends in non-Maya archaeology of Honduras. From the beginnings of archaeological investigations in Honduras, there has been a strong research focus on the Maya city of Copan in the extreme west of the country. But already in early years, pioneers like William D. Strong, Doris Stone and Claude Baudéz made valuable contributions, in order to reveal the hidden history of central

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Honduras, the Atlantic and the Pacific coast. The lack of research in these regions of Honduras in the following years, due to the ongoing interest in the influence of the Maya culture in western Honduras, and also to the difficult sociopolitical situation, resulted in an imbalance of archaeological research which today prevents the understanding of cultural processes between Mesoamerica and Lower Central America.

In recent years, new archaeological projects were started which reveal the great potential of research in the hitherto less studied regions. A well trained new generation of archaeologist is using new methodologies and technologies to systematically study settlement patterns, regional chronologies and intercultural relations. This new research results in the definition of new strategies for archaeological research in Honduras in the future.

Reindel, Markus [141] see Mader, Christian

Reinhardt, Eduard [224] see Fletcher, Beatrice

Reitsema, Laurie [188] see Van Hagen, Logan

Reitz, Elizabeth (University of Georgia)

[217] *Rare Animals at a Mississippian Chiefly Compound: The Irene Mound Site (9CH1), Georgia, USA*

The Irene site (ca. AD 1150–1450) was a small, prestigious community occupied by a chief and his lineage. It was located on the Savannah River, a few kilometers inland from the Atlantic Ocean. The presence of animals rare in the region and animals rare or absent in other coastal assemblages distinguishes the Irene collection from other tidewater collections. Many of these animals exhibit atypical, even dangerous, behavior. Rare animals, and other attributes, provide a standard for assessing ritual activities, site functions, and the status of specific residents at this and other coastal sites.

Reitze, William (University of Arizona)

[182] *Of Truck Tires and Kelly Bars: Geoarchaeological Perspectives of a Toolpusher*

Over the course of several summers I had the opportunity to apprentice to Vance Holliday as he worked on the Southern High Plains. Whilst this work typically involved long hot days I had the opportunity to learn a lot of the intricacies of how field work is conducted by itinerant geoarchaeologists. This allowed me to be directly involved in research at some of the most prominent projects in Arizona, New Mexico and Texas. It also exposed me to a cross-section of small towns, motels, and BBQ restaurants few people will ever experience. I learned a great deal about the intricacies of hydraulics and witnessed first-hand the tensile strength limits of steel. I was even exposed to a fair amount of soils and sediment analysis. While these things at times formed a steep learning curve, I had the opportunity to apply them to my own work in the Estancia Basin of Central New Mexico. My dissertation research focused on developing an interpretation of Paleoindian behavior in conjunction with models of shifting environments at the Pleistocene/Holocene transition. This paper will present my research in the Estancia Basin, interspersed with my educational foundation in field geoarchaeology with Vance on the Southern Plains.

Ren, Lele [45] see Ma, Minmin

Renner, Amanda (National Park Service, Midwest Archeological Center), Ralph Hartley (University of Nebraska-Lincoln) and William Hunt (University of Nebraska-Lincoln)

[239] *A Geospatial Analysis Exploring Movement and Perception in the Selection of Alpine Cairn Locations in Southeast Alaska*

In 2013 an intensive archaeological survey of a portion of northern Baranof Island in southeast Alaska, focusing on the slope and crest of Cross Peak Mountain, resulted in the discovery and documentation of fifty loose rock "cairns" estimated to have been constructed 500–1500ypb. These prehistoric alpine features, overlooking the intersection of Hoonah Sound and Peril Strait, are often associated with stories and narrative referencing the "Flood" by Tlingit people from both Sitka and Hoonah (Xutsnoowú) territories. Exploratory spatial analysis of the distribution of these alpine cairns is pursued with the goal of increasing our understanding of Tlingit activities in this alpine setting. Using Geographic Information Systems (GIS) tools and methodologies to examine the environmental characteristics of cairn locations, as well as assess accessibility and visibility, we explore the ancient decision-making that may underlie the placement of these rock features. Different approaches for assessing accessibility including site catchments, least-cost paths, networks, and corridors, as well as varying cost parameters are explored. Potential patterns in the visibility of the surrounding landscape from each cairn location are examined to explore the role of vision and perception in the activities in this setting.

[276] *Discussant*

Renson, Virginie (University of Missouri), Marx Navarro Castillo (Universidad de Ciencias y Artes de Chiapas), Andrea Cucina (Universidad Autonoma de Yucatan), Brendan J. Culleton (Penn State University) and Hector Neff (California State University)

[176] *Tracing Mobility in Pacific Coast and Highlands of Southern Mexico during the Classic Period*

This study presents the strontium isotopic analysis of enamel, dentine and bones of four individuals recovered from two sites (Miguel Aleman and PIN7), dating respectively from the Early and Late Classic period, both located the Pacific coast of Chiapas. The enamel samples of the four individuals have a Sr isotopic composition that varies between 0.70540 and 0.70631 for the 87Sr/86Sr ratio. The results were compared to data available for human bones and teeth, as well as rock, plant, water, and clay sources from Mexico and Guatemala. The enamel samples have a Sr isotopic signature that differs from that of the local rocks, plants, water and human remains. They have a Sr isotopic signature compatible with the metamorphic province developed in the valley of Motagua and the Copan area as well as farther northwest of the sites in the upper edge of the piedmont. They are also compatible with samples from sites in the Basin of Mexico and along the Gulf Coast in the northern part of the Veracruz Province. The different hypotheses on the origin of the four individuals are discussed in the context of regional interactions and demographic changes in southern Mexico during the Early and Late Classic period.

Renson, Virginie [187] see Werlein, Amanda

Renteria, Rebecca (University of Arizona Tree-Ring Lab)

[334] *Community Archaeology Starting Young: Local High School Engagement in Tucson, Arizona*

The past few years archaeology has seen an increase in community-based approaches. These approaches are important when addressing issues of who archaeology knowledge, interpretation, and sites belong to. Archaeological interpretations historically come from those in roles of academic authority, but we increasingly see acknowledgement of collaboration and contribution from community members not in those roles. A rise in diversity of cultural and heritage backgrounds among archaeologists is a factor in decentering approaches as they have been traditionally practiced. Encouraging this diversity should begin with archaeology education and exposure before college years. Linking Southwest Heritage through Archaeology is a program that aims to expose high schools students, who are from historically underserved and underrepresented groups in archaeology, to sites and opportunities that may spark interest in their continuing education and activism in archaeology. With a partnership between the National Park Service, University of Arizona, and nonprofit Environmental Education Exchange we have been providing opportunities for students to learn about archaeology while they contribute ideas that are shaped by their cultural and heritage backgrounds. By providing these opportunities we learn approaches to increase diversity in our field while providing a conduit for students to continue involvement in archaeology.

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Reuther, Joshua, Ben Potter (Department of Anthropology, University of Alaska), Nancy Bigelow (Alaska Quaternary Center, University of Alaska), Charles Holmes (Department of Anthropology, University of Alaska) and Francois Lanoe (School of Anthropology, University of Arizona)

[182] *Beringian Landscapes and Human Responses in the Middle Tanana Valley, Alaska*

The middle Tanana Valley of interior Alaska, an unglaciated region of Eastern Beringia, holds a high-resolution record of human-environment interaction that extends over 14,000 years. The Late Glacial and early Holocene landscapes of this region were dynamic with considerable ecological restructuring. Aeolian deposits accumulated in lowland areas and adjacent foothills at relatively high rates, soils were relatively underdeveloped, river down-cutting prevailed across the valley, and wild fires were common. These disturbance regimes and periods of landscape instability fostered a wide expanse of early- to mid-successional mixed vegetation communities that included herbaceous tundra, shrubs and deciduous trees, key habitats for large grazers and browsers that were significant resources for early hunter-gatherer populations.

Major environmental transitions occurred in the region as the Holocene climate warmed and effective moisture increased, including the spread of boreal forests and peat lands, an expansion of lake development, and intensified landscape stability. These transitions introduced changes to the extent of habitat and seasonal availability of mammal and aquatic food resources. We discuss broad human responses to these environmental shifts in this region from the late Pleistocene through the later Holocene.

Reuther, Joshua [332] see Esdale, Julie

Reyes, Omar (CEHA, Instituto de la Patagonia, UMAG), César Méndez (Centro de Investigación en Ecosistemas de la Patag) and Manuel J. San Román (CEHA, Instituto de la Patagonia, UMAG)

[184] *Chronology of the Human Occupation of the North-western Channels of Patagonia (43°-46° S), Chile*

We present results of a systematic radiocarbon dating program carried out in the Chonos archipelago, the northernmost part of the channels of western Patagonia. Eighty-six samples obtained from a variety of archaeological sites, including: strata beneath organic soils, open-air shell middens, caves and rock shelters, individual burials and ossuaries, and modern industrial extraction shell middens, were analyzed. The chronological and spatial distribution of dates along with the analyzed contexts, allows us understanding occupation of this archipelagic territory by marine hunter-gatherer-fishers at different scales. We evaluated the intensity of the archaeological signature starting with the first evidence of occupation at the Middle Holocene (6300 cal BP), to the European contact (16th century) and post contact. We recorded continuities and discontinuities in the use of space, discernible in time and throughout the archipelagic geography. These are used to discuss the human trajectories. FONDECYT Grant # 1170726.

Reyes, Omar [153] see Belmar, Carolina

Reyes Carlo, Ivonne (Independent)

[128] *Atributos y función de las deidades del Clásico en el Centro de Veracruz: una propuesta metodológica*

Una constante en la Costa del Golfo es utilizar elementos de deidades del Altiplano (Tláloc por ejemplo) para interpretar las representaciones de seres con características sobrenaturales pertenecientes a esta área de estudio. Si bien, podrían existir rasgos iconográficos que justificaran esas semejanzas no podemos únicamente traslapar elementos similares entre unas imágenes y otras ya que sólo se obtiene una propuesta parcial sobre su interpretación y tal vez nos aleje de su significado original.

Estas divinidades están plasmadas en todos los materiales arqueológicos e importante también será definir si son deidades o representaciones de personajes investidos. Analizaremos ejemplos en murales, cerámica y piedra de sitios representativos del Centro de Veracruz (Tajín, La joya, Higuera) con el fin de encontrar patrones de representación y acercarnos al panteón centro veracruzano.

Proponemos entonces, partir de una interpretación a nivel local, es decir, de los propios elementos iconográficos de cada imagen. Después ubicarla en su contexto de representación (escena) y por último vincularla en el contexto social, con el fin de conocer a quienes regían los destinos de los habitantes del Centro de Veracruz durante el Período Clásico.

Reynolds, Cerisa R. [182] see Hill, Matthew E.

Rhode, David (Desert Research Institute)

[174] *Tibet before Pastoralism*

The Tibetan pastoral economic system that has evolved over the last several millennia involves permanent high altitude herd management combined with mutualistic relationships with lower-elevation agricultural communities. How this traditional pastoralist system developed in the middle to late Holocene from a prior foraging lifeway remains something of a puzzle, requiring the domestication of the native high-altitude adapted yak, the establishment of sustained relationships between Tibetan foraging societies with lower elevation agricultural communities, and the possibility of conflicts between foraging and pastoralist economic strategies. Based on archaeological evidence from the northeast Tibetan Plateau, this paper hypothesizes some aspects of the economic and social transition from a pre-pastoralist Tibetan subsistence foraging lifeway to Tibetan pastoralism during the middle to late Holocene.

Richard, Francois (University of Chicago)

[181] *Imperial Mixtures and Paradoxes of Government in Colonial Senegal*

This paper examines the travails of colonial government in Senegal, looking specifically at material histories in the rural region of Siin. One tenet of French colonial policy was to govern through the operation of commerce, specifically through the infrastructure of cash-cropping. If peanut agriculture would, in principle, create both wealth for the colony and 'African subjects,' on the ground, peanuts combined with a web of material entities that bent, diverted, or interrupted the flow of imperial power: traditions of community-making; collective attachments to land, self-sufficiency, and ancestral influence; and cultural economies of objects, all of which had long shapeshifted to the beat of broader historical forces. These mixtures of imperial and vernacular materialities—and the fields of agency they set in motion—find expression in the artifact assemblages of village vestiges occupied between 1800 and 1960. Tracing shifts in consumption practices during that period, I reflect on the fraught, ambiguous process of colonial rule, whose effects were chronically interrupted, twisted, or evaded by Siin villagers; at the same time, colonial commerce also gradually wove peasants into a web of dependencies—on markets and the state, primarily—whose strains are still felt in rural Senegal today.

Richards, John (University of Wisconsin—Milwaukee), Sissel Schroeder (University of Wisconsin) and Jarrod Burks (Ohio Valley Archaeology, Inc.)

[215] *Unseen Aztalan: Preliminary Results of a Geomagnetic Survey of the Aztalan Enclosure*

Lynne Goldstein's compilation of a GIS-based map of the Aztalan site, portraying all investigations through 1996, visually integrated almost two centuries of archaeological work at the site in southern Wisconsin. Lynne's map made two things startlingly clear. First, decades of excavations were not all referenced to a common datum and few had left visible surface indications, making it difficult to relocate earlier excavations and avoid re-excavating disturbed contexts. Second, just 10% of the core residential area has been excavated and far less than 10% of the entire site has been

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studied. To gain large-scale spatial control over ancient and modern subsurface disturbances across the site, the authors undertook a comprehensive magnetic gradient survey of the entire palisaded portion of the site. Data were collected using a Foerster Ferex 4.032 4-probe fluxgate gradiometer array mounted on a handcart. Data collection and processing was conducted by Ohio Valley Archaeology, Inc. Results of the survey are leading to a more comprehensive understanding of site organization and refined knowledge of the locations of excavations and other modern ground disturbance activities. Future fieldwork will focus on ground-truthing geophysical anomalies and updating archaeological knowledge of the site for all stakeholders.

Richards, Julian (University of York Archaeology Data Service)

[316] Moderator

Richards, Katie (Washington State University)[267] *A Low Technology Approach to Understanding Fremont Ceramic Production*

Unlike other regions of the American Southwest, many basic aspects of Fremont ceramic production have never been adequately explored, and many of the assumptions about the production process presented in the literature have never been rigorously tested. Low-technology analysis techniques such as re-firing can provide a simple and cost-effective way to begin exploring these processes and test assumptions made by past archaeologists. Re-firing Fremont ceramics has provided new information about the choices made during the production process of the two main types of Fremont painted wares, Snake Valley Black-on-gray and Ivie Creek Black-on-white, some of which contradict previous assumptions. This information includes clay sources, slip choices, and paint pigment composition. These data concerning the production process provide insights into the technological style of Fremont ceramics as well as the communities of practice that produced them.

Richards, Patricia (University of Wisconsin-Milwaukee)

[107] *Law and Ethics: The Milwaukee County Poor Farm Cemetery Excavations in the Context of the Wisconsin Burial Site Preservation Statute*
The 1987 Wisconsin Burial Site Preservation Statute (WisStats 157.70) serves as the basis for the protection of all burial sites in the State of Wisconsin and assures that all human burial sites be accorded equal treatment under the law regardless of age or affiliation. A burial site, under the law, refers to any place where human remains are buried and includes marked and unmarked cemeteries, Native American mounds, small family cemeteries, and other less obvious locations that are reported to the Wisconsin Historical Society. No burials, regardless of age, ancestry, cultural affiliation or condition may be intentionally disturbed without first obtaining a permit from the director of the Wisconsin Historical Society. This law also determines the final disposition of all materials related to the granting of an excavation permit. Excavation at the Milwaukee County Poor Farm Cemetery 2 in 1991 and 1992 and again in 2013 have provided a unique test of the application of the Wisconsin law. This paper examines the legal and ethical issues related to excavation, analysis and final disposition of all human remains, personal artifacts, burial hardware, field notes and field images associated with the excavations at the Milwaukee County Poor Farm Cemetery 2.

Richards, Patricia [215] see Freire, Shannon

Richards-Risetto, Heather (University of Nebraska-Lincoln)

[320] Moderator

[235] Discussant

[286] Chair

Richards-Risetto, Heather [40] see Goodwin, Graham

Richter, Kim (Getty Research Institute) and María Eugenia Maldonado Vite (INAH Veracruz)[128] *Domestic vs. Elite Religious Cults: Revisiting the Huastec Tlazolteotl-Ixcuina Deity Complex*

Pre-Columbian Huastec stone sculptures and clay figurines for the most part have been interpreted as deities and assumed to belong to the same religious cult. They also have typically been interpreted through a central Mexican lens and been identified as and associated with Late Postclassic central Mexican deities. Female figures in particular have been interpreted as Tlazolteotl, the central Mexican goddess of parturition, sexuality, and purification—a deity thought to be closely related to the Teenek (Huastec-Maya) goddess Ixcuinan, the lady of cotton. This presentation will reassess this interpretation, taking into account new archaeological data alongside well-known pictorial and textual sources. It also address interpretations of this Tlazolteotl cult from a broader Gulf Coast perspective and consider the Classic-to-Postclassic connections. We propose that although Huastec figurines and sculptures share stylistic features, they indicate different levels of cult. While the female sculptures appear to represent Huastec high-status women, female figurines seem to reflect local domestic cults tied to the cultivation of cotton.

[206] Chair

Rick, John [66] see Slovak, Nicole

Rick, Torben (Smithsonian Institution)[161] *Archaeology, Museums, and the Anthropocene*

While debate continues about when the Anthropocene began, many researchers have shifted focus away from questions about the onset of the Anthropocene to questions of why, how, and what next? Museums are poised to play an important role in societal and scientific conversations about the pressing issues of the Anthropocene and how best to move forward in the age of humans. Building on a variety of ongoing efforts, I discuss the role of museum based archaeological research, collections, and education and outreach in helping frame perspectives on the Anthropocene and engage members of the public in meaningful conversations about the future of our planet. Archaeological data and the long record of human-environmental interactions that we have at our disposal are poised to play a leading role in future dialogue about a host of issues related to the Anthropocene and museums should be at the forefront of this effort.

[192] Discussant

Ridge, William [6] see Reid, David

Ridwan, Nia (Indonesian Ministry of Marine Affairs and Fisheries)[78] *The Development of Marine Archaeology in Indonesia and Southeast Asia Region and the Current State of Underwater Heritage Preservation and Management*

This paper will focus on the development of marine archaeology in Indonesia and Southeast Asia. It will also highlight the interdisciplinary and integrated marine archaeology research programs in the region having aims to investigating shipwrecks, cargoes, and maritime heritage recent condition as well as identifying human and environmental threats. Marine archaeology research, sustainable shipwreck utilization for tourism development, and local people engagement in underwater cultural heritage (UCH) preservation have helped an appropriate shipwreck management as appeared in United State Army Transport (USAT) Liberty shipwreck site in Bali. This paper will also share information on the current state of UCH

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preservation and legal protection issues, for example, some problems faced by the historic World War II shipwrecks, United State Ship (USS) Houston and Her Majesty Australian Ship (HMAS) Perth; the good prospect of long term on-site shipwreck monitoring involving local communities and general public; public education and awareness programs; as well as capacity building activities in local, national, regional, and international levels. It is expected that this paper will give a better understanding that marine archaeology in Indonesia has contributed in improving communities welfare and providing scientific-based recommendations for local and central government on site protection and management plan.

Riebe, Danielle (The Field Museum of Natural History) and János Dani (Déri Museum)**[245]** *A Dynamic Past: The Prehistoric Interactions on the Plain Project*

The collaborative, American-Hungarian Prehistoric Interactions on the Plain Project explores the past through the reconstruction of interactions. Investigations on interactions as an active mode of social investment and social construction challenges normative concepts of “culture” by modeling socio-cultural boundaries as a dynamic and negotiated process, as opposed to a static categorically assigned social unit. Moreover, our research contextualizes regional developments as the result of multi-scalar social processes. Initially, PIPP focused on the regional scale and reconstructed Late Neolithic (5,000—4,500 BC) long- and short-distance interactions between Herpály and Tisza sites through the stylistic, technological, and compositional analyses of lithics and ceramics. The results suggested a strongly enforced socio-cultural boundary between Tisza and Herpály sites in the Körös region. However, by focusing on the regional scale, the local dynamic interactions have been completely obscured. The current phase of PIPP focuses on the local scale at the Herpály site of Csökmő-Káposztás Domb to investigate how variation in household access to long- and short-distance interaction networks resulted in the previously modeled strongly enforced socio-cultural boundaries.

Riegert, Annie (Texas State University) and Lucy Gill (University of California, Berkeley)**[243]** *Mortuary Landscapes and Placemaking through Veneration at the Maya Site of Colha*

Traces of veneration are sedimented within the landscape and the collective memory of its occupants, transforming these spaces into places. Such palimpsests become potent, which, in the case of mortuary landscapes, can manifest in increasingly complex burial rituals through time. The 2017 excavations at Colha revealed a series of 9 interments in the main plaza of the 2000 sector, yielding a minimum number of 13 individuals. This mortuary area initially utilized during the Middle Preclassic was reused during the Late Preclassic, with some later interments cutting into those of the preceding period, as suggested by associated practices and material accoutrements. Zooarchaeological evidence indicates that although certain taxa, including deer, were exploited throughout the entire temporal span, others, specifically ichthyofauna, are characteristic of Late Classic mortuary contexts. The placement of elements from this taxonomic group within vessel burials alongside commingled human individuals is associated with the elaboration of mortuary practices more broadly, which includes complex secondary depositions and increasingly specialized craft production of grave goods. We argue that this change, which corresponds to an expansion of stone tool workshops and population increase at Colha, can be considered an act of veneration specific to this space—an act of placemaking.

Riegert, Annie [302] see Koutlias, Lauren

Rieke-Zapp, Dirk (AICON 3D Systems) and Elisabeth Trinkl (Karl-Franzens-University of Graz, Institute for Ar)**[118]** *3D Comparison of Attic Head Vases*

Several hundred attic head vases are known worldwide and stored in museums and collections. In 1929, Beazley has categorized twenty groups based on stylistic properties and historic methodology. Head vases are assembled in several steps, most important for our comparison is the moulding of the head area. Since moulds were used to shape the heads, our initial hypothesis was to perform a quantitative comparison of head shapes based on digital scan data. Comparison of scan data is straight forward and is very similar to quality control and inspection processes in industrial applications. Initial analysis was performed on older scan data. In addition, a high-resolution fringe projection scanner was employed to scan further head vases in museums in Germany and Italy. Scan resolution and accuracy of approximately 0.1 mm in all dimensions were required to reveal differences below 1 mm. Shape analysis results of the head areas confirm that it is likely that the same mould was used for shaping some of the head vases. According to our results, it is also not unlikely that a first generation of larger head vases was used to prepare moulds for consecutive generations of head vases that are slightly smaller in size.

[118] *Chair***Riel-Salvatore, Julien (Université de Montréal)****[329]** *Acculturation and Its Discontents: Rethinking Models of Interpopulation Interaction during the Middle-Upper Paleolithic Transition*

Given how large the topic of acculturation looms in discussions of the Middle-Upper Paleolithic transition, it is surprising how little attention has been paid to defining it in order to develop operational concepts that can be tested against the archaeological record. In the specific context of the Middle-Upper Paleolithic transition, the notion of acculturation has usually been considered as a unidirectional, one-size-fits-all social mechanism to explain both the appearance of transitional industries and the disappearance of Neanderthals. However, considering the growing genetic evidence of sustained interbreeding between distinct hominin populations during the Pleistocene, it is likely that interpopulation interactions were more fluid and dynamic than often assumed under the acculturation scenario. To account for this, we present here a review of the notion of acculturation and the likely archaeological manifestations of its different forms. We then compare this against the archaeological record of Western Europe in order to demonstrate how a more nuanced and ethnographically-grounded approach to the notion of acculturation is needed in order to properly model and ultimately make sense of the full variety of human experiences in that critical moment of our evolutionary past.

[219] *Discussant*

Riel-Salvatore, Julien [219] see Pothier Bouchard, Genevieve

Riggs, Chuck (Fort Lewis College)**[110]** *Indigenizing Archaeology in the 21st Century*

Nearly 30 years after the passage of NAGPRA, indigenous perspectives and consultation have led to significant positive changes within the practice of archaeology in the United States. Despite these advances, however, it seems that many archaeologists continue to adhere to the letter of the law while disregarding its spirit, suggesting that the colonial imperatives that gave rise to our discipline remain firmly entrenched. The Eurocentric interpretive frameworks, use of loaded terminology, and paternalistic application of science in determining cultural affiliation show that as a discipline, we still have much learn from those whose pasts we attempt to understand. We ought to critically and reflexively evaluate our discipline's very purpose. Instead of self-serving, academic ladder climbing and insensitive explication of scientific “truths,” the practice of archaeology has the power to strengthen indigenous rights to place and to critical resources. As Western scholars, we need to listen more and pontificate less if we truly wish to serve the needs of descendant communities. This is, after all, what NAGPRA and other federal laws ask of us. Regardless of law, however, our professional ethics should compel us to do better.

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Riley, Tim (Prehistoric Museum @ USU Eastern)**[126]** *Fremont Paleocuisine: Reconstructing Recipes from Rectal Remnants*

The role of maize agriculture among the Fremont has been debated for decades. Archaeologists have organized dietary evidence from these widely dispersed communities, including faunal and floral debris, dental calculus studies, and experimental farming and foraging, to examine farming in the high desert. The Fremont farming/foraging frontier provides a framework to explore agriculture along the margins and the importance of diversified subsistence strategies across a network of rural communities.

Aside from the broad patterns of diet derived from skeletal stable isotope data, direct dietary evidence from Fremont communities remains scarce. Researchers have studied only a small number of Fremont coprolites from widely scattered sites. The coprolite record of neighboring Ancestral Puebloan communities is well-documented and contains specimens from maize-dependent nucleated pueblos and earlier dispersed farming villages. This coprolite data, along with specimens deposited by Archaic foragers across the Great Basin and northern Colorado Plateau, situates the Fremont data along a regional spectrum from foraging to agriculture. Framing each coprolite as a menu of consecutive meals yields insight into nuanced aspects of diet, including preparation and cooking techniques as well as deconstructed recipes. Ingredient lists derived from each specimen allow glimpses into the flavor combinations and basic techniques of Fremont paleocuisine.

[290] *Discussant***Rimer, Esther****[15]** *Sampling Archaeology at the National Museum of Natural History*

The Anthropology department at the Smithsonian Institution's National Museum of Natural History holds over 2.2 million ethnological and archaeological artifacts from the USA and all over the world in its collections, including archaeofauna and bioarchaeological specimens. Every year a handful of researchers sample from our collections for destructive and non-destructive sampling analysis. These analyses run the gamut from portable XRF on textile dyes, isotope analysis of oyster shells from middens, and ancient DNA from humans and prehistoric plants. The sampling requests have changed over the years as techniques have evolved- for example, we increasingly have requests to sample ancient DNA. Our curators must balance sampling requests with the need to conserve museum collections for posterity. If you're interested in learning what we have to sample and how to go about getting access, stop by this poster. You will learn what kinds of sampling have been done in the past, and how to increase the likelihood of your future sampling proposal being approved!

Rimer, Esther [139] see Martinez, Maria

Rincon Mautner, Carlos**[136]** *Cave Character, Ritual Performance, and Social Participation in the Mixteca-Puebla Region of Mexico.*

The Southern Mexican Highlands of Southern Puebla and Oaxaca present some of the most varied karstic landforms of Mesoamerica including rock shelters and well-developed sinkholes (dolines) and caverns. Its inhabitants known as the "people of the rain", shared cultural traditions that acknowledged the vital relationships between clouds, mountains, caves that lead to their interiors, and reliable, perennial springs found at the base of mountain ranges. Climatic variability in terms of the timely arrival of the rainy season, rainfall frequency and its duration made prognostication critical, as were the rituals that evolved in which the desire for a bountiful food supply could be expressed. Some caves seem to have served as places where ceremonies focused the social group's intentions aimed at obtaining the favor of the earth and rain deities. This paper analyzes the material evidence for ritual performance drawing from a small sample of caves and rockshelters, in which their unique and wide-ranging character is highlighted.

Ringberg, Jennifer (California State University—Stanislaus)**[165]** *Living Large at Cerro León: A Comparative Look at Living Spaces in the Early Intermediate Period Moche Valley*

The hill slope settlement of Cerro León (AD 1–400) contains all the typical elements of Early Intermediate period residential sites; spaces for cooking, crafting, sleeping and storage. The flow of most daily activity likely occurred between enclosed, roofed kitchens with heavily used hearths and enclosed but sunlit patios for food processing, spinning, weaving, and tool-making. However, some residences at Cerro León stood apart, not only because of their spaciousness and greater number of rooms but also their large dedicated ancestor worship areas and supra-household gathering spaces. Are these houses truly atypical? How do Cerro León's largest residential compounds compare to other residences at the site or to earlier and later patterns of residence in the Moche valley? Are differences apparent among contemporary dwellings elsewhere in the Moche valley—especially on the coast or in the sierra—where topography was less of a factor in construction? I address these questions and related themes in this paper.

Ringle, William (Davidson College), Tomás Gallareta Negrón (Centro Yucatan-INAH), Ken Seligson (USC) and David Vleck (Independent)**[18]** *Hidden in the Hills No Longer: LiDAR Coverage in the Puuc Region of Yucatan, Mexico*

LiDAR imagery is revolutionizing interpretations of ancient Maya demography, land use, and community organization, among other concerns. This paper provides preliminary observations on LiDAR coverage of 200 km² of the Puuc region of northern Yucatan, Mexico, collected in 2017 by NCALM. The Bolonchen Regional Archaeological Project has been working in this area since 2000, and although we have intensively studied settlement at both the urban and intersite level, LiDAR provides the opportunity to assess spatial organization on a far broader canvas. Until now, no Puuc center of any size has been fully surveyed, but these data provide coverage of at least seven centers in their totality. With substantial samples of two broad ecological zones, the LiDAR dataset also provides the basis for testing ideas concerning land management. They demonstrate, for instance, the absence of terrain modifications such as terracing on any significant scale. The distribution of settlement revealed in the imagery also point out the limitations of traditional categories of site analysis.

Ringle, William [162] see Galvan, Melissa

Riordan, Kyle (The Ohio State University), Julie Field (The Ohio State University) and John Dudgeon (Idaho State University)**[8]** *Scanning Electron Microscopy and Geoarchaeology of Naihehe Cave, Fiji*

This poster reports on field-work and laboratory investigations conducted on geoarchaeological samples from Naihehe Cave, located in the Sigatoka river valley of Viti Levu, Fiji. This research employs novel and exploratory methods, including Scanning Electron Microscopy (SEM), Fourier Transform Infrared spectroscopy (FTIR), and Inductively Coupled Plasma Mass spectrometry (ICP-MS) to determine the elemental content of sediment samples and for detailed imagery useful in grain size and shape analysis. These analyses have revealed that the sediments consist of several classes ranging from calcium hydroxide crystals, ilmenite, magnesium aluminum silicates, and calcium silicates that represent naturally occurring parent materials found in the Sigatoka River Valley. Other analyses include petrographic microscopy (XPL), phosphate burnoff, organic matter burn-off, carbonate burn-off, and radiocarbon dating. Geoarchaeological analyses such as these are critical to understanding the natural and cultural history of Naihehe Cave, as the site is associated with the first agriculturalists in Fiji, and may reveal new information pertaining to the settlement of the archipelago during the Lapita and Post-Lapita period. Using these methods adds to the conversation on how traces of human activity can be discerned at the smallest of scales, and how sedimentological "ecofacts" can aid in understanding archaeological deposits.

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Rios Allier, Jorge (Indiana University) and Ma. del Pilar Casado Lopez**[42]** *Public Policies and Rock Art in México*

This paper aims to present an overview of the public policies applied to rock art in Mexico in the last years. This cultural resource is perhaps little known in its entirety, yet presents an invaluable variety for its study. Its registration, conservation, and study have allowed in recent years to know more about the vast heritage which the country has it. One of the goals is also to comment on the public steps that have been implemented in this area in different regions.

Ripley, Kevin, Laura Dzvonick (Los Angeles Pierce College), Tina Nupuf (Los Angeles Pierce College), Noble Eisenlauer (Los Angeles Pierce College) and Ronald Faulseit (Los Angeles Pierce College)**[155]** *Convergence of Tears at Momonga: Spiritual, Social and Personal Interactions of the Multiethnic Mourning Ceremony*

The village of Momonga (Ca-LAN-357) is located in the San Fernando Valley of Southern California, along the pre-Columbian boundaries of multiple ethnic groups. Rock art in the area indicates ritual activities involving people from various cultural traditions, including ancestral Chumash, Tongva, Yokuts, and Tataviam peoples. Excavations in a portion of the site have produced exchange and utilitarian items, such as shell beads, stone beads, amulets, stone bowls, hammer stones, pressure flakes, mortars, and pestles. Yet, there is little evidence for residential occupation. Instead, a significant number of buried offerings and human burials with intentionally broken utilitarian items placed over the bones, lead us to consider this area the locus of ritual activity. In particular, we suggest that the contents of these offerings as well as their placement in close proximity with important terrain features show similarities with modern day Mourning Ceremonies, involving dance, music, spiritual acknowledgment and worship, communication with the dead, physical manifestation of tears, wailing, and body convulsions. In this poster, we present the physical evidence that supports this interpretation and further postulate that the site may have served as a center of convergence between neighboring ethnic groups.

Rissolo, Dominique (University of California, San Diego)**[258]** *The Rise of Northern Maya Ceramic Chronologies: Emerging Perspectives on Middle to Late Preclassic Processual Dynamics and the Legacy of Joseph W. Ball*

Seminal and persistently relevant work by Ball has shaped and reshaped our understanding of Middle to Late Preclassic population movements on the Yucatan Peninsula and the establishment of local potting communities and traditions. Evidence of Middle Preclassic ceramic production in the northeastern-most Maya Lowlands had remained elusive until the mid-1990s. Early Nabanche affinities observed in the locally produced pottery of northern Quintana Roo suggested an expansion of peoples across the northern plains by the mid 7th century BC. Initial movements of populations from the eastern Petén and northern Belize were assumed to be coeval with the appearance of Chicanel Horizon assemblages in the northeast of the Peninsula. However, ongoing research in northernmost Quintana Roo suggests an introduction of the southeastern lowland Mamom tradition at a time earlier than Yucatecan influences from the west. Interestingly, recent excavations in Yucatan have revealed pre-Mamom pottery that may similarly reflect a "heterogenic homogeneity" described by Ball, whereby these earliest of types represent emerging yet distinctive regional traditions with deep ties to the south. Proyecto Costa Escondida (PCE) and Proyecto de Interacción Política del Centro de Yucatán (PIPICY) address these issues as well as Ball's contributions to northern lowland ceramic studies more broadly.

[192] *Discussant***[330]** *Chair*

Rissolo, Dominique [134] see Lo, Eric

Ritchison, Brandon (University of Georgia)**[5]** *Immigration and Transformation: Local Community Response to the Abandonment of a Neighboring Region*

Following the abandonment of the Middle Savannah River Valley at the end of the 14th century, communities on the neighboring Georgia Coast adopted a new settlement system. At the scale of the region, this appears as a dispersal of settlement and an increase in size of the largest population centers that had previously existed. This paper presents the results of the first systematic intra-community survey of a large site on the Georgia Coast. Results show how residents of the site spatially reorganized their community following the arrival of Savannah River immigrants and how this reflects changed socio-political organization.

[5] *Chair***Rivas, Alexander (Washington University in St. Louis) and Brent Woodfill (Georgia State University)****[292]** *Teaching Climate Change in Red States*

Although scientific consensus was reached on the issue of human-made climate change earlier this century, it continues to be a controversial subject in the public sphere. Archaeologists, as scientists interested in a *longue durée* approach to human society and the environment, have thus been thrust into another ideological battlefield as hard-fought as the theory of evolution by natural selection, but with perhaps graver consequences. As we move fully into the Capitalocene, it is of the utmost importance to educate future professionals and politicians about the nature of climate change, its impacts on almost every aspect of our lives and livelihoods, and possible solutions. However, most archaeologists are working within the academy, already seen as a bastion of liberalism, political correctness, and "un-American" viewpoints by many of the people who have already been turned off to the message. The authors of this paper are working in institutions of higher education in Missouri and Georgia, two typical "red states" that are dominated by people who typically do not listen to the climate change message, and they discuss the best strategies and curricula to open students' minds to a scientifically grounded perspective.

Rivas, Alexander [176] see Leight, Megan

Rivas Panduro, Santiago [178] see Arroyo-Kalin, Manuel

Rivera, Antonieta**[28]** *The Architectural and Urban Design Principles of Tenochtitlan*

There exists a vast literature examining every aspect of Aztec culture. Despite this, few studies focus specifically on Aztec architecture and its implications for understanding broader aspects of Aztec cosmology. This paper contributes to our knowledge of Aztec society through an exploration of architectural and urban design principles that guided the building of their cities and ceremonial precincts. By examining ethnohistoric and archaeological sources, and drawing on evidence from several disciplines—art, astronomy, geography, geometry, mathematics and religion—I present a body of information relevant to the study of Aztec architecture and urban planning in order to analyse it from an archaeoastronomical perspective. I present a methodology that allows accurate analyses of the astronomical and topographic orientations of settlements and ceremonial architecture. This methodology integrates a wide range of digital applications including Google Earth, Google Maps, solar charting, topographic analysis, open-content collaborative, geo-location-oriented photo sharing applications as well as a custom-built geometric application. The results allow for a new understanding of: (1) the design principles of the Huey Teocalli, (2) the layout and design principles utilized in the construction of Tenochtitlan and Tlatelolco and, (3) the Aztec remodelling of Tenayuca, Santa Cecilia Acatitlan and Teopanzolco.

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[28] *Chair*

Rivera, Arturo [100] see Baitzel, Sarah

Rivera, Luz Stephanie, Gianfranco Ciassiano (INAH), Ana María Álvarez and David Gárate

[285] *Huayacocotla's Early Holocene and Middle Archaic Human Occupations*

The Hunter-gatherer Phase in Veracruz and Mexico project has studied the Huayacocotla region, located in the state's northern highlands. Until a few years ago the richness of evidence that these archaeological sites contain were unknown and today they make up part of the little we know about the state's earliest people. Here we review the relative chronology and different occupations for the Early Holocene and Middle Archaic sites by interpreting the alteration, refunctionalization and redistribution of lithic artifacts and tools found so far.

Rivera, Mario (ICOMOS, Chile)

[333] *The 1973 Seminar on the Lacustrine Kingdoms in the Titicaca Basin*

Co-organized by John V. Murra and Luis G. Lumbreras, this seminar was planned as an international and interdisciplinary study on the Lacustrine Kingdoms around the Titicaca basin (Lupaqa and Paqajes), and their interaction towards the western lowlands. Murra and Lumbreras were able to gather a group of leading Andeanists and students from Bolivia, Peru, Chile, Ecuador, Canada, and the U.S. who worked in the field for almost three months in Southern Peru, Northern Chile, and Bolivia. The Seminar, defined as a scholarly exercise to investigate about how the vertical archipelago thesis worked from the core area out became one of the most important attempt to integrate different research strategies dealing with ethnohistorical and historical documents, archaeological investigations, and ethnography. It represents a turning point in the development of Andean studies that contributed to advance further knowledge and theoretical issues about the Andean world.

[333] *Chair*

Rivera, Patrick (University of Maryland)

[296] *When Is an Artifact an 'Ethnic' Artifact? Case Studies from Ireland and Mexico*

Given the impressive variety of objects produced and used by most ethnic groups, why do some forms of material culture—but not others—come to be identified as signs of ethnic identity? Who makes these identifications, and what sort of work do they do? This paper examines how particular historic artifacts (or representations of them) have come to signify an Irish or Mexican ethnic identity in the contemporary imagination, what role archaeologists have played in this process, and what this might mean for archaeological attempts to recover ethnicity in the material record.

Rivera Prince, Jordi (Fulbright Open Research Fellow, Universidad Nacional de Trujillo), Gabriel Prieto (Programa Arqueológico Huanchaco, Universidad Nacio) and Celeste Gagnon (Anthropology Department, Wagner College)

[270] *Disturbing the Ancestors: Interpreting Early Intermediate Period Commingled Remains at La Iglesia, Huanchaco Perú*

While the Inca, Moche, and Chimu cultures boast grand sites along the north coast of Perú, much is to be learned about the earlier Gallinazo (50 BC/100 AD–500 AD) Salinar (200 BC–200 AD), and Cupisnique (ca. 1500–300 BC) cultures from small, coastal settlements. The 2017 field season of the Programa Arqueológico Huanchaco investigated these earlier Peruvian cultures during a five week excavation near the Iglesia de Huanchaco, approximately 15 km northeast of the Huacas de Moche. Initial ceramic analysis shows evidence for cultural occupation of Cupisnique through the Moche cultures. Within the lower strata of the Gallinazo occupation, two distinct contexts of layered, commingled human remains were discovered. Individuals are represented by varying degrees of completeness, from isolated fragments to crania and their associated cervical vertebrae, to fully articulated limbs. These two post-mortuary features provide evidence for Moche disturbance of Gallinazo burials. The excavation of these layered, commingled features will be described and basic demographic and health information will be presented. These data will allow for comparison of the two contexts and an examination of the implications of these features for understanding how Early Intermediate Period people interacted with their dead.

Rivera-Collazo, Isabel (University of California San Diego)

[135] *Coastal Erosion and Extreme Atmospheric Events: Climate Change and Coastal Cultural Heritage in Puerto Rico*

Islands and coastal zones preserve the cultural heritage of maritime traditions and livelihoods. The expected environmental impacts linked to climate change present a severe threat to their preservation, placing heritage at risk of being completely lost, possibly in an instant. Coastal cultural heritage in Puerto Rico has been the focus of research for the last two years, starting with a risk assessment, and continuing with plans for monitoring, documentation and possible intervention. However, the severity of climate change and the intensity of recent extreme events highlights the urgency of these tasks and outpace the research to document and preserve the contexts that have survived until now. This presentation provides an update on the work undertaken on Puerto Rican coastal heritage, contextualizing our progress within the effects that Hurricane Irma had on some of the known and threatened coastal heritage sites.

Rivers Cofield, Sara (Maryland Archaeological Conservation Laboratory)

[149] *Discussant*

Rizvi, Uzma (Pratt Institute)

[201] *On the Right of Refusal: Decolonizing Archaeology and Equitable Praxis*

Fore fronting that "decolonization is not a metaphor" (Tuck and Yang 2012), this paper demonstrates how decolonization is not just an historical process but rather an action that is political at its core. As global efforts to redefine archaeological practice are underway to ensure a more just and equitable practice, political historiographies of colonial archaeology in high income postcolonies, such as the United Arab Emirates (UAE), must also be investigated. Epistemic violence embedded within colonial archaeology maintains itself under the guise of 'science,' as archaeology continues to make demands upon bodies, landscapes, memories, histories, and heritage.

This paper investigates what refusing to work in inequitable conditions might look like and what sorts of alternative pathways exist for an equitable and decolonized archaeological praxis. This will include entering archaeology (as a discipline) into transdisciplinary dialog with contemporary art and design. Engagement is not limited to a human to human interaction but rather, this paper will consider conceptual engagement as a key facet to epistemic rearrangements. Utilizing over five years of work with collaborators in the UAE, in this paper I will provide multiple formats through which ethical praxis emerged within frameworks of critical pedagogy, public engagement and archaeological practice.

[278] *Discussant*

Rizzuto, Branden (University of Toronto) and Justin Jennings (Royal Ontario Museum (ROM))

[154] *Procurement and Use of Obsidian at the Middle Horizon—Late Intermediate Site of Quilcapampa, Valle de Sigüas, Arequipa, Peru*

This poster highlights emerging results of our ongoing study to further characterize the procurement networks and use strategies of obsidian sources in the south-central Andes during the Middle Horizon (600 CE—1000 CE) and Late Intermediate Periods (1000 CE—1476 CE). We present archaeometric analyses and provenience studies of excavated obsidian objects from the Middle Horizon—Late Intermediate site of Quilcapampa,

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located in the Valle de Sigüas, Arequipa, Peru. In total, 70 objects were analyzed using handheld energy-dispersive x-ray fluorescence spectrometry (pXRF). Preliminary results demonstrate that the obsidian used at Quilcapampa originates from several distinct outcrop sources within the central Andean region, and particular attention is given to how obsidian procurement practices at Quilcapampa varied over time.

Roache-Fedchenko, Amy

[85] *Spatial Modeling of 18th Century Blacksmith Shops*

The location of blacksmith workshops is often noted on historic maps, yet the archaeological attributes of the workshops are often not well understood within the context of the 18th century. Most knowledge of blacksmithing derives from the 19th and early 20th centuries. The various tools and techniques used to produce and repair metal objects are well documented from these later time periods, as is the spatial layout of the blacksmith shops. These depictions of blacksmiths and blacksmithing are often idealized and not an accurate depiction of the archaeological attributes found on 18th century sites. This presentation explores the applicability of a general model for better understanding the ways in which 18th century blacksmithing spaces were used and how these areas become visible in the archaeological record.

Robb, John (Cambridge University)

[54] *The 20th Century Archaeology of the High Mountains: State Projects and the Forces Resisting Them*

The mountains of southern Calabria above 1400 m were used throughout prehistory and history, but except for an attempt to found highland agricultural settlements in the Greek period, they were always used for special purposes rather than as primary centres of habitation. The 20th century saw a massive transformation in land use, with intensive state investment in creating new kinds of mountain landscapes dedicated to special purposes. These purposes included political control, economic exploitation, and the invention of recreational worlds for use by urban dwellers (trekking, skiing, and more recently heritage landscapes). More populist initiatives included the development of religious landscapes of pilgrimage to local shrines, and ongoing bottom-up, informal exploitation of mountain places and resources. Archaeologically, some of these efforts proved successful (notably reforestation, creating a road network, and creating recreational landscapes). Others have proved less so, foundering upon long-term political and structural problems to create a landscape littered with the relics of a wide range of short-lived development projects.

[214] *Discussant*

[54] *Chair*

Robb, John [54] see Michelaki, Kostalena

Robbins, Helen

[322] *Discussant*

Robbins, Lawrence [198] see Goldstein, Steven

Roberts, Emily

[300] *Craft Production and Consumption in the City of Huari: A Spatial Analysis*

In this paper, major focus will be given to metal artifacts and fragments, examined with respect to object type, production technique, and their distribution throughout different architectural spaces during the 2017 excavations of Patipampa, a domestic sector of the Middle Horizon (AD 500–1000) city of Huari. These artifacts, collected during excavation and flotation, will be compared to finished products and fragments belonging to other artifact classes, such as shell, across multiple architectural spaces using Geographic Information Systems (GIS). Spatial analysis will be conducted using GIS in order to assess possible correlations with respect to craft production and consumption by the people who lived in Patipampa, allowing for examination of the organization of urban spaces with regards to production and consumption.

Roberts, Heidi, Janet Hagopian and Richard Ahlstrom

[164] *Margaret Lyneis and the Pottery Traditions of Corn Creek and Ash Meadows in Southern Nevada*

Margaret Lyneis examined pottery collected from surface and excavation contexts at two of southern Nevada's desert oases, Desert National Wildlife Refuge and Ash Meadows National Wildlife Refuge. These rich islands of springs and lush vegetation were occupied fairly continuously from the Early Archaic period, with farming practiced during the Formative and Post-Formative periods. Dr. Lyneis' investigations demonstrated, for the first time, that pottery was made locally during the later periods, with temper for both gray and brown wares consisting of crushed rock obtained from adjacent mountains. This paper summarizes these studies and reflects on the implications of Dr. Lyneis' research for understanding Nevada's prehistory.

Roberts, Jerod (Shumla Archaeological Research & Education Center), Victoria Roberts (Shumla Archaeological Research & Education Center), Amanda Castañeda (Shumla Archaeological Research & Education Center) and Carolyn Boyd (Texas State University, San Marcos)

[180] *A Feasibility Analysis of Rock Art Recorded Thus Far for the Alexandria Project*

The Lower Pecos Canyonlands of southwest Texas is home to over 350 identified rock art sites depicting multiple styles, complexity, and intricacy. In 2017, Shumla Archaeological Research and Education Center launched the Alexandria Project, a three year mission to revisit each known rock art site in Val Verde County and perform baseline documentation, with the aim to answer overarching questions requiring a large and consistent dataset. Our documentation methods utilize Structure from Motion 3D modeling, high resolution gigapanoramas, specialized recording forms, and GPS coordinates. We are collecting a dataset intended for future research and analyses including stylistic variation, attribute identification, and iconographic interpretation. To examine the feasibility of conducting such analyses from baseline data, a test analysis was conducted using a sample of the sites recorded thus far. We conducted figure identification, stylistic classification, and iconographic inventory using only the recording forms, gigapanoramas, and 3D models processed from baseline data. This presentation discusses the results from the analysis along with what further research questions may be addressed from the Alexandria Project dataset.

Roberts, Jerod [180] see Roberts, Victoria

Roberts, Patrick (Group Leader of the Stable Isotope Laboratory, Department of Archaeology)

[213] *'Finding the time': A Long-Term Perspective on Human Interactions with Tropical Landscapes and Its Implications for Sustainability*

Archaeology provides a truly long-term record of anthropogenic landscape interactions and human responses to environmental change. Such a record is particularly important in tropical settings that contain some of the most threatened terrestrial ecosystems in the world today. However, poor preservation and assumed human avoidance have meant that past records of human behaviour have been patchy for these biomes. Here, I review how new methodologies and archaeological interest has enriched datasets of human tropical forest use from the Pleistocene to the historical period. Alongside growing information relating to palaeoenvironmental fluctuations in different tropical regions, I seek to demonstrate that these datasets have much to offer modern conservation and policy-making in tropical regions. From documented millennia of tropical forest hunting, gathering, and burning alteration by hunter-gatherers to agricultural and urban populations surviving and collapsing through significant periods of climate change, I argue that a resource already exists for helping to understand problems facing human populations in tropical landscapes today. Archaeology and

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palaeoenvironmental science can contribute to future predictions of climate change severity and tropical forest degradation, as well as potential solutions and mitigation practices, at a time when these regions are becoming ever more densely populated by our species.

Roberts, Victoria (Shumla Archaeological Research & Education Center)

[180] *Research Questions Driving Rock Art Recording Methodology in the Alexandria Project*

For over twenty years, Shumla Archaeological Research & Education Center has studied and promoted the preservation of rock art in the Lower Pecos Canyonlands along the U.S.-Mexico border. In July 2017, Shumla launched the three-year Alexandria Project designed to gather an extensive dataset from over 350 known rock art sites in Val Verde County, where the majority of US sites are located. Research questions driving data collection reflect two main aspects: geospatial distribution and iconographic content. Are there patterns in rock art site locations? Is there a correlation between other archaeological features and rock art? What are the distributions of key motifs across the landscape? Shumla will provide high-resolution data to better understand distribution, density, range, and context of Pecos River Style pictographs in addition to the lesser known pictographs styles and petroglyphs. This paper explores the Alexandria Project research questions and potential for future research.

[180] *Chair*

Roberts, Victoria [180] see Roberts, Jerod

Robertson, Robin (University of Texas, San Antonio)

[258] *The Terminal Preclassic in Northern Belize Defined*

Joseph Ball has devoted his professional career to masterfully determining how the ceramic complexes at one site related to those at another, generating models for Maya movements and prehistory from the identified similarities or differences between them. Following his example, this paper proposes to take the data from Cerro Maya in Northern Belize and correlate it with other sequences in the region to produce a carefully researched sequence for the region with specific attention to the pre-Tulix and the Terminal Preclassic material. In the process, a definition for the Terminal Preclassic (as opposed to the "protoclassic") will be explicated and its meaning explored.

Robertson, Robin [243] see Sullivan, Lauren

Robichaux, Hubert [30] see Ek, Jerald

Robin, Cynthia (Northwestern University) and Laura Kosakowsky (University of Arizona)

[147] *Terminal Classic Terminal Deposits at Chan, Belize*

This presentation examines a series of terminal deposits at the ancient Maya farming community of Chan in Belize, Central America. We propose a contextual analysis of terminal deposits to facilitate the development of archaeological interpretations that move beyond the static category of "problematical deposits." The terminal deposits at Chan are located in its community center, primarily in two locations: in the eastern temple and southern range structure of Chan's central group. The deposits date to the period of the depopulation and abandonment of the community and are interpreted as terminal deconsecratory acts by the community's final residents. Most terminal deposits were placed on final structure floors and covered by collapse debris that accumulated through time. One unique terminal deposit, on the final structure floors of a diviner's room, was carefully buried in a lens of fine sascab suggesting that special care and attention was taken to "bury" the terminal deposits in this room. Examined in context, Chan's terminal deposits shed light on the uses of key buildings in a community center and illustrate how a dwindling population deconsecrated their buildings at the end of the occupation of a community.

[300] *Discussant*

Robinson, David (University of Central Lancashire, UK)

[214] *Sequencing the Gordian Knot: Implications of the Pleito Main Cave Superimposition Analyses*

The over-painting sequences at the elaborate rock-art site of Pleito, South-Central California, is one of most complex in the Americas. In a region famous for its polychromatic traditions, including Chumash, Yokuts, Kitanemuk, and other Californian native groups, Pleito stands out as the richest in terms of variety of colours, iconography, and over-painting. This over-painting, or superimposition, offers the 'deepest' data rich relative sequence in the region. Integrated work employing analytical and imaging techniques on the Gordian Knot project over the last few years has aimed to disentangle the sequences found in the Main Cave at Pleito by integrating analytical and imaging approaches. With over a dozen panels, multiple dozens of layers, and hundreds of elements, the results offers a unique view of change-through-time in the iconography of the wider region. As this project enters its final year, we present the first interpretation and implications of the Pleito sequence based upon this comprehensive approach.

[214] *Chair*

Robinson, Erick (University of Wyoming), Jacob Freeman (Utah State University), David Byers (Utah State University), Spencer R. Pelton (University of Wyoming) and Robert L. Kelly (University of Wyoming)

[105] *Climate Change, Economies of Scale, and Population Growth in Prehistoric Hunter-Gatherer Societies: A Case Study from Southwestern Wyoming*

Increasing energy consumption returns, or economies of scale, have been illustrated similarly for modern urban societies and ancient complex societies. However, the relationship between underlying scaling relationships and the development and decline of population and social complexity over the long-term are yet to be investigated. This poster addresses their role in hunter-gatherer societies. Using formal mathematical models from macroeconomics, we examine the long-term variability of economies of scale in hunter-gatherer societies from southwest Wyoming throughout the Holocene. We compare means and variances in the scaling relationships between time-series datasets for population growth, social organization, housepits, ground stone, plant and faunal resources. These scaling relationships are then compared to paleoclimate records in order to investigate correlations between different economies of scale over time, population growth, and climate change. In particular, we investigate whether increasing variance in the underlying scaling of proxies for population, subsistence technology and social organization correlates with accelerating climate change and/or precedes major declines in prehistoric population. We develop a theoretical and methodological framework for research on the socio-ecological drivers of tipping points in prehistoric hunter-gatherer populations.

Robinson, Erick [105] see Latorre, Claudio

Robinson, Eugenia

[176] *Cakhay: A Strategic Classic Center in the Kaq'chik'el Maya Area*

Archaeological survey of Cakhay, the largest Classic site (200–800 A.D.) in the Maya Kaq'chik'el area, was carried out in 2017 by the Proyecto Arqueológico del Área Kaq'chik'el (PAAK). The goal of the survey was to determine the limits of the site and survey its periphery. Reconnaissance of 20 sq km found that populations were nucleated on the hillside surrounding the defensive and religious center with some look out sites in the periphery. Within the center and the nucleus of the site, Teotihuacan style Middle Classic incensarios and tripod vessels and Cotzumalguapan style sculpture

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indicate interregional interaction with elite trading centers in the area of Escuintla. Routes of travel, determined by the application of the Least Cost Analysis of GIS, show Cahkay dominated north-south and east-west routes on the western edge of the Chimaltenango plain. It was engaged in trade to the northeast with San Martín Jilotepeque as well. The site had significant roots in the Late Preclassic and had occupations during the Terminal Classic-Early Postclassic and Late Postclassic indicating it was an integral part of the highland network of exchange and communication from Kaminaljuyu to Lake Atitlán and to the Pacific Coast from the Preclassic through the Postclassic periods.

[176] *Chair*

Robinson, Francis “Jess” (Vermont State Archaeologist) and R. Scott Dillon (Vermont Division for Historic Preservation)

[294] *Trends, Traditions, Interregnums, and Continuities: An Examination of the Cultures of the Early Holocene of the Far Northeast*

This paper will examine several early Holocene archaeological complexes producing Late Paleoindian St. Anne/Varney bifaces, quartz unifaces (Early Maritime Archaic), and bifurcate-based Early Archaic bifaces across the Far Northeast. Recent examinations by the authors have raised questions about the timing and spatial extent of some of these complexes and what the patterns or lack thereof suggest about the cultural and technological origins of the Native Americans producing them, their lifeways, and the potential of their coevally in portions of the Far Northeast.

Robinson, Mark [59] see Prufer, Keith M.

Robledo, Ivanna [270] see Black, Valda

Robles García, Nelly (Instituto Nacional de Antropología e Historia)

[158] *Registro y Documentación 3D de la colección de Piedras Grabadas de Monte Albán, una experiencia participativa entre la sociedad civil e instituciones*

Las estelas grabadas de Monte Albán, que forman parte del sistema de escritura más antiguo de América, se han enfrentado a serios peligros de deterioros a lo largo de su historia pasada y reciente. Elaboradas desde 500 a.C., se encuentran entre las más importantes de la escritura prehispánica de las culturas mesoamericanas. En 1994, se tomó la decisión de reunir la mayoría de estelas sueltas de los contextos no originales en una bodega provisional que causó resultados adversos. A partir de 2006 iniciamos un nuevo proyecto para su documentación y resguardo, con la participación del World Monuments Fund, la Fundación Alfredo Harp Helú Oaxaca, e insumos donados por el Gobierno de Japón, instancias que se unieron para ayudar al Instituto Nacional de Antropología e Historia en la tarea de protegerlas. Los resultados nos alientan a continuar en la búsqueda de participaciones extra-institucionales para proteger la memoria prehispánica de Oaxaca, y poder continuar con las investigaciones en torno a este importante tema.

Robrahn-Gonzalez, Erika (UISPP)

[331] *Building Societies of Knowledge*

This paper aims to analyze the implementation of integrative project designs developed with local communities in Brazil, in a bottom-up strategy. The objective is deliver relevant outcomes and outputs to society incorporating local social values to the process.

This strategy is also aligned to the development of UNESCO's Sustainability Science goals, from which archeology cannot be isolated. It considers the development of Cultural Environment Projects, where archeology research has more visibility and encourages more participation when integrated into wider scope studies. In such multi-variable projects, archeology is part of a “bigger picture” and is in dialogue with current issues advocating for integrative approach regulations.

Therefore, we must design methodologies and build an agenda, including:

- The development of an Applied Science, that allies the accomplishment of scientific research with the symmetrical involvement of local communities;
- The intensive use of technology not only to disseminate the research, but especially to increase the involvement of the communities in the construction of Knowledge Societies.

This perspective aims to link archeological evidence based on scientific findings to the history and identity of local communities, positioning archeology within the transdisciplinary studies that are necessary to meet the global challenges of the 21st century.

[331] *Chair*

Roche Recinos, Alejandra (Brown University) and Javier Estrada (Universidad del Valle de Guatemala)

[163] *A Lithic Approach to Economic Organization at Piedras Negras, Guatemala*

Analysis of the production of imported lithic artifacts, especially obsidian and jade, has been important to recent research on the economic organization of the lowland Maya. However, the data for lithic production has come from a few key sites with clear evidence of workshops devoted to the working of such materials. Less attention has been dedicated to the diversity of obsidian and jade working within individual sites, much less across a given kingdom. This paper presents preliminary evidence for heterogeneity in obsidian and jade working in the kingdom of Piedras Negras, notable for being at the tail end in the exchange of obsidian, jade, and other imported lithic goods. The focus is especially on the diversity of production in household versus non-household areas, drawing comparisons with known market and production areas in Mexico and Guatemala, highlighting the connection with the subordinate center of Budsilha that yielded the best evidence to date for lithic production activities, to better understand regional economic dynamics. Macroscopic analyses are complemented by the results of XRF analysis.

Roche Recinos, Alejandra [109] see Golden, Charles

Rock, Carolyn

[67] *Architectural Conformity vs. Slave Identity: An Example in Late Antebellum Georgia*

In 2015, Brockington and Associates conducted Phase III Data Recovery at a middle-nineteenth century field slave settlement within the Colonel's Island Plantation in Glynn County, Georgia. Excavations at five slave dwelling footprints showed that all exhibited nearly identical dimensions and construction techniques. Dwellings appeared to be double-pen wood frame with central chimneys and wooden floors. Rather than set off the ground by wood or brick supports, each dwelling was marked by a perimeter trench and series of eight-inch diameter vertical posts. The architectural landscape consisted of the placement of the double-pen dwellings in two rows of three, separated by an open activity area with open-air structures at either end. The architectural style was consistent with late antebellum efforts to improve slave health and productivity by providing better housing such as wood floors and sturdier dwellings. At the same time, settlement configuration and location were consistent with increased perceived need for control of the slave population amid more frequent news of slave runaways and rebellions. Despite the owners/overseers' efforts at control, our excavations

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uncovered noticeable differences in artifact distributions among the dwellings excavated, revealing individuality within a slave community that is rarely if ever revealed in the historical record.

Rockman, Marcy (U.S. National Park Service)

[247] *Status Update on Archaeology in Relation to the Climate Change Movement*

Archaeology has many connections to climate change: damage and loss due to the impacts of changing environments, the capacity to provide insights for policy and decision-makers about the human processes of adaptation and migration, community connections to the past and the importance of place, citizen science, media coverage, and connections between heritage and identity in conflict, to name only a few. This paper overviews this range of connections and the importance of assessing where cultural heritage, historic preservation, and the field of archaeology particularly, stand in relation to global efforts to address climate change.

[247] *Chair*

Rockman, Marcy [247] see Hritz, Carrie

Rockwell, Heather [77] see Kitchel, Nathaniel

Roddick, Andrew [333] see Janusek, John

Rodgers McGraw, Kendra [268] see Leonard, Daniel

Rodning, Christopher (Tulane University) and Michelle Pigott (Tulane University)

[275] *Native American Responses to Spanish Contact and Colonialism in the American South*

As it did elsewhere around the world, early Spanish exploration and colonization of the American South led to diverse forms of engagement, entanglement, diplomacy, and resistance by Native American groups. Community identity persisted in some places and in some instances, and it was transformed in others. Geopolitical relationships among towns and chiefdoms were altered in diverse ways, both because of colonial exploration, trade, settlement, and missionization, and because of Native American strategies for navigating new geopolitical landscapes and rapidly changing social geography of the colonial American South. This paper considers diverse outcomes to early stages of sixteenth-century Spanish contact and exploration and later stages of Spanish missionization and settlement in the 1600s and early 1700s, with reference to the cases of Cherokee towns in the southern Appalachians, the Calusa chiefdom and its neighbors in southern Florida, the Apalachee chiefdom in northern Florida, and sixteenth-century chiefdoms such as Coosa and Joara.

Rodriguez, Boris [57] see Hernandez-de-Lara, Odlanyer

Rodriguez, Enrique (University of Texas)

[181] *Coins and Empire in Sixteenth-Century Mexico*

Scholars have asked how empires solidify power when colonizers, the agents of empire-building, often have diverse goals and backgrounds and their actions do not necessarily support the goals of the empire. Two answers to this question have received much attention: that empires promote ideologies that support cohesion among colonizers, and that coercion and violence can promote the expansion of empires. I propose a third answer, in which colonizers create varied material forms that may challenge the goals of empire, but later appeal to the king for regulation and control over the material world. To study this proposition, I use the example of coins among Spanish colonizers in Mexico City. Colonizers invented and used a variety of coins, in part by diluting gold into different alloys to make up for the scarcity of gold that they found in the colonies. Thus, they challenged imperial authority by creating new ways of measuring value and wealth (in this case, by creating more wealth with diluted gold). But when they found that their new coins created problems of conversion and exchange, they appealed to the crown requesting regulations over the minting, value, and use of different coins, thereby strengthening imperial authority.

Rodriguez, Gonzalo (Proyecto Arqueologico Huari)

[300] *Replacing Houses and Building a City: Huari, Ayacucho*

Huari urbanism in the Middle Horizon (AD 500–1000) introduced several changes in the landscape and ways of life of people in the Ayacucho region. The construction of walled compounds, contiguous houses or orthogonal cellular architecture, and increasingly dense populations create housing needs that lead the Wari people to innovative solutions. The reduction of open space within internal courtyards, the construction of two- or even three-story buildings, and the probable use of pathways on top of wide walls are some examples. This presentation will compare two different patterns of room filling possibly related to building replacement at the beginning and end of the occupation of the study area, reflecting different approaches to using space in an increasingly urban place.

Rodriguez, Monica (Universidad Nacional Autonoma de Mexico), Vera Tiesler (Universidad Autonoma de Yucatan), Jeffrey B. Glover (Georgia State University) and Dominique Rissolo (University of California, San Diego)

[330] *Living and Dying on the Fringes of the Sea. The Bioarchaeology and Archaeothanatology of the People of Vista Alegre, Quintana Roo, Mexico*

In this paper, we provide a synopsis of the two dozen burial findings from the archaeological site of Vista Alegre, Quintana Roo, recovered during a decade (2008 to 2017). Most of the mortuary contexts from Vista Alegre were documented using detailed in situ recording (archaeothanatology), followed by macroscopic and isotopic research in a collaborative effort between the Georgia State University and the Bioarchaeology Lab of the University of Yucatan. Put in context with other burial series from coeval coastal sites from the Yucatan, our present results showcase quotidian aspects of local lifestyle, diet and health risks, as experienced by the settlers of Vista Alegre. Here, sea products blended in with maize and other inland native staples as locals traded salt and other goods in the midst of growing social and economic networks along the shores of Yucatan. The second part of our talk addresses the deathways of locals, collective mortuary traditions and social identities of local folk, as showcased by cranial shaping and dental decorations.

Rodríguez, Carol (Pontificia Universidad Católica del Perú)

[69] *A Methodological Proposal for the Analysis of Style in Ceramics*

This study explores a recurrent problem in the archaeological field. How to start the analysis of archaeological material? Specifically, how to analyze a ceramic sample stylistically? Based on research carried out at the Cerro de Oro archaeological site on the south coast of Peru, the author proposes a methodology that covers identifiable aspects in most data groups. The study of decorative techniques, the identification of iconographic designs and the observation of distribution patterns will provide us with relevant and necessary information when developing investigations related to archaeological materials, particularly those that focus on the decoration of vessels. The objective of this proposal is to be useful for those researchers who follow this line of work and who need a starting point or alternative ways of approaching their data.

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Rodríguez, María Fernanda [174] see Pintar, Elizabeth

Rodríguez López, Isabel [59] see Borejsza, Aleksander

Rodriguez Suarez, Roberto [323] see Chinique De Armas, Yadira

Rodríguez-Alegría, Enrique [63] see De Lucia, Kristin

Rogers, Lisa (University of Victoria)

[304] *Human-Material Interactions during the Aurignacian of Europe, 35,000–27,000 BP: An Analysis of Marine Shell Ornament Distribution*

This research explores dynamic relationships between people and materials during the Aurignacian period of Europe, 35,000–27,000 BP. More specifically, a network analysis is used to determine whether there are discernible patterns in the geographic distribution of marine shells used for the creation of beads and pendants. As early inhabitants of Europe moved across the landscape they came into contact with others and left behind material traces of these interactions. Whether these artifacts came to be deposited through processes of migration or exchange, marine shells are particularly useful for exploring these processes, as their presence far from the sea can be indicative of dynamic interactions between materials, individuals, and groups.

Through the use of social network analysis software called Gephi, this research visually maps the interactions between sites and regions based on the genera of marine shells present. By creating network visualizations that are analyzed mathematically, in addition to geographic maps of site locations, patterns in the interactions within which materials and people were embedded and entangled are explored. Engaging with theories of materiality, this research sheds light on the active role of marine shell ornaments in the complex interactions between individuals and groups.

Rogers, Mary [183] see Darrington, Glenn

Rogers, Thatcher (University of New Mexico)

[21] *The Northern Periphery of the Casas Grandes World: An Assessment and Update of the Animas Phase*

In the 1930s through 1960s, several sites in southeastern Arizona and southwestern New Mexico were excavated to assess their role in a regional system that spanned across the international border. Many of these sites were characterized by their shared, mixed composition of architectural, ceramic, and iconography traits that did not neatly fit into established archaeological cultures. Subsequently, they became the basis of understanding for the northern Casas Grandes frontier, oftentimes termed the 'Animas Phase'. More recently over the past thirty years, significant progress has been made in understanding the character and extent of the Medio period Casas Grandes culture. However, these new changes in understanding have seldom been applied to the Animas phase assemblages analyzed and site interpretations constructed. This paper reassesses the use and meaning of the Animas phase in response to these developments and seeks to understand incorporated sites not only as a Paquimean 'hinterland', but on the local scale as multiethnic communities integrated into several socio-cultural networks spanning across the borderlands.

Rogoff, David (Methodist University)

[331] *Archaeological Use of Meta-analyses to Limit Researcher Bias: Results from El Coyote, Honduras*

There is extensive evidence that people are self-serving in the interpretation of data and are very likely to reach their desired conclusions. This paper describes the use of meta-analyses for combating researcher bias in archaeological and the results of my research at El Coyote, a Classic Period center in western Honduras.

Roksandic, Mirjana [323] see Chinique De Armas, Yadira

Roland, Jaelyn (University of Wisconsin- La Crosse)

[48] *Cultural Changes during the Protohistoric Period: An Oneota Case Study*

George Milner points out in his 2015 work, "Population Decline and Culture Change in the American Midcontinent: Bridging the Prehistoric and Historic Divide", that reactions and changes by Native Americans during the Protohistoric period were highly localized, and that each tribe was affected differently through direct and indirect contacts with Europeans. The La Crosse locality was inhabited by the Oneota until c. 1625 when the area was abandoned for the Riceford Creek locality (in southeastern Minnesota). This study looks at how the Oneota were affected by European presence on the continent, even before direct contact was made. We see evidence of stress in a change in settlement patterns between La Crosse and Riceford to more protected areas, more utilitarian ceramic vessels, the abandonment of key resources (e.g. wild rice, large river fish, large river mussels, etc.), and an increase in catlinite pipes. During the Protohistoric period, we see the Oneota shifting to a more protective and secluded stance.

Roldan, Jonathan, Marisol Cortes-Rincon (Humboldt State University) and Abby Barrios (Humboldt State University)

[118] *Digital Preservation Era: A Toolbox for Archaeologists to Transition into the Digital Age*

Digital tools, such as photogrammetry and virtual environments have been around for decades. However, it was not until the past decade that the academic community introduced such tools into their work and have taken such discipline seriously. For this reason, the practice, management, teaching and potential of digital archaeology has remained a lagging field. As a response, this paper will provide a guide for traditional archaeologists to assist in the transition to the digital medium. An introduction to the essential vocabulary, theories and must know phases are provided in the paper. In addition, methodologies for a successful digital documentation, preservation and curation are given. Since such discipline is at its infancy in the academic world, we will address the advantages and disadvantages of this new type of data acquisition and post-processing. A complete description of available tools that will advance research questions, interpretations and communication in archaeology is presented here as well. Like any innovation, issues and concerns arise; common and noteworthy issues will be summarized.

Roldan, Jonathan [18] see Cortes-Rincon, Marisol

Romero, Ashuni (Escuela Nacional de Antropología e Historia) and Nelda Issa Marengo (University of California, Riverside)

[330] *Vista Alegre: The Architecture of a Coastal Site in Northern Quintana Roo, México*

El Proyecto Costa Escondida, dirigido por Jeffrey Glover y Dominique Rissolo, ha realizado investigaciones en la costa norte de Quintana Roo, México desde el año 2005. El sitio de Vista Alegre está ubicado en una pequeña isla dentro de la laguna de Yalahau, formó parte de los asentamientos costeros que, a lo largo del litoral de la Península de Yucatán, mantuvieron una circulación de bienes durante la época prehispánica. Estos sitios presentaron y compartieron algunas características arquitectónicas de acuerdo a las regiones y a los distintos periodos. En este trabajo mostramos un estudio comparativo de la arquitectura presente en el sitio de Vista Alegre con relación a la de otros sitios costeros y de la región. Consideramos que, mediante esta comparación, podremos tener un mejor entendimiento sobre algunos de los procesos culturales de los habitantes de la costa norte de Quintana Roo durante el periodo Formativo Tardío y el Postclásico.

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Romero, Danielle M. [325] see Baustian, Kathryn

Romih, Stanislava (Northern Arizona University) and Rafael Guerra (New Mexico University)

[18] *Unleashing the Beast: New Methodologies in Exploring Peri-abandonment Deposits in the Maya Lowlands*

The BVAR project recently renewed its investigations of peri-abandonment deposits at several sites along the Belize River in Western Belize. Also referred to as de facto refuse and problematic or sheet-like deposits, these cultural remains are predominantly recovered in palace rooms and courtyards in site cores across the Maya lowlands. The purpose of the BVAR investigations is to better understand the formation of such deposits as well as their temporal and spatial significance across sites in the Belize Valley region. To accomplish these goals, the project employs microstratigraphic excavation methods that utilize subplot systems for more comprehensive analysis of the assemblages of individual deposits. This paper describes our methodological approach in greater detail, and presents preliminary results of our investigations of terminal deposits at the site of Lower Dover in western Belize.

Rondeau, Michael (Rondeau Archeological)

[120] *Far West Fluted Points: Variability and Trends*

The CalFLUTED project has studied hundreds of Far Western fluted points allowing for a wide ranging recognition of the variability and trends in fluted point morphology, manufacturing technology, use breakage, repair and hafting techniques in the region. Conclusions are supported by study data. Discussion of the implications of those conclusions is provided.

Rondeau, Rob (Simon Fraser University)

[78] *Archaeological Geovisualization Underwater*

New research continues to challenge the "Beringia" explanation of the peopling of the Americas. During the Last Glacial Maximum sea level in the Gulf of Alaska was approximately 100–120 meters lower than present. Vast areas of adjacent coastline extending south along the Pacific Northwest Coast may have been deglaciated beginning about 16,000 BP; providing a coastal corridor for people using watercraft to move south along the coast from eastern Beringia. The focus, now, is locating a coastal migration route. How would one locate early New World archaeological sites underwater?

Underwater surveying techniques, developed in collaboration with related scientific disciplines such as Geophysics and Oceanography, continue to improve the spatial understanding of undersea environments. I refer to this next generation of marine archaeology as "underwater archaeological geovisualization" (UAG).

This paper outlines research focused on new underwater remote sensing technologies, incorporating new computing sciences; such as three-dimensional (3D) imaging, virtual reality (VR), geographic information systems (GIS) and agent-based and virtual modeling, in conjunction with applied technical engineering; developing new underwater remotely operated vehicles (ROVs).

UAG will allow archaeologists to both predict and locate submerged ancient occupational sites as well as investigate these in a way not previously possible.

[78] *Chair*

Roney, John [91] see Whisenhunt, Mary

Ronsairo, Karleen (The George Washington University)

[288] *A Preliminary Analysis of Early Ramos Phase Ceramics from the Mixteca Alta, Oaxaca, Mexico*

During the Late Formative period, social relations were transformed due to increasing political centralization and urbanization in regions throughout Oaxaca. In the Nochixtlán Valley of the Mixteca Alta, Early Ramos phase (300–100 B.C.) ceramics from urban centers in the region reflect significant stylistic change from the preceding Yucuita phase (500–300 B.C.) ceramics. This presents an opportunity to explore how social change may be reflected in stylistic changes of material culture from this period. Changes in ceramic styles in this region, as well as the social practices associated with ceramic production, consumption, and exchange, can be considered to provide a more nuanced view of social change during the urban transition in Late Formative Oaxaca. I conducted visual analyses of Early Ramos phase ceramics from Yucuita and Etlatongo in the Mixteca Alta, which provide a foundation for comparative analyses of ceramic styles and paste compositions of Early Ramos phase ceramics from other Late Formative sites in the region. Future stylistic and paste compositional analyses of these ceramic collections will provide insight into the urban dynamics within the Mixteca Alta and the nature of social relations between urban centers in regions throughout Late Formative Oaxaca.

Roos, Christopher (Southern Methodist University) and William Hockaday (Baylor University)

[182] *Late Pleistocene and Early Holocene Biomarkers from Stratified and Cumulic Soils in Highland Environments of the Jemez Mountains, New Mexico*

Through his meticulous work on stratified and buried soils, Vance Holliday has transformed our understanding of Paleoindian environments in the lowlands of the Southwest and Great Plains. Inspired by Vance's example, we have used a geoarchaeological approach to explore Paleoindian visitation and use of highland environments. Paleoindians have been visiting the Jemez Mountains for obsidian since at least the Folsom period. However, direct archaeological evidence of their presence in and use of highland environments of the Jemez Mountains has not yet been discovered. We use lipid biomarkers extracted from stratified and cumulic soils to reconstruct highland plant communities of the Late Pleistocene and Early Holocene in what are now ponderosa pine forests (2,200–2,600 m). Furthermore, we use fecal biomarkers to infer properties of the Terminal Pleistocene mammalian fauna that may have attracted Paleoindian foragers to the highlands and ultimately to the high-quality obsidian.

[182] *Chair*

Roos, Christopher [224] see Field, Julie

Roosevelt, Anna (Univ. Illinois, Chicago)

[177] *Large Centralized Fired-Clay Cooking Stoves of Communal Households on Marajoara Mounds at the Mouth of the Amazon c. AD 400–1100*

Rarely does the New World anthropological literature mention the existence of large centralized, multi-unit fired clay cooking structures of some prehistoric or recent indigenous Amazonian households. Yet these large, highly patterned features have been informative for archaeology from several points of view. Their existence and common presence as permanent structures built into the floors of prehistoric mound sites on Marajo Island have demonstrated that the mounds they occur in had sizeable, long-term domestic occupations as well as ceremonial remains. Until their discovery, the mounds were assumed to be purely ceremonial monuments. The strong magnetic signatures of stove groups allow them to be mapped by surface geophysical survey, giving potential settlement footprints and thus evidence of site populations and organization, as well as maps to aid excavations. Excavations at and around the structures revealed by geophysical survey revealed that they were set into housefloors, and the extent of the floors indicated that the houses must have been large, multifamily dwellings, a form still common in Amazonia at present. Further useful evidence from the

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excavations has been the identification of small fish and cultivated palm fruits as a staple foods and vegetation patterns with more forest cover than at present.

[317] *Discussant*

Roosevelt, Christopher H. [130] see Moss, Emanuel

Rorabaugh, Adam (Colville Confederated Tribes)

[83] *Precontact Coast Salish Seasonality in Social Networks: A Modeling Approach*

A crucial aspect for examining the production and reproduction of material culture among complex foraging societies such as those of the Pacific Northwest Coast is understanding the relationships between social networks and assemblage diversity. This model examines one small aspect of this issue, seasonal variation in social network size. The model is ethnographically informed by Coast Salish ethnographic household sizes. Assemblage richness and evenness in discrete artifact styles are examined under random social learning, varying seasonal social network size and innovation rate. Larger seasonal aggregations appear to result in a higher frequency of rare types, but this effect is not significant enough to strongly pattern the record of interest. Changes in innovation rate appear to also overwhelm any signals in this aspatial model from differing social network sizes through seasons.

Roscoe, Paul (University of Maine) and Alice R. Kelley (University of Maine)

[84] *Middens or Monuments? The Shell Middens of Maine and the Construction of Peace*

Although some attention has been given to the possibility that circular, semi-circular, and U-shaped piles of shell in southeastern North America represent monumental architecture (e.g., Thompson and Pluckhahn 2012), little attention has been afforded to the possibility that large shell middens of the eastern North American coast might be monumental constructions. Here, using an argument drawn from New Guinea ethnography, we hypothesize that some Maine middens were not simply rubbish heaps, but conspicuous constructions that, among other things, maintained peace among neighboring aboriginal polities.

Behavioral ecologists theorize that, as honest signals of fighting strength, threat displays and ritualized fighting are information-gathering devices that allow both parties to a conflict to establish the victor without either having to risk the potentially catastrophic costs of serious fighting (Enquist and Leimar 1990). Analogously, we propose, some Maine shell middens were indexical signals of a polity's fighting strength that helped maintain peace by mediating inter-polity conflict. As signals of consumption, scale of feasting, and available food resources, the middens broadcast the number of members and allies a polity could muster, as well as their commitment to its projects. The hypothesis gains support from the distribution of both middens and their contents.

Rose, Alexa and Michael E. Smith (Arizona State University)

[49] *Almenas and Architecture*

Almenas, roof ornaments comprised commonly of ceramic or stone in Teotihuacan that most archaeologists toss aside unknowing of their identity, have been a source of research in archaeology recently after Michael E. Smith and Clara Paz Bauista's paper "Las almenas en la ciudad Antigua de Teotihuacan" in 2015. Continuing Dr. Smith's original research, I have compiled a database of complete almenas from museums and published resources to make new categories for the artifacts. Although many whole almenas are within museums and published sources little is known about their significance. Given the complete roof ornaments, I could reevaluate the pieces Dr. Smith originally studied and give less subjective categories to as well. Then Dr. Smith and I analyzed the information known spatially about the roof ornaments to denote if these almenas truly do, as previously thought, denote building function. Dr. Smith and Paz showed in their paper that almenas were widespread in Teotihuacan and associated with several distinct types of structures. The database of whole almenas permits new hypothesis about how these artifacts signal functions continuing with Dr. Smith's work. This research will assist in defining building function and give clearer categories to these artifacts to aid future archaeologists.

Rose, Courtney [72] see Sezate, Adam

Rose, Katherine (Harvard University)

[40] *Legitimizing Nearness: Negotiating Identities in the Spatial Design of 25th Dynasty Nubian Cemeteries*

Ancient Egypt is characterized as a highly centralized and dominating state. However, following the disintegration of the New Kingdom in the 11th century BC, division of state and conquests by foreign rulers ushered in a period of economic decline and political instability. The fracturing of dominion continued until the 8th century BC, when the Nubian kingdom of Kush unified Upper and Lower Egypt into the geographically largest empire since the New Kingdom. The Nubian pharaohs began construction of necropolises near the Fourth cataract of the Nile. While Kush material culture in the form of royal statuary and temple architecture indicates a reaffirmation of classical Egyptian practices, what is the relationship between Nubian and Egyptian royal identity on a landscape level? This research represents a study of the design and utilization of space in mortuary landscapes of the Nubian pharaohs. This project focuses on spatial analyses of the sites of El-Kurru, Nuri, and Gebel Barkal. The Kushite kings deliberately appropriated the Egyptian architectural symbol of the pyramid and other styles in the construction of royal mortuary landscapes. However, the formation and maintenance of royal identity manifested differently in the design and utilization of built landscapes, across the various periods.

Rose, Nicole (The Graduate Center, CUNY)

[196] *Corroded but Enduring: On the Perpetuation of a Scholarly Iron Curtain in Western Archaeological Thought and Practice*

Archaeological schools of thought vary between countries, with the discipline growing along disparate theoretical trajectories dependent on the historical particulars of a nation's academic traditions. Often distance between such diverging theoretical trajectories is mitigated by communication and collaboration across borders between scholars. However, the Cold War that divided Western and Soviet nations geographically, politically, and culturally also applied to archaeological research, as the flow of information and people across borders was stifled. Despite the collapse of the Soviet Union in 1991 and the mostly normalized relations that developed afterwards, a scholarly Iron Curtain has remained, diminished but enduring. Though certainly not as rigid as decades past, such a divide is visible in the limited number of American scholars conducting research in modern Russian, and in the exclusion of Russian research from our narratives about the prehistoric and ancient past. This paper examines the legacy of the Cold War in American archaeology, specifically in relation to the marginalization of Russian archaeological phenomena in our popular narratives. Ultimately, the peripheralization of these phenomena and regions does not result from anything that existed in pre- or ancient history, but in the modern political and cultural context's shaping of archaeological thought and practice.

[196] *Chair*

Rosen, Arlene [259] see Dawson, Emily

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Rosencrance, Richard (University of Nevada, Reno)**[47]** *New Data and Potential Pathways of Paleoindian Exploration in the West Virginia Highlands*

Comparatively few Paleoindian artifacts have been found throughout the Appalachian Highlands, especially in the uplands of West Virginia. Lack of professional research in West Virginia appears to be the leading cause for this paucity of data. A literature review and newly identified artifacts from surface collections provide a baseline for future research questions and survey strategies. Most artifacts derive from the Ohio and Kanawha river valleys, but new artifacts from the most mountainous portions of the state suggest that early groups also utilized interior river valleys and uplands. The Tygart and Greenbrier valleys are the largest of these interior river systems, and are most accessible by following waterways out of the lower elevations of the Ohio valley to the west. This research identifies high probability areas for Paleoindian sites in the West Virginia highlands based on artifact distribution, topography, hydrologic systems, and lithic raw material sources.

Rosenfeld, Silvana (University of South Dakota) and Megan Street (University of South Dakota)**[335]** *The South Coast and Yungas as Seen from the Highlands during the Middle Horizon*

In this presentation we will discuss different non-local materials recovered from the Wari site of Conchopata and the imperial capital of Huari to better understand the interactions between costa, sierra, and selva during the Middle Horizon. The mapping of the origins of exotic material recovered at these sites will help us understand and better characterize how people in these regions were interacting with each other. By exploring least-cost pathways, among other criteria, we will make inferences on the possible exchange routes used in a diverse landscape marked by many topographic changes during this important time period.

Rosenswig, Robert (University at Albany)**[109]** *Is the Study of Ancient Money Really So Difficult?*

The difficulty that many economists and anthropologists have with studying ancient money lies with inadequate understanding of modern monetary systems. I briefly review the establishment of two currencies: the British pound in the 18th century and the US dollar in the 19th and why the establishment both currencies were political (not economic) constructs. Modern Monetary Theory (MMT) economists analyze the current fiat currencies as political constructs and David Graber's Debt: The First 5000 Years provides a historical perspective that undermines classical and neo-classical economists' assumptions of the subject matter. Most discussion by both economists and anthropologists are limited to written accounts. Therefore, I next turn to our ability as archaeologists to investigate money in Prehistoric contexts and employ the Formative-period kingdom of Izapa (800–100 BC) and the early cities on the Pacific coast of Mesoamerica as forum for this to be done.

[262] *Discussant*

Rosenthal, Jeffrey [44] see Morales, Jessica

Rossi, Franco (Boston University)**[110]** *Monuments that Weren't: Reckoning with Unmarked Histories of Violence*

With recent events in the United States, monuments and their powerful implications have been widely covered across media outlets. Less often considered, however, are the monuments that were never built in the first place. This paper grapples with these questions archaeologically, ethnographically and historically by considering monuments and memory through extremely well-explored cases in Bavaria and through other far less discussed cases in the Northeastern U.S. It considers the historical narratives that American public school students grow up learning in relation to monuments and material markers, and discusses potential pedagogical approaches for exploring histories of monuments that never were. Drawing from Indigenous theories of settler colonialism, it seeks to probe possibilities for how future memory work might be envisioned as part of archaeological teaching and public engagement.

[110] *Chair***Ross-Sheppard, Callan (McGill University)****[246]** *Discussant***Rostain, Stéphen (PhD. National Center for Scientific Research, France)****[116]** *Upano, an Anthropized Valley in the Upper Amazon*

Sangay, Ecuador, is probably the most prestigious and impressive site in Amazonia. It is indeed an immense establishment regrouping dozens complexes of artificial earthmounds and a network of endless paths dug along the edge of a terrace of the left bank the Upano. Many archaeological sites have been found in this narrow and straight Upano Valley has been modified over tens of kilometers in length by the pre-Columbian, but few of them have been excavated. Does this multitude of interconnected sites correspond to a central power or a swarm of small local chiefs? This presentation will show the main types of monumental modifications, their chronology from the Formative period to the European conquest and the assumptions that can be made on the pre-Columbian societies that carried out these earthworks.

[116] *Chair***Roth, Barbara (UNLV)****[122]** *Ash Matters: The Ritual Closing of Domestic Structures in the Mimbres Mogollon Region*

Throughout much of the Southwestern U.S., ash was an important component of ritual deposition and has ethnographically been closely associated with processes of cleansing and renewal. The presence of ash in ritual contexts is well documented, but it also appears to have played an important role in the closing of domestic structures. In this paper, I present cases of ritual closure of domestic structures and examine the role that ash played in these closures using data from pithouse sites in the Mimbres region of southwestern New Mexico. These data show that ash was an important component of the abandonment and closure of domestic structures throughout the Pithouse period. I explore the reasons for the use of ash in these contexts and the relationship between domestic and ritual closure during the Pithouse period.

[317] *Moderator***[122]** *Chair*

Roth, Barbara [325] see Baustian, Kathryn

Rotman, Deborah (University of Notre Dame)**[220]** *Collective Labor, Communal Lives: Social Dynamics of 19th-Century Rural Life in Northwest Co. Mayo, Ireland*

Nineteenth-century tenant families on the Bingham Estate and throughout rural Ireland resided in cottage clusters known as clachans, nucleated groups of farmhouses, where land-holding was communal and often had considerable ties of kinship. These settlements were intimately associated with rundale farming, a system of cooperative or collective agriculture. This system was a sophisticated response to specific ecological conditions.

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Lands within infields, outfields, and commonage were allocated so that each household received a proportionate share of productive and non-productive land. Thus, each community was highly adapted to its unique environmental niche. These settlements were also highly complex social

organisms. Children kept cattle away from the gardens, cut and planted potatoes, and gleaned fields where grains were harvested. Women provided for the children, carded and spun wool, and tended to the household. Men were responsible for the management of farm lands. Thus, activity within each clachan and rundale was shaped by gender and age. Although maligned as 'backwards' and 'primitive,' clachans were in fact well-orchestrated socio-economic systems that distributed the risk of agricultural production among its members. This paper explores the social dynamics of these fascinating gendered landscapes.

Rowan, Yorke (University of Chicago) and Austin Chad Hill (Dartmouth College)

[4] *Droning On: UAV Survey in the Black Desert of Jordan*

In this paper we discuss preliminary results of UAV-survey in one area (c. 32 sq. km.) along the Wadi al-Qattafi, Jordan as part of the larger Eastern Badia Archaeological Project. Excavation and survey in this area of the Black Desert revealed hundreds, or possibly thousands, of unmapped and unrecorded structures that required a new approach to their accurate identification and documentation. With the exception of the large desert 'kites' (hunting traps), most stone structures are too small to map effectively using satellite imagery, and too sparsely distributed to map efficiently with traditional terrestrial survey tools. Our results reveal new insights into the distribution of kites, buildings, and other structures in this area. In addition, we note how this mapping project will affect our future research directions, and the challenges drones present for documenting the cultural landscape in this remote region.

Rowe, Ann (The Textile Museum, George Washington University)

[139] *Reconstructing the Inca Occupation Period in Chancay*

Comparatively little excavation information is available from the Chancay valley, particularly pertaining to textiles, which are abundantly preserved there. Yet, it turned out to be possible to identify in museum collections, including that of the NMAI, two distinct styles of highland tunics found at sites in the mid and lower Chillon valley and vicinity that in turn influenced mid-valley and coastal tunics, particularly Chancay-style examples. Moreover, textile designs made it possible to date these tunics to the Inca-occupation period. The identifications were based on technical analysis and the use of site provenience information as well as design comparisons. The conclusions were subsequently confirmed by textiles in a grave lot from the Chancay valley excavated in 1904 by Max Uhle, kept in the Hearst Museum of Anthropology in Berkeley, whose ceramics show no Inca influence. The tunics reveal that people from the upper valley in Chillon probably had some administrative role during the Inca empire in Chancay, and that textiles reflected the imposition of the Inca administration in Chancay to a much greater extent than ceramics.

Rowe, Marvin [74] see Blinman, Eric

Rowe, Sarah (University of Texas Rio Grande Valley)

[196] *Periphery and Perspective: The View from Late Prehispanic Coastal Ecuador*

The small country of Ecuador is sometimes categorized as part of the Andean cultural region and sometimes included in the Intermediate Area. Located as it is next door to archaeological behemoth Peru, Ecuadorian archaeology has frequently been overshadowed by that of its neighbor. Banal oversights, such as maps that show the Inca Empire stretched across the Ecuadorian coast, serve to emphasize the subordinate position of archaeology in the country to the north. Periphery, however, depends on perspective. The central role of ancient Ecuadorian trade networks in supplying the rare materials required for ritual and social life (*Spondylus* shell, specifically) is often acknowledged but rarely examined. In this talk I explore the historical subordination of Ecuadorian archaeology, and outline what may be gained by centering the archaeology of coastal Ecuador within larger archaeological and anthropological discourses. Specifically, I outline the novel forms of social organization that characterized the late prehispanic Manteño tradition, and examine the potential of these forms to rethink and enrich our understanding of other societies in the region.

[324] *Discussant*

Rowley, Rex [116] see Erickson, Clark

Roy, Natasha [167] see Woollett, James

Royster, Thomas [90] see Manzano, Bruce

Rozier, Kristen [265] see Mazow, Laura

Rubin de Rubin, Julio Cezar [2] see Silva, Rosicler

Rubinstein, Emily [224] see Elfström, Petra

Ruby, Bret (National Park Service, Hopewell Culture National Historical Park), Friedrich Lueth (German Archaeological Institute), Rainer Komp (German Archaeological Institute), Jarrod Burks (Ohio Valley Archaeology, Inc.) and Timothy Darvill (Bournemouth University)

[190] *Revealing Ritual Landscapes at Hopewell Culture National Historical Park*

Hopewell Culture National Historical Park preserves six monumental mound and earthwork complexes in south-central Ohio. Archaeological attention in the 19th and 20th centuries remained narrowly focused on mounds and mortuary contexts, ignoring the vast spaces between the monuments. At the same time, agricultural plowing steadily eroded the above-grade features. Recently, the National Park Service forged an international partnership to conduct high-resolution, landscape-scale geomagnetic surveys in collaboration with the German Archaeological Institute, SENSYS GmbH, Bournemouth University, and Ohio Valley Archaeology, Inc. This poster presentation will present highlights from the nearly 500 ha surveyed, along with the results of targeted ground-truth excavations. These investigations are revealing subsurface landscapes of unexpected integrity and complexity, marked by ditched enclosures, wooden post circles, communal earth ovens, and other previously unknown ritual architecture.

Ruhl, Donna (Florida Museum of Natural History)

[89] *Isotopes & Curation: New Lessons Learned from Legacy Waterlogged Wooden Artifacts*

A pilot study was conducted to test the feasibility of applying strontium isotope analysis to source the origins of archaeological "canoe trees" tested to make pre-contact dugout canoes spanning some 5000 years. Many canoes collected decades ago from Florida's lakes produced unexpected signatures. These results raised further questions about the methods' feasibility and the impact of past preservation approaches to the curation of waterlogged wooden artifacts. The anatomical nature of wood cells from legacy samples along with modern proxies was analyzed and experiments indicate the highly hygroscopic nature of wooden log boats/dugouts/canoe trees. New considerations regarding these "wooden sponges" and the potential preservation/conservation for these unique waterlogged remains and the isotopic research will be the focus of this presentation.

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Ruhl, Erika (University at Buffalo) and Sanna Lipkin (University of Oulu)**[25]** *Though we walk through the valley of the shadow of death: Co-burials and Identity in Pre-modern Northern Finland*

This paper specifically addresses the cultural construction of children's age and identity by examining the textiles and burial clothing from a series of pre-Modern mummified children's burials recovered from beneath church floors in northern Finland.

During the pre-modern era, children's burials in pre-modern Finland take one of three forms: (1) alone, in individual coffins (2) in association with other burials but still in their own coffin (3) co-burial, in the same coffin as others. This project specifically considers the temporal, geographic, and religious variations which impact these burials.

Pre-Modern Finnish identities; of "child" and "adult", "male" and "female" are explored through the detailed analysis of the garments with which these children were interred. This also offers the opportunity to consider what childhood meant vis-a-vis adult society, particularly in cases of co-burial. The roles to into which children were enculturated, and the unique boundary between "dead" and "alive" are explored through role identity theory, socialization theory and material and technological choice in the funerary textiles and manner of burial.

Ruhl, Erika [9] see Lipkin, Sanna

Rumberger, Jacklyn (University of Central Florida), Arthur Joyce (University of Colorado, Boulder), Sarah Barber (University of Central Florida), Stacie King (Indiana University, Bloomington) and Guy Hepp (California State University, San Bernardino)**[306]** *Comparing Isotopic Data for Diet and Mobility of Males and Females in the Lower Río Verde Valley, Oaxaca, Mexico*

This poster presents a comparison of the isotopic data from male and female individuals interred in the lower Río Verde Valley of coastal Oaxaca, Mexico from the Early Formative period, beginning in 2000 BC, to the Early Postclassic period, ending in AD 1100. Our previous work in this region has focused primarily on broad dietary changes through time, focusing little attention on comparisons by sex. Our sample for the present study includes 54 individuals: 31 males and 23 females. These individuals were buried at the sites of La Consentida, Cerro de la Cruz, Charco Redondo, Yugué, and Río Viejo—all of which are located in the lower Valley. With this poster, we aim to fill a gap in previous research by investigating inequality, access to resources, and mobility patterns between males and females. We base our findings on evidence from the study of stable carbon, nitrogen, and oxygen isotopes. Employing a sample that spans nearly three thousand years gives us an opportunity to observe changes and continuities in inequality, subsistence, and mobility over time.

Runnels, Curtis (Boston University)**[200]** *Discussant***Running, Garry (University of Wisconsin-Eau Claire)****[182]** *Sand, Rivers, Glacial Lakes and the Prairie-Forest Border: A Doc Holliday Student Heads North*

In this paper I link ongoing research along the eastern shore of Glacial Lake Agassiz (GLA) to Doc Holliday, the person who made it possible. Doc instilled in his students an interdisciplinary mind-set, and taught them to emphasize archaeological questions first and to consider past human groups as active agents of paleoenvironmental change as well as sophisticated responders to it. My research up North began where the ancestral Sheyenne River entered GLA from the west. After patient mentoring from Doc, results of that work suggested that such geomorphologically complex places are, in turn, ecological complex, exhibiting a tight mosaic of ecotones and microhabitats that provided a rich resource base attractive to prehistoric peoples. Later, the interdisciplinary SCAPE project (Study of Cultural Adaptations in the Prairie Ecozone project), was organized to apply that Holliday-inspired model. Doc's model was fruitfully applied in many localities along the prairie-forest border, from Alberta to Manitoba. Now, twenty-six years later, and once again working along the shores of GLA, I am introducing a new generation of researchers to the Holliday way of doing things, from his interdisciplinarity and generosity to students and colleagues, to his singular lunch menu and use of movie lines for field communication.

Ruscillo, Deborah (Washington University in St. Louis)**[298]** *Hunting the Helmet: Social and Practical Aspects of Building a Boar's Tusk Helmet*

From the earliest occurrence of the boar's tusk helmet from Grave Circle B at Mycenae (ca. 1650BCE) to the latest from a sub-Minoan tomb from the North Cemetery at Knossos (ca. 1000BCE) presents a span of 650 years of reverence for this important accessory of Bronze Age warriorhood. Depictions and copies of this helmet in other cultures, including in the Hittite, Egyptian, and even later Roman cultures, demonstrate its pervasive and deeply respected meaning. Helmets of this kind were known to have been passed down through generations and even stolen and gifted. Homer describes one helmet being passed through seven hands before finally ending up on the head of Odysseus. All this raises the question of why warriors did not make their own helmets. What was it about the production and ownership of these helmets that was so special? Why did this type of helmet develop a romantic and timeless reputation in art and stories? The assemblage of broken tusk refuse from Iklaina provides a unique opportunity to explore the techniques involved in the making of a helmet. Microscopy of tool marks and experiments on modern tusks will embellish the information we have on how the illustrious helmets were made.

Rush, Laurie [332] see Schulz, Margaret

Russ, Jon [86] see Colclasure, Cayla

Russo, Michael [34] see Bissett, Thaddeus

Russell, Morgan [254] see Dedrick, Maia

Russell, Nerissa (Cornell University)**[121]** *Guardians in Life and Death: Dogs at Neolithic Çatalhöyük and Beyond*

Dogs often occupy a spiritually ambiguous position in human-animal relations. Domestic but not livestock, they typically share human space and diet more than most herd animals. They are more likely to be considered persons, with souls—a trait they share with wild animals. Here I examine the spiritual status of dogs in early Near Eastern herding societies, as livestock-keeping spread through the region and it became possible to situate dogs in relation to other domestic animals as well as wild ones. I rely primarily on data from Çatalhöyük in central Anatolia, where I have extensive contextual information, supported by patterning from other PPNB/early Pottery Neolithic sites. Drawing on the contextual analysis of animal bones, burial practices, and animal representations, I argue that dogs were not regarded in the same way as wild animals, but that they held greater spiritual power than domestic sheep and goats. This power is evident through taboos: on human consumption of dogs, and on dogs entering occupied houses. However, dogs lived near specific houses, and in death their primary role was the protection of houses and their dead human inhabitants, rather than of individual humans.

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Rutecki, Dawn (Grand Valley State University)**[81]** *Movement and Places Between: The Power of Raccoons*

Informed by ethnographic accounts, iconography has helped clarify how people materialized otherwise intangible aspects of their realities. In this paper, I examine the use of raccoons in imagery from Mississippian archaeological contexts. By considering placement of independent raccoon motifs in iconographic scenes, as well as raccoon motifs associated with figures, I identify use patterns of raccoon imagery. Considering these iconographic data alongside faunal data generated from Spiro, Oklahoma, I argue that associations between raccoon motifs and other images, such as the Striped Pole Motif, suggest that raccoons may be associated with movement between the Middle World and other places. In addition, I suggest that considering possible links between the ability to access or wield this power materialized through use of raccoon bindings in various scenic constructions provides an opportunity to center indigenous ontologies in interpretations of material culture.

Rutherford, Cady [18] see Cortes-Rincon, Marisol

Rutkoski, Ashley (Kent State University) and Michelle Bebbler (Kent State University)**[301]** *Assessing the Distribution of Limestone Temper in Southern Ohio*

The earliest known occurrence of limestone temper usage in Ohio began sometime during the Middle Woodland Period, and becomes common in Late Woodland cave sites in the southern part of the state. However, little is known about the overall temporal and geographic distribution of this temper type. Toward this end, we analyze pottery throughout the southern Ohio Woodland period by assessing it with hydrochloric acid (HCl) for the presence or absence of limestone. The results of this examination have relevance for understanding the broader adoption of limestone temper.

Rutkoski, Ashley [44] see Eren, Metin

Ruvalcaba, Jose Luis (Instituto de Fisica UNAM), Paulina Guzmán (Instituto de Fisica UNAM), Edgar Casanova (Instituto de Fisica UNAM), Miguel Angel Maynez (Instituto de Fisica UNAM) and Isaac Rangel (Instituto de Fisica UNAM)**[293]** *Technical Examination of Mural Painting Fragments from Plaza of the Columns Complex of Teotihuacan: A Comparative Study*

The discovery of numerous Maya-style mural painting fragments during the archaeological excavations in the Plaza of the Columns Complex of Teotihuacan, sprouted debates concerning if these murals were drawn by a Maya artist. In order to compare the pigments composition and the pictorial technique of these paintings with mural paintings from the Maya area from the Classic Period, a non-invasive characterization of the thin ground layer of stucco and the pigments used in the painting discovered in Teotihuacan was carried out. The color palette shows red, yellow, blue, green, black and white pigments. First a False Color Infrared Imaging method combined with Optical Microscopy was used to contrast the pigments. Afterwards, several spectroscopic non-destructive techniques (X-ray fluorescence, Fiber Optic Reflectance and Raman Spectrometries), as well as Scanning Electron Microscopy (SEM-EDS) were applied for pigment identification. The main results of this comparative study are discussed in order to understand the degree to which local or non-local pigments were utilized by the artist in question.

Ruvalcaba, Jose Luis [89] see Lozano Bravo, Hilda

Ryan, Christopher (Vandenberg Air Force Base), Rick Bury (Rock Art Documentation Group), Jon Picciuolo, Antoinette Padgett (Rock Art Documentation Group) and Dan Reeves (Rock Art Documentation Group)**[214]** *Illuminating Event-Based Significance at Three Rock Art Sites on Vandenberg AFB, CA*

Although we now have highly technical equipment that allows analyses and observations of rock art in new ways, this should in no way diminish pursuing our personal sense of curiosity, ability to develop hypotheses out of hunches, and test those hypotheses as best we can, to discover layers of significance for a rock art site that no piece of equipment would ever be capable of detecting. One such area of inquiry is consideration of ephemeral, event-based ways rock art interplays with the surroundings—the way rock art may have been created against a backdrop of specific environmental conditions—in some cases conditions that are unique and clear, in other cases seemingly undistinguished. Discoveries may come slowly while a hypothesis is tested under various conditions. There are some obvious starting points—solstice and equinox, for example—but even then the opportunity for discovery comes but once a year. Three rock art sites on Vandenberg AFB, California, have pictographs and petroglyphs that were created in interplay with either sunrise or sunset during Winter solstice. This paper discusses the interplay at each site and the methods used to document these events.

Ryan, Ethan**[239]** *Chipping Away through Space and Time: A Macroevolutionary Approach to Household Spatial Organization*

Archaeological investigations at Housepit 54 within the Bridge River site have exposed seventeen discreet floors primarily dating to ca. 1500–1000 cal. B.P. In this poster, we draw data from a subset of the site's floors in order to address questions about the potential spatial and temporal relationships between the patterning of hearth-centered activity areas by primarily examining variability in lithic artifacts. Faunal remains and other features will also be included in analysis. Using the same methodological and theoretical approach for each floor, we examine feature form and function, lithic tool production and maintenance, animal and plant processing, taphonomic processes, and potentially, ritualistic practices in order to reconstruct the means by which the items within each activity area came to be co-associated. From these studies, we draw conclusions regarding the functional uses of these spaces on the house floor and their relationship over time. We then seek to address potential relationships between activity areas by the application of the ArcGIS spatial analysis toolbox and the examination of inter-assemblage variability. Results of this research permit us to develop a range of implications regarding household occupational history and sociality.

Ryan, Ethan [97] see Super, Clare

Ryan, Susan (Crow Canyon Archaeological Center)**[122]** *Sequencing Termination Events: Preparing Hearths for the Ritual Decommissioning of Ancestral Pueblo Pit Structures in the Northern U.S. Southwest*

With the development of a detailed contextual archaeology, we have gained the ability to identify how termination behaviors are related by subtle linkages in time and space. Individual actions that take place within the various portions of a structure are temporally distinct events, but are contextually related via ultimate decommissioning objectives. Each individual behavior qualified the meaning of those that preceded or followed it. Using multiple ancestral Pueblo sites in the Mesa Verde region dating to the Pueblo I–Pueblo III periods (A.D. 750–1280), this research examines how pithouse and kiva hearths were ritually prepared prior to the termination of the structure as a whole. Various preparatory behaviors identified include filling hearths completely with ash, placing material culture on and within hearth ash, and placing hatch covers over hearths prior to roof collapse. The

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timing of distinct decommissioning events is an important factor in determining the duration of the termination period as well as the order and nature of decommissioning behaviors.

Rybin, Evgyny [41] see Gillam, J. Christopher

Ryker-Crawford, Jessie

[337c] Moderator

[60] Discussant

Ryzewski, Krysta (Wayne State University)

[201] Discussant

Saban, Chantel [38] see Cromwell, Richard-Patrick

Sabatino, Giuseppe [85] see Iovino, Maria Rosa

Sabin, John (Florida State University) and Austin Cross (Florida State University)

[102] *Predictive Modeling of Paleoindian and Archaic Sites across Florida with GIS*

Florida's terminal Pleistocene and early Holocene archaeological sites form interesting settlement patterns when projected upon various geographic representations. Probably many unknown Paleoindian and Early Archaic sites still remain hidden and unstudied, as more than half of Florida's landmass was inundated during these cultural periods. Due to constraints in visibility and access, the practical limits of traditional survey hinder progress in discovering additional sites around the state. With the advent of geographic information systems and its spatial statistics capabilities, researchers working in the area are able to utilize remote-sensing as well as other techniques to uncover new sites. In addition, predictive models can be created through the incorporation of LiDAR scans available through state databases correlated with existing spatial data. These allow for novel displays of the archaeological landscape in Florida. Conventional methods in both terrestrial and underwater excavation and mapping can now be bolstered via the aid of GIS to get a more complete picture of Paleoindian and Early Archaic settlement patterns in the coastal plains of the American Southeast.

Sabin, John [102] see Cross, Austin

Sabloff, Jeremy (Santa Fe Institute)

[1] Discussant

Sabloff, Paula

[25] *The Political Agency of Pre-modern State Royal Women*

Royal women—queen consorts and princesses—were pawns in rulers' marriage game. But once established in their husbands' courts, they exhibited political agency through several means, e.g., spying, ruling in their husbands' or sons' stead, participating in the usurpation of the throne, etc. They were able to do so partly because of their position, which gave them access to power, and partly because of their ability to accumulate wealth, which enabled them to become patrons in their own right. This presentation defines agency in pre-modern societies and shows how royal women in eight pre-modern societies (from Old Kingdom Egypt to the Aztec Empire) exhibited similar patterns of agency.

Saenz Serdio, Martha Adriana and Mikaela B. Razo (Georgia State University)

[330] *Los montículos de Conil: Excavaciones recientes en la costa norte de Quintana Roo, México*

El Proyecto Costa Escondida, quien a través de un equipo interdisciplinario dirigido por los doctores Jeffrey Glover y Dominique Rissolo ha explorado la costa norte de Quintana Roo desde el año 2005, excavó en su temporada 2017, dos montículos del sitio llamado Conil; este es uno de los dos asentamientos más grandes registrados en la costa norte involucrados en cierta medida, en el comercio costero de la época prehispánica. Las estructuras presentan distintas formas, tamaños y técnicas constructivas, las cuales son nuevas evidencias contextualizadas sobre la temporalidad y las características del sitio. Los artefactos asociados recuperados como cerámica, lítica, concha, restos óseos animales y humanos permitirán en estudios posteriores, hacer comparaciones con el cercano sitio de Vista Alegre, excavado por el mismo proyecto durante el año 2016, para así explicar el papel que tuvieron estos sitios durante los periodos Formativo Medio al Posclásico.

Sagripani, Jose-Luis (RETIRED US Army), Dan Wise (Edgewood CB Center, U.S. Army), Ralph A. Anthenien Jr. (Propulsion and Energetics, U.S. Army), Elias Yoon (Edgewood CB Center, U.S. Army) and Christopher Kleihege (Zona Arqueologica Caral, Peru)

[46] *High Energy Generation and Elevated Temperature Potential of an Archaic Furnace in Ancient Peru*

We present an aerodynamic and thermal study of the architectonic complex including a fire pit (locally named Fogon Mayor) on top of the largest pyramid in Caral, a society that flourished between 2627 and 2020 cal B.C. near the Pacific coast of present day Peru. The air flow produced by wind on the corridor and ducts feeding the fogon was estimated by various engineering approaches that agreed (within 7–18%) with calculations obtained by fluid-dynamics-modeling of the whole pyramid. Results were validated by measuring wind gradient along the pyramid in Caral and by testing a scale model of the complex in a wind tunnel. The air flow produced by wind harnessed in the corridor and ducts was in remarkable agreement with the required for complete combustion of wood loads in the fogon. Thermal analysis indicates that after reaching steady state, combustion in the fogon would have produced between 95 KW and 350 KW at an operational temperature above 1120oC and likely between 1180 and 1350oC. This temperature range was confirmed by nondestructive spectrographic analysis of ancient burn samples in the walls of the fogon. The remarkable sophistication of the complex will be discussed from an engineering perspective.

[46] Chair

Saitabau, Henry [99] see Hu, Lorraine

Sakaguchi, Takashi

[45] *Regional Sociopolitical Transformations among Complex Hunter-Gatherers: A Macroregional Approach to the Late Jomon of Central Hokkaido*

This paper presents a new perspective on the study of the emergence of shuteibo (a type of communal cemetery enclosed by a circular embankment constructed during the Late Jomon) by employing a macroregional approach combining several analytical dimensions: 1) settlement pattern, 2) site scale, 3) household, 4) burials, and 4) interaction. This approach is crucial to understanding the sociopolitical evolution of community organization and

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status variability involved in the emergence of the communal cemetery. All of the evidence from the analyses suggests that the emergence of the communal cemetery appears to be tied to the dramatic changes in mortuary practices, economic systems, household organizations and settlement patterns during the latter half of the Late Jomon of central Hokkaido. These factors were also intimately related rather than being isolated factors represented by static models.

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Sakai, Sachiko (California State University Long Beach)

[164] *Changes in the Sources of Olivine-Tempered Ceramics and the Social Interaction Patterns among the Virgin Branch Ancestral Pueblo*

Various forms of social interactions seem to have been adopted as risk-buffering strategies in the marginal agricultural environment of the Virgin Branch Ancestral Puebloan region. The olivine-tempered ceramics are widely distributed in this region and the sources of olivine are in the highlands near Mt. Trumbull and Tuweep. Thus, the presence of olivine-tempered ceramics in the lowland Virgin area indicates economic and social ties between the highland and lowland populations. This ceramic compositional study using LA-ICP-MS suggests that the sources of the olivine-tempered ceramics found in the Mt. Trumbull and the lowland Virgin areas are not only in Mt. Trumbull but also in the lowland Virgin area, with the latter production centers having used olivine from Mt. Trumbull. The study also suggests that some of the olivine-tempered ceramics made in the lowland Virgin area were moved back to Mt. Trumbull. In this study, I explore the mechanisms of social interactions that moved olivine-tempered pots within various areas. In particular, I address the question of whether olivine-tempered ceramics were transported as a result of trading or human migration in various time periods. To answer this question, ceramic compositional data will be combined with optically stimulated luminescence (OSL) dating.

[164] *Chair*

Sakai, Sachiko [164] see Buck, Paul

Salazar, Diego [34] see Flores-Fernandez, Carola

Salazar, Julian (Universidad Nacional de Cordoba—CEH Segreti—CONICET), Valeria Franco Salvi (ISES CONICET—Universidad Nacional de Cordoba) and Dana Carrasco (Universidad Nacional de Cordoba)

[295] *Multiple Temporalities in the Andean Eastern Piedmont (Tucumán Province, Argentina).*

New perspectives from social archaeology have recently addressed the constitution of early village landscapes in the Northwest of Argentina. These new ideas have recognized the existence of multiple temporalities rather than the unilinear historical development of cultures or settlements conceived by previous normative and processual approaches. This dissertation will discuss the relevance of multi-temporal perspectives in order to understand social and political transformations in the long term process and the reproduction of social practices in the microscale, emphasizing the role played by ancestor veneration. Furthermore, we are interested in the diversity of material features in which ancestors were represented (e.g. cist tombs, huancas or menhirs, figurines, sculptures) with the purpose of generating measurable and testable data about this kind of archaeological record.

Salazar Chavez, Victor Emmanuel (The George Washington University), Cuauhtemoc Vidal-Guzman (Formative Etlatongo Project) and Jeffrey Blomster (The George Washington University)

[288] *The Materiality and Creation of Constructed Space at Etlatongo, Oaxaca, Mexico*

This paper explores the ontological relationality between humans and the creation of space during the Cruz B phase (1200/1150–850 BC) in the late Early Formative Etlatongo, in the Mixteca Alta of Oaxaca. In particular, we focus on how the use of bedrock afforded the construction of a 'lived' place. By looking at the materiality of its intrinsic properties, we argue that the Mixtecs of Etlatongo intentionally used bedrock as part of construction episodes in the formation of a public space so that its symbolic properties were able to emerge with the building's form and history. Considering that ethnographic accounts mention that Mixtecs understood reality as an indivisible whole animated with sacred life forces, we examine the ways in which this existential unity manifested during construction events and through the life histories of buildings; we link our Cruz B example with ethnographic practice through subsequent construction episodes at Etlatongo that illustrate the abiding interest in certain attributes of bedrock. Furthermore, we contemplate how the relational co-constitution of sediments, structures, and humans afforded the articulation of new relationships during the formation of Early Formative Etlatongo.

Saldana, Marie (Rice University)

[40] *Procedural Modeling for Archaeology*

The archaeology of landscapes and cities produces large quantities of data that presents a challenge to visualization. Libraries of procedural scripts or "rules" can help to streamline the process of modeling built environments and their topographical contexts, by identifying typical elements that can be adapted to empirical data through the modification of parameters. One of the advantages of procedural modeling as opposed to other types of archaeological visualization is that it allows for the rapid prototyping of many different iterative versions of a model, thereby allowing researchers to test different theories and present many different hypotheses side by side. A second advantage is the ability to connect, line by line, the code or "rules" that generate the models with source data and process documentation. This paper presents projects that use procedural methodology for archaeological reconstruction of cities, landscapes, and individual buildings.

[320] *Discussant*

Saldana, Melanie (California State University Los Angeles), James Brady (California State University Los Angeles), Robert Schmittner (Gran Aquifero Maya), Cristina Verdugo (University of California Santa Cruz) and Guillermo De Anda Alaniz (Instituto Nacional de Antropología e Historia)

[134] *Balankanche Revisited: Some Preliminary Observations*

With the discovery of passages sealed behind a blockage in 1959, Balankanche became the preeminent cave in Maya archaeology. Because so many of the intact vessels were incense burners and because of the Maya ceremony recorded as part of the investigation, Balankanche's ritual function was never questioned even though at that time most caves were thought to be habitational. E. Wyllys Andrews IV's monograph on the cave has remained one of the field's best reports.

In the summer of 2017, the Gran Aquifero Maya explored Balankanche in hopes of mapping additional underwater passages. While such passages

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have not yet been located, our investigations have made it quite clear that our knowledge of this cave needs to be updated in light of advances in cave archaeology over the last 50 years. These advances are most acutely apparent in the recognition of ritual features overlooked in the previous study as well as revealing a cave much larger and extensively utilized than previously reported. Based upon these preliminary observations, a more thorough restudy is recommended.

[157] *Chair*

Salem, Rebecca (University of Nebraska—Lincoln) and Effie F. Athanassopoulos (University of Nebraska—Lincoln)

[70] *Archaeology and Tourism in the Early 20th Century: Pompeii through a Photographic Archive*

Since its rediscovery in 1748, Pompeii has remained a destination for travelers and tourists from around the globe. Originally, a tourist destination during the Grand Tour, mainly in the 17th-18th centuries, Pompeii attracted the educated elite. In the course of the 19th century, the site was transformed into an open-air museum and became accessible to a broader group of visitors seeking an authentic experience. This presentation offers a glimpse at a tourist's experience in the early 1900s through a private archive of 32 original photographs. This collection of images can provide significant information on the history of archaeological excavation and tourism in Pompeii at the turn of the 20th century. GIS's Network Analysis is used to create a visualization of a route throughout Pompeii based on the locations and monuments captured in the photographs. These images can be correlated with excavation histories to ascertain which unearched features were observable to visitors and those that were inaccessible—an issue that is of continuing relevance to the present day. Furthermore, souvenirs acquired during the visit suggest that tangible objects played a significant role in the quest of tourists to capture the experience and memory of the site.

[70] *Chair*

Salgado-Flores, Sebastian (University of Texas at San Antonio)

[76] *Prey Choice and Politics: Modelling Postclassic Maya Wood Selection at La Punta, Chiapas, Mexico*

How did Postclassic Maya communities decide which tree species to harvest for firewood and timber in a diverse forest environment? Most studies of ancient tree selection have used the principles of optimal foraging to construct a baseline of expectations for interpreting archaeological charcoal datasets. This paper will explore the implications of such a model on the interpretation of wood charcoals from the site of La Punta in Chiapas, Mexico, while also considering how the political structure of Postclassic Maya society could have influenced the resource gathering behavior reflected in the data. La Punta is one of several contemporaneous Postclassic Maya sites located along the shores of Lake Tzibá'na in the Metzabok nature reserve in Chiapas, Mexico. In 2014, excavations in its public central plaza encountered terminal deposits of charcoal, ceramic, and animal bone. The charcoal from this communal context will be compared to charcoals found in domestic contexts elsewhere at the Metzabok sites to understand if (and how) wood selection strategies varied significantly based on context.

Salgán, Laura (CONICET/ IANIGLA Museo de Historia Natural de San Rafael), Gustavo Neme (CONICET/ IANIGLA Museo de Historia Natural de San), Sergio Dieguez (Museo de Historia Natural de San Rafael, Mendoza,), Paz Pompei (CONICET/ IANIGLA Museo de Historia Natural de San) and Adolfo Gil (CONICET/ IANIGLA Museo de Historia Natural de San)

[9] *Geoarchaeology, Geochemical and Spatial Distributions of the Obsidian Source in Southern Mendoza (Argentina): The Case of Coche Quemado Source*

During the last twenty years, four primary obsidian sources have been recorded in southern Mendoza province. The archaeological record indicates that all were used from the Holocene until pre-hispanic times, however many obsidian artifacts still are assigned to unknown sources. Recent surveys allowed discovery a new obsidian source called Coche Quemado. It is located in the western margin of the lower basin of the Rio Grande, in the Mendoza Andean piedmont. The obsidian from the source appears as nodules of variable sizes and very good quality for the manufacture of tools. The nodules are part of a conglomerate that corresponds to the geological formation Agua de la piedra (Oligocene). In this paper, we present the spatial distribution of the source, the variety of the macroscopic characteristics of the raw material and current trends in the archaeological record. Seventeen samples were analyzed by INAA and XRF by the Archaeometry Laboratory at MURR. The results indicate that the Coche Quemado source has a different geochemical signal than all other sources in the region.

Salisbury, Roderick B. (Austrian Academy of Sciences), Katharina Rebay-Salisbury (Austrian Academy of Sciences), Doris Pany-Kucera (Austrian Academy of Sciences) and Julie Dunne (School of Chemistry, University of Bristol)

[87] *Feeding Vessels in Later European Prehistory*

Small vessels with spouts, from which liquid can be poured, are known from settlements and graves of the European Bronze and Iron Ages. Sizes, shapes and decorations are highly variable, and although they generally fit the period-specific style, they represent a functional type. One explanation for this vessel form is libation—the act of pouring a liquid as a sacrifice to a deity. Recent discoveries, however, reinforce an association with children's graves and suggest a function as feeding vessels for babies and small children. Experimental work has confirmed that it is possible to feed small children with liquid from feeding vessels. In the course of the European Research Council funded project 'The value of mothers to society,' we are currently using GC-C-IRMS to test vessel fragments for organic molecules from liquids that may be preserved in the ceramic matrix. This paper will discuss if and how feeding vessels were used for the care of babies, small children, and the sick, as well as potential health implications of using alternatives to breastfeeding in prehistoric Europe.

[319] *Discussant*

Salwen, Stephanie (University of California, Los Angeles)

[171] *The Agency of Flowing Water in Human Mobility and Interaction*

Water is one of the most powerful agents of change on the planet. Flowing water can build and destroy landscapes rapidly in dramatic fashion as with flash flooding or gradually through incremental natural processes, shaping the terrain through sedimentation, erosion, and seasonal fluctuations in water flow. Within human societies, these waterways may be perceived as a source of danger, but also provide subsistence and non-subsistence resources, and serve as landscape features that alter how people move through the physical world. Though scholars widely recognize the extent to which humans have incorporated flowing water into cultural processes such as for trade, this paper focuses on the idea that waterways introduce possibilities and limitations to which communities respond. I consider several case studies in North America, with a focus on the Northeast and Mid-Atlantic regions, to show that flowing water is not a passive element of the human environment, but an active participant in the creation of physical and social worlds. Flowing water alters human mobility and resultant interaction spheres, particularly during period of significant social and economic transformation such as occurred during the early reorganization associated with early colonial presence along the Atlantic coast of North America.

Samba, Roger [114] see Douglass, Kristina

Samei, Siavash (University of Connecticut)

[217] *Chair*

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Sampeck, Kathryn (Illinois State University)**[271]** *Barrios de mulatos in the Izalcos Region of Colonial Guatemala*

While much scholarship has focused on indigenous-Spanish relationships in the construction of colonial Mesoamerica, a substantial and growing part of the population of colonial settlements were people of African descent. This trend was equally true in the Izalcos region of colonial Guatemala, what is today western El Salvador. This region was a crucial center in the developing trans-colonial economy because of its early leading role in the production of cacao, the tree whose seed is the main ingredient for chocolate. Because of the extraordinary place of the Izalcos in this colonial moment, the region experienced intense social, political, and economic pressures. One expression of colonial anxiety was the development of a social classification system known as castizaje. While some casta terms are part of the sixteenth-century vocabulary, the system of castas was not systematic until the eighteenth century. Censuses and other documentary evidence indicate that discrete barrios in Izalcos region towns were mostly Afro-Central Americans. This paper presents evidence of their material worlds, including spatial arrangements and portable material culture from the sixteenth to eighteenth century, the time of the development of racial ideologies in Spanish America.

[170] *Discussant***[271]** *Chair***Sampson, Christina (University of Michigan)****[81]** *Late Pre-Columbian Craft and Community at the Weeden Island Site (8P1)*

In the past, as in the present, political-economic relationships occur at multiple social scales: for instance, we recognize regional relationships of dominance or tribute, degrees of dependence or rivalry between trading partner communities, and patterns of collaboration or competition between neighboring households. Enduring inequalities may become established at any of these levels at different times. This paper will discuss the local organization of residential communities in the context of the Safety Harbor culture, which occurred on the west-central Gulf coast of Florida in late pre-Columbian times. Early Safety Harbor culture represents a transition from Woodland-period communalism to the hierarchical systems witnessed in the early historic period, though the timing and nature of these changes remains ambiguous. The limited amount of evidence from domestic contexts has made it difficult to understand the degree to which changes in regional settlement corresponded with new ways of managing local relationships. I will focus in particular on recent work at the Weeden Island site (8P1), including evidence for an emphasis on crafting special-purpose shell ornaments and the integration of crafting activities with other aspects of subsistence.

Samson, Alice (School of Archaeology and Ancient History, University of Leicester)**[123]** *When Is Creolization?*

Multiple episodes of identity transformation can be seen in the archaeology of Mona island. From the emergence of "Taino-ness" (cf. R. Rodríguez) in the 12th century, to the catastrophic (after S. Mintz) eruption of colonial identities in the 16th century. We contrast the dynamics and character of creolizations from a diachronic and material perspective by looking at the archaeology of 500 years of subterranean ritual landscapes of Mona. We ask whether an expanded use of the term creolization is useful to challenge the rigidity of concepts such as Taino, indigenous, Spanish, Christian.

[57] *Discussant*

Samson, Alice [283] see Cooper, Jago

Sam-Stanley, Christina [114] see Armstrong, Chelsey Geralda

San Román, Manuel J. (Universidad de Magallanes), Flavia Morello Repetto (Universidad de Magallanes, Instituto de la Patagon), Jimena Torres (Universidad de Magallanes, Instituto de la Patagon), Victor Sierpe (Universidad de Magallanes, Instituto de la Patagon) and Karina Rodríguez (Museo Antropológico Martín Gusinde, DIBAM, Chile)**[155]** *Maritime Hunter-Gatherers from Southernmost Patagonia (South America, Chile): Discussing Occupation Intensity and Resource Exploitation Strategies for the Central Strait of Magellan during the Late Holocene (2500 BP—XVIII Century)*

Maritime hunter-gatherers from Fuego-Patagonia are of special archaeological interest given their sudden emergence in the archaeological record and their highly specialized economic adaptation. In 2011 we carried an intense salvage archaeological excavation program along the central area of Strait of Magellan in Southernmost Patagonia, Chile. Here we present the results obtained from 1.546 m² of excavation, where a total of 18 archaeological sites, located along the eastern shore of the Brunswick Peninsula (south of Punta Arenas), were rescued. The excavations have generated an important archaeological assemblage of materials that provide significant information regarding the human occupations of this region between c. 2500 years BP and the XVIII century.

This study assesses the general characteristics of the occupations in this region, and discusses their technological components (bone and lithic instruments) and the faunal resources exploited. The results obtained are then compared with previous studies in this region. These data are used to discuss the intensity of human occupation in the area, and the role of marine and terrestrial fauna in the subsistence strategies of the maritime nomads from Southernmost Patagonia during the Late Holocene.

San Román, Manuel J. [153] see Belmar, Carolina

Sanchez, Kristie [335] see Lozada, Maria

Sánchez, Guadalupe [155] see Sánchez-Morales, Ismael

Sanchez Miranda, Guadalupe (Instituto de Geología-UNAM/INAH) and John Carpenter (Centro INAH Sonora)**[59]** *Pleistocene and Holocene People of Sonora*

Recent interdisciplinary investigations have revealed that the Sonoran Desert region is not only one of the earliest regions occupied by humans on the American Continent but also has one of the longest occupation records. The earliest Sonorans were proboscidean hunters in the Late Pleistocene, Archaic foragers and hunters in the Early and Middle Holocene and maize farmers in the Late Holocene. Several sites in the state of Sonora, Mexico have a well-preserved archaeological record with stratigraphic deposits that cover the last 15,000 years. Based upon multiple sources of evidence (pedological data, isotopes, pollen samples, macrobotanical remains, diatoms, and cultural material) primarily from the El Fin del Mundo and the La Playa sites; we explore the mobility, social and economic organization of the peoples of Sonora from the Pleistocene to the acquisition of maize.

Sanchez Miranda, Guadalupe [131] see Carpenter, John

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Sánchez-Morales, Ismael (School of Anthropology—University of Arizona), Kayla Worthey (School of Anthropology—University of Arizona) and Guadalupe Sánchez (ERNO—Universidad Nacional Autónoma de México)

[155] *A Gomphothere Kill and a Clovis Campsite: The Clovis Faunal and Lithic Assemblages from El Fin del Mundo, Sonora, Mexico*
El Fin del Mundo is a Clovis site with multiple activity areas located in the Sonoran Desert of Northwest Mexico. The site contains the only gomphothere (*Cuvieronius* sp.)-Clovis association yet known in North America and has produced one of the largest assemblages of diagnostic Clovis stone tools south of the US-Mexico border. Zooarchaeological and taphonomic analyses indicate that Locality 1 preserves the remains of two gomphotheres, aged to approximately 2 years and 8–19 years old, and that the spatial integrity of the site is well preserved. Clovis points and flakes are scattered in and around two bone concentrations, each containing the remains of a single gomphothere. Lithic materials are scattered across the stable upland surface to the south of Locality 1. The lithic assemblage from these uplands includes bifaces, unifaces, and blades. The artifact classes, tool types, and their contexts are indicative of a Clovis camp or camps where domestic tasks took place on the stable uplands surrounding the gomphothere kill.

Sanchez-Tornero, Francisco (Francisco J. Sanchez-Tornero)

[95] *The Use of White Engobe in the Formative Ceramics in Ojo de Agua Spring from San Antonio La Isla, Toluca Valley, Mexico*
In the present research analyzed by Scanning Electron Microscopy (SEM) and Energy-Dispersive X-ray (EDX) the Formative (ca. 1500BC-200BC) ceramics with white engobe, located in Ojo de Agua spring from San Antonio La Isla, Toluca Valley, with the objective of identifying the first manifestations of the use of white engobe and/or dye in a comparative framework and its cultural significance for the lacustrine societies in the studied regions. Micrometric images and chemical data identify fossil diatom structures in the engobe, indicating that it is the raw material used for the elaboration of the white engobe applied to the Formative ceramics in the Alto Lerma basin and the southern basin from Mexico. The chemical-elemental results suggest that the use of the diatom fossil as a dye material was a chromatic tradition rooted in Alto Lerma and in the south of the basin of Mexico, which prevailed in riverside communities for millennia. The similarities and specific variations, recorded in archaeometric information, allow the recognition of the relationship between different human groups, the technique and/or the techniques used, serving as a basis for knowing the cultural legacy that identifies a population group.

Sandberg, Paul [143] see Monroe, Cara

Sandweiss, Daniel H. (University of Maine)

[84] *Discussant*

Sandweiss, Daniel H. [135] see St. Amand, Ani

Sanger, Matthew (Binghamton University)

[156] *Chair*

Sanger, Matthew [156] see Hunt, Rebecca

Sanger, Matthew [156] see Raymond, Tiffany

Santana Sagredo, Francisca (Research Laboratory for Archaeology and the History of Art, University of Oxford), Petrus le Roux (University of Cape Town), Rick Schulting (University of Oxford), Julia Lee-Thorp (University of Oxford) and Mauricio Uribe (Universidad de Chile)

[249] *Travelling across the Atacama Desert: New Evidence for Human Mobility in Northern Chile Based on Oxygen and Strontium Isotopes*
The study of human mobility is key to understanding the social and cultural dynamics of the pre-Columbian groups that inhabited northern Chile's Atacama Desert. Material culture suggests that during the Late Intermediate Period (AD 900–1450) individuals frequently crossed the desert from the coast to the Andes and vice versa. Fish remains have been found in the interior valleys, and inland textiles and crops at the coast. This paper explores mobility in northern Chile through the application of strontium and oxygen isotope analyses on human teeth from several archaeological sites. First we present a local bioavailable strontium baseline for the study area, based on plant and animal remains, which helps to alleviate the scarcity of bioavailable strontium isotope data for northern Chile. Results show that non-local individuals of both sexes were buried in the dispersed cemeteries of Pica 8, Quitor 6 and Los Verdes 1. These results support the idea that varied groups of individuals moved across the landscape, complementing and augmenting the larger discussion on mobility patterns in the Atacama Desert.

Santasilia, Catharina (University of California, Riverside)

[262] *Tlatilco Revisited*

Since Tlatilco was discovered in the 1930s by Miguel Covarrubias, our understanding of the Early Formative site has changed with a steady flow over the last 80 years. During the 1940s, 50s, and 60s Tlatilco was excavated revealing the dynamic of the site, with the objective to establish the chronology and preserve the many burials. There seems to be extensive evidence that Tlatilco in fact was more than a burial site. The established (calibrated) dates for Tlatilco to be between 1200–900 BCE which makes Tlatilco contemporary with many other significant cultures in Central Mexico, including: San Lorenzo and Las Bocas. My research involves gathering iconographic and archaeological data from major collections all over the United States, as a supplement to understand the variation within the material expression of this ancient culture. Through comparative techniques, as well as utilizing advanced laboratory analysis, I am investigating the diversity of the community of Tlatilco and its neighbors. New observations and research has yielded changes to our previous understanding of Tlatilco.

Santiago, Louis [76] see Fedick, Scott

Santoro, Calogero (Universidad Tarapacá, Instituto Alta Investigación, Arica, Chile) and Mauricio Uribe (Departamento de Antropología, Facultad de Ciencias)

[100] *Inca Imperial Colonization and Ethnicity of Northern Chile*

Were the Inca aware of the restrictive possibilities for labor and productivity in the extreme arid territories of the Atacama Desert of northern Chile? How did the Inca officials manage to obtain information that enabled them to identify (i) strategic enclaves for farming, installing administrative and political nodes, exploiting and processing ores, and (ii) a selection of conspicuous mountains to place hilltop shrines? Here we discuss the idea that the rapid, extensive, and efficient expansion of the Inca into northern Chile was not the consequence of random decisions. On the contrary, the three study cases we present, the Zapahuira, Tarapacá Viejo, and Catarpe nodes, show strategic geopolitical decision-making, by reducing conflict of interest for resources and land between foreign polities and local leaders, who were active agents in promoting and facilitating the State programs. Furthermore, by transforming the economic, political, and ideological system, the Inca integrated northern Chile into a pan-continental political and economic network, and ethnic identity through the Qhapaq Ñan, among other mechanisms.

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Santoro, Calogero [86] see Mcrostitie, Virginia

Sanz, Nuria (Head and Representative of the UNESCO Office in Mexico)
[213] *Discussant*

Sara, Cesar (Pontifical Catholic University of Peru) and Eisei Tsurumi (University of Tokyo)

[64] *Renovation of Temples during the Kotosh Mito Phase: 2016 Excavations at Kotosh, Huanuco, Peru*

In the 1960s, the University of Tokyo excavated the archaeological site of Kotosh (department of Huanuco, Peru) and discovered monumental constructions of a ritual character which predate the first appearance of pottery in the region. The superposition of many temples (ritual chambers) suggests that there were repeated architectural renovation events during the Late Preceramic occupation referred to as the Kotosh Mito Phase. However, the chronological position of the Kotosh Mito Phase has been uncertain because the deepest level of the mound was left unexcavated to preserve its important cultural heritage features such as the Templo de las Manos Cruzadas. Furthermore, the intensive alteration by the Early Horizon occupation made the architectural transition from the Preceramic Period to the Initial Period unclear. The authors will present new data from excavations in 2016 of the same mound, aiming to elucidate the complete process of renovation of temples during the Kotosh Mito Phase.

Sara, Timothy [22] see Gollup, Jasmine

Sario, Gisela [154] see Cattaneo, Roxana

Sassaman, Kenneth (Univ of FL—Anthropology), Asa Randall (University of Oklahoma) and Neill J. Wallis (Florida Museum of Natural History)

[122] *The As(h)endant: Cosmological Work of Material Traces of Burning in the American Southeast*

Archaeological contexts of the American Southeast are rife with ash deposits that go beyond the residues of mundane burning activities. Burials and other pits at Stallings Island have layers of wood ash sandwiched between charcoal and shell; some rockshelters of the Cumberland Plateau contain successive layers of ash, each capped with earth; freshwater shell was mixed with ash to fill a massive pit on Silver Glen Run; and in north-central Florida, a dried sink filled with peat was burned to produce an ash layer containing scores of vessels. These and other cases span millennia and vast geography, and thus do not lend themselves to generalizations about the meaning or purpose of ash as a medium of ritual practice. However, in the broader cosmological framework of the Native Southeast, ash is a substance that was brought into existence through a transformation of matter that connected the Lower and Upper Worlds. In this sense, ash was indexical of cleansing or rebirth, much as the lifting smoke of a burning fire or the rising celestial bodies of the eastern horizon. As an ascendant, ash interacted with other agents to effect change or ensure desired outcomes while offering technical options for materializing expectation.

[292] *Discussant*

Sassaman, Kenneth [95] see Gilmore, Zackary

Saucedo, Alfredo

[19] *Maíz y olmecas: una truculenta trayectoria*

Tradicionalmente en la arqueología de la costa del golfo y en específico, dentro de la zona nuclear olmeca se había propuesto que uno de los principales productos que se consumieron durante el preclásico por la sociedad olmeca fue el maíz. Aunado a esto las constantes representaciones de esta planta dentro del sistema de registro olmeca, sugerían una tendencia muy marcada y una preferencia inminente a la producción de este alimento, ya sea con fines ceremoniales o para consumo. Sin embargo, recientemente se ha observado que durante la larga trayectoria ocupacional de este grupo en la zona nuclear hay diferentes tendencias alimenticias que indican la diversificación de alimentos y la preferencia o viabilidad de algunos productos sobre otros en distintas épocas. Por lo tanto, a través de la iconografía inmersa en el arte escultórico masivo y portátil olmeca, y de los datos paleoetnobotánicos disponibles se traza la trayectoria y cambios más notorios en la dieta olmeca para lograr un acercamiento a los procesos que desembocaron en esta selección de alimentos. En este sentido, ¿Cómo, cuándo, dónde y en que nivel tuvo preferencia el consumo del maíz?.

Saunders, Cece (Historical Perspectives, Inc.)

[203] *What a Pain in the Ash....Traveling That Bumpy Road*

How did man, horse and wagon traverse the muck and marshes that so often surrounded America's earliest coastal towns? Without the benefit of iron, steel, and concrete, the 18th century road builder could span muddy stretches with a corduroy road. This road type was made by placing whole, sand-covered logs perpendicular to the direction of the road in low or swampy areas. The corduroy road was an essential technique for establishing networks between communities and critical resources. The Ash Creek Corduroy Road is a preserved archaeological site directly associated with the colonial history of Fairfield, CT. A tidal grist mill and a dam were established ca. 1750 at the mouth of Ash Creek. A corduroy road was constructed along the Creek's salt marsh to link an early town road, the mill, and the Black Rock residents. Today, an intact 53-foot section of this road is visible at low tide, resting 36" below a mat of cord grass. It survives as an evocative remnant of a colonial road system. It appears to be the oldest remaining example of a preserved wooden road in the state and is a protected Archaeological Preserve.

Saunders, Hunter [182] see Miller, D. Shane

Savage, Sheila (University of Oklahoma), Scott Hammerstedt (University of Oklahoma) and Amanda Regnier (University of Oklahoma)

[119] *Life on the Margins: Eastern Oklahoma's Arkansas Drainage between 1300 and 1500 CE*

Beginning around 1100 CE, residents of the eastern Oklahoma Arkansas River drainage built mounds, shared elaborate mortuary rituals, and on some level participated in a maize-based agricultural system. These aspects of the broader Mississippian pattern were centered at Spiro Mounds. Beginning in 1300 CE, people began abandoning the mound sites on the margins of the Southern Plains. As climate conditions worsened in the fifteenth century, the residents of the Arkansas drainage adopted Plains Village strategies, including bison hunting. The emergence of this new way of life coincided with the widespread collapse of Mississippian polities in the east.

Savarese, Michael (Florida Gulf Coast University), Antonio Arruza (Florida Gulf Coast University), Victor Thompson (University of Georgia), Karen Walker (Florida Museum of Natural History) and William Marquardt (Florida Museum of Natural History)

[35] *Paleoenvironmental Context of Calusa Cultural Evolution on Mound Key, Estero Bay, Southwest Florida*

The Calusa occupied Mound Key in Estero Bay, southwest Florida, from approximately AD600 to the 1700s with this location serving as a cultural and political center from ca. AD950. As a fisher-gatherer-hunter society, they heavily exploited the shellfish and finfish resources of the estuary. During this time, Estero Bay's estuarine ecology and coastal geomorphology developed in response to variable rates of sea-level rise (SLR) and climate change.

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Our work integrates archaeological and geological perspectives on this intertwined history of the Calusa and their environment. Specifically, we found correlations between shifts in estuarine salinity of the bay, as it closed, and the types of shellfish exploited by its inhabitants. As salinity lowered in the bay, favoring oyster reef productivity, the Calusa shifted away from more marine-based shellfish and to more heavily exploit oyster resources for surplus production. Concomitant with these shifts were changes in site organization and layout, which included construction and alteration of new landforms and features (e.g., canals and mounds). Estuarine conditions today are comparable to those in Calusa's later history, but SLR acceleration threatens a shift back to the earlier estuarine ecology and geomorphology. Consequently, Calusa's historical ecology provides insights for future environmental management of the bay.

Savarese, Michael [35] see Marquardt, William

Savelle, James [16] see Howse, Lesley

Sawchuk, Elizabeth [198] see Chritz, Kendra

Sawyer, Alicia (School of History, Classics, and Archaeology, Newcastle University)

[23] *Beyond a Record of Environmental Change: The Influence of Variability in Peat Composition on the Archaeological Record in Viking Age Iceland*

Research suggests non-woody resources, such as peat, can serve as unique repositories of environmental change. This paper discusses how peat serves such a role, and sheds light on the how these processes affect the archaeological record, an aspect of environmental change that has been overlooked. During the colonization of Iceland in the 9th century AD, early Icelanders (Vikings) began to affect and be affected by local environments. Viking colonization led to rapid deforestation of woodland resources, resulting in soil loss and increased aeolian deposition. As wood was scarce, peat and turf were commonly used as fuel sources and construction materials in Iceland. Due to the ubiquity of these materials, changes in the quality of peat and turf potentially influenced past human behavior (i.e., fuel selection, resource management, and waste production) and the archaeological record (i.e., waste disposal, farm mound development, and landscape alteration). Using micromorphology and geochemical analyses on experimentally combusted peat from a continuous bog sequence, this research will identify compositional changes and shifts in fuel quality over time. These data will provide information on resource access, wealth distribution, site formation processes, and human-environment interactions.

Sawyer, Elizabeth (Monticello Department of Archaeology), Katelyn Coughlan (Monticello Department of Archaeology) and Crystal Ptacek (Monticello Department of Archaeology)

[241] *Identifying Source Deposits in Monticello's South Pavilion*

During the winter of 2016, archaeologists excavated the interior of Monticello's South Pavilion in advance of restoration. The South Pavilion's basement served as the original kitchen until 1808, when it was connected to the main house via the South Dependency Wing and repurposed into a wash house. In order to level the floors between the South Pavilion basement and the new, immediately adjacent wing, Thomas Jefferson's enslaved laborers used three feet of sediment to raise the basement floor. Recent excavations removed nearly a third of this fill. Preliminary analysis presented at the 2017 SHA Conference sought to establish a chronology for these South Pavilion deposits. Results also indicated a strong resemblance in both sediment and artifact composition to strata excavated in the nearby Kitchen Yard by Dr. William Kelso during the 1980s and re-analyzed in 2008. Using statistical analyses, this poster expands upon those findings to check the validity of one origin source for both the Kitchen Yard and South Pavilion deposits. Using a stratified random sample of Kitchen Yard deposits with established, pre-1809 depositional date ranges, we assess similarities in ceramic assemblages to the fill in the South Pavilion basement.

Sayle, Kerry [29] see Hamilton, Derek

Sayre, Matthew (University of South Dakota), Aaron Mayer (South Dakota State Historical Society), Corina Kellner (Northern Arizona University) and Justin Jennings (Royal Ontario Museum)

[335] *Ritual Foods Compared with Daily Diet at Tenahaha in the Cotahuasi Valley during the Andean Middle Horizon*

People in the past actively chose which foods were used in different contexts. Here we compare plant remains with human skeletal remains to understand dietary practices at Tenahaha in the Cotahuasi Valley (AD 850–1050). Tenahaha was built during the Middle Horizon as a communal space to take advantage of new social interaction spheres, stimulated in part by the Wari state. Tenahaha includes burial areas as well as food storage and preparation zones. Macrobotanical remains were found in public rather than private locations, indicating communal production of food and drink. Quinoa, tubers, and molle were ubiquitous at the site, along with maize, with chicha made of maize/molle produced and consumed there. These remains suggest a ritual or communal diet heavy in C3 foods, although taphonomy and food processing will also be considered as mediating factors. In comparison, stable isotope analysis of individuals buried at the site compare favorably to the elite inhabitants of the Wari secondary city of Conchopata, who ate a diet dominated by C4 plants (maize) and meat (maize foddered camelids). Taphonomic concerns should not be ruled out, but communal use of foods with deeper histories than maize suggests active differentiation between daily and ritual diet at Tenahaha.

Scaffidi, Beth (Arizona State University)

[335] *Violent Ritual and Inter-regional Interaction during the Early Intermediate Period and Early Middle Horizon in the Majes Valley, Arequipa, Peru*

Artifacts from yungas and coastal zones of Arequipa, Peru show varying degrees of integration into the ideological and material networks of prominent neighboring cultures of the Early Intermediate Period (Nasca) and Middle Horizon (Wari). Ongoing research suggests these communities and towns were well-integrated into foreign trading networks, whether through direct interaction with foreign traders or down-the-line exchange. While foreign-produced goods and emulation of foreign goods or architectural canons can provide circumstantial evidence of inter-regional connectivity, isotopic analysis of human skeletons can offer concrete evidence that non-locals visited, resided in, or were buried in a community. This research synthesizes results of isotopic analysis of human skeletons from the cemetery of Uraca, in the Majes Valley, and describes the artifact assemblage recovered. The data presented will demonstrate that the individuals interred at the site were linked to material and ideological traditions of Nasca and other desert and coastal valleys through mortuary practices and violent trophy-head taking, while there is only limited evidence that they emulated Wari material culture or tapped into Middle Horizon trade networks. The results suggest that Uraca's interaction with foreigners was ideologically linked to rituals of violence and death, rather than materially linked to economic and subsistence practices.

[335] *Chair*

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Scarborough, Vernon (University of Cincinnati) and Christian Isendahl (University of Gothenburg)**[213]** *The Early Role of Biogeography in the Creation of Modern Ecology Assessments*

The landscapes and natural environments within the tropics and their wet-dry forests were the seat for understanding modern ecological principles. Initiated by Alexander von Humboldt and fundamentally altered theoretically by Charles Darwin, contemporary views of the couple human-nature dynamic were "discovered" in the New World first. Unlike the prominent worldview identifiable in the Near East and subsequently in early colonizing Europe in which "man must have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moves upon the earth" (Genesis 1:28), Central and South America settings show the inextricable affinity between humanity and the slowly modified biogeography. Clearly denudation did occur, but it was never on the scale practiced in the West. Technological thresholds and breakthroughs seldom accelerated through time; and the role of labor in an environment without widespread domesticated animals and zoonotic diseases made for a different ecological emphasis and a worldview that cultivated the role of plants, animals and their interplay. The domestication process was markedly different than in the Old World, one that less honored and preserved the greater environs.

Scarborough, Vernon [76] see Lentz, David L.

Scarry, C. Margaret (Univ. of North Carolina-Chapel Hill) and W. Flint Dibble (Wiener Lab, American School of Classical Studies a)**[298]** *Bridging the Divides at Azoria: Environmental Archaeology at an Archaic Greek City*

Excavations at the Archaic (7th-6th centuries B.C.) city of Azoria on Crete demonstrate the value of intensive environmental archaeology for understanding an historical Greek context. Texts document the important role of food and dining to ancient religion and politics; however, ancient authors presented a normative picture and excluded details they assumed were common knowledge. Studying plant and animal remains can "ground-truth" ancient sources on foodways and provide contextual nuances not afforded to historians.

The prevalence of a few domesticates presents difficulties in fields largely based on discussions of taxonomic variability, especially when trying to bridge the divide between archaeobotanical and zooarchaeological assemblages. While it is difficult to relate the numerous goats to the abundant olives at Azoria, our interdisciplinary study presents the opportunity to examine varied contexts. Deposition of plant remains happens largely before the meal is served while animals are largely deposited after dinner. Our analyses reveal that conspicuous storage and communal dining formed the backbone of the political structure at Azoria. The specific foodstuffs stored and consumed in civic buildings were much the same as those consumed in townhouses. However, the quantity and elaboration of foodstuffs within communal dining structures created a convivial community at Azoria.

Schaafsma, Polly (Research Associate, MIAC\LOA)**[131]** *Proposed Historical Origins of the Tablita Dance of the Rio Grande Pueblos*

The Tablita Dance, commonly known as the Corn Dance, is a well-known event among the Rio Grande Pueblos where, in connection with saint's days, it is performed during the growing season. The corn dance may occur at other times as well, but without a linkage to the village patron saint. A number of diverse factors, however, indicate that this dance as known today is a post-Hispanic aspect of Pueblo ceremonialism. In addition to the dance's obvious link to the Catholic patron saint of each Pueblo, is the bannered standard of proposed native Mexican origin, and finally the absence in prehispanic Pueblo art for the distinctive iconography of this dance. In this paper I explore this proposal with the supporting evidence from Aztec codices, Spanish documents, and prehispanic Pueblo rock art and kiva murals to suggest that in origin, this ritual occasion is more complex than a simple synthesis of homage to a patron saint tacked on to a preexisting ancient indigenous ceremony.

Schaan, Denise [116] see Maezumi, S.

Schach, Emily (Arizona State University) and Jane E. Buikstra (Arizona State University)**[66]** *Gender at Chiribaya Alta: A Multiple Correspondence Analysis of Funerary Offerings*

Chiribaya Alta is a Late Intermediate Period cemetery site located in the Osmore drainage of Southern Peru and is the largest, most elaborate site associated with the Chiribaya polity. Previous univariate mortuary analyses at Chiribaya Alta have identified gendered grave goods, related to roles during life. These analyses, however, assume a binary distinction between males and females by only testing graves with sexed skeletons. Here, we use a multivariate technique, multiple correspondence analysis, to analyze the graves at Chiribaya Alta. Sex is not included in this analysis and thus, the MCA groups graves without assuming a binary construction of sex. Instead, sex information is only used in the interpretation phase of the analysis. Our MCA confirms that Chiribaya graves are differentiated by gender based on funerary objects but shows greater variation in the graves of females in comparison to males, suggesting that women's gendered activities were more variable than those of men. Furthermore, the overlap in the graves of males and females suggests that these gender categories are not binary opposites, and thus we suggest an alternative system for conceptualizing gender identity in the Chiribaya polity.

Schachner, Gregson [218] see Duff, Andrew

Schaefer, Benjamin (Department of Anthropology, Georgia State University), Sloan Williams (Department of Anthropology, University of Illinois) and Nicola Sharratt (Department of Anthropology, Georgia State University)**[270]** *Constructing a Colony: Investigating Stress from Endogenous Cortisol in Archaeological Hair from a Lupaqa Colony at Estuquiña*

Using enzyme-linked immunosorbent assay (ELISA) to obtain segmented cortisol levels, these cortisol levels can reconstruct periods of heightened month-to-month duress leading up to death. Segmented cortisol levels provide a more nuanced understanding of stress variation through biocultural change and lived experiences in antiquity. This study aims to reconstruct periods of duress through assaying endogenous cortisol in archaeological hair (n=11) from the site of Estuquiña and investigate the effects of a mitmaquna development. The site is located outside the modern city of Moquegua in the Moquegua Valley of southern Peru and was likely established as a Lupaqa colony settlement during the Late Intermediate Period (AD 1100–1476); a period characterized by regional development and political transition throughout much of Andean South America. Preliminary results suggest that there is a difference in cortisol levels in juveniles (18–64±19 ng/g) compared to adults (150–248±68 ng/g) and clinical data (104–134±40 ng/g). This exploratory research suggests that the variation in cortisol levels at Estuquiña differs based on sex and pre- and post- pubertal development at time of death.

Schaefer, Jonathan (University of Missouri) and Leslie Aragon**[91]** *Regional Influences on Cliff Phase Ground Stone in the Upper Gila Area*

Ground stone tools are a productive means of studying subsistence and technology practices in the American Southwest. Excavations at the Gila River Farm Site and other nearby settlements have provided a large collection of ground stone objects used for various tasks. Here, we evaluate the use of the tools from these sites and compare their morphology to tools recovered elsewhere in the Kayenta and Mogollon areas. Regional and temporal variations in ground stone characteristics provide insights into how earlier archaeological traditions influenced ground stone tool morphology in the Cliff phase in southwest New Mexico.

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Schaefer, Richard (Historical Perspectives, Inc.)

[203] *"His Beloved Aunt Polly": The Aunt Polly Archaeological Preserve and the Life of the First Sherlock Holmes*

The most renowned stage portrayal of Sherlock Holmes, it was William Gillette who brought Conan Doyle's detective to life for audiences as well as for every actor that followed in his footsteps. Most importantly, he originated the Holmes "look": the deerstalker hat, the curved pipe, and the Inverness cape. In his day, Gillette was the wealthiest actor in the country. He spared no expense in building his eccentric stone "Castle," perched high above the Connecticut River, and in the creation his beloved Aunt Polly, a naphtha-powered yacht he commissioned in 1899. Moored at the riverbank beneath the Castle, Aunt Polly burned to the waterline in 1932 under mysterious circumstances. Research and underwater archaeology on the Aunt Polly and her remains are now being incorporated into the Gillette Castle's museum and waterfront park.

Schäfer, Manfred [83] see Borck, Lewis

Schaffer, William (Arizona State University)

[337b] *Mitochondrial DNA Results from the Kormantse Archaeological Research Project*

Kormantse is an influential and celebrated place name in the African Diaspora. Some scholars estimate that more slaves were transported from Kormantse and nearby Fort William in Anamabo than most other West African ports. For the last ten years, the Kormantse Archaeological Research Project (KARP) has been studying the human skeletal remains recovered from the site. A combination of PCR-based techniques, targeted enrichment, and next-generation sequencing of Kormantse teeth has confirmed endogenous DNA that is associated with common African haplogroups. While it is expected that little DNA will survive in the tropical and subtropical latitudes of Africa, this study demonstrates that small amounts of aDNA—in some cases informative of mtDNA haplotype—can survive extensive tropical environs and humidity as well as aggressive seasonal turnover provided that the remains are from recent excavations, and are controlled for DNA contamination during and after the field season. These haplogroups are discussed within the context of the African Diaspora and its occurrence in areas of the Americas, particularly the Caribbean, circum-Caribbean and South America.

[337b] *Chair*

Scharf, Elizabeth (University of North Dakota)

[35] *Vegetation Change at Poverty Point, Louisiana*

This paper presents pollen data as a proxy of past vegetation at Poverty Point, a large Archaic mound site in northeast Louisiana. The paleoecological focus of this presentation revolves around the rate and nature of change over time. Patterns and changes in taxonomic diversity are presented and discussed in light of environmental productivity. The rate of vegetation change is calculated and related to ecosystem stability. Additionally, changes in individual taxonomic representation are examined to determine if change over time occurs piecemeal or to entire plant communities. Such findings will be related to the impact of vegetation change on people and the role of anthropogenic change in shaping the local environment.

Schauer, Peter (UCL Institute of Archaeology), Kevan Edinborough (UCL Institute of Archaeology), Stephen Shennan (UCL Institute of Archaeology), Andrew Bevan (UCL Institute of Archaeology) and Mike Parker Pearson (UCL Institute of Archaeology)

[29] *Explaining Variation in the Scale of Neolithic Quarry and Mine Production*

In recent years new methods have been developed for using summed radiocarbon probabilities as a population proxy and for comparing radiocarbon datasets to establish whether they are significantly different from one another, while taking into account sampling variation and the patterns in the calibration curve. On the basis of newly collected and updated radiocarbon data on the dating of Neolithic mines and quarries in Britain, Ireland and continental Northwest Europe, the paper will present the results of using these methods to compare the chronological distribution of mine and quarry exploitation with regional fluctuations in the population of early farmers and in the scale of forest clearance that they undertook, to test the hypothesis that the intensity of production depended on variation in the demand generated by the population and its clearance activities. It will do this by simulating large numbers of mine date samples on the assumption that they represent random samples of the population and clearance distribution and comparing these with the observed distribution.

Scheffler, Kirk [240] see Harris, Ashley

Scheiber, Laura (Indiana University) and Kirsten Hawley (Indiana University)

[101] *A Picture Is Worth a Thousand Words: Reading the Past and (Digital) Interpretation in the 21st Century, a Case Study from the Bighorn Basin, Wyoming*

During 2016 and 2017, Bighorn Archaeology participants used on-the-ground photogrammetric methods and aerial photography to document features at archaeological sites throughout the Bighorn Basin and surrounding foothills in northwestern Wyoming. The sample includes both horizontal and vertical features such as stone circles (tipi rings), a hunting driveline, defensive rock bulwarks, and pictograph rock shelter overhang panels. In this presentation, we discuss our evolving methodology and the resulting three-dimensional models and orthomosaics, along with implications for future uses of these techniques. The applied methodology highlights the potential of this emerging technology to rapidly document and assess site features when on-site time is limited. We also discuss issues related to processing, affected by proprietary software availability and computer memory capacity, especially for building models while in the field. High-precision technology applied to document surface architecture and fragile rock art on the mountains and plains of western North America in the last decade has focused on establishing regularized patterns of domestic life and distributions of resources across the broader social landscape. Layering in three-dimensional models produced using hundreds of photographs from a DSLR camera further directs these efforts and re-defines expectations for archaeological interpretations, especially in cultural heritage and preservation dialogues.

Scheiber, Laura [124] see Ortman, Scott G.

Scher, Sarahh (Salem State University)

[216] *Seeing Gender Ambiguity in Moche Visual Culture*

This paper explores the visual language of gender expression in Moche art, seeking to determine the relationships among ambiguous gender, social role, and status in Moche visual culture. The Moche are well-known for their representations of warriors and warfare, as well as the sacrificial rituals associated with the taking of prisoners. However, this martial focus was not consistent across Moche time and space, and regional variations indicate the existence of a potential field of expression which was used differently in different areas and times. In this paper, I explore that potential field of expression, and the representations of gender that could exist outside of the strongly-gendered warriors and priests. I focus instead on the center of a Moche spectrum of gender that had women at one end and men on the other. Clothing could cover areas of the body associated with gender identity, and diagnostic elements such as hairstyle could be covered or simply not expressed. In addition, contextual elements such as ornaments and adornments, items held in the hand, or settings can give clues to social roles and status relative to the warriors and priests, and form a greater understanding of how the iconography deals with gender.

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Scherer, Andrew (Brown University)

[163] *Recent Investigations of War, Economy, and Population at Piedras Negras, Guatemala*

This paper presents a synthesis of current results from the 2016–2017 research seasons at Piedras Negras, Guatemala with implications for understanding warfare, economy, politics, and population dynamics throughout the ancient kingdom. First, while project members had identified a series of fortified centers and palisades in the region's hinterlands, the recent identification of fortifications in the near periphery of Piedras Negras makes it one of the rare polity capitals in the southern Maya lowlands where such features have been reported. Second, while regional research had revealed evidence for craft production and exchange, prior evidence for craft production at Piedras Negras was relatively scant. Recent excavations have significantly altered this perspective and changed our understandings of economic integration at the capital and across the kingdom. Third, prior subsistence and diet research largely focused on soils and bone isotopes, while the present project adds the complexity of research into plant economies. Further, project participants have begun to draw together the disparate threads of settlement research to produce a more integrative picture of settlement dynamics. Finally, a return to Piedras Negras has also afforded the opportunity to further conserve the site and engage with local stakeholders for long-term protection.

[292] *Discussant*

[163] *Chair*

Scherer, Andrew [109] see Golden, Charles

Schermer, Shirley J. [166] see Tiffany, Joseph

Schiappacasse, Paola (Universidad de Puerto Rico)

[138] *Stored and Forgotten: Academic Research Projects Using Archaeological Collections*

Around the world, there are a large number of archaeological collections in the repositories of museums, universities, foundations, government agencies and other organizations. The curation crisis has generated a great deal of debate as to how we can help to ameliorate the various problems faced in collections management. This paper will present a proposal of how collections can be used to develop academic projects, both in local repositories and those outside the country, by outlining case studies that can serve as a template for research design. Finally, it will be demonstrated that the collaboration between personnel from the repositories and universities is the ideal alliance to encourage students to revisit archaeological collections for their research projects.

[108] *Discussant*

[57] *Chair*

Schiappacasse, Paola [57] see Pérez, Jan

Schieppati, Frank [73] see Hayward, Michele

Schilt, Flora [198] see Thompson, Jessica

Schjellerup, Inge

[178] *The Capac ñan from Chachapoyas to the Tierra adentro*

The capac ñan from Chachapoyas to Moyobamba was used for centuries before another road was built for driving traffic and latest with the Marginal further on to Tarapoto. The capac ñan was used by the Incas in their conquest of Moyobamba and later to be used by the many Spanish campaigns in their search for Eldorado. This important highland/lowland route crossing the cordillera and continuing into the Ceja de Selva gave access to coveted resources from both sides but also facilitated war parties to attack the highlanders. During our investigations in recent years, we have located the ancient trail which was stone paved for long stretches and found documents in the archives showing the existence of hitherto unknown tribes that lived along the river systems up to the end of the 17th century.

Schlegel, Trinity

[338] *Prioritizing Title IX in Private Cultural Resource Management*

Cultural Resource Management (CRM) employs approximately 63% of archaeologists in the United States. Private consulting firms contract with federal agencies to assist in compliance with federal laws such as NHPA, NAGPRA, ARPA and AHPA, and additional state laws. As contract archaeologists, we often work extended periods within small groups in isolated areas, which lends to work environments away from support systems of family and friends. Co-workers depend on each other for safety and support in more intimate environments than non-field work. This intimate nature of our work environment often permits lines between professional/formal relationships and personal relationships to blur. Consequently, individual behaviors, intentional or not, can result in uncomfortable and/or un-safe work environments. Field conditions can provide a context in which civil rights and Title IX can inadvertently be lost. In addition, the small, isolated nature of the group can act as a deterrent to speaking out against harassment or discrimination. I argue that CRM firms need to prioritize Title IX to the same degree as other federal laws that govern our work. To redefine the existing culture of our field, individuals at all levels must participate in the discussions and creation of a safe, healthy and respectful work environment.

Schleher, Kari (Crow Canyon Archaeological Center), Emma Britton (University of California, Santa Cruz), Donna Glowacki (University of Notre Dame), Jeffrey R. Ferguson (University of Missouri) and Robin Lyle (Crow Canyon Archaeological Center)

[95] *Pottery Production at the Dillard Site: An Early Basketmaker III Community Center in the Central Mesa Verde Region*

The Dillard site (5MT10647)-the earliest community center identified in the Mesa Verde region-may contain among the oldest examples of multi-household pottery production during the Basketmaker III period. A thorough understanding of how pottery was produced and obtained at this early large pithouse village, which is centered on a great kiva, provides important insights on village organization and interpersonal relationships. In this poster, we explore compositional variation in pottery production using three data sets to evaluate variation in materials used in pottery production: binocular and petrographic qualitative analyses of temper, refiring, and neutron activation analysis of paste. These lines of evidence allow us to identify spatial patterns in the distribution of pottery and its potential compositional differences among the pithouses at the Dillard site in order to address the organization of production, as well as the extent of influence the Dillard site may have had on the broader surrounding community through pottery production and exchange. Methodologically, we also compare the correspondence of compositional groups to refire color groups in order to determine the potential use of the refiring technique as an inexpensive compositional method for future projects in the area.

Schleier, Jonathan [332] see Herbert, Joseph

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Schmader, Matthew (University of New Mexico)

[27] *Evolutionary Change in Household Architecture, Settlement Patterns, and Subsistence Technology: A 4000 Year-Long Record from the Middle Rio Grande Valley, New Mexico*

Evolution in domestic architecture, settlement patterns, and subsistence technology can be revealed by long-term stability followed by rapid change. Research in the middle Rio Grande valley of New Mexico documents a 4,000-year long record from 3000 BC to AD 900. Archaic period structures, dated 3000 BC to about AD 250, display little change in form, size, and construction details. Settlement pattern changes appear with the first midden deposits and increased numbers of dwellings with associated storage features. Constructed milling features for processing wild seed appear before the adoption of cultigens.

Long-term architectural and technological stability gave way to rapid change coinciding with the appearance of agricultural domesticates after AD 500. Multi-dwelling sites and architectural investments indicate decreased residential mobility. Simultaneously, distinctions in functionally specific domestic spaces appear with the separation of cooking areas from sleeping spaces. Sweeping changes occur in subsistence technology: groundstone reflects the shift from a seed-based diet to a corn-based diet. Cooking features changed from rock-lined pits to formalized hearths. Domesticated corn required ceramics for cooking; size, shape, and location of storage features also changed rapidly. Implications for cultural continuity and in-place population growth are discussed in light of these long-term trends.

Schmittner, Robert [134] see Saldana, Melanie

Schneider, Tsim [327] see Panich, Lee

Schneiderman, Faline

[203] *Canning and Preserving History at The Borden's Condensed Milk Factory Site in Torrington, CT*

Gail Borden was a man of persistence and a creative inventor. Were it not for his inquisitiveness and drive in the wake of numerous failures, canned milk and Elsie the cow would never have become irrevocably connected in the minds of millions. Failing to make functional his terraqueous prairie-schooner or to make his desiccated meat-bread palatable, he pursued methods of condensing and preserving milk in sealed containers at several locations in Connecticut. Before his success, bacterial infested milk caused a dreaded, and sometimes lethal, illness. His meticulous attention to cleanliness and adoption of a vacuum pan for condensing milk that the Shakers used for condensing juice was a recipe for success. His preserving and canning process allowed protein-rich sanitary milk to reach those who could not reach for the cow. His successes proved vital to the military and long-distance travelers alike. The Borden's Condensed Milk Factory Site in Torrington Connecticut was one of his earliest condensing factories, relying on the waters cascading down from Burr Mountain Pond to power the process—the same waters that eventually carried much of his factory building away. The factory site and its remains are now, befittingly, a Connecticut State Archaeological Preserve.

Schnell, Joshua (Brown University), Sarah Newman (James Madison University) and Andrew Scherer (Brown University)

[163] *Animal, Human, and Crafted Bone from the S-Sector of Piedras Negras*

Excavations within the S-Sector at Piedras Negras in 2016 yielded an assemblage of lithic and bone artifacts consistent with evidence of craft production. The Proyecto Paisaje Piedras Negras—Yaxchilan returned to the S-Sector during the 2017 field season to conduct more extensive excavations in an attempt to understand production and exchange at this Maya polity capital. Between the 2016 and 2017 seasons, over 4,300 fragments of worked and unworked bone, both human and animal, were excavated from the S-Sector. Here we present the preliminary results of an integrated bioarchaeological and zooarchaeological analysis of the materials. The significance of this assemblage lies in its composition, consisting of both human and animal bone, including finished tools, ornaments, and production debris. Especially notable are large quantities of bone objects used in the working of textiles. Among the human remains are a sizeable quantity of isolated, pathological teeth that we believe may be the remains of tooth extractions.

Schollmeyer, Karen (Archaeology Southwest)

[91] *Strange Birds: Avian Remains in the Upper Gila and Mimbres Drainages*

Bird remains are seldom abundant in archaeological assemblages in the Mimbres region of southwest New Mexico. Despite their relatively low frequency, many of the occurrences of bird remains in this area are derived from interesting or unusual archaeological contexts, and provide a wealth of information on cultural practices and local and regional environmental conditions. This study examines data from over 70 archaeological assemblages from the upper Gila area and elsewhere in the Mimbres region, presenting regional and drainage-level patterns in the abundance of different bird taxa as well as temporal changes visible over the period from AD 200–1450. It also highlights recurring associations of particular taxa with specific archaeological contexts, including room closure deposits.

[91] *Chair*

Schollmeyer, Karen [91] see Johnson, Susannah

Scholnick, Jonathan [302] see Munson, Jessica

Schon, Robert (University of Arizona)

[305] *The Archaeology of Baseball: Excavations at Warren Ballpark in Bisbee, AZ*

Warren Ballpark is considered the oldest continuously operating baseball field in the United States. The list of athletes who played at the park throughout its history includes Connie Mack (Major League Baseball's winningest manager), Jim Thorpe (arguably the greatest athlete of the twentieth century), and Earl Wilson (the first African-American pitcher for the Boston Red Sox). Despite this history of competition, very little is known about the spectators who visited Warren Ballpark. The excavation, the first ever of a baseball field, explores areas underneath the grandstands where fans congregated. Early results consist primarily of bottle fragments. We have identified soft drink bottles from the 1920's-1940s including Orange Crush, Coca Cola, and Pepsi as well as beer and liquor bottles from the 1940s-1950s. Spatial patterns also emerged with soft drinks dominant in the infield and alcohol more prevalent in the outfield. In addition to revealing beverage consumption patterns, bottle remains have yielded data concerning Bisbee's economy as we have identified bottles made in local bottling plants, as well as those imported to Bisbee by rail from points east. Such micro-historical data provide valuable insights into the lives of people who lived in this remote mining town during the early twentieth century.

Schott, Amy (University of Arizona, Petrified Forest National Park)

[221] *Soil Quality and Agricultural Productivity of Eolian Landscapes in Petrified Forest National Park*

The Petrified Forest National Park in northeastern Arizona contains extensive sand sheets and dunes. Archaeologists have long recognized the importance of the eolian landscape for prehistoric agriculture. Archaeological sites dating from c. 200–1400 A.D. correlate with eolian landscape features, which suggests that eolian soils were used for dry-farmed dune agriculture. Eolian soils are not always conducive to dry-farmed agriculture;

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however, dune farming is known ethnographically, and has been inferred in archaeological contexts on the southern Colorado Plateau. Previous work by the author has demonstrated that eolian soils in the Petrified Forest National Park are high in clay, which may have increased the water holding capacity of the soils, improving their suitability for farming. This study uses soil chemistry to further test the suitability of eolian sediments for prehistoric cultivation in the region. Soil chemical and physical analyses include soil nitrogen, phosphorus, phosphate, organic matter, calcium carbonate, and bulk density. These are used to document the relative quality of eolian soils in the study region for prehistoric agriculture. In addition, soil geomorphic studies demonstrate the geologic conditions that made agriculture possible, and perhaps even productive, in a marginal landscape.

Schreg, Rainer [140] see Fisher, Lynn

Schreiber, Katharina (University of California—Santa Barbara)

[335] *Discussant*

Schreiner, Nina

[39] *Archaeology of a Frontier Plantation: Collections Analysis at Woodville Plantation, Pennsylvania, c. 1780*

Woodville Plantation, also known as the Neville House, is an important archaeological resource just outside Pittsburgh, Pennsylvania. The mansion was constructed c. 1780 by the family of Virginian General John Neville—of the Seven Years War, Revolutionary War, Whiskey Rebellion, and early state and local governments—and was occupied by their descendants until 1973. This unique record of ownership resulted in a relatively undisturbed site delivered into the hands of a private preservation organization. Recent architectural renovation projects have unearthed an extensive collection of artifacts dating to the entire period of European occupation and an earlier Monongahela Indian hamlet. This report introduces the curated collection, which will be available for the first time for professional research. It also illustrates challenges in the analysis and preservation of diverse archaeological collections at privately owned institutions with limited space and financial resources, highlighting public engagement through archaeological education programs.

Schrire, Carmel

[308] *Social Life and Social Death among Cape Slaves*

A central imperative in historical archaeology is to produce original information and insights that cannot be derived from historical records. Sophisticated analyses of slave burials that combine the physical elements of burial grounds, coffins, and grave goods, with the biology and chemical signatures of the human remains, can identify and source first-generation slaves, and help to infer the social bonds reflected in their burial. Orlando Patterson has defined slavery as “social death” to reflect the nature and impact of forced translocation and cultural depletion. Unassailable as this might seem at first glance, recent work in underclass burial grounds at the Cape and elsewhere, challenge this deathly pronouncement by suggesting that slaves from a multiplicity of foreign homelands were incorporated into a vibrant community of free and unfree people and who nurtured them beyond their short life into the long comfort of death. This finding casts a new light on the historical records to reveal the permeable nature of slave society in the wider colonial world.

Schroder, Whittaker (University of Pennsylvania) and Socorro Jimenez Alvarez (Universidad Autonoma de Yucatan, Merida)

[163] *The Kingdom of Piedras Negras: A View from Mexico*

Though today the Usumacinta River marks part of the boundary of Mexico and Guatemala, during the Classic period the Usumacinta would have passed through numerous kingdoms, including Piedras Negras and Yaxchilan. Alternate travel routes through the valleys to the west in Mexico crossed an even more complicated political landscape approaching the kingdoms of Palenque, Tonina, and Sak Tz'i', as well as the plentiful minor centers and rural settlements throughout the region. While surveys between Piedras Negras and Yaxchilan in Guatemala have identified a definite border between the two kingdoms, research in Mexico has demonstrated a complex frontier that changed throughout the Late Classic period. Still, many of the sites identified by the Proyecto Arqueológico Busiljá-Chocoljá and others known from epigraphy can safely be associated with Piedras Negras at least for part of the Late Classic period, either based on proximity or emic accounts from inscriptions. Where carved monuments are absent, we must rely on archaeological evidence, primarily from ceramics and architecture, to understand this frontier zone of the kingdom of Piedras Negras. In this paper, we present survey and excavation data from this study region to reconstruct a perspective of Piedras Negras from adjacent areas across the Usumacinta in Mexico.

Schroeder, Sissel [215] see Richards, John

Schroedl, Gerald (University of Tennessee), Callie Bennett (University of Tennessee), Ann Ramsey (University of Tennessee) and Todd Ahlman (Southwest Texas State University)

[90] *Historical and Archaeological Contexts for Zooarchaeological Analyses at Brimstone Hill Fortress, St. Kitts, West Indies*

Research at Brimstone Hill Fortress (1690 to 1854) focuses on comparative studies of the eighteenth century lifeways of British soldiers and enslaved Africans. The St. Kitts colonial government and British Royal Engineers designed the fort, and enslaved and free Africans constructed and maintained it. Excavations in areas occupied by British Army officers, enlisted soldiers, and enslaved Africans have produced substantial faunal remains. Especially revealing is the use of imported and local fishes, contrasts in the consumption of fresh and barreled meat, and evidence for the manufacture of bone buttons. Production of these data is attributable to the dogged determination of Walter Klippel and his students.

Schroll, Andrew (Tulane University), Jason Nesbitt (Tulane University), Rachel Johnson (Tulane University) and Sadie Weber (Harvard University)

[6] *Analysis of the Lithic Assemblage from Canchas Uckro (1100–800 BC), Eastern Ancash, Peru*

Canchas Uckro is a large platform situated above the Puccha River, and approximately 25 km to the north of Chavín de Huántar. Recent excavations recovered a lithic assemblage consisting of 245 artifacts from stratigraphic layers dating between ca. 1100 and 800 BC. This poster describes the analysis of this lithic assemblage, including raw materials utilized, technological organization, and patterns of tool design in relation to possible subsistence activities. Expedient flakes from locally available sandstone and limestone comprise the majority of tool types, although finely made chipped quartz and ground slate points, as well as more formal tools like notches, drills, and scrapers, comprise over 5% of the assemblage. In addition, we discuss how the composition and organization of the assemblage complements the zooarchaeological analysis of faunal remains recovered from Canchas Uckro. We argue that the patterns within the Canchas Uckro lithic assemblage indicate a subsistence and processing strategy that largely centers on the exploitation of wild game. Finally, we consider the implications of these patterns for understanding the late Initial Period in highland Peru.

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Schubert, Ashley (University of Michigan) and Maureen Meyers (University of Mississippi)**[255]** *Recognizing Variation in Pisgah Identity across Space and Time*

The late Mississippian Pisgah culture, dating from 1200- 1500 CE, is found across a wide geographic area including western North Carolina, eastern Tennessee, and southwestern Virginia. Pisgah sherds are often recognized by the presence of distinct rectilinear and later curvilinear stamped decoration with sand, grit, and/or mica temper. Excavations by Dickens (1976), Keel (1976), and Moore (1981; 2002) better defined changes over time in Pisgah ceramics while simultaneously showing the variation in Pisgah-associated features, households and settlements. This paper will examine Pisgah ceramics from two sites, Cane River in western North Carolina and Carter Robinson in southwestern Virginia, using an attribute analysis approach and taking into account the artifact, features, and household contexts in which these sherds are found. In addition, comparative data from other Pisgah collections in Virginia, Tennessee, and North Carolina will be used to better understand Pisgah identity.

Schubert, Ashley [119] see Steere, Benjamin

Schuldenrein, Joseph (Geoarcheology Research Assoc)**[289]** *Discussant*

Schuldenrein, Joseph [39] see Wiley, Kevin

Schulenburg, Marcus (University of Wisconsin-Milwaukee)**[26]** *Building Village Communities: Early Fort Ancient Villages in the Ohio Valley*

The Fort Ancient Period (AD 1000–1700) saw the introduction of formal villages to the peoples of the Middle Ohio Valley. To help understand the transition to full time sedentary villages, this paper explores how these new villages operated as communities. This allows for an examination of the relationship between communities and villages as concepts and as organizational units. This paper uses the Guard Village site (12D29), an Early Fort Ancient village, as a case study to examine this new form of community organization. Lines of evidence will be drawn from village architecture, such as site layout and construction techniques as well as the ceramic assemblage including production communities. These data will be used to attempt to identify the social processes, interactions, and mechanisms that were utilized to integrate larger populations into villages, and how people adapted to this new social unit.

Schulting, Rick, Petrus le Roux (Dept. of Geological Sciences, University of Cape T), Yee Min Gan (School of Archaeology, University of Oxford), Gary Lock (School of Archaeology, University of Oxford) and Chris Gosden (School of Archaeology, University of Oxford)**[29]** *The Ups & Downs of Iron Age Animal Management on the Oxfordshire Ridgeway, Southern England*

As in any mixed farming system, the management of animals doubtless played an important part in Iron Age societies in southern Britain. Economically, they furnished meat, milk, wool and manure, and served as draught animals for transport and tillage. Intersecting with their economic uses, they were also important socially, politically and ritually. It is relatively straightforward to determine the proportional representation and mortality profiles of the major species—cattle, sheep/goat and pig. While this provides insights into how and why animals were managed, it does not allow the detailed investigation of how individual animals were actually kept, how they were moved around the landscape, and how various nearby communities integrated their animal management practices. Isotopic approaches can offer insights into just these practices. We report the results of a multi-isotope study Early/Middle Iron Age domestic fauna (cattle, sheep/goat and pig) within a very constrained study area of the Oxfordshire Ridgeway, south-central England. Strontium isotope measurements on dental enamel provide evidence primarily for the mobility of cattle, while bone collagen stable nitrogen isotopes suggest separate herds and flocks. The results indicate that Early/Middle Iron Age stock-keeping on the Ridgeway and in the Vale was complex, and both integrated and distinct.

Schulting, Rick [249] see Santana Sagredo, Francisca

Schultz, John (University of Central Florida, Department of Anthropology)**[62]** *Discussant*

Schultz, John [88] see Gidusko, Kevin

Schulz, Margaret (Colorado State University) and Laurie Rush (DoD-Army, Fort Drum, NY)**[332]** *Staying Relevant: Turning Your Sites from Blights to Rights*

One of the hazards of doing archaeology on federal land is being viewed as a roadblock to training, construction and other undertakings. The normal treatment for National Register eligible sites once they are found is to set them aside as off limits to training and other activities. Naturally, this is not popular with those providing funding to keep training lands open and sustainable. The Fort Drum Cultural Resources Program has developed unique methods for protecting sites while allowing them to be used as training assets. In collaboration with Civil Affairs Operations, they have provided site data in the form of no-strike lists to military trainers, allowing sites to be put into play during several large-scale training events. Program staff also served as role-players, representing host nation officials and indigenous peoples in a training scenario. Not only did this approach enrich the training opportunity, designation of off limits areas as sacred properties where incursion would result in violent retribution or command consequences resulted in the best site protection and avoidance in the history of these exercises. As a bonus for the program, it also served the purpose of keeping cultural resources and heritage relevant in an ever-changing political and social environment.

Schulze, Jurgen (UCSD), Connor Smith (UCSD), Philip Weber (UCSD), Thomas DeFanti (UCSD) and Thomas E. Levy (UCSD)**[172]** *3D Cyber-Archaeology Dissemination through Scientific Visualization—Personal and Large-Scale Virtual Reality Platforms*

We created a walk-up virtual reality system consisting of six large 3D TV displays with 4k resolution, for easy dissemination of spatial and three-dimensional archaeological findings. We call this system the CAVE Kiosk. The system has been placed in the campus library to make it easily accessible to the entire campus community. We currently support three types of data: regular photographs, high resolution panoramic stereo photographs, point clouds such as from LIDAR scanners, and 3D models such as those created by 3D scanners. The user will see all available sites with data on a 3D world map, displayed as a globe. When the user clicks on a site, the available data sets will be listed and the user can choose what to see. The data is hosted by a remote server and is downloaded on demand, with a caching system for faster access. We deployed three more, similar, viewing stations on other campuses of the University of California system. They all connect to the same server, and collaborators at those campuses can upload their data to the shared server via our custom software tool called CAVE Base.

Schulz-Kornas, Ellen [89] see Martisius, Naomi L.

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Schumacher, Mara (Institute for Archaeological Sciences, University of Tuebingen), Susan Mentzer (Institute for Archaeological Sciences, University), Cynthia Debono Spiteri (Department for Prehistory and Early History, Unive) and Mihriban Özbasaran (Arkeoloji Bölümü, İstanbul Üniversitesi)

[126] *Biomolecular and Micromorphological Analysis of Suspected Fecal Deposits at Neolithic Aşıklı Höyük, Turkey*

Suspected fecal matter from the Aceramic Neolithic site of Aşıklı Höyük was analyzed using biomolecular and micromorphological approaches to study behavioral and environmental processes. Aşıklı Höyük provides the earliest evidence for sedentism and domestication in Central Anatolia. The main goal of this study is to identify the origin of suspected fecal deposits to gain a better understanding of the use of space and waste management strategies in this early Neolithic settlement. Suspected fecal materials from middens, open-space deposits and building fills were analyzed using GC-MS to distinguish between fecal and non-fecal sources. Steroid biomarkers were used to differentiate between human and faunal excrements. Preliminary results from biomolecular analysis show that not all suspected fecal materials are actually of fecal origin and may instead be secondary phosphates. Suspected coprolites collected from a building fill could be confirmed to be of ruminant origin suggesting that animals were kept inside the settlement. This finding is supported by the identification of intact dung deposits in thin sections from middens and open-space areas. Coprolitic materials identified in dumped refuse deposits in thin sections yield biomarkers that suggest that omnivore (potentially human) fecal material was disposed together with domestic waste in designated areas within the settlement.

Schumann, Rebecca (University of Illinois)

[42] *The History We Remember: Race, Law, and Understanding the Archaeological Landscape*

Law works in ways to promote specific interests of those with power, often leading to racial and economic marginalization. Through an examination of 18th and early 19th century Virginia laws, I investigate the relationship between law and race. I explore how laws help shape racial categories and forms of structural racism, and promotes economic inequality. These historical economic and racial inequalities impact how we understand archaeological landscapes and whether sites meet the criteria for the National Register of Historic Places. As a result, past forms of structural racism continue to affect our present day understanding and treatment of historical people in the present, engendering historical silences. Using archaeological sites from George Washington's Mount Vernon, I examine how laws governing archaeological sites continue to marginalize in the present those who US society marginalized in the past. Since these laws help determine what constitutes historically significant parts of the American past, they and promote disparity in determining whose history we remember and preserve.

Schurr, Mark (University of Notre Dame) and Madeleine McLeester (University of Notre Dame)

[26] *Native Prairie: The Kankakee Protohistory Project and Ongoing Excavations at the Terminal Prehistoric Middle Grant Creek Site in Northern Illinois*

Archaeologists have long explored the early interactions between Native Americans and Europeans in the Great Lakes region of Eastern North America. In particular, they have prioritized investigating these relationships at late prehistoric sites containing European trade goods. However, this narrow focus has led to neglecting late precontact sites that precede this period and which are essential for fully contextualizing these early interactions. In this presentation, we summarize the second year of ongoing excavations of the Middle Grant Creek (MGC) site at Midewin National Tallgrass Prairie in Wilmington, IL. This well-preserved, very late prehistoric Huber phase village expands our understandings of lifeways during the final period before European arrival. As one component of the broader Kankakee Protohistory Project, excavations at MGC refine existing understandings of Huber communities with particular focus on human-environment entanglements, mobility, and long distance trade. In this presentation, we summarize the geophysics, excavation, and ongoing analyses at MGC and contextualize the regional significance of the artifact assemblage, especially unexpected finds such as marine shell, painted pottery, and unique points. Conducted at one of the few single component sites in the region, this public archaeological project exposes the diversity of terminal prehistoric assemblages in ways that continue to unfold.

Schurr, Theodore [14] see Fleskes, Raquel

Schwadron, Margo (NPS-Southeast Archeological Center)

[247] *Engaging Community in Climate Change, Heritage Resource Management and Citizen Science: Examples from Florida's National Parks*

The National Park Service's core mission is to protect and preserve unimpaired for future generations natural and cultural resources under its management. Climate change presents unprecedented challenges as humans have set in motion an unstoppable sea-level rise that will eventually submerge, damage and destroy many heritage resources. Many sites are already undergoing severe erosion, and we struggle with prioritizing limited resources for protecting sites. What are our options? Using case studies from several Florida National Park units including Canaveral National Seashore's massive shell mounds; Everglades' millions of acres of wetlands, subtropical estuaries and prehistoric waterways interconnecting thousands of tree islands and shell work islands; Biscayne prehistoric earth middens; and Castillo de San Marco's fortifications, we illustrate various options for planning preservation of resources. A major success in protecting sites has been leveraging partnerships and engaging communities to participate in citizen science—enacting site protection measures, mitigation, ecosystem restoration, building living shorelines, and engaging locals of all ages in participating in heritage stewardship and resource management. These examples illustrate that despite sometimes difficult challenges, large sectors of the American public are eager, willing and ready to build a community of practice to help preserve, protect and understand threatened heritage resources.

Schwadron, Margo [111] see Hawthorne, Paige

Schwartz, Christopher (Arizona State University) and Andrew Somerville (Universidad Nacional Autónoma de México)

[21] *Local Origins, Distant Connections: Exploring Prehispanic Macaw Exchange through Radiogenic Strontium Isotope Analysis at Paquimé, Chihuahua, Mexico*

The prehispanic settlement of Paquimé (ca. 1200–1450 CE) lay at the intersection of traditionally-defined "Mesoamerican" and "U.S. Southwest and Northwest Mexico" (SW/NW) macro-regions in northern Chihuahua, Mexico. Extensive evidence of exchange with distant communities exists at the site, including remains of over 300 scarlet macaws; brilliantly plumed birds whose natural habitat is located at least 1000 km southeast in the humid lowlands of Mexico. Archaeological and historical records indicate these birds were ideologically and economically significant to SW/NW populations, one reason being their association with the rainy, agriculturally fertile lands of central and southern Mexico. Researchers have concluded that scarlet macaws discovered at Paquimé were largely fed and bred at the settlement, though dietary evidence suggests some birds were imported from distant, southern locations. This study employs radiogenic strontium isotope analysis on a sample of 30 scarlet macaws recovered at Paquimé to assess whether these birds were raised locally or imported. We find most 87Sr/86Sr values are consistent with baseline and local human 87Sr/86Sr values at the site, suggesting local origins, while eight individuals exhibit non-local values. We discuss several possible points of origins for these birds and consider the economic and ritual significance of this pattern.

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Schwarz, George (Naval History and Heritage Command) and Ben Ford (Indiana University of Pennsylvania)

[39] *Rebirth of the Schooner Royal Savage: Documenting and Interpreting Disarticulated Ship Remains from the American Revolutionary War*
The 70-ton schooner Royal Savage played a pivotal role as the flagship of Benedict Arnold's squadron in the American Continental Army's defense of Lake Champlain during the first year of the American Revolution. Misfortune led to her sinking during the Battle of Valcour Island in 1776, and the wreck was left largely undisturbed in shallow waters for over a century and a half until, in 1935, her remains were rediscovered and salvaged for exhibit in a museum that never materialized. Instead, the hull was disassembled and passed undocumented through several owners before being returned to the U.S. Navy in 2015 for preservation, documentation, and exhibit. Currently a disarticulated assemblage of deteriorated timbers, traditional and digital (LiDAR, photogrammetry) recording methods are being used to document, interpret, and reconstruct Royal Savage to better understand the design and use of this early and rare U.S. naval vessel. This presentation provides a brief history of the sinking and recovery of the hull and over 3,000 associated artifacts, the misguided transfer of materials over the course of 80+ years, and an overview of the current documentation and interpretation efforts—which aims to breathe new life into an old collection.

Schwenninger, Jean-Luc [41] see Frouin, Marine

Scott, Alyssa (University of California Berkeley)

[85] *Tuberculosis Sanatoriums: Historical Archaeology, Landscape, and Identity*

This paper examines the archaeology of the Weimar Joint Sanatorium, an institution which functioned as the county tuberculosis hospital for fifteen counties in California during the early twentieth-century. Field data from topographical survey, historic structures recording, geophysical survey, and surface collection are interpreted along with historical information in order to understand how the institution and people connected to it were situated within the larger landscape. Within the institution and surrounding communities, people navigated narratives about health, illness, disability, gender, race, ethnicity, age, class, and other forms of identity. Tuberculosis sanatoriums as a building type occupied a space midway between an institution and a domestic space, and tuberculosis sanatoriums consisted of a variety of building configurations, from dorms to private cottages. Archaeology can be used to understand narratives about the body and normative expectations which are embedded in the built environment and the landscape, and identifying these narratives is an important step towards destabilizing structures of inequality and stigma.

Scott, Ann (Terracon Consultants)

[289] *Discussant*

Scott, Tasia

[324] *Abandonment Processes in Manabi, Ecuador: Ethnoarchaeological Interpretations from the Cloud Forest*

The purpose of this research is to determine the manner in which site abandonment occurred in Manabi, Ecuador. The Manteño were one of many pre-Hispanic cultures exchanging local resources, engineering new technologies, and mass-producing goods along the coast of Ecuador. Successful in their chiefdom and independent from the expanding Inca Empire, the Manteño remained culturally uninterrupted for more than 800 years. The focus of this research is to understand the interruption and thus abandonment of the cloud forest. In order to understand abandonment processes in the Las Tucas valley, this research uses behavioral and contextual lines of evidence. Areas of activity are established by comparing soil chemical indicators (phosphate and pH), with ceramic analysis, and overall artifact distribution. Pre-abandonment behavior will then be examined within the social, political, and environmental context of the last occupation at site C4-044. The sum of this information will be further assessed in accordance with ethnohistorical perspectives from individuals whom participated in the abandonment of a modern day village in the cloud forest. This investigation supports a gradual and planned abandonment of site C4-044, with evidence for ritual abandonment.

Scott Cummings, Linda (PaleoResearch Institute, Inc.), R. A. Varney (PaleoResearch Institute, Inc.), Thomas W. Stafford Jr. (Stafford Research, LLC), Scott Anfinson (Minnesota State Historical Society) and Patricia Emerson (Minnesota State Historical Society)

[74] *Dates Too Old?: Mixed Carbon Reservoirs Integrate Carbon from Freshwater Reservoirs and the Atmosphere*

Sources of carbon in wetlands and calcareous areas represent unique challenges for interpreting the archaeological radiocarbon record. Atmospheric carbon dioxide is assumed to be the only carbon source for photosynthesis. However, dating modern and historic reference fish and modern reference wild rice indicates the presence of ancient carbon in bones and plant material. Dating four historic reference fish obtained from the Mississippi River in 1939 in southeastern Minnesota yielded four distinctly different dates that do not overlap. Instead, they span 1223 to 307 BP, leading to the conclusion that dissolved inorganic carbon (DIC) and perhaps other ancient carbon contributes to a freshwater reservoir affect. Trophic level of the fish (and their diet) is implicated in this date range since they were caught in the same river, probably during the same fishing expedition. Adding additional reference fish, including northern pike, caught elsewhere in the state returned differential offsets implicating geology and DIC as sources of ancient carbon. Wild rice harvested in 2015 yielded similar age offsets to the highest trophic level fish, suggesting both high trophic level fish and wild rice take in carbon from both the freshwater reservoir and the atmosphere. Implications for dating archaeological materials are discussed.

[289] *Discussant*

[74] *Chair*

Scott-Ireton, Della (Florida Public Archaeology Network), Jeffrey Moates (Florida Public Archaeology Network) and Nicole Grinnan (Florida Public Archaeology Network)

[78] *SSEAS of Change: Sport Divers, Heritage Monitoring, and the Future of Submerged Resources Management*

The growth and sustained popularity of scuba diving has resulted in increased visitation to historic shipwrecks and other submerged heritage sites. In Florida, one of the top diving destinations in the world, archaeologists and resources managers are concerned with the ongoing preservation of the state's underwater cultural heritage, both as heritage tourism attractions and as tangible parts of our common maritime heritage. The Submerged Sites Education & Archaeological Stewardship, or SSEAS, workshop was developed by the Florida Public Archaeology Network to train sport divers in non-disturbance recording techniques in order to engage divers in preservation ethics and methods, instilling a preservation mindset while developing teams of trained assistants for state managers. After several years of workshops, FPAN is using lessons learned and new strategies to adapt the SSEAS curriculum to the changing needs of both managers and divers, including advanced monitoring of sites, in situ preservation technology, and citizen science initiatives.

[233] *Discussant*

Seabrook, Melina [71] see Twiss, Katheryn

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Searcy, Michael (Brigham Young University), Scott Ure, Michael Mathiowetz, Jaclyn Eckersley and Haylie Ferguson
[68] *Aerial Imaging Using UAVs (Drones) in Chihuahua and Nayarit, Mexico, to Map and Archive Archaeological Sites*

In 2017, we used UAVs (drones) to record eight archaeological sites from the air. As this type of technology becomes more refined, we have found that it is especially useful in carrying out three specific tasks: contour mapping, archiving site conditions, and identifying architecture. This paper reports our findings resulting from aerial images captured while flying archaeological sites in Nayarit and Chihuahua, Mexico.

Searle, Jeremy [125] see Hulme-Bearman, Ardern

Sears, Erin (University of Kentucky/Smithsonian Institution)
[139] *The New Adventures of Old Ceramic Figurines from Tres Zapotes, Mexico*

The long-term exploration of Formative fluorescence within the Veracruz region of Mexico has been supported through mid-20th century archaeological excavations and collection management protocols of the Smithsonian Institution's Natural History Museum Department of Anthropology. The Olmec site of Tres Zapotes has been a focus of archaeological investigation since 1938 by Smithsonian's Bureau of American Ethnology Director, Matthew Stirling. Research at the site continues to explore the regional diversity as currently carried out by Christopher Pool and team members from the University of Kentucky. This report concerns the use of miniature ceramic figurines as a focus for understanding variation using current and previously excavated material. Through the use of technical studies, archives and comparative methods, interpretive benefits of incorporating museum collections with data emerging from current research are discussed.

Sebastian, Lynne (SRI Foundation)
[233] *Discussant***Sedig, Jakob (Harvard University)**
[97] *An Archaeologist amongst Geneticists: Overview of My Experiences as an Archaeologist in an Ancient DNA Laboratory*

In this paper, I provide insight on the field of ancient DNA (aDNA) analysis from my unique perspective as an archaeologist employed in a leading aDNA laboratory. Ancient DNA research has advanced so much that genomic data from thousands of individuals across the globe are now available for study. These data are allowing geneticists and archaeologists to conduct studies that provide new insights into migration, demographic transitions, and relatedness of ancient individuals. They also afford an entirely new dataset to examine longstanding archaeological questions. While aDNA analysis is having a significant impact on interpretation of the past, due to the very rapid growth and development of the field, archaeologists might find themselves falling behind on increasingly complex methods and numerous publications. Thus, I provide a brief overview on the process of aDNA research. Additionally, this paper addresses some of the recent controversies in aDNA studies, such as "sample hoarding," the seeming focus on European samples, and ethical issues surrounding aDNA analysis. Finally, while there certainly have been many fruitful collaborations between archaeologists and geneticists, there have also been disagreements about results and data interpretation. I therefore also examine how archaeologists and geneticists can better collaborate in future research.

Sedig, Jakob [91] see Gilman, Patricia

Seeley, Sarah, Jonathan Reeves, Matthew Douglas and David R. Braun
[99] *Lithic Taphonomy and Digital Hydrogeologic Models: A GIS Based Approach to Understanding the Formational History of Surface Assemblages*

Surface assemblages play an important role in understanding human behavior. However, modern erosional processes—specifically flowing water—can limit the behavioral inferences that can be gained from surface assemblages by transporting materials from their original discard sites. The influence of these processes can be observed in the size distribution and condition of surface lithic assemblages. The topography and geomorphology of the landscape heavily dictates the degree to which fluvial processes erode and redistribute artifacts. Thus, considering formation processes alongside aspects of topography and geomorphology provides a means to investigate the extent to which modern geomorphological processes have altered surface assemblages. Here, we use digital terrain analysis to explore this relationship between the surface assemblages and modern erosional processes. We characterize the location of surface artifacts from the Koobi Fora Formation, Kenya, by stream power (erosive potential) and topographic wetness (the potential for water to pool). We then pair these data with attributes of stone tools that reflect post-depositional damage. We assess the overall influence of hydrological processes on the spatial arrangement of surface assemblages. A discussion of the applied methods and preliminary results is presented. This research was supported by the U.S. National Science Foundation, OISE awards 1358178 and 1358200.

Seeman, Mark [74] see Nolan, Kevin

Séguy, Isabelle [302] see Granados Vazquez, Geraldine

Seibel, Scott (AECOM) and Christopher McDaid (Joint Base Langley-Eustis (Eustis))
[42] *Managing the Effects of Erosion and Sea Level Rise on Archaeological Sites at Fort Eustis, Newport News, Virginia*

Fort Eustis, part of Joint Base Langley-Eustis, located on Mulberry Island along the James River in Virginia, is extremely vulnerable to the threat of erosion resulting from sea level rise, increased tidal range, and flooding from increased rainfall and storm surge. Currently, dozens of archaeological sites on the island are experiencing damage resulting from erosion, including sites where human remains have been found protruding from erosional scarps. To meet the installation's short and long-term planning needs and their regulatory obligations under the National Historic Preservation Act, the Fort Eustis Cultural Resources Management Program implemented a study of the effects of sea level rise and shoreline erosion on 31 threatened archaeological sites at Fort Eustis. The interdisciplinary study involved archaeologists and coastal engineers from AECOM and examined historic and current erosion rates and future sea level rise projections, conducted site visits, developed comprehensive risk assessments, evaluated of current and long-term threats, and generated potential management strategies. The installation currently uses the data from the study to establish priorities regarding which sites to evaluate for significance, to develop cost estimates, and to aid when deciding whether to protect a site or to conduct data recovery.

Seibert, Michael [154] see Elliott, Daniel

Seidemann, Ryan (Louisiana Department of Justice)
[62] *Discussant*

Seidemann, Ryan [107] see Halling, Christine

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Seidita, Max (Brandeis University) and Charles Golden (Brandeis University)

[163] *The Economic Relationships of Epicentral and Peripheral Households at Piedras Negras, Guatemala*

More than half a century of archaeological and epigraphic research at Piedras Negras has produced one of the best understood epigraphic corpus in the Maya region and provided archaeologists with a plethora of information related to the nature of rulership, courtly life, and the regional political landscape of the Classic Period. Despite this work, questions persist about the economic structure of Piedras Negras households. Here we present the results of recent investigations undertaken at Piedras Negras and situate them in the context of earlier research at the site and its hinterlands, to better characterize the relationship of epicentral economic infrastructure and near-periphery residential occupation through the lens of the house and household. Particularly, we explore the relationship of residential economies to larger-scale economic processes in the kingdom.

Seif, Assaad (ICOMOS / ICAHM Expert Member)

[145] *The Doctrine for Management of Archaeological World Heritage Sites, the Case of Some Selected Sites in Lebanon*

The Salalah Doctrine regarding the management of archaeological world heritage sites seeks to recognize the differences between archaeological sites, standing monuments and landscapes. Consequently, new and adapted management approaches to the Archaeological sites that present distinct management challenges are needed. The ICAHM doctrine proposed strategies for sustainable conservation and preservation still need to be addressed critically and contextually to ascertain their applicability. Aiming to further contribute to the discussion, this paper proposes to present case studies from specific sites in Lebanon.

[145] *Discussant*

Seikel, Katherine (AmaTerra Environmental; Australian National University), Rachel Feit (AmaTerra Environmental, Inc.) and Jon Budd (Texas Department of Transportation)

[44] *A Greasy Mess: Reconsidering Prehistoric Bone Grease Extraction and Its Implications for Site Interpretation*

Ethnohistoric accounts and archaeological evidence show that North American Indigenous hunter gatherers utilized fats and oils rendered from smashing and boiling faunal bone for dietary and other uses. In the archaeological record, evidence of bone grease extraction is interpreted from fractured faunal remains recovered from midden deposits and thermal features. However, most archaeological studies of bone grease extraction tend to focus on subsistence to the exclusion of other uses. This preoccupation with subsistence has often led to formulations of indigenous lifeways as pure response to environmental conditions. Most notably, the idea that prehistoric bone grease processing was a response to resource stress is a topic of vigorous discussion.

Archaeological studies of bone grease processing have mostly overlooked its other uses. For instance, bone grease was commonly mixed with ocher, charcoal, and other minerals to make grease paint for decorative, ritual and medicinal uses. Our review of ethnohistoric literature coupled with archaeological data from sites in Texas shows a strong correlation between pigment minerals and bone grease processing. This has important implications for how bone grease processing locales are understood, indicating that the rendering of grease had a function in social life that went well beyond subsistence.

Sekaquaptewa, Susan [218] see Young, Lisa

Selden Jr., Robert [90] see Manzano, Bruce

Seligson, Ken (University of Southern California), Soledad Ortiz Ruiz (Universidad Nacional Autónoma de México) and Luis Barba Pingarrón (Universidad Nacional Autónoma de México)

[177] *Prehispanic Maya Burnt Lime Production: Previous Studies and Future Directions*

Burnt lime has played a significant role in daily Maya life since at least as far back as 1100 BC, and yet its ephemeral nature has limited archaeological studies of its production and distribution. The application of new surveying and remote sensing technologies in recent decades is now allowing for a more in-depth investigation of the burnt lime industries that existed in different sub-regions of the Maya area. In this talk, we present an overview of the current understanding of Prehispanic Maya burnt lime production, including recent identifications of lime kilns in the northwestern Yucatán peninsula. We also discuss the broader socio-economic and resource management issues to which burnt lime production studies have the potential to contribute.

Seligson, Ken [18] see Ringle, William

Sellen, Adam (Universidad Nacional Autónoma de México)

[206] *Where Have All the Collections Gone? Mexican Archaeology in World Museums*

In the second half of the nineteenth century, before the era of professional archaeology, those interested in the evidence of the past collected, and on an unprecedented scale. Most of these massive holdings have been since acquired by public museums around the world, where they have been co-mingled with other collections, and in the process, objects have been severed from their historic moorings. Focusing on Mexican collections, this talk looks back on a decade of work in museums and archives to recuperate a dispersed archaeological record, presenting an overview of the evidence and the lessons learned from its analysis.

Sellers Wittie, Kelly [90] see Coughlin, Sean

Sellet, Frederic (University of Kansas) and Michael Guarino (University of Kansas)

[120] *Miniature Folsom Points from the Lindenmeier Site, Colorado*

Among the Folsom artifacts excavated by Frank Roberts at the Lindenmeier site in Colorado are several unusually small projectile points, both fluted and unfluted. This paper explores the hypothesis that these miniature points are toys. To do so, we review the ethnographic literature on miniature weapons and contextualize the production and use of such objects. Second, we compare the small Folsom artifacts to full-size points from a typological and technological point of view. Finally, we discuss their spatial distribution relative to other evidence of weaponry manufacturing activities.

Seltzer, Heather (University of Colorado Boulder)

[325] *Cultural Icons: Understanding Social Identity through Iconography in the Contact Era Pueblo World*

The arrival of the Spanish shattered the Pueblo people's worldview in the Rio Grande during the 16th century. Nevertheless, the Pueblo people held onto specific icons that socially identified them as Pueblo, while yet creating Spanish commissioned pottery and other Spanish materials. The 1680 Pueblo Revolt and cultural revitalization movement by Puebloan groups sought to return indigenous peoples to their heritage through an emphasis on traditional religious practices and lifeways. Using iconography on historic pottery, this paper will explore the ways social identity can be maintained yet transformed in situations of intense cultural contact. I compare motifs on pots from the Northern and Middle Rio Grande, dating from the pre-Contact through post-Revolt period. These areas experienced different degrees of colonization which is evident in the degree to which indigenous or Spanish linked motifs occur on pottery.

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Semon, Anna (University of North Carolina)**[266]** *A Comparison of Late Mississippian Complicated Stamped Designs from the Georgia Coast*

Complicated stamped pottery dominates Late Mississippian (AD 1300–1580) ceramic assemblages on the Georgia coast. The most prolific design is the filfot cross, which is symmetrical and comprised of four basic elements. Although the overall filfot design does not change, the basic elements can differ to create unique combinations that can be used to track filfot variation and paddles. In this poster, I present the methods and results of a complicated- stamped pottery study, which tracked filfot cross design variations from several Late Mississippian sites on the Georgia coast. These data expand our knowledge of Late Mississippian artwork, woodcarving technology, pottery practices, and coastal social interactions.

Semon, Anna [154] see Edwards, Alexandra

Semple, Sarah [40] see Buchanan, Brian

Seowtewa, Octavius**[72]** *Discussant*

Serneels, Vincent [32] see Kienon-Kabore, Timpoko H  l  ne

Serra, Margot, Jakob Hanschu, Amandine Flammang and Danielle Kurin**[270]** *Using Parry Fracture Data to Further Assess Violence in Andahuaylas during the Late Intermediate Period*

Previous studies of crania showing recurrent trauma suggest high rates of violence in the Andahuaylas province of Peru during the Late Intermediate Period. Through an assessment of direct blow fractures to radius and ulna bones (lower arm bones), we further examined violence in the region, anticipating a high rate of parry fractures. The skeletal remains assessed come from Sonhuayo, a fortified habitation sector of Cachi, a Chanka site in the west-central portion of the Andahuaylas province. Since crania from the site were formerly investigated, locations and types of cranial trauma and parry fracture data can be synthesized to further define the methods and frequency of violence in Andahuaylas during the LIP. Indeed not all types of violence result in parry fractures. De factor our study determined rates of parry fractures to be quite low, while cranial trauma reflects frequent injury. The results suggest that close, defensible hand-to-hand combat was not the primary means of administering violence.

Serra Puche, Mari Carmen (IIA-UNAM)**[262]** *La Interaccion regional de Xochitecatl-Cacaxtla durante el Formativo en el valle Tlaxcala-Puebla. 800 a.C.—200 d.C.*

El surgimiento del Centro Regional de Xochitecatl-Cacaxtla tiene sus or  genes en los primeros asentamientos aldeanos del Valle de Tlaxcala, la elecci  n del lugar donde se construy   se debe a la ubicaci  n estrat  gica entre los ejes de los volcanes que rematan el valle reconstruyendo un paisaje sagrado y tambi  n por el acceso y control de las rutas de intercambio con la cuenca de M  xico, el Valle de Morelos y el Golfo y Oaxaca.

Su   rea de interacci  n y control fue cambiando en el Transcurso del tiempo, gracias a la identificaci  n de varios niveles de relaci  n con los asentamientos cercanos en el valle de Tlaxcala, la presencia de tipos cer  micos y otros indicadores arqueol  gicos nos se  alan el control econ  mico y pol  tico de la regi  n.

Sin embargo, debemos explicar tambi  n la interdependencia con los asentamientos m  s cercanos y con otros centros regionales contempor  neos como Tlalcalegua y La Laguna, resultado de un sistema pol  tico de interacci  n interregional caracter  stico de los Altiplanos centrales.

Serrano, Victor (University of Leicester)**[140]** *In the Hunt for Mona Island Guano Miners: Archival Documentation in the General Archives of Puerto Rico*

This paper presents initial archival research from the "Archivo General de Puerto Rico" (Puerto Rican General Archives) relating to C19th-20th guano extraction on Mona island in the Caribbean. This is part of a PhD project which examines the lives of guano miners through archaeology and historic archives. Guano as a manure was highly sought as a fertilizer during the nineteenth century for its high contents of nitrogen, phosphate and potassium, nutrients needed for plant growth. It revolutionized farming practices across the world and catalyzed the colonization of remote islands with the intent of mining them. Very little is known about the daily experiences, regimes, and identities of guano miners on Mona Island, part of the Puerto Rican archipelago. Guano extraction started in Mona Island around 1854 under the Spanish government and lasted until 1936 under the USA government. During this period multiple international companies operated on Mona Island, relying on the manual labor of hundreds of workers. An examination of the lives of guano miners on Mona island is important to understand the hidden histories of itinerant laborers across the Caribbean post-emancipation, but also to shed light on the human story of modern industrial capitalism more widely.

Setalla, Gwen [218] see Young, Lisa

Sexton, Joe (Yakama Nation / Galanda Broadman PLLC)**[253]** *Reflection on Jelderks' Judicial Decision and the Ninth Circuit's Decision in the Bonnicksen Litigation*

The Bonnicksen litigation commenced shortly after the discovery of the Ancient One's (aka Kennewick Man) remains and involved several scientists suing the United States to keep the remains and use them for their claimed scientific purposes. Judge Jelderks, Magistrate Judge for the United States District Court in Oregon, found in favor of plaintiffs in 2002. His decision advances a skewed analysis of NAGPRA cultural affiliation claims that hinders tribal rights and serves as a deterrent for meaningful government-to-government consultations between sovereign tribes and their trustee, the United States. The U.S. Court of Appeals for the Ninth Circuit upheld Judge Jelderks' decision in a far more limited opinion published in 2004. I will focus on (1) Judge Jelderks' analysis, (2) how this decision impacted tribes' advocacy for repatriation of the Ancient One under NAGPRA, (3) how it may impact future tribal advocacy for repatriation, (4) the Ninth Circuit's more limited analysis, and (5) what a proper preponderance analysis of cultural affiliation claims should look like under NAGPRA, consistent with the statute and federal common law precedent on a preponderance burden of proof.

Sexton, Clayton [286] see Simon, Katie

Seymour, Deni**[131]** *Whenever the Twain Shall Meet: Merging Ethnohistorical and Archaeological Data*

Data sources, including documentary and archaeological, represent rich caches, full of mundane descriptions and an occasional succulent morsel that adds to the richness of our understanding of the past or potentially changes those understandings in fundamental ways. Yet facts are situated in frameworks of conventional wisdom, existing reconstructions, methodological practice, and extant data. Many substantial advances effectively and critically combine the particular with the generalizable, recognizing that humans respond in a predictable set of ways given similar parameters. Our work is to understand the variations and exceptions, the boundary conditions, the richness of the cultural overlay, and the effects of time and interaction on more generalizable behavior. Yet, archaeologists and ethnohistorians use data sources in different ways, establishing the question as to whether

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twain shall meet. Some methodological differences relate to how one selects or weighs documents, and parts, passages, or elements therein, (2) assumptions as to clarity of meaning and soundness of translation, (3) the use of external evidence to assess interpretations, and (4) willingness to cede authority to other sub-disciplines. Apachean and O'odham examples are used to explore these issues and to assess effective tools, such as correlate grids, for reconstructing the past using all applicable data.

[191] *Discussant*

Sezate, Adam (University of Arizona/ Pima County OSC), Courtney Rose (Pima County, Arizona), Ian Milliken (Pima County, Arizona) and Roger Anyon (Pima County, Arizona)

[72] *A Local Government and Tribal Collaborative Approach to Cultural Resources Management*

The Pima County (Arizona) Office of Sustainability and Conservation is applying a proactive approach to cultural resources management on approximately 100,000 acres of Conservation Lands the County has recently acquired for conservation purposes. County stewardship and management of these lands brings with it several responsibilities, among them developing a management plan through collaboration with Tribes that guides 1) the identification of Traditional Cultural Properties, 2) monitoring of current and future agents that may impact Traditional Cultural Properties, 3) determining strategies to mitigate impacts to Traditional Cultural Properties. Prior to writing a management and monitoring plan, Pima County began collaboration with several Tribes that have ancestral ties to the Conservation Lands, by holding a series of meetings with each of the Tribes. These consultations documented and assessed the level and focus of Tribal interest, concerns, and needs. This means that Tribal concerns and perspectives are incorporated into planning, fieldwork, documentation, and management protocols. Each of the Tribes observed that this type of proactive approach to cultural resources management is especially valuable. This provides Tribes an opportunity to have meaningful input during both the plan's formulation and implementation.

Sgarlata, Cosimo [294] see Singer, Zachary

Sgheiza, Valerie and P. Willey (California State University, Chico)

[179] *Demography of Skeletal Remains from Point San Jose*

A critical question concerning the Point San Jose (PSJ) skeletal remains is the nature of the living population from which the assemblage was derived. We approach this issue indirectly through comparison with other mortality profiles. Here, we report the age, sex, and ancestry of the PSJ skeletal remains, and compare them with those parameters of other groups. The comparative age distributions consist of the 1870 California mortality census, 1870 California living census (as a proxy for a catastrophic population), mortality data from California military regulars, a hospital distribution, and a prehistoric distribution. The PSJ age distribution shows significant differences from all those groups except the hospital distribution. The PSJ sex ratio (approximately 3 females: 4 males) demonstrates similarities with the 1870 California mortality census. Ancestries present in the PSJ skeletal series indicate that Asian or Asian-related individuals equaled the number of European-derived ones, contrasting with the 1870 California mortality census. That mortality census consists of many more deaths among European-related people than Asian or Asian-related ones. Such exclusionary testing allows us to draw inferences about the selection processes at work in incorporating individuals into the PSJ assemblage.

Sgheiza, Valerie [179] see Cox, Maria

Shable, Jamaludin [268] see Rawan, Atifa

Shaffer Foster, Jennifer (Medaille College)

[85] *Healing Places and Objects in Irish Archaeology*

The concept of healing—in any time period—has received relatively little attention in Irish archaeology. While bioarchaeologists have examined ailments and injuries in prehistoric and historic Irish populations, discussion and understandings of how, why, and where people sought treatment, and which treatments were deemed successful, remain elusive. This paper will draw on Gesler's (1992) concept of therapeutic landscapes, most commonly utilized in health geography, in order to examine healing places and material culture in post-Medieval and Historic Ireland. Historical and ethnographic accounts provide an extensive source material on widely used healing concepts integrated into uniquely Irish cultural and physical landscapes, such as visits to spas, sweat houses, holy wells, and rag trees. These and other places where people went to be treated by practitioners or healed through interaction with the built environment, natural world, or supernatural beings often survive as recognized sites today, and their position vis-à-vis contemporary domestic and ritual landscapes will be explored in order to gain a more nuanced understanding of healing in archaeological and historical contexts.

Shakour, Katherine (University of South Florida)

[296] *Choosing Building Materials: Multi-scalar Construction of Identities and Heritage Following Disaster*

Scholars and communities have been discussing ownership of the past for the last few decades, and they have explored ways in which social and political movements empowered communities to reclaim ownership of their heritage. These communities use archaeology and material culture to construct their heritage. However, few scholars have discussed how communities are constructing heritage with respect to disasters and social upheaval. This paper explores the multi-scalar construction of heritage and identity through material culture and archaeology in a post-colonial and post-disaster environment. Through a case study in Ireland, I explore heritage construction motivations and techniques following the Great Famine and the fight for independence through the present day. I compare heritage and identity on a national scale to a regional scale in County Galway and a local scale on Inishbofin, an Atlantic island off the western coast of Ireland. The examination of multi-scalar heritage compares uses of the past following the suffering, death, and mass migration of over a million Irish people. This paper sheds light on how small communities construct their identity with material culture, discusses the disparities between various scale of heritage in post-disaster and post-colonial environments, and explores the consequences of those differences.

Sharma Ogle, Mini (Portland General Electric)

[268] *'Powering the Future while Protecting the Past'- Cultural Resource Matters at an Electric Utility*

Portland General Electric has embarked on a cultural management stewardship program to elevate its responsibility towards its historic resources, including hydro-electric plants, traditional cultural properties, and even a company town. This poster will discuss some of the creative solutions PGE has developed in an effort to balance its needs to generate safe and reliable electricity while protecting cultural resources in its service territory.

Sharon, Gonen [71] see Berger, Uri

Sharp, Emily (Arizona State University)

[94] *Confronting Popular Perceptions of a Violent Past: Active Learning Strategies for a Large Introduction to Archaeology Course*

One goal of archaeological pedagogy is to make students question assumptions about "progress" and the relationship between modern human beings and their historical ancestors. One persistent idea is that violence has declined over time, which coupled with stereotypical illustrations of the past as

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particularly savage, influence how students conceptualize violence today. Developing teaching strategies that ask students to confront popular assumptions about violence can be difficult in introductory classes with enrollment of several hundred students. This presentation will describe two examples of implementing active learning strategies about these topics in an introduction to archaeology course at Arizona State University. Engaging students in small group activities within a large, lecture-based class included strategies such as think/pair/share and write/pair/share. Each activity prompt will be presented, along with a discussion of student feedback and suggested future modifications. The activities gave students hands-on experience with archaeological data and incorporated discussions of past violence in the media and popular science writings. Students were required to evaluate the data based on a set of given parameters to help develop critical thinking skills. By contextualizing modern perceptions of past violence around actual archaeological data, this encouraged students to become better informed consumers of archaeology.

Sharp, Emily [211] see Grávalos, M. Elizabeth

Sharp, Kayeleigh (Southern Illinois University Carbondale)

[141] *Beneath the Surface: Steps toward Resolving Gallinazo-Mochica Debates in Peru's Northern North Coast*

Understanding the role of the widespread yet under-recognized art style known as Gallinazo, its persistence alongside the more conspicuous Mochica art style, and the social factors that facilitated their long-term coexistence on Peru's North Coast during the first millennium, are primary concerns of this work. Investigation of the Songoy-Cojal site in the mid-Zaña Valley shows that Gallinazo-Mochica coexistence persisted at least until the 8th century CE (based on new C-14 dates). Many problematic assumptions concerning the role of the Gallinazo (e.g., culture, political or non-cultural entity), however, have emerged in recent decades, resulting from the widespread adoption of conventional stylistic and art historical interpretations. In this paper, I operationalize a new practice-based approach which combines concepts of technological style and technological choice, to explore more meaningful dimensions of these artifacts. Combining techno-stylistic, metric and archaeometric (pXRF and NAA) data, and social network analysis (or SNA) techniques, this work takes several steps toward resolving debates over the nature of Gallinazo-Mochica coexistence. Herein, I present new perspectives on the nature of Gallinazo multi-craft production from various work-related activity settings at Songoy-Cojal, finding that long-standing dichotomies between these two distinct stylistic traditions are far more superficial than previously thought.

Sharpe, Ashley (Smithsonian Tropical Research Institute), Kitty Emery (Florida Museum of Natural History, University of F) and John Pfeiffer (Florida Museum of Natural History, University of F)

[217] *Bringing Two Halves Together: Combining Modern Phylogenetics and Zooarchaeological Analysis to Understand Past and Present Trends of Freshwater Mussels (Unionidae) in Mesoamerica*

For over a century, the taxonomy of the Central American freshwater mussels (family Unionidae) has been the subject of numerous classifications and reclassifications, with naturalists identifying morphologically identical taxa as different genera or species, while at the same time classifying obviously distinct taxa under the same name. Zooarchaeologists at the mercy of these erratic classification schemes have been unable to effectively compare datasets. This study uses a combined zooarchaeological and molecular phylogenetic approach to identify both the ancient and modern freshwater mussels in Guatemala's Pasión River. Modern mussels were surveyed and collected near the archaeological site of Ceibal and then tested to understand their molecular phylogeny. Phylogenetic results were used to identify the archaeological shells spanning the site's history (1000 BC to AD 1000). Field data gathered on the live mussel biology, and interviews with the local residents familiar with the mussels, were used to produce a comprehensive understanding of how the different taxa may have been gathered and used by the ancient Maya. Results indicate that some taxa present in the river today were rare or entirely absent in the past, while certain taxa commonly found at Ceibal millennia ago cannot be found today.

Sharpe, Ashley [299] see Elvir, Wilmer

Sharratt, Nicola (Georgia State University)

[141] *Tradition and Transformation during the Middle Horizon to LIP Transition: Visual and Compositional Analyses of Tumulaca and Estuquiña Pottery in the Moquegua Valley, Peru*

In many Andean regions, the shift from the Middle Horizon to the Late Intermediate Period, or LIP, is archaeologically identified by stylistic changes. In the Moquegua valley, southern Peru, LIP (ca. AD 1250–1476) Estuquiña architecture and portable material culture is starkly different from that associated with terminal Middle Horizon (ca. AD 950–1200) Tumulaca populations. Until recently Tumulaca settlements were thought to have been completely abandoned prior to the appearance of Estuquiña styles. Incorporating both visual analyses of and compositional derived from LA-ICP-MS analyses of Tumulaca and Estuquiña pottery, I complement the long recognized stylistic distinctions by examining the transformation of productive practices and the organization of ceramic production as Moquegua underwent processes of population replacement and cultural change. Drawing in particular on material from Tumulaca la Chimba, a site with an Estuquiña occupation partially superimposing a Tumulaca occupation, I propose that the ceramic data suggest a more nuanced and complex picture of the transition from the terminal Middle Horizon to the LIP which, in tandem with new radiocarbon dates and excavation data, challenges the assumed temporal break between terminal Middle Horizon and LIP occupations in Moquegua and instead raises the possibility of a period of social interaction between communities.

Sharratt, Nicola [270] see Schaefer, Benjamin

Shaw, Justine (College of the Redwoods)

[173] *Sacbeob in the Cochuh Region: Barriers or Links?*

During the Terminal Classic, sacbeob were built at three Maya sites in the Cochuh region of west-central Quintana Roo, Mexico. The roads provided a physical connection between portions of Ichmul, San Felipe, and Yo'okop, running between important structures, out to outlying groups, and even to what had likely been separate settlements. Although they would have been used for processions between termini and may have had numerous symbolic meanings, the impact of some of the roadways on the lives of commoners may have instead been that of impeding the flow of transit. An examination of the contexts, features, and physical forms of these roadways shows how, rather than necessarily easing transit in the manner of most modern roads, some sacbeob were set apart as sacred space no longer available for quotidian functions. In contrast, other causeways seemed to be designed to welcome public access, providing for the ready flow of foot traffic along and across their spans. This difference, related to the intended function, reveals another way in which what archaeologists consider to be one feature class may have been conceived of as multiple categories by residents.

Shaw, Philip [217] see Sykes, Naomi

Shaw-Müller, Kyle [82] see Walden, John

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Sheehan, Beth (University of Illinois at Urbana-Champaign)**[222]** *The Influence of Journal Publishers on Archaeology Data Sharing*

Journal publishers are poised to influence and be influenced by disciplinary attitudes toward data sharing. A previous study of the relative strength or weakness of data sharing policies in journals that publish gene microarray expression data (Piwowar and Chapman, 2008) found that stronger data sharing policies are generally associated with higher journal impact factors and an increased percentage of articles with shared and available data. In fact, even the presence of a “weak” policy increased data sharing, as compared to journals with no data sharing policy. This poster presents the summarized findings of a similar review conducted in 2017 that examines the presence/absence and relative strength of data sharing directives from the top 50 archaeology journals (as ranked by the 2016 Scimago Journal Rank indicator scores). The results reveal a snapshot of the current state of the archaeology discipline’s data sharing attitudes as reflected in the culture of archaeology publishing and scholarly communication, and inspire discussion about the potential benefits and drawbacks of publisher-encouraged or mandated data sharing in this discipline.

Sheets, Kimberly (Washington State University)**[187]** *Understanding Changes in Lagomorph Proportions within the Homol’ovi Settlement Cluster, Northeast Arizona*

Lagomorphs (rabbits and hares) were a critically important dietary resource for inhabitants of the pre-contact American Southwest, where they typically dominate faunal assemblages. It is useful to examine proportions between genera of lagomorphs—specifically, cottontails (*Sylvilagus* sp.) and jackrabbits (*Lepus* sp.)—to elucidate information about the past environment and how it might have changed in response to human actions. Based on habitat preferences and predator evasion strategies, the lagomorph index is a useful tool for examining this relationship and tracking how the environment might have changed throughout time. This poster examines changes in the lagomorph proportions through time within the Homol’ovi Settlement Cluster, a group of five Pueblo IV villages occupied at various points between AD 1260 and 1400. Results show an increasing reliance on cottontails over jackrabbits through time. The implications of this trend are discussed through optimal foraging theory.

Sheets, Payson (University of Colorado) and Christine C. Dixon**[173]** *Constructing the Social Fabric of a Community: Household Service Relationships to the Ceren Village*

Volcanic preservation allows for detailed reconstructions of a variety of social relationships and material boundaries at Ceren. Service relationships are inferred from proximity of households associated with special-function structures, such as the religious complex, the sauna and the community governance center. These data show a social function of providing service relationships from each household to the community. Socioeconomic functions are also evident in the form of other specializations, one household producing specialty crops, another with spindle whorls for fine threads and groundstones, and another for painted gourds. The interpretation of evidence from Cerén documents the division of household groups into social units responsible for different economic needs within the community, which wove a deep fabric of social interaction. Physical markers of the Cerén landscape formed boundaries, agricultural fields separated by crop type, a sacbe and drainage canals dividing fields and providing transition from the border of the site center into the manioc field south of the community, and notably a large adobe block demarcating a division of space between fields, likely related to ownership. Such evidence from Cerén provides the rare opportunity to examine in detail the social obligations and physical divisions of a Classic Maya farming community.

Sheets, Payson [142] see Dixon, Christine C.

Shellenberger, Jon (Native Anthro)**[255]** *The Original Cultural Resource Managers of America: Going beyond Integrating Native Perspectives in Cultural Resource Management*

The perspectives of Native Americans within the field of archaeology can no longer be tossed aside. Native Americans have placed special cultural significance on archaeological resources long before 1492. The relationship between Archaeology and Native Americans is well-known to be a tumultuous one. The integration of Native American perspectives on the management of resources significant to tribes has been a continuum of paternalism and racial segregation. Archaeologists are in a rare position to perform great services, as well as great harm to significant Native American archaeological resources. The integration of Native perspectives within cultural resource management has been rewarding for all parties and expand our scientific understanding of human land use through time. This will force us to challenge existing biases and break down barriers to entry for Native American participation. In addition, a more diverse and holistic approach will provide different opportunities to resolve issues within the framework of existing laws and identify where changes need to be made in their application.

Shelton, China [298] see Allen, Susan

Shen, Chen [24] see Cheng, Wen Yin

Shen, Dewei (Yale University)**[24]** *Inscribing Behaviors on Oracle Turtle Plastrons: A New Method to Analyze Tributary Networks of Late Shang China (c. 1250 BCE–1046 BCE)*

Processed from turtle shells and bovid scapulae, oracle bones were massively exploited by the ruling house of the late Shang Dynasty for divination. As opposed to traditional scholarship that holds primary interest in inscriptions engraved on these bones, I consider late Shang divination in entirety as a technological process that proceeds from the preparation and delivery of bone material via tributary networks all the way to bones’ after-use discard into pits. By switching the attention to the least examined pre-divination and post-divination stages, I focus on the texts of marginal inscriptions, the data of the used turtle plastrons and the records of stratigraphy recovered from Pit YH127 and Pit H3 at Yinxu. I argue that since regional tribute payers, capital scribes and diviners were made bound by the tributary networks of oracle turtles, their major behavioral patterns that aimed to facilitate the provision of turtle shells for divination would have been “recorded” by the altered materiality of the shells at each step of change. To detect and reconstruct such behavioral patterns and the physicality of divination can deepen our understandings of the groups that attended the industry of oracle bones, and thus the nature of oracle bones as well.

Shennan, Stephen**[137]** *Dates as Data: Where Are We Now in Using Radiocarbon Dates to Infer Population Histories?*

Archaeologists have long used site counts and other measures to infer past population histories and such efforts have always been criticised by those who point to all the known and unknown unknowns that in their view make such efforts as dubious as getting to the topmost steps on Hawkes’s ladder of inference. In recent years most effort has been devoted to the use of summed radiocarbon probabilities for demographic inference since for most of later prehistory in most of the world it gives a much higher degree of chronological resolution than any alternative, resulting in many cases in a qualitatively new view of population patterns, which have turned out to be characterised by booms and busts. To overcome the many obvious problems to using radiocarbon dates in this way a great deal of effort has been devoted to the development of rigorous methods combined with large-scale data collection. The methods involve either building and testing specific models of population change through time, for example exponential growth, or

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comparing patterns in different data sets by means of permutation tests to see if they are significantly different from one another. The methods, criticisms and ways forward will be described.

Shennan, Stephen [29] see Schauer, Peter

Shepard, Lindsay (University of New Mexico)

[269] *Assessing the Effectiveness of Various Scanning Technologies in Digitally Capturing Fingerprints on Corrugated Wares*
Methodological advances in the study of fingerprints by criminologists have revived an interest in using dermatoglyphic evidence to conduct archaeological research. The analysis of fingerprint impressions left in ceramics is being used to investigate topics such as craft specialization and social organization. While most impressions left in ceramics lack the completeness needed to identify individual potters, fragmentary prints can be used to analyze things such as ridge density. Given a large enough sample size, the analysis of ridge density can be used to determine the sex ratio of potters, information that can be applied towards many lines of archaeological inquiry. As an initial step in conducting ridge-line analysis, I test four surface scanning technologies (NextEngine and HDI Advance 3D scanners, a Dino-Lite digital microscope, and photogrammetry) to determine which will produce images most conducive to performing such an analysis. Consideration is given to multiple factors, such as image resolution, ease of use, processing time, and the cost of operation. Gray wares from Chaco Canyon, New Mexico are used to conduct the analysis.

Shepardson, Britton L. [101] see Sullivan, Kelsey

Shepard, Christopher (College of William and Mary) and Martin Gallivan (College of William and Mary)

[328] *Persistent Places, Enduring Objects: Ritualized Spaces and Things in the Powhatan Political World*
Seventeenth-century colonial chroniclers repeatedly mention a series of places and objects that surrounded political negotiations and efforts at alliance-building by Powhatan societies. While regional scholarship has focused on competition over subsistence resources, regional trade dynamics, and the regulated exchange of “prestige goods” as central to the development of these political structures, we shift the focus toward the engagement between these societies and specific places and objects whose enduring legacies spanned multiple generations. We argue that the development of the seventeenth-century political geography was predicated on the maintenance of persistent ritualized spaces and the circulation of enduring objects whose shifting meanings connected the past and present, bolstered political structures, and facilitated the transfer of power from one generation to the next. Archaeological evidence indicates that shell and copper adornment objects entered the region during the thirteenth century, coinciding with the first appearance of palisade architecture, and the development of intentionally constructed ritual landscapes that served to create individual community identities, while at the same time drawing communities into a cross-regional political system.

Shepherd, Alison (VCP Augusta), Kelly Brown (VCP Augusta) and Josh Wackett (VCP Augusta)

[326] *Teaching Archaeology to Veterans: Case Studies from the Veterans Curation Program*
According to 36CFR79, collections recovered with federal funds must be made accessible to the public for research and educational purposes. However, this goal is deceptively difficult to achieve. Collections can be made available to professionals and archaeology students easily enough, but is there a way that we can involve the public in the process? The Veterans Curation Program (VCP), funded by the United States Army Corps of Engineers (USACE), St. Louis District, has become well known for doing just that; employing recently separated veterans as laboratory technicians to rehabilitate USACE owned or administered collections. USACE and VCP contractors have worked to close the gap between archaeologists and non-archaeologists by developing various reference guides, training exercises, and teaching collections. In this paper, we will highlight a few examples of the aforementioned training aids and examine how they have enabled the VCP’s veteran technicians to process archaeological and archival collections with accuracy and understanding.

Shepherd, Alison [326] see Janesko, Sarah

Sheptak, Rus (University of California—Berkeley)

[272] *Engaging Archaeology and Native American and Indigenous Studies*
Using concepts proposed and developed in Native American and Indigenous Studies would provide a useful way for archaeologists, especially those dealing with the relatively recent past, to address the challenge posed by indigenous scholars to decolonize archaeology. A few concepts have already been employed by archaeologists in North America, notably Gerald Vizenor’s idea of “survivance”. But as Maarten Jansen and Mixtec scholar Gabina Aurora Pérez Jiménez have shown in their work decolonizing Mesoamerican archaeology, there are even more ways to push forward. In this paper, I present a discussion of a series of concepts from Native American and Indigenous Studies that are being used by archaeologists working in the Americas, ranging from survivance to articulation to refusal to the indigenous archive, showing how the use of concepts developed under a decolonizing framework markedly shift the goals and interpretations of archaeologists.

[272] *Chair*

Sheridan, Kelton [176] see Pezzarossi, Guido

Sheridan, Thomas (University of Arizona) and Stewart B. Koyiyumtewa

[131] *The Way Forward: Native and Non-Native Collaboration as well as Multi-disciplinary Research Strategies*
As Native peoples assert their sovereignty over intellectual property as well as land and water, relationships between them and anthropologists are entering a new era characterized by collaboration as well as conflict. Ethical anthropologists in North America recognize that they need to secure tribal/First Nations permission for their research. Sometimes permission is granted only for projects of interest to the tribes themselves. And sometimes publication of that research for a wider audience may be restricted or denied. But the benefits of collaboration result in a much richer understanding of Native and non-Native relations, one informed and shaped by the perspectives of Native people themselves.
The Hopi Tribe of Arizona has been insisting on such collaboration for decades now. Nonetheless, some scholars working on the Hopi people continue to ignore such ethical guidelines and understandings. We argue that Southwestern archaeology, cultural anthropology, and ethnohistory will never progress beyond the limitations of Western epistemologies and lines of evidence biased by Western ethnocentrism and silences until collaboration is embraced and institutionalized as the only ethical and productive way to understand our shared pasts and presents. We discuss Moquis and Kastilam: The Hopi History Project as one example of such collaboration.

Sherwood, Sarah (Sewanee: The University of the South)

[180] *In the Morning House: The Redhorn Cycle Depicted in Rock Art from Kentucky*
This presentation reports on a new rock art site from Kentucky, brought to the authors’ attention by local citizens. Inside a large sandstone rockshelter, more than a dozen black pictographs show several anthropomorphic characters. These images bear distinctive features and regalia associated with the “Redhorn Cycle” hero narrative reported by Paul Radin in 1948 from his ethnographic work among the Ho-Chunk. The rock art from this “Morning

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House" strongly resembles well-known Mississippian period paintings from the Gottschall Shelter in Wisconsin and some of the paintings in Picture Cave, Missouri. The similarities include both subject matter and how the images are rendered. Morning House extends the geographic range of the Redhorn rock art corpus to the Eastern Woodlands, east of the Mississippi River.

[112] *Discussant*

Sheumaker, Christian [28] see Levi, Laura

Shi, Tao (Cotsen Institute of Archaeology, UCLA)

[140] *Resource, Transportation and the Political Landscape of the Chinese Bronze Age*

The political landscape of the Chinese Bronze Age was characterized by controlling the key resource situated in the distant regions from the Luoyang Basin. The study of key natural resources and their transportation networks should therefore be an important facet of research into state formation during the Chinese Bronze Age. The extraction and transportation of key resource, and its relationship with the cultural landscape addresses the basic political framework of the states in Early China. With the geoarchaeological survey into the turquoise and cinnabar mines in the Qinling Mountain Range, this paper explores the political landscape of the first Bronze-Age state, Erlitou, through analysis of geography, resource flow, transportation, and archaeological sites in the Qinling Mountain Range. Moreover, by integrating the materials from 3rd to 2nd Millennium BC in a broader geographical scale, this paper details the dynamic process leading from the prosperity of the fringe areas of the Loess Highland to the Luoyang-centric network. This transformation is not only reconfiguration of the political landscape, but also the preparation of knowledge prerequisite for the political landscape of the Chinese Bronze Age.

Shillito, Lisa-Marie (Newcastle University)

[126] *Feeding Stonehenge: The Potential of Coprolites as Tools for Reconstructing Diet*

The Feeding Stonehenge project combined zooarchaeology with pottery residue analysis to explore the diets and provisioning of the inhabitants of Neolithic Durrington Walls, the settlement associated with the construction of the iconic Stonehenge monument in southern Britain. A lack of preserved plant remains at the site, and an overwhelming dominance of porcine and ruminant lipids in the pottery, suggests that animal products were the major source of nutrition. This research tests this hypothesis through analysis of organic residues preserved in coprolites, which have not previously been incorporated into dietary studies. Can these more unusual forms of evidence provide additional information on non-animal inputs to diet at the settlement? Coprolites identified as human on the basis of sterol and bile acid profiles can be further analysed for dietary residues including plant microfossils.

[126] *Chair*

Shillito, Lisa-Marie [126] see Blong, John

Shimada, Izumi (Southern Illinois University), Carlos Elera (National Sicán Museum), Haagen Klaus (George Mason University), Alexandra Greenwald (Arizona State University) and Jenna Hurtubise (University of Alabama)

[65] *Large-Scale Human Sacrifice and Feasting at Sicán, Peru during the 11th-Century Mega-El Niño: A Multidisciplinary Vision*

We present a multidisciplinary summary vision of the natural and cultural contexts and impacts of an 11th century mega-El Niño event and the extraordinary social responses to and consequences of it. Evidence and impacts of torrential rains and associated severe flooding dated ca. 1050 CE have been documented at multiple sites along the Peruvian coast, particularly in the Lambayeque region. The flood buried the Middle Sicán capital of Sicán with fluvial deposits 1.0 to 1.5 m thick. During this calamitous process that may have lasted many months, three episodes of large-scale human sacrifice of well over 200 individuals who were overwhelmingly healthy young to adult males took place near the center of the Gran Plaza of Sicán. There are suggestions of possible live burials. Efforts aimed at the clarification of victim identities and life histories are ongoing, however, the abundance of serving vessels and food remains indicate correspondingly large-scale feasting events that were closely associated in time and space. Resultantly, we posit that these events may have been pleas for the return of normalcy. Within a span of one or two generations, the Middle Sicán polity underwent transformations, likely triggered by adverse effects of this mega-El Niño.

[141] *Discussant*

Shin, Dong Hoon [56] see Kim, Yong Jun

Shinde, Vasant [56] see Kim, Yong Jun

Shiner, Marion (University of Sheffield, UK) and Katie Hemer (University of Sheffield, UK)

[87] *Concern for the Living, Care for the Dead: Non-adult Burial at the Early Christian Cemetery of St Patrick's Chapel, Pembrokeshire*

Recent excavations below the ruins of a 13th–16th AD century chapel dedicated to St Patrick, at Whitesands Bay, Pembrokeshire in southwest Wales revealed ninety well-preserved burials dating to the 7th–11th century AD. There was an unusually high concentration of non-adults buried at the site, including a number of foetuses and infants. Some of these young individuals received elaborate burial forms, including the use of quartz-topped burials and cross-inscribed grave markers. It is necessary to consider why so much was invested in the burial of those whose lives were so short. This paper will therefore explore how the funerary rites accorded to these individuals reflect the concerns of the living regarding the well-being of society's youngest members in the afterlife.

Shiratori, Yuko (The Graduate Center, CUNY)

[252] *Commemorating the Preclassic Monumental Construction at Tayasal, Guatemala*

Research into the Main Group at Tayasal, Guatemala, revealed that the Postclassic inhabitants re-occupied areas and buildings that were constructed during the Preclassic period. Most of those buildings in the Main Group stand on a massive elevated platform, which was also constructed during the Preclassic period. The Preclassic period was the period during which the construction of monumental architecture such as E-groups and Triadic Group occurred at numerous sites including Tayasal. It was also the period during which ritualistic ideologies and collective identity were established and permeated. At Tayasal, the massive platform was elevated by a natural hill and held several platform groups. Two Triadic groups were constructed at the margin of the site, probably indicating the boundary of the community. The construction effort required for such monumental architecture may be a result of the emergence of a collective community identity and political authorities. In this paper we discuss Preclassic monumentality at Tayasal and how later occupants perceived and incorporated these constructions into their landscapes. Repeated occupation and remodeling of Preclassic architectures in the Postclassic period may mark the commemoration of ancestors.

[252] *Chair*

Shock, Myrtle [116] see Watling, Jennifer

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Shoji, Kazuho, Takayuki Omori and Vanessa La Rosa

[64] *The Change and Chronology of Preceramic Mound-Building Practices at the Cruz Verde Site in the Chicama Valley, Peru*
Excavations in 2016 and 2017 at the Cruz Verde site which is located in the coastal area of the Chicama Valley, revealed a stratified record of preceramic mound-building practices. These practices are constituted by various mortuary contexts and are particularly noted for their use of architectural reconstruction, an activity repeated from around 4000 cal. BC ~1900 cal. BC divided into two phases, the CV-1 phase and the CV-2 phase. We conducted a stratigraphic examination of these contexts, and carried out radio carbon dating to further analyze the processes of constructing mound and its change over time. These analyses revealed that accumulation of food waste midden and embedded mortuary contexts caused the growing of mound volume in the CV-1 phase, and the abrupt change to the beginning of architecture construction on the mound: an activity of constructing a room and the reconstructions of floors and walls which led to the division of inside space in the CV-2 phase. These processes indicate that the monumentality of mounds gradually increased in the CV-1 phase as the mortuary and food waste accumulating practice, and the increased monumentality caused the change of the utilization of this place around 2800 cal. BC, in the CV-2 phase.

Sholts, Sabrina

[143] *Ancient Biomolecules and Destructive Sampling at the National Museum of Natural History*

Biomolecular analyses have revolutionized the field of archaeology in the 21st century. Rapid advances in technology have lowered barriers to biomolecular information by increasing the speed, affordability, and effectiveness with which researchers can extract and analyze biomolecules from ancient materials. Amid growing attention on museum collections as a source of samples for biomolecular research, the people who curate and manage these collections are faced with new challenges and considerations. Although destructive sampling is often necessary for the best available techniques, critical questions remain about how to balance the gain of scientific knowledge against the loss of materials for future study.

This paper addresses major issues in biomolecular research and destructive sampling within the context of the physical anthropology collections at the National Museum of Natural History (NMNH) of the Smithsonian Institution. External and internal processes for destructive sampling requests are reviewed, and appropriate conditions and expectations for approved proposals are discussed. Ultimately this paper aims to facilitate ethical and excellent biomolecular research on archaeological remains at NMNH, which has a responsibility to preserve and provide access to its collections in the service of science and for the public, as well as an institutional mandate to increase and diffuse knowledge.

[143] *Chair*

Sholts, Sabrina [143] see Carreon, Samuel

Shott, Michael (University of Akron) and Erik R. Otárola-Castillo (Purdue University)

[103] *Parts of a Whole: Reduction Allometry and Modularity in Experimental Folsom Points*

Points were designed for use but also for repair or rejuvenation. Points accumulated in the archaeological record at stages from first use to extensively resharpened. Thus, specimens of a single type could enter the record in a range of sizes and shapes. Resharpening allometry has been documented in many studies, including geometric-morphometric (GM) ones. One hypothesis is that flintknappers designed points as separate "modules" to accommodate their overall function. This hypothesis views the base and blade portion of points as two modules of whole units, designed to perform different tasks and thus treated differently during the design and resharpening process. Using geomorph and the recently developed zooRchGUI that exploits the functionality of R through a graphical user interface, we conducted 3D GM analyses of a set of experimental Folsom points as they passed through successive stages of use, damage, and repair. We report degree of allometric variation in both base and blade as a function in part of number of resharpening episodes, and changing patterns of integration within separate base and blade modules. Results are a step toward calibrating point size and shape to number or degree of resharpening episodes.

Shpall, Cahill (University of Oregon Anthropology Department), Katelyn McDonough (Graduate Student Texas A&M) and Dennis Jenkins (University of Oregon, Department of Anthropology)

[47] *Elko Chronology: Connelly Caves Lithic Analysis and Great Basin Implications*

Consistent Elko chronology in the Northern Great Basin remains elusive to the archeological community. Numerous symptoms can be determined to be the cause of this absence of information, including a lack of in depth analysis in the region, extensive sediment disturbance leading to non-conclusive stratigraphic dating where studies have taken place, and a shortage of differential site comparisons. Connelly Caves provides an amazing opportunity to combat this archeological affliction through the analysis of the convergence of Elko era lithic technologies. Paired with extensive literature analysis, site comparisons and detailed chronological construction, further insight into Elko lithic technologies and implications can be achieved. The completion of this poster will result in a detailed explanation of Elko Lithic technology, including physical identification, construction, use, and chronology. Implications of the importance of using lithic technologies within the archeological record to track cultural transmission and evolution will be discussed, along with the results of in depth analysis of the Elko presence at Connelly Caves. Further extrapolation of the caves geographic importance and history will be addressed and the placement of the lithic chronology into the larger world-view of the Elko Archeological record will bring this undertaking to completion.

Shrestha, Ramesh [299] see Fernandez Diaz, Juan

Shreve, Nathan [241] see Ermenwein, Eileen

Shunkov, Mikhael [41] see Douka, Katerina

Shuttleworth, Andrew (Queen's University Belfast)

[329] *Paleoanthropology and Pedagogy: Raising Horizons for the Next Generations*

The 21st century will be remembered as a period of exponential change within paleoanthropology. Though such developments pose academic challenges, an overlooked issue is how we communicate this information to students. A constantly changing foundation of knowledge that increasingly requires an understanding of complex theoretical techniques, coupled with the importance of student satisfaction surveys, educators are faced with a pedagogical dilemma: stick with 'established' teaching methods though they are increasingly recognised as being ineffective and may even alienate students from their passion of human origins, or invest more of what little time we have in developing new, innovative ways of teaching even if that increases the risk of failure. This paper presents two pedagogical exercises, developed over four years of undergraduate teaching, that 'open up' theoretical concepts in paleoanthropology by removing paleoanthropology entirely. Utilising a pop cultural staple in the form of Star Trek which addresses issues of speciation and diversity relevant to paleoanthropology, these exercises offer an innovative, fun, and informative way for students to learn, understand, and apply the theoretical underpinnings of species recognition and phylogeny; that once understood can be applied to the fossil record with a greater understanding and confidence than more traditional methods currently provide.

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Sichler, Judith (Pellissippi State CC)**[90]** *Provisioned and Caught: Historic Perspectives on Diet in the Danish West Indies*

Historic records indicate that during the late 18th and into the 19th century preserved North Atlantic fishes were shipped to the West Indies as a relatively cheap source of protein to feed enslaved persons and also the planter class. However, in historic zooarchaeological analyses of faunal assemblages from the Caribbean, the presence of these food remains is often not identified. Using two sites from the Danish West Indies, a case will be made for the use of fine-screen techniques to ensure adequate recovery of these remains to provide a more complete dietary picture and definitive evidence of provisioning. Additional faunal data show a predominance of marine fish and mollusk remains and limited use of domestic species.

Sidéra, Isabelle [89] see Martisius, Naomi L.

Sieg, Lauren (National Museum of the American Indian)**[322]** *Moderator*

Sierpe, Victor [155] see San Román, Manuel J.

Sievert, April (Indiana University)**[60]** *Moderator*

Sigurðardóttir, Ragnhildur [167] see Hicks, Megan

Sillar, Bill (Institute of Archaeology, UCL)**[207]** *Canas, Canchis and Cuzco: What Was the Scale of Community Allegiance in the LIP?*

The Inca encountered the Canas and Canchis ethnic groups when they expanded out of Cuzco. Canas sites in the herding areas of Espinar show larger scale and more developed settlements than most of those in their agricultural region of the upper Vilcanota Valley. This raises questions about the scale of 'community' (village, kinship group, subsistence group, ethnic group). But to address this we need to consider the degree to which allegiance to leaders, ancestors and huacas as well as the seasonal exchange of commodities and labour can integrate spatially separated groups. It is suggested that some aspects of 'LIP' social organisation began to develop in the final stages of Middle Horizon and were widely shared across the Andean highlands. Finally, the developments of social organisation by the Canas and Canchis in the LIP will be compared with contemporary developments in the Cuzco region.

Silliman, Stephen (University of Massachusetts Boston)**[272]** *Beyond the Holes of Archaeology: Paying Attention to Indigenous Academics, Artists, and Activists*

Archaeology continues to need the infusion of indigenous perspectives, not only to take responsibility for the discipline's past in colonial contexts, but also to advance its ability to understand human histories—especially indigenous ones—in respectful, innovative, and inclusive ways. This need is particularly strong for those archaeologists who study Native American cultural and community life just before, right into, and well after the onset of European colonialism and for those who are paying attention to the broader context in which archaeology operates (or doesn't) today as a direct result of those colonial issues. To do so, we often have to get out of our archaeological "holes" to engage with other scholarship and artistic interventions. This paper highlights some Indigenous academics, artists, and activists whose works have influenced me—showing me broadened ways to think about the past, better ways to use archaeology, and deeper contextualizations of the issues well beyond our disciplinary confines.

Silva, Rosicler (Pontifícia Universidade Católica de Goiás), Julio Cezar Rubin de Rubin (Pontifícia Universidade Católica de Goiás), Maira Barbari (Pontifícia Universidade Católica de Goiás) and Sibeli Viana (Pontifícia Universidade Católica de Goiás)**[2]** *New Perspectives in the Geoarchaeological Context of Hunter-Gatherer Sites from the Beginning of the Holocene, Serranópolis, Brazil*

The GO-JA-01 and GO-JA-02 archaeological sites, located in sand stone shelters of Serranópolis excavated from the 1970s to 1990s and earliest at 10,400 years B. P., were occupied by hunter-gatherer and agricultural-ceramic groups. Recent studies have raised hypotheses regarding the appropriation and construction of the landscape by hunter-gatherer groups, based on evidences related to the paleoenvironment and the archeological site formation process in the Rio Verde river alluvial plain. The purpose of this study is to present some of the variables used in approaching the geoarchaeological context, broadening discussions regarding the occupation of the area.

Silver, Josh [251] see Troccoli, Ruth

Silverman, Shari (Washington State Parks & Recreation)**[84]** *Geoarchaeology of Lwalb Old Channel One (45KI815), South Park, Seattle, Washington*

Lwalb Old Channel One, a shell midden, spans both sides of an oxbow within the historic Duwamish River floodplain. The oxbow is buried under the streets of the South Park neighborhood, Seattle, Washington. Also called 45KI815, the site's shell component is light. Therefore, the midden does not mask contemporaneous geomorphological features of the oxbow and surrounding wetland. Visible soil features include the channel; vegetation effects on soil movement; midden migration; possible liquefaction scars; and even old shovel marks, potentially from shellfish harvest. The Duwamish River itself has undergone massive geographical changes. Natural forces governed these changes initially. During the turn of the twentieth century, however, humans significantly altered the landscape. Lwalb Old Channel One's geoarchaeology opens a window into this transition.

Silverstein, Jay (Univ of Hawaii/DPAA) and Hamedy Mashaly (Supreme Council of Antiquities, Egypt)**[32]** *Sacred and Profane Aspects of Water Management in Ancient Thmuis, Egypt*

Water management in ancient Egypt entailed harnessing natural and supernatural forces. Thmuis grew to power in the heart of the Nile Delta evolving as a nexus of Greco-Egyptian ideological syncretism within a riverine/lacustrine environment. Water management challenges included mitigating damage from annual floods, optimizing production, and maintaining transport. To survive in this dynamic hydrologic regimen, the people of Thmuis harnessed and controlled the Nile waters through engineering and spiritual intervention. Over the last several seasons of archaeological study at Tell Timai, evidence of the religious and profane hydraulic infrastructure have been unearthed. A nilometer, well-constructed paved channels, large and small wells, lesser drains, and evidence of floods attest to the effort and investment made in water management. These discoveries help shape our understanding of the relationship between Greco-Roman Thmuis and the lacustrine delta fill environment where it thrived.

Simek, Jan and Alan Cressler**[90]** *Sacred Animal Images in Precontact Southeastern Rock Art*

Walter Klippel has always focused his research on animal remains from archaeological sites, especially from Southeast North America. In honor of his retirement, we review how animals are depicted in Precontact rock art sites from the region he knew so well. A wide variety of creatures—mammals, birds, reptiles, fish, and even insects—were illustrated by ancient southeastern artists. Animal imagery appears in both open air and cave art, although

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the kinds of animals vary between these two contexts. The animals used most intensively for food, however, were less commonly drawn on rock and cave walls. Animals that were depicted most often were those who could cross between land and water, from the air to the ground, or from the surface to subterranean worlds. We argue for a spiritual aspect to rock art animal images.

Simek, Jan [180] see Sherwood, Sarah

Simeonoff, Sarah, Curtis W. Marean (Institute of Human Origins, School of Human Evolut) and Jamie Hodgkins (Assistant Professor Department of Anthropology Uni)

[99] *Zooarchaeological Analysis of a Late Pleistocene Interglacial-Glacial Transition at Pinnacle Point Site 5–6, South Africa*
Understanding if and to what extent early anatomically modern humans adapted to dramatic climatic events is essential to human origins research. Pinnacle Point—a complex of cave sites and rockshelters along the southern coast of South Africa—offers a unique opportunity to study human adaptability through time. The long sequence at Pinnacle Point Site 5–6 (PP5–6) spans 164–44 thousand years ago and encompasses two Interglacial to Glacial Marine Isotope Stage transitions (Stages 5–4–3). This study analyzes faunal remains dated to the MIS 5–4 transition occurring early in the sequence at PP5–6. The change in climate during this transition caused the Paleolithic coast to retreat, possibly necessitating a change in resource procurement strategies by humans occupying the cave. The extent and nature of this change is examined through surface modifications (i.e., cut marks, percussion marks and notches), extent and location of burned remains, and the species composition of fauna transported to the site. Preliminary results suggest that the frequency of surface modification and burning increased during the transition. This zooarchaeological analysis will add to research on the adaptability of early humans to environmental shifts at Pinnacle Point.

Simmons, Alan (University of Nevada Las Vegas, Department of Anth)

[41] *Aquatic Neanderthals and Paleolithic Seafaring: Myth or Reality? Examples from the Mediterranean*
It long has been assumed that most of the world's islands, especially remote ones, were first visited or colonized by fully modern humans. With few exceptions, these events occurred late, during the Neolithic or later, with an implied assumption that most islands could not support hunters and gatherers. We know that this scenario is no longer viable, with examples from Australia and southeastern Asia, such as Flores and Sulawesi, suggesting considerable antiquity extending prior to the emergence of both modern *Homo sapiens* and Neolithic economies. In this presentation, I summarize some of the emerging data from the Mediterranean that suggests pre-Neolithic, and in some cases, pre-modern, seafaring to some of the islands. Also addressed are the substantial problems of documenting and dating such sites. Finally, I conclude with the implications of systematic seafaring in human evolution, especially as it relates to the considerable skills required for seafaring, such as long-term planning, adequate technology, navigation abilities, and, ultimately, "why" such activities would even be undertaken in the first place. If pre-modern seafaring can be adequately documented, and shown to be systematic rather than random or one-time events, it indicates that these early humans had cognitive skills similar to fully modern people.

Simmons, Scott (University of North Carolina Wilmington)

[302] *The Integration of Island and Mainland Maya Communities: Perspectives from Ambergris Caye, Belize*
After a span of over twenty years archaeological investigations have resumed at the San Pedro site, located in downtown San Pedro, Ambergris Caye. Investigations in the early 1990s revealed portions of a Spanish contact period Maya community that was settled as early as the 14th Century CE. Based on previous as well as ongoing investigations at the San Pedro site and other Maya sites on the island and the mainland, it appears that communities on the cayes were linked to one another in various ways. Likewise, communities on the island shared certain characteristics with those on the mainland of northern Belize, most notably in the areas of material culture and mortuary behavior. Here the results of investigations in previously untested areas at the San Pedro site are summarized, and the evidence for Maya cultural adaptations to changing environmental and social conditions on Belize's coast is highlighted. Research conducted on Ambergris Caye also draws attention to the similarities the San Pedro site and other sites on the island share with those on the mainland of northern Belize, as well as the unique characteristics of the island sites, particularly with regard to their architecture and settlement characteristics.

Simon, Arleyn

[152] *Discussant*

Simon, Arleyn [91] see Wright, Aaron

Simon, Katie

[286] *Illuminating Haiti's Royal Past: Advancing Analytics through 3D Data Fusion of Terrestrial Surface Models and Subsurface Geophysical Data*
Since 2015, the Milot Archaeological Project has conducted a series of archaeological explorations at the Royal Palace of Henry Christophe in the town of Milot in Northern Haiti. This site, called Sans-Souci, was a principal site of political authority in the short-lived Kingdom of Haiti (1811–1820) and is a UNESCO World Heritage site of paramount importance to national development strategies in Haiti. Working with the Institut National du Patrimoine Culturel (Haiti), the Bureau National d'Ethnologie (Haiti), the Center for Advanced Spatial Technologies (University of Arkansas), and the Center for Digital Archaeology (CoDA), the Milot Archaeological Project sought a research strategy centered on minimally invasive excavation, maximal data recovery, and rapid reporting. This paper outlines the results of ground penetrating radar and terrestrial laser scan surveys conducted by CAST and explores the utility of combining these 3D datasets to investigate research questions regarding construction phases that would otherwise be difficult, if not impossible, to address using traditional methods. This effort aims to elucidate the analytical potential of employing advanced 3D data fusion and visualization methods beyond mere documentation.

[286] *Chair*

Simon, Rebecca and Shanna R. Diederichs (Crow Canyon Archaeological Center)

[226] *"Where the Stone Wall Ends": Exploring Community Development through Great House Architecture*
Crow Canyon Archaeological Center's latest project, the Northern Chaco Outliers Project (NCOP), continues the tradition of research around the theme of community. The Lakeview group is one of the densest concentrations of great houses in the central Mesa Verde region of southwest Colorado. The group includes three sites, the Haynie site (5MT1905), the Ida Jean site (5MT4126) and Wallace Ruin (5MT6970). The NCOP focuses on community development, social stratification, and identity formation at the Lakeview group during the Chaco to post-Chaco transition (A.D. 1000–1280). Using a combination of archival data, architectural documentation, and spatial analysis, this study demonstrates the deep history of the Lakeview group and begins to explore the economic, social, and symbolic bonds between the great houses within the community and to the greater Chaco regional system.

[289] *Discussant*

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Simova, Borislava (Tulane University)**[129]** *Negotiations in the Ritual and Social Landscape of Actuncan, Belize*

Our understanding of the ancient Maya is informed to a great extent by the material remains of ritual performance in both domestic and public contexts. Maya populations throughout Mesoamerica were united by a shared cosmology patterning the timing, location, and material aspects of ritual performance. Yet, ritual was not a static or rigid construct, dutifully replicated across populations. At the site of Actuncan, Belize, we find that aspects of domestic ritual cycles,—including form, content, placement, and frequency,—show a flexible, even creative approach to ritual. In each foundation, renovation, and termination of a house, the inhabitants had the opportunity to carry out rites before groups of varying sizes, conveying a sense of community in some and distinction in others. These performances, and their material remains, were key components in the literal and figurative construction of the Actuncan community, as commoner and elite households actively reworked architectural forms and ritual templates to either perpetuate existing identities or signal new trajectories. This paper examines household ritual deposits associated with construction events as resources used to different ends by elites and commoners to negotiate interactions between existing physical structures on the landscape and sociopolitical structures in the Actuncan community.

Simova, Borislava [129] see Fulton, Kara A.

Simpson, Ian [34] see Madsen, Christian K.

Simpson, Nick (Colorado State University) and Christopher T. Fisher (Graduate Advisor)**[31]** *Using LiDAR to Map an Ancient Purépecha Water Management System in ArcGIS*

Recent applications of LiDAR technology at the Late Postclassic city of Angamuco, located in the heartland of the ancient Purépecha Empire in modern day Michoacan, Mexico are allowing for the identification and analysis of urban features in innovative ways. A complex system of constructed water management features consisting of reservoirs, sunken plazas, and connective canals were a vital form of infrastructure that were required for the movement of water across the dynamic landscape upon which the city is located. Access to water played a crucial role for the occupants of Angamuco in everyday life, and for the maintenance of inner-city gardens located throughout the city. Using various tools in ArcGIS to render different visualizations and employing mapping contours at various scales, my aim is to identify and measure the natural depressions and constructed features that compose the water control system across the site. The primary goal of this research is to better understand the hydrological makeup of the city and surrounding landscape as well as to better understand the ways the inhabitants of Angamuco organized themselves to optimize access to water throughout the year.

Sims, Marsha**[180]** *A Mesoamerican Culture Hero Legend in Western U.S. Rock Art*

Research ties Mesoamerican search for ancestors to U.S. rock art. A hero in Mexican Aztec legend fought his sister, Coyolxauhqui, and the titans, decapitating her, rolling her body down the mountain, and leaving her head on the mountain. Coyolxauhqui is a floating head on Mesoamerican murals, decapitated and dismembered on the Coyolxauhqui stone. She was the moon, queen, and an avatar of their Earth Mother. She is commemorated in Basketmaker and later rock art in Colorado and Utah at 5 Faces and 4 Faces pictographs in Davis and Salt Creek canyons, and in Bullet Canyon, Little Rainbow Park, and Cub Creek. The Earth Mother is represented as unclean, covered with snakes in Mesoamerican iconography. In North America she is rendered in charcoal at Bullet Canyon, Hog Springs, Black Dragon Canyon, San Rafael Swell, Horseshoe Canyon, and presented in this research is a newly recorded pictograph in a deep crevice along the eastern Front Range. The hero, as the hummingbird, is in Tsankawi and Long House ruins, Black Canyon, La Cieneguilla, San Crisóbal, and Galisteo. Titans, as proboscideans, are at Bullard Cove, Shay Canyon, Colorado River gorge, and Indian Creek Canyon.

Sinclair, Jacinda (Memorial University of Newfoundland)**[36]** *The Complexity of Archaeological Site Revisits: A Case Study from Labrador*

The five sites recorded in Junius Bird's 1934 survey of the Hopedale area are both culturally important to the local Inuit community and to the history of the creation of archaeological narratives about the Labrador Inuit. Recently, the Hopedale and Nunatsiavut governments have stated a desire for additional archaeological research prompting Memorial University to revisit the Avertok and Karmakulluk sites to conduct additional excavations. In the 83 years that have passed since Bird's work, many transformations have occurred within archaeological theory and methodology and this time period has also seen many transformations within the town of Hopedale and its community. The effects of these transformations on the current research are complex, presenting both advantages and disadvantages and impacting both the data obtained and how it is interpreted and utilized.

Singer, Zachary (University of Connecticut), Peter Leach (University of Connecticut; Geophysical Survey Syst), Tiziana Matarazzo (University of Connecticut), Cosimo Sgarlata (Western Connecticut State University) and Dawn Beamer (University of Connecticut)**[294]** *Beyond a Stone's Throw from the Lithic Source: New Investigations of the Paleoindian Component at the Templeton Site in Western Connecticut*

2017 marks the 40th anniversary of Roger Moeller's initial excavation of Templeton, the first Paleoindian site systematically studied in Connecticut. New excavations at Templeton were conducted in 2016 and 2017 to further document the Paleoindian component of the site. This presentation reports on the results of the new excavations and the reanalysis of the Paleoindian materials recovered Moeller.

Singh, Ravindra [121] see Petrie, Cameron

Singleton, Hayley (Amherst College)**[149]** *Discussant*

Sion, Julien [80] see Hiquet, Julien

Siqueros, Bernard [331] see Hill, Brett

Sise, Samantha [241] see Anderson, C. Broughton

Sistiaga, Ainara (Massachusetts Institute of Technology), Sepideh Parkour (Broad Institute), Mathilde Poyet (Massachusetts Institute of Technology) and Roger Summons (Massachusetts Institute of Technology)**[126]** *Variation in 5βstanols Excretion in Humans and Its Implications for the Application of Fecal Biomarkers in Archaeology*

Fecal biomarkers have proven to be a valuable tool to identify the likely source of fecal matter and have successfully been applied in archaeology. They provide direct evidence of the digestive physiology and diet of the source, and critical data to assess the origin of fecal deposits. 5βstanols can be used as fecal biomarkers because they uniquely form in the gut of higher mammals during metabolic reduction of sterols. However, the actors of this

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microbial conversion still have to be elucidated and only a few cholesterol-reducing strains have been isolated (only one from human feces). Genes or enzymes involved in this metabolism are still unknown.

Here we present GC-MS and genomic data from fecal samples collected from healthy individuals with different diets and lifestyles. Our results show high diversity in lipid content which can be related to inter-variation of gut microbiome. Almost half of our donors showed little or no conversion, presenting elevated levels of cholestadiene. Our study shows the complexity of 5 β stanols production in the human gut and its application to archaeology. Further investigation into the microbial actors of this conversion could open a new window into the study of ancient microbiomes and their role in human evolution.

Sittig, Peter [184] see Cassedy, Daniel

Siveroni, Viviana (Institute of Archaeology, University College London)

[132] *The Incas in Nasca: A Review of Data from the Northern Drainage*

Little research has been conducted in the Nasca region to explicitly improve our understanding of the nature of Inca occupation in the region. A while back, Menzel (1959) noted the lack of local monumental architecture associated to Inca sites in Nasca. In contrast to the Ica valley, surface data from sites in the Nasca area suggest that local populations lacked socio-political complexity and were organized at the level of simple chiefdom structures. Later on Schreiber (1992) suggested that the integration of the territory was achieved by adding an administrative tier to the local settlement pattern. However, there is no known local settlements which are spatially associated to Inca buildings. Schreiber suggests the Incas' interest in Nasca was due to its strategic location at the junction of the highland with the coastal Inca road. In this paper, I use data from excavations at Huayuri in the Santa Cruz Valley in the Nasca drainage to explore the nature of interactions between local households and the Inca state. I will focus on the analysis of ceramic material to delineate possible cultural and economic interactions. Also, I will draw on surface data from three other sites to further understand this relationship.

Skaggs, Sheldon (Bronx Community College CUNY)

[256] *Caches, Burials, and Vases, Oh My: Ritual Deposits in an Elite Courtyard at the Ancient Maya Site of Pacbitun, Belize*

Recent investigations in a large, enclosed courtyard on the southwest corner of the ancient Maya site of Pacbitun, Belize, revealed evidence of successive emplacements of ritually important deposits. Initial analysis of the ceramic material suggests that the entire courtyard plaza has only one or two floors, with construction and use only during the Late to Terminal Classic period (600–900 CE). Five caches and two cyst graves were related directly to the plaza floor. The caches consisted primarily of ceramics, but some also included jade and obsidian eccentrics. The two cyst graves were on the western and eastern edges of the central excavation unit. Additional graves, with slate capstones, were found west of the central unit. Either these were initially intrusive through the plaza floor, or subsequent revisiting of the burials breached the plaza floor. A burial on top of the westernmost slate capstones was particularly interesting, with associated fragments of a partially restorable Uluva Valley marble vase, a pair of carved shell atlatl finger loops, jade inlaid teeth, and shell and bone grave goods. The burials, caches, and associated artifacts are compared with other Belize Valley and lowlands sites, illuminating relationships between ritual practices across these areas.

[256] *Chair*

Skaggs, Sheldon [256] see Powis, Terry

Skeates, Robin, Jessica Beckett and Cezary Namirski (Durham University, UK)

[136] *Ritual Performances in and around Caves in Bronze Age Sardinia*

This paper understands performance as an embodied, site-specific and temporary event. It consequently emphasizes the diversity of ritual performances identifiable archaeologically, not only in the context of different types of cave and rock-shelter, but also between these and other types of site in the landscape. In doing so, the paper evaluates the liminality of these places and ritual performances, which were—to varying degrees—separated spatially, temporally and symbolically from the rest of life. It also considers the extent to which traditional practices were transformed over the course of successive performances. Mortuary rituals in Bronze Age Sardinia are used as a case-study. Mortuary practices (and especially the treatment of human remains) identified at cave sites, megalithic tombs and rock-cut tombs are compared. Particular attention is focussed on a group of Bronze Age burial caves and rock-shelters excavated and studied recently by the authors in the territory of Seulo in central Sardinia.

Skeens, Jeremy (University of Iowa)

[26] *Sifting through the Sherds: An In-Depth Look at the Ceramic Assemblage from Woodpecker Cave (13JH202)*

Woodpecker Cave (13JH202) provides a unique opportunity to study variation in ceramic technology and resource allocation during the ceramic production process at a Late Woodland East-Central Iowa site. Excavations by the University of Iowa field school spanning six seasons have recovered hundreds of ceramic pottery sherds from Woodpecker Cave, including a modest amount of decorated rim pieces and a large number of undecorated body sherds. Previous typological analyses of the ceramic assemblage have supported the hypothesis that the site was host to repeated seasonal occupations spanning hundreds of years. In this study, both quantitative analysis of ceramic thin sections and elemental analysis of sherds utilizing portable x-ray fluorescence (pXRF) were implemented to identify variations in local clay sources, paste characteristics, and potential tempering agents within vessels at the site, as well as local and regional patterns. Additional residue analysis helped to define temporal aspects of the site and allowed for broader comparative analyses involving similar regional research, which can aid in further studies regarding social behavior in the prehistoric Midwest.

Skillern, Megan [243] see Hankins, Sharon

Skinner, Dougless, Paul Williams Sr. (Gwich'in Elder), Holly McKinney (University of Alaska Fairbanks) and Michael Koskey (University of Alaska Fairbanks)

[250] *White Eye Traditional Knowledge Camp: Exploring Prehistoric Subsistence Behavior through Gwich'in Traditional Ways of Knowing*

This study explores how indigenous archaeological methods can quantitatively assess prehistoric subsistence practices in interior Alaska. Archaeological sites in Alaska are among the oldest in the Americas, providing valuable information concerning human/animal interactions. Although there are substantial amounts of archaeological information present in the literature, there is a distinct lack of indigenous ecological knowledge. The goal of this project is to combine traditional indigenous ways of knowing with archaeological methods to make inferences about past human behaviors. The traditional knowledge camp, conducted during the summer of 2017 along the banks of the Yukon River, was a collaboration between elder Paul Williams Sr. and the University of Alaska Fairbanks. It was created for elders to teach Gwich'in ways of knowing to community members and students in a traditional fish camp setting. This research utilized that learning space to explore the effects of traditional capture, processing, and cooking activities on fauna in a way which appropriately represented traditional elder knowledge. Isotopic analysis was then used to quantitatively associate the modern subsistence activities to prehistoric behavior. The research to be presented will discuss how the traditional knowledge and the isotopic analysis of this project informed about past human behaviors in the Arctic.

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Skinner, Jessica

[306] *Three-Dimensional Musculoskeletal Modeling in Commingled Analysis: A Preliminary Study at the Milwaukee County Poor Farm Cemetery*
The analysis and disentanglement of human skeletal elements from commingled burial contexts is an essential step in creating individual identifications. This commingled analysis often includes a reliance on joint articulations to determine holistic element reassociations. Manual methods currently exist to test joint articulations for potential reassociation, but most appendicular joint articulations fall within the low reliability category for this method (Adams and Byrd 2014). Many cases of commingling at the Milwaukee County Poor Farm Cemetery may benefit from joint articulation designations of these low reliability categories. In an effort to provide additional lines of evidence to support these reassociations, this study investigates the efficacy of a three-dimensional joint articulation simulation technique, using a NextEngine scanner and open source software to test joint articulation designations.

Skov, Eric [332] see Giles, Bretton

Skowronek, Russell (University of Texas Rio Grande Valley), Brandi Reger (University of Texas Rio Grande Valley), James Hinthorne (University of Texas Rio Grande Valley) and Juan Gonzalez (University of Texas Rio Grande Valley)

[89] *pXRF Identification of Prehistoric Lithic Artifact Material, Resource Clusters along the Lower Rio Grande*
The U.S.-Mexico border region along the Rio Grande River, separating the southernmost Texas counties (Cameron, Hidalgo, Starr and Zapata) from the Mexican state of Tamaulipas, is a strategic corridor for prehistoric human travel connecting the Gulf of Mexico with the interior of the continent. The area contains a history of human presence extending over 11,000 years, evidenced by a wealth of projectile points that have attracted collectors for decades. To understand prehistoric people's choices of raw materials for making artifacts, we have partnered with local museums and local private collectors to construct a geochemical data set, currently at ~1,000 entries, from modified and unmodified local lithic materials, using portable x-ray fluorescence to measure ratios of selected elements in each sample. We then use cluster analysis to differentiate populations of rock types, notably the wide range of chert types and volcanic rocks found in local rock and gravel units. Unique among the rock types so far identified is the El Sauz chert, with high contents of zirconium and titanium and known restricted outcrops in south Texas.

Slater, Donald (Phillips Academy, Robert S. Peabody Museum, & Brandeis University) and Ryan Collins (Brandeis University)

[134] *Just for the Celt of It: Investigations and Discoveries beneath the Petroglyph Panels of Aktun Kuruxtun, Yucatan*
During 2011 excavations deep beneath the petroglyph panels in Aktun Kuruxtun, Mexico, members of the Central Yucatan Archaeological Cave Project (CYAC) uncovered a small tunnel leading into a previously unknown chamber of the cavern. The discovery came in the final days of the field season, however, and the chamber was too choked with flood sediments to be methodologically investigated. As a result, the passage was reburied. Last summer, CYAC returned to the cave and successfully explored the tunnel and the small chamber to which it led. In the process, the team discovered an altar just outside of the tunnel, and also unearthed a cache of two ceremonial greenstone celts at the threshold of the interior chamber. These finds, and associated organic material, have allowed for a more nuanced interpretation of the ancient usage and chronology of the Petroglyph Chamber in Aktun Kuruxtun. Further, the raw material used in the production of the celts, and their axial positioning within the cave, situates the deposit within wider cultural contexts in Central Yucatan and more broadly across the Maya region.

Slaughter, Mark (Bureau of Reclamation) and Lauren E. Jelinek (Bureau of Reclamation)

[72] *Lessons Learned through Tribal Consultation*
The federal government examines, funds, and constructs a wide variety of projects ranging in size from very small to those that cover multiple states. At any given time both the federal and tribal governments are working on multiple projects of different scales simultaneously. This can create challenges when engaging in consultation, both in the establishment of the appropriate level of consultation and in and the maintenance of those relationships. Establishing productive collaborative relationships between tribal governments and the federal government can be exacting, especially when discussing projects that could modify the landscape. We have found that by meeting "early and often" with tribal officials, we learn from each other and develop a more effective consultation environment. In this paper we discuss our experience consulting with tribal governments to identify sacred sites and traditional cultural properties, and working together to ensure those resources are given the attention and protection they require.

[289] *Discussant*

Slaughter, Michelle [39] see Larkin, Karin

Šljivar, Duško [77] see Mlyniec, Michael

Sload, Rebecca

[134] *Means, Motive, and Opportunity: Use of the Sun Pyramid Cave at Teotihuacan Post Termination*
Ceramics and radiocarbon dates indicate that Teotihuacanos ceased using the cave beneath the Sun Pyramid around the middle of the third century CE, at a time when the city was only just entering its "Classic" period florescence. A reverential termination seems quite likely. Evidence also indicates that post termination use of the cave occurred. As there were approximately 1700 years in between cessation of initial use and modern discovery of the cave in 1974, this paper explores the question of when reentry could have occurred. What evidence constrains the time frame? Could Teotihuacanos have reentered? As suggested by ethno-historical sources, could Aztecs have used the cave? I consider means, motive, and opportunity.

Sloum, Diane (Northern Arizona University) and Jaime Awe (Northern Arizona University)

[30] *Contextualizing Xunantunich in the Late Classic Belize Valley through Investigations of Structure A9*
Xunantunich, an ancient Maya site in the Belize Valley, rose rapidly from a minor political center to a powerful regional polity during the Late Classic period (AD 600–900). Previous researchers suggested that this rapid rise was influenced by Xunantunich's relationship with the more powerful polity of Naranjo in the nearby Petén Province of Guatemala. Their argument was based in part on a Late Classic period building program at Xunantunich resulting in a site layout that resembles that of sites in the eastern Petén. Through our investigations of Structure A9, a temple pyramid in the site's civic-ceremonial epicenter, we examine the local and regional socio-political significance of the site, and test the hypothesized influence of Naranjo on Xunantunich's dramatic Late Classic period apogee.

Slotten, Chelsi [14] see Wesp, Julie

Slotten, Venicia (University of California, Berkeley) and David Lentz (University of Cincinnati)

[254] *The Social Dynamics of Ceren's Household Gardens*
The Late Classic Maya village of Joya de Ceren's extraordinary preservation by the Loma Caldera eruption allows for a unique opportunity to not only understand what plant species the ancient inhabitants utilized in their daily lives but also how the cultivation of these plants shaped the social and economic environment. While Ceren has spectacular preservation of extensive outfields of maize, manioc, and numerous weedy species, this paper will focus on the cultivated spaces surrounding the various structures uncovered at the site. Various fruit trees, annual and root crops, fibrous and other

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useful plants were chosen to be cultivated within the village center. The assorted array of economically useful species reveals the diversification of foodstuffs readily accessible to the inhabitants on a daily basis that weren't just the annual crops planted within the outfields. The gardens further created a distinction between village members and households with various roles and positions implied by what flora each household prioritized as their preferred nearby resources. Additionally, the gardens show the incorporation of plant-derived materials into the political economy of the region. The long history of paleoethnobotanical research at the site allows for a deeper study of the social meanings behind Mesoamerican kitchen gardens.

Slovak, Nicole (Santa Rosa Junior College) and John Rick (Stanford University)

[66] *Who's Who? Investigating Historic Burials at Chavín de Huantar Peru Using Radiogenic Strontium Isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) Analysis*
 Since 2009, the Programa Arqueológico Chavín has unearthed a series of historic burials from the Monumento Arqueológico Chavín de Huántar. Although the identity of the deceased remains a mystery, initial archaeological and ethnographic evidence suggests that the individuals may be casualties of the War of the Pacific (1879–1883), perhaps even Chilean soldiers who met an unusual and unfortunate fate at the hands of Chavín's residents. The current paper presents radiogenic strontium isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) data from tooth enamel from 10 of these skeletons in order to evaluate the above hypothesis. Results demonstrate that nearly all of the individuals exhibit $^{87}\text{Sr}/^{86}\text{Sr}$ values that fall within Chavín's bioavailable range, suggesting that they were either born locally or hailed from a region with a $^{87}\text{Sr}/^{86}\text{Sr}$ signature similar to that of Chavín. One individual, however—an older man buried in what appears to have been the remains of a military uniform—exhibited a $^{87}\text{Sr}/^{86}\text{Sr}$ value clearly outside of Chavín's range, raising interesting questions about his identity during this politically-volatile phase in Peru's history.

Sluka, Victoria (University of Wisconsin-Madison)

[3] *Knotting Accuracy & Dimension Variation in Modern Turkmen Carpets*
 A pilot study of pile carpet variation and error is carried out on ethnographic Turkmen carpets. No such work has been previously published, and so this analysis provides basic data and conclusions on carpet variation, including type and intensity of variation, to be used as a starting point for further study of archaeological carpet samples. Data is taken from six comparable carpets, informing on two aspects of carpet variation. The dimensions and knot densities of the carpets' motifs are used to examine the variation introduced to the carpets through technological limitations of an upright loom. The carpets are found to be well standardized, with overall dimension and density error rates within range of the published limits of human replication ability (approx. 3%). However, underlying trends in the distribution of this variation informs on the abilities and tendencies of the knotters to correct for limitations of the loom technology. The accuracy of weaving patterns is also analyzed, giving indications of the error rate of the knotters in a highly repetitive task. The knotting error rate is found to be far below the accepted limit of replication, indicating significant, though not uniform use of external aids of manufacture.

Small, David (Lehigh University)

[30] *Limited Territorial Control and Incomplete Political Economies in Small States: A Look at the Classic Maya and Classic Greek*
 The limited territorial control of small states, here the Classic Maya, has hindered the development of political economies in several cases. This paper looks at the issue of non-ruling elite interstate economic and political networks, and their effect on the evolution of internal political economies for the Classic Maya. Examples will be drawn from such polities as Copan, El Palmar, and Caracol. A further window into the dynamics of the effect of limited territorial control on political economies will also be drawn from similar examples among Classical Greek polities.

Smallwood, Ashley (University of West Georgia), Thomas Jennings (University of West Georgia) and Charlotte Pevny (SEARCH, Inc.)

[120] *Tracing Paleoindian Projectile Point Diversity in the American Southeast*
 Paleoindian projectile points occur in high incidences in the American Southeast, and compared to other regions in the East, the Southeast has the greatest projectile point diversity. One effective way to understand this diversity is by tracking broad-scale morphological variation in suites of point traits to build cultural lineages. In this paper, we take a more trait-specific approach. We trace changes in projectile point design to understand the evolution of specific point attributes that were under selection. Through this approach, we explore when and where certain aspects of point design were adopted, what traits were linked or co-adopted, and how these traits may have influenced point function. By tracing changes in specific technological design elements, we hope to identify some of the social and adaptive processes that resulted in such high regional point diversity.

Smallwood, Ashley [81] see Jones, Katherine

Smeeks, Jessica (Binghamton University)

[65] *A Post-Wari World: Late Intermediate Period Defensibility in the Huamanga and Huarpa Provinces of Peru*
 Following the collapse of the Wari empire (ca. AD 1000), a widespread demographic and settlement change occurred in the Ayacucho Region of Peru. People were moving away from the rich farmlands and ritual centers of the flatlands to settle on hilltops and ridges. Many scholars point to strategic defense as a cause of settlement shift during this period—the Late Intermediate Period (ca. AD 1000–1450), suggesting warfare was endemic, while others suggest the sites facilitated agro-pastoralism and warfare was sporadic. This paper presents the preliminary results of two pedestrian reconnaissance surveys conducted in July 2014 and July 2017 in the Huamanga and Huarpa provinces of Peru—the provinces surrounding the Middle Horizon (ca. AD 600–1000) Wari capital. During these surveys, in an effort to assess the role of defensibility in the settlement shift, we considered the general designs and arrangements of architecture at 15 Late Intermediate Period hilltop sites.

Smejda, Ladislav (Czech University of Life Sciences Prague) and Anna Pankowska (University of West Bohemia)

[29] *Reconfiguring Normative Funeral Rite in European Prehistory: Second Thoughts on Secondary Manipulation of Human Remains*
 Mortuary variability in European prehistory has long been perceived through the lens of Christian worldview from which the discipline of archaeology originally developed. Expectations rooted in this conceptual perspective inevitably shaped the ways that the archaeological record was approached and interpreted. As a case study we consider the Central European Bronze Age, on which we can deconstruct the traditional 'textbook' understanding of ancient funerary traditions. During this period, general development observed in formal cemeteries is characterised by the gradual shift from prevailing inhumation towards cremation, but with strikingly frequent finds of complete, partial, or disarticulated human skeletons in settlement pits and ditches. We argue that what is usually regarded as a normative burial, or its opposite, i.e. seemingly careless and non-ritual deposition of human remains, may be a very problematic categorization. Gradually accumulated evidence suggests that the most visible forms of human burial in the archaeological record may not have been the dominant type of treatment of the dead. According to our research, secondary manipulation and fragmentation of human bodies, which was turning them into objects of cultural patrimony that could be shared and curated, seems to have been the most frequent destiny awaiting the deceased.

Smiarowski, Konrad (CUNY Graduate Center), Christian K. Madsen (Greenland National Museum & Archives) and Michael Nielsen (University of Greenland)

[135] *From Medieval Wool Tunics to Bone Powder: Rapid Degradation of Norse Middens in Southwest Greenland*
 This presentation is one of the products of a series of ongoing inter-connected, international, interdisciplinary fieldwork projects coordinated by the North Atlantic Biocultural Organization (NABO) research cooperative since 2005 in Greenland. The projects drew upon more than a century of prior

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field research, where four generations of archaeologists described and assessed organic preservation conditions at their sites in several regions of the Norse Eastern Settlement. This created a unique form of “archaeological TEK” (Traditional Ecological Knowledge) that represents an invaluable guide into the changing preservation conditions since the late 19th century. Between 2005–2017 we conducted extensive coring surveys of over 100 Norse middens, and open area and small test excavations at over 15 sites. The results show a shocking and almost complete loss of once outstanding organic preservation in a region where only 60 years ago wood, bones, leather, wool, and feathers were recovered. Our findings draw attention to the destructive process of the modern climate change that has been affecting the organic preservation conditions for at least 60 years, and to the need to organize a circumpolar-wide, international response strategy to rescue the endangered sites and their unique cultural heritage before it is too late.

Smit, Douglas (University of Illinois at Chicago)

[295] *Geology and Governance: Colonial Andean Mercury Mining and the Marroquín Collapse of 1786*

The study of an event may seem in opposition to the investigation of deep time, yet it is difficult to analyze one temporal scale without invoking the other. This paper examines this paradoxical linkage of events and the *longue durée* through the case study of a catastrophic event in the Spanish colonial mercury mines of Huancavelica in the Central Andean Highlands. The Marroquín collapse of 1786 claimed hundreds of indigenous lives, and symbolized the late 18th century decline of Spanish governance in the Viceroyalty of Peru. While this disaster may appear to be a singular event, this paper argues that understanding the causes and consequences of this collapse requires an investigation of how three different temporal scales (geological, institutional, and quotidian) articulated with one another. By investigating how different forms of temporality become entangled with human action, this case study of colonial Andean mercury mining will highlight the spatial and material aspects of social transformation in the archaeological record.

Smith, Alexander (The College at Brockport, State University of New York)

[117] *Indigenous Persistence in the Balearic Islands: Carthaginian and Roman Colonial Engagements in the Western Mediterranean*

The Balearic Islands are the westernmost island group in the Mediterranean. Of the four main islands of the group, Mallorca and Menorca were home to an indigenous Iron Age culture known as the Talayotic people. Their story is considered a minor one by many historians in the grand narrative of Mediterranean domination by Carthage and then Rome. Nevertheless, the archaeology of these two islands has revealed fascinating evidence of the scope and effects of ancient colonialism by these two powers. The groups inhabiting these islands during Carthaginian contact as well as Roman conquest do not display a passive acceptance of colonial influences, nor does the archaeological and historical evidence evoke outright resistance. Yet these groups persisted in settlement structure, religious practices, and even in the funerary realm well into the first centuries C.E. Through the lens of colonial negotiation, it also becomes clear that the islands contained multiple groups of varying identities that cannot be simply understood as broadly “Talayotic.” This paper will examine the ritual evidence from sites on Mallorca and Menorca to understand the varying expressions of these island communities during this period of outside interaction at the end of the first millennium B.C.E.

[160] *Discussant*

Smith, Byron (Humboldt State University) and Marisol Cortes-Rincon (Humboldt State University)

[30] *Sub-tropical Agronomy on a Variable Landscape: Exploring Classic Maya Farming through Geotechnical Design and the Distribution of Edaphic Variables*

Late Classic hinterland agronomy presents a compelling glimpse into the socioeconomic dynamics of production and demand in the Three Rivers region. This project focused on a prominent house-group located 350 meters east of the site of Dos Hombres which was known to exhibit intensive agricultural strategies as well as a specialized degree of stone working. Additionally, a series of four karst depressions bordered the site and likely leveraged moisture demand resulting from agricultural needs as well as personal requirements. The goal was to delineate hinterland cultivation among the common Maya and to identify stratigraphic evidence of nutrient depletion resulting from exhaustive farming practices. The task of defining the breadth of agricultural strategies was accomplished through remote-sensing, field survey and excavation. Soil sampling was conducted along two terrace platforms and soils were analyzed using the ascorbic acid method for phosphorus determination in order to develop an index of phosphorus availability. While structural analysis of the site’s geotechnical features demonstrated regional cohesiveness in design, the scale of the land management strategy suggested a level of economic complexity witnessed through multiple lines of resource specialization. Soil analysis revealed sporadic evidence of unnatural Phosphorus distributions with increases occurring in subsoil regions.

Smith, Byron [18] see Cortes-Rincon, Marisol

Smith, Carolyn

[272] *Discussant*

Smith, Catherine (Indiana University)

[337c] *Discussant*

Smith, Cecilia (Texas A&M University)

[231] *Ethics and Best Practices for Mapping Archaeological Sites*

Principle 6 of the Society of American Archaeology’s Principles of Archaeological Ethics emphasizes archaeologists’ responsibility to publically report archaeological investigations with the stipulation that “An interest in preserving and protecting in situ archaeological sites must be taken in to account when publishing and distributing information about their nature and location.” This paper first provides a critical review of current geolocation sharing recommendations and practices, and then describes available methods for dealing with sensitive location data and suggested best practices. Particular attention is paid to geomasking techniques, which communicate observed spatial relationships while obscuring sensitive geographic coordinates. Currently, only two geomasking techniques are widely used in archaeology: aggregating archaeological site locations into grids or administrative units, or placing points that represent site locations at a particular distance from their true locations. These techniques, while useful, are part of a larger and growing suite of tools that visually convey spatial data without revealing sensitive site locations. Principle 6 allows researchers flexibility in tailoring methods of communicating site locations, which is useful given the range of archaeological contexts. However, this work encourages researchers to responsibly exercise that flexibility by incorporating archaeological and environmental data into an explicit decision-making process for representing those places.

Smith, Claire (Flinders University)

[166] *Zimmerman’s Influence on World Archaeology*

This presentation focusses on Larry Zimmerman’s contributions to world archaeology through his leadership roles within the World Archaeological Congress. This includes his various roles on the WAC Executive and Council and his convening of the first Indigenous Inter-Congress, held at Vermillion, South Dakota in 1989 and the subsequent development of the Vermillion Accord on Human Remains.

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Smith, Emily (Social and Behavioral Sciences, California State University, Monterey Bay), Taylor MacDonald (College of Arts and Science, Vanderbilt University) and Tiffany A. Tung (College of Arts and Science, Vanderbilt University)

[270] *Two Individuals, One Urn Burial from La Real, Peru: A Bioarchaeological Investigation of Urn Burial Practices*

The site of La Real, located in the southern, near-coastal region of Peru, was an elite burial ground where mortuary contexts reveal Wari imperial influence during the Middle Horizon (600–1000 CE). This study examines the mortuary treatment of two human fetus/neonate skeletons placed inside a decorated, ceramic urn and compares funerary treatment to Wari fetus/neonate burials and others in the Andes to evaluate the geographic reach, chronological depth, and cultural significance of this funerary practice.

To estimate age-at-death, the long bones and basilar occipitals were measured, indicating an age of 30–36 weeks in utero for both individuals.

Although we suspect they were twins, thus far no data support or refute that hypothesis. The urn was decorated with Nasca-influenced motifs, and the fetuses/neonates were wrapped in plain, cotton textiles and cotton ropes. Fetus urn burials have also been recovered at Conchopata, a Wari heartland site, and comparisons show some key distinctions. For example, the La Real urn contained a double burial, the fetal/neonate remains were wrapped in textiles, and no other artifacts were found in the urn. These distinctions reflect the importance of local mortuary practices in the face of Wari imperial influence in the region.

Smith, Geoffrey (University of Nevada, Reno) and Derek Reaux (University of Nevada, Reno)

[92] *Western Stemmed Tradition Projectile Technology and Raw Material Use in Guano Valley, Oregon*

Western Stemmed Tradition (WST) projectile points mark Late Pleistocene/Early Holocene occupations in the Great Basin. Considerable morphological variability exists among WST points and over the years researchers have come to recognize various types (e.g., Cougar Mountain, Haskett, Parman, and Windust). Because most substantial WST sites are near-surface scatters that likely represent palimpsests of multiple occupations, it remains unclear whether this variability reflects tools used during different time periods, tools discarded at different stages in their use-lives, or tools used by different groups visiting the same places. Using data collected from Guano Valley, Oregon, where one of the largest concentrations of WST points in the Great Basin was recently discovered by the University of Nevada, Reno, we explore these and other possibilities. To do so, we examine the relationship between WST point morphology and raw material type and whether particular WST point types cluster together or are instead generally intermixed.

Smith, Heather (Eastern New Mexico University)

[120] *The Manufacture of Northern Fluted Points: A Production Sequence Hypothesis*

Fluted projectile points have been found in the archaeological record of the North American Arctic for over 50 years. Only recently, however, have fluted points found in buried contexts associated with dateable materials and included in region-wide comparative analyses provided chronological, morphological, and technological evidence to support the cohesion of the Arctic specimens as their own fluted variant: the Northern Fluted Complex (NFC). Few sites have provided the opportunity to observe examples from the NFC discarded early in the production sequence, which can provide a glimpse of Northern manufacture protocols. This paper presents a hypothetical sequence of NFC point production developed using evidence from exhausted and discarded fluted point fragments, and a collection of rejected and damaged bifaces from four NFC sites. Discussion will address the integrity of the archaeological evidence for production stage by using multiple reduction indices, as well as an experiment re-creating NFC points using the manufacture sequence proposed. Conclusions address whether characteristics of the NFC reduction sequence can inform on the mode used to culturally transmit fluted point technology to the North.

[120] *Discussant*

[120] *Chair*

Smith, J. Gregory (Northwest College), Alejandra Alonso Olvera (INAH), Soledad Ortiz (UNAM) and Atasta Flores (ENAH)

[173] *Boundary Dynamics between Chichen Itza and Ek Balam*

Social boundaries of the past and present are usually nebulous, contested, and fluid. In this paper we examine the ancient towns and villages between the two Maya kingdoms of Chichen Itza and Ek Balam in northern Yucatam. We hypothesize that the boundary area between these two cities in the 9th century AD was based on Classic Maya concepts of ruler-centered polities but changed dramatically in the 10th century as Chichen Itza became a fundamentally different kind of Maya city the likes of which had never been seen before. As Ek Balam faded in power, smaller communities in the vicinity became tethered to Chichen Itza in a variety of ways. We focus our discussion on Ichmul de Morley, located halfway between Chichen and Ek Balam but supplement it with information from Santa Cruz, a small outlying site south of Ichmul that was the focus of our 2017 fieldwork.

Smith, Jaye, Kelley Hays-Gilpin (Northern Arizona University), Linda Pierce (Archaeology Southwest) and Chris Downum (Northern Arizona University)

[70] *The Ray Robinson Collection—A Successful Collaboration to Save Safford Basin Archaeological Artifacts*

In 1957, Arizona State Museum director Emil Haury, ranch owner Ray Claridge and geologist/avocational Ray Robinson visited the Bonito Creek site in Arizona's Safford Basin as reported by Wasley in 1962. Robinson returned to the site after that initial visit to "save" many objects that Haury did not take with him that day, along with "prospecting" other sites during the 1960s in the Safford Basin being threatened by development. For 59 years, Robinson preserved these objects along with limited provenience. Starting in 2015, at 100 years old, Robinson felt the need to ensure the objects' preservation after his death by making contact with numerous stakeholders who could help him find a "safe resting place" to "protect and keep it [the collection] together." Only through the collaboration of a diverse mix of archaeologists, anthropological departments, accredited repositories/conservation professionals, a non-profit organization and avocational volunteers, Robinson's desire became reality just months before his death and prevented the disbursement of the objects to the open retail market.

Smith, Jolene

[231] *Always Halfway There: Keeping Up with Digital Archaeological Data in Virginia*

Since being one of the first State Historic Preservation Offices to adopt electronic records management in the late '80s, the Virginia Department of Historic Resources has worked through several iterations of databases and web applications. These systems manage basic site information, details about physical collections, and now digital media and datasets themselves. Over time, the agency's priorities and objectives surrounding digital records and data have evolved in ways common to other institutions. As the most recent web GIS and database application reaches mid-life after four years, a thorough assessment of current and ideal approaches to digital data curation, preservation, and distribution is coming due as planning begins for what comes next. Building from concepts in libraries and archives, informatics, and data science, this presentation explores possible road maps.

[276] *Discussant*

[231] *Chair*

Smith, Kevin (Haffenreffer Museum, Brown University)

[277] *Moderator*

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Smith, Michele (Haffenreffer Museum of Anthropology)[277] *Moderator***Smith, Monica L. (UCLA)**[171] *Nature as Agent: Mass-Event, Incremental, and Biotic Perspectives*

The recent development of the “Anthropocene” as a distinct geologic era, added to a century’s worth of scholarly discussion about the role of humans in their ecosystems, has solidified an interpretive view of humans as prime mover. Yet nature has a “mind of its own” relative to human knowledge, action, and volition. In this session, presenters will discuss the ways in which natural entities, ranging in size from mega-storms to viruses, have presented challenging conditions to which humans can only respond. We will examine mass-event phenomena as large-scale events that are interpreted as “catastrophic” visitations on the human landscape; incremental processes of vegetation, oxidation, and material fatigue and their effects on artifacts, architecture, and agricultural landscapes; and biotic agents from disease-causing microbes to intelligent commensals, birds, and domesticated animals. As an example of the co-dependent interactions between humans and nature, the introductory paper will also consider the way in which fire as a natural occurrence has been coopted by humans to result in profound changes at every scale of interaction, from the intimacy of the domestic hearth to landscape-transforming anthropogenic fire regimes.

[80] *Discussant*[171] *Chair***Smith, Morgan (Texas A&M University)**[244] *Stuck in the Middle: A Technological Organization Study on an Underwater Paleoindian Assemblage*

Unfluted lanceolate point types in the Southeast United States, including Suwannee, Simpson, Quad, and Beaver Lake, are poorly understood. A lack of robust unfluted point assemblages found in secure context in association with radiocarbon datable material has made interpreting these types difficult. However, a few sites in the Southeast contain unfluted lanceolate points within relative stratigraphic sequences or associated with extinct fauna. Based on this evidence from these sites, these styles are often attributed to the Middle Paleoindian period (~10,600–10,200 rcybp). The Middle Paleoindian period in North America is theorized to be a time of regional specialization and settlement following a phase during which people maintained generalized, adaptable toolkits suited for high mobility. However, the rarity of discreet Middle Paleoindian components in the Southeast has made this theory difficult to test in the region. Here, I examine the only site in the Southeast at which excavations have revealed a discrete Suwannee lithic component; the Ryan-Harley site (8JE1004) in North Florida. I present a technological organization perspective from Ryan-Harley to provide insight on Suwannee point makers and to test the theory of Middle Paleoindian regional specialization by examining patterns in land-use and technological provisioning through assemblage variability and tool-kit curation.

[244] *Chair***Smith, Ryan (University of Pittsburgh) and Sarah Kennedy (University of Pittsburgh)**[190] *Minimizing Distractions and Focusing on What Matters: Using Autonomous Drone Flight Technology to Examine Architecture across the Circum-Titicaca Basin (Puno, Peru)*

Drones have tremendously influenced how archaeologists can capture data, hailed as particularly “efficient” tools for our field. Such is the case, for example, in projects which aim to produce highly detailed basemaps useful for various site-level GIS analyses. However, despite radical developments within the past few years which have significantly improved accessibility and in-field usability, an under-represented reality is the unexpected challenges these technologies almost always present in the field. As a result, drone troubleshooting often takes away valuable time from principal research objectives. This poster presents results from a macroregional investigation of late prehistoric and early colonial architectural remains (AD 1000–1700) in the circum-Titicaca Basin of southern Peru. The authors pre-programmed fully autonomous drone flight paths as a novel approach to archaeological site mapping in order to reduce the amount of time tending to drone flight. Ultimately, while autonomous flight was not without challenges, initial testing of this methodology alongside more traditional manual flying methods at several sites across the Titicaca Basin demonstrates how pre-programming flights can alleviate many in-field technical distractions and cut down on the time necessary to capture systematic and site-wide coverage, thus allowing archaeologists to turn their attention to more important observations.

Smith, Scott (Franklin & Marshall College)[264] *Ceremonial Waterscapes: The Desaguadero River Valley in Antiquity*

The Lake Titicaca Basin in the Bolivian Andes was a dynamic place that saw the development of early religious centers like Chiripa and Khonkho Wankane, the subsequent emergence and expansion of the Tiwanaku state, and the incursion of the Inca empire. The Desaguadero River is the only river that drains Lake Titicaca, flowing south and connecting the region to the central altiplano and Lake Poopó some 250 kilometers downriver. This paper examines the ceremonial and political importance of the Desaguadero River itself. I draw on excavation, survey, and remote sensing data from the sites of Iruhito, Cerro Chijcha, Simillake, and Khonkho Wankane to explore the ways that the river actively shaped the ceremonial and political lives of residents of the region throughout the pre-Columbian period, and into the early Colonial period.

Smith, Susan and Karen Adams[115] *Plant Tales from Pueblo Bonito, Room 28*

The plant record of Room 28 is filtered through a complex stratigraphy composed of early excavation backfill from adjacent rooms, Room 28 features and floor, and below to an older surface. Plant specimens from 11 macrobotanical, 7 flotation, 10 maize cob samples, and 13 pollen samples reveal an exceptionally rich record of the resources valued and used by Pueblo Bonito people. Their reliance on maize registers strongly, supplemented by a mix of native foods including pinyon nuts, cacti, cattail, and small-seeded annuals. Imported Douglas fir wood, identified from charcoal, provides perspective into Chacoan connections with regional landscapes where special resources were obtained through trade or community efforts.

Smith-Guzmán, Nicole (Smithsonian Tropical Research Institute)[260] *The Bioarchaeology of Greater Chiriquí: Challenges, Finds, and Future Directions*

Greater Chiriquí, the pre-Columbian cultural sphere encompassing western Panama and southern Costa Rica, has been subjected to intense looting activities since the mid-19th century. Nevertheless, archaeological exploration of the area to date has successfully contextualized the nature and transitions of non-perishable material culture. However, organic remains rarely survive in funerary contexts due to the high acidity of the soil, high humidity, and high precipitation in this region. Human remains almost never remain in the stone-lined tombs of Greater Chiriquí, in which one or more occupants were buried (as evidenced by the number and placement of mortuary offerings). But in shell-bearing middens along the coast, the increased soil pH from high calcium carbonate contents allows better preservation of human and animal bone. These differences in preservation have led to a sharp division in the variety and quality of mortuary information derived from coastal (lowland) and inland (highland) sites. The present study traces the few examples of human remains recovered from archaeological sites in the region and what they tell us about the cultural activities and health of pre-Columbian populations. It will highlight the case of ancient cancer found recently in a 700-year old burial from Bocas del Toro, Panama.

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Smyth, Michael (The Foundation for Americas Research, Inc.)**[162]** *Preclassic Settlement Hierarchy at Xcoch in the Puuc Region of Yucatan*

Some of the earliest and largest monumental architecture in the Puuc Hills are found at the Maya center of Xcoch. Noted by John Stephens in 1841 as a large city with a deep water cave and gigantic pyramid, Xcoch is among a host of Puuc sites now dated to the Preclassic period. An interdisciplinary research program at Xcoch and vicinity from 2006 to 2013 revealed Preclassic Maya community patterns, megalithic architecture, and material culture for a developing complex society. Massive high building platforms, numerous stone pyramids and plazas, heavy stone habitation structures, and an internal site causeway connecting the large Gondola Aguada to the Xcoch grotto are among the many Preclassic settlement features extending across nearly 3 sq km. This paper examines Preclassic settlement patterns at Xcoch and its role as a regional center for the central Santa Elena plain and the greater Puuc region. Other Preclassic sites show mounting evidence for early megalithic architecture and formative ceramics supporting the presence of a multi-tiered hierarchy within Xcoch's immediate settlement orbit. These data suggest that Xcoch was a stratified society at the center of a formative regional settlement hierarchy centuries before the apogee of the world heritage site of Uxmal.

Snetsinger, Andrew (Past Recovery Archaeological Services Inc.) and Maxime Lamoureux St-Hilaire (Tulane University)**[147]** *Explaining Variability in On-Floor Assemblages: The Contextual-Behavioral Method*

Settlement abandonment studies are crucial for understanding the archaeological record, as they yield the key to decipher the context of on-floor deposits, or assemblages. We advocate the use of a behavioral-contextual method for studying on-floor assemblages for ascribing them to one of several categories of abandonment. This behavioral-contextual approach examines the vertical and horizontal architectural contexts of artifacts, the relative completeness of vessels, and the represented vessel forms in order to better understand on-floor assemblages. This method accounts for mundane and ceremonial abandonments of gradual and catastrophic nature, along with abandonment with anticipated return. The proposed method is framed in a visual model built on archaeological case-studies from across the Maya world. Most of the featured examples correspond to residential architecture, but this model should be applicable to other types of buildings. While it is far from exact, the interpretational framework that we propose allows to explain the variability of documented abandonment contexts and promises the avoidance of such equivocal terms as "problematical deposits".

Snitker, Grant (Arizona State University)**[177]** *Anthropogenic Fire and the Origins of Agricultural Landscapes during the Neolithic Period (7,700–4,500 cal. BP) in Eastern Spain*

Humans have intentionally set fires for millennia to transform the arrangement and diversity of resources within their landscapes, often altering the relationship between fire and ecosystems at multiple scales. Although scholars regularly identify human-altered fire regimes through paleoecological studies, archaeological research has not yet fully incorporated the spatial, temporal, and cultural dimensions of human-caused fire into discussions of the development of agricultural landscapes. This paper presents new, integrated research on anthropogenic fire and landscape change during the Neolithic period (7,700–4,500 cal. BP) in Eastern Spain. Using an analysis of charcoal morphology from sedimentary records, the spatial distribution of prehistoric land-use and fire across the landscape, and an ethnographic review of burning practices of small-scale agriculturalists, this project aims to better understand the socio-ecological processes that drove the pace and scale of agricultural landscape development during the Neolithic. This research builds on data and analyses from the Mediterranean Landscape Dynamics Project (MedLanD), a collaborative project between Arizona State University and the University of Valencia.

[234] *Discussant*

Snitker, Grant [221] see Bergin, Sean

Snoddy, Anne Marie (University of Otago), Charlotte King (University of Otago), Vivien Standen (Universidad de Tarapaca), Bernardo Arriaza (Universidad de Tarapaca) and Sian Halcrow (University of Otago)**[87]** *Nutritional Stress and the Maternal-Infant Nexus: Insights from Isotopes and Paleopathology in the Ancient Chilean Atacama (ca 9000–1500 BP)*

The Atacama Desert is a remarkably marginal environment. Children are vulnerable individuals and the perinatal and weaning periods are high-risk even under ideal conditions. Investigation of stress during early life is therefore vital to the characterisation of human adaptation in this region. We compared isotopic evidence for infant diet and stress with paleopathological data to assess potential changes in maternal and infant health between the pre-agricultural Archaic Period (9000–3500 BP) and early agricultural Formative Period (3500–1500 BP). Incremental isotopic analysis (δN and δC) was conducted on 14 individuals. Results show an increase in nitrogen isotope values suggestive of maternal stress during in utero development between the Archaic and Formative Periods. Additionally, 57% of Formative Period children analysed have carbon isotope values consistent with the use of micronutrient-poor maize-based weaning foods, while Archaic period individuals appear to have been weaned onto marine resources. Paleopathological analysis of individuals from the Archaic (N = 72) and Formative (N = 115) Periods shows a significant increase ($X^2 = 6.667$; $p = .010$) in the prevalence of scurvy (vitamin C deficiency), a disease of low dietary diversity. We discuss these findings in terms of adaptive mechanisms to resource scarcity, maternity, and food allocation.

Snow, Dean (Pennsylvania State University)**[119]** *Discussant***Snow, Meradeth (University of Montana)****[97]** *Genetic Identity and Relationships in the Southwest United States and Mexico*

The prehistoric occupants of the Southwestern United States and Mexico have many similarities, including maize agriculture and the Uto-Aztecan language family. A genetic relationship, potentially due to migration between the regions, has been investigated through mitochondrial DNA analysis. However, limited modern and ancient samples, a focus on the hypervariable region of the mitogenome, and limited samples from intermediate regions between the Valley of Mexico and the cultural complexes in the Southwest US, may have masked the maternal relationship between the regions. A larger sample size from modern populations in Mexico, as well as whole mitogenomes from geographically intermediate sites such as Paquime, have allowed for a better understanding of the two regions and their relationship. An analysis of modern and ancient, as well as full mitogenomes and solely the hypervariable region, will be discussed to better understand the genetic relationship between the regions and what this means regarding expansion of cultural complexes in the past.

[97] *Chair*

Snow, Meradeth [97] see Waller, Kyle

Snyder, Daniel (USDA-NRCS), Kathryn Whalen (SUNY Buffalo Archaeological Survey) and Douglas Perrelli (SUNY Buffalo Archaeological Survey)**[22]** *Using Debitage Analysis, MANA, and Landscape Utilization to Illuminate the Archaic-Early Woodland Transition in Western New York*

Recent CRM fieldwork in western New York by SUNY Buffalo Archaeological Survey has afforded the opportunity to address questions of how people, technology, and the environment related from newly discovered sites which span thousands of years. One of the most fruitful avenues of research is in

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the examination of the transition from the Late and Transitional Archaic to the Early Woodland, a period in which it is suggested there was dramatic linked cultural and environmental change, where multiple competing groups gave way to the Meadowood, a culture centered on a vast network which spread trade goods, idiosyncratic objects of great social significance, and a worldview which would unite people across the Northeast. This view is supported by lithic analysis, including in-depth debitage analysis which identifies idiosyncratic patterns for cache blade production between sites, Minimum Analytical Nodule Analysis (MANA) for raw material use, as well as correlations of landscape utilization between wetland/upland setting between time periods. The transition from the Archaic to Woodland time periods in archaeological literature, initially conceived of as a simple marker between aceramic and ceramic cultures, has proven prescient for reasons which more reflect the people behind these artifacts.

Sobolik, Kristin [294] see Ingraham, Robert

Soderland, Hilary (University of Washington School of Law)
[193] *Discussant*

Solazzo, Caroline and Jean Soulat (LandArc Laboratory, France)

[77] *The Trade of Tortoiseshell between the Caribbean and Europe during the 17th–18th Centuries: An Archaeological and Biomolecular Approach*

Tortoiseshell is made from the scutes of sea turtles; historically, hawksbill turtle was the main source of tortoiseshell but other species might have been used. Between the 17th and 18th c. tortoiseshell obtained in the Caribbean was traded on North American and European markets. Tortoiseshell was used for making combs, fans, boxes, in bookbinding, and as veneering for furniture. Excavations in European workshops (Paris and Amsterdam) attest of the use of this exotic material into luxurious items. However, archaeological fragments of tortoiseshell or artefacts have degraded, so that often the material has lost its recognizable tortoiseshell pattern, making identification to species difficult.

The carapace and plastron of sea turtles are covered with keratinous scutes mainly composed of beta-keratins, a category of structural proteins that stack together to produce β -pleated sheet structures. Here, reference materials from five species of marine turtles were characterized by proteomics analysis to build a database of beta-keratin sequences and determine robust markers for species identification. Preliminary data have shown significant differences between hawksbill and green turtles, allowing distinction of these species in ancient materials. In addition, comb fragments from archaeological sites and workshops in France were examined.

Soler, Ana Maria [89] see Lozano Bravo, Hilda

Soler-Arechalde, Ana (UNAM), Cecilia Caballero-Miranda (UNAM), Ma Carmen Osorio (UNAM) and Itzayana Bernal (UNAM)

[293] *Archaeomagnetic Dating Results of PPC Project*

Archaeomagnetism is a dating technique whose application has been rising. This technique originally required burned materials, but in certain Mexican archaeological sites, volcanic products with magnetic minerals were added to the stucco mix, enhancing the geomagnetic field record and allowing us to determine it in non-burned samples. Thanks to this the number of dating events increased, improving the detail of the chronologies; a clear example of this happened in Teopancazco's neighborhood. A detailed sampling of burned and non-burned stuccos sampled between 2015(31) and 2016(33) had been processed. The dates obtained will be analyzed and compared with other previous results in order to get a greater image of the development of Teotihuacan city.

Soleski, Anna Marie (University of Toronto, Department of Earth Sciences), Yiting Xu (Zhejiang University), Joseph R. Desloges (University of Toronto) and Zhou Lin (Zhejiang University)

[284] *Holocene Floodplain Development of Qujiang, Zhejiang, China in the Context of Early Human Occupation of Jinhua Basin*

The Qujiang drains mountainous terrain in Zhejiang Province of east-central China. Shangshan cultures have been identified on floodplain terraces and earth mounds within the Qujiang valley. The choice of settlement in the area (10,000+ years BP) is constrained by several geographical factors, including topography, climate, access to water resources and human factors. The relationship between cultural occupation sites and river dynamics over the Holocene is poorly known in this region. Lateral and vertical river stability can be an important determinate of land use and settlement patterns. We investigate the geomorphic record of the Qujiang in relation to the Hehuashan river terrace occupation site using geophysical methods (GPR) and cores on the adjacent floodplain to infer long-term floodplain stability. Floodplain structure is dominated by shallow narrow channels comprised of basal gravels and sand (4 m depth), overlain by horizontally laminated infilled silty sands. We interpret the long-term natural channel pattern of the Qujiang to be a cobble-bedded, sandy anabranching river, subject to rapid and frequent lateral channel shifting and formation of large back-swamps during heavy flooding. This suggests poor habitat for occupation on the river's floodplain and supports settlement on the adjacent Pleistocene aged river terraces.

Solinis-Casparius, Rodrigo (University of Washington), Christopher T. Fisher (Colorado State University), Anna Cohen (Utah State University), Juan Fernandez Diaz (NCALM/University of Houston) and Jason Bush (Defense POW/MIA Accounting Agency (DPAA))

[299] *Excavations at the City of the Jaguar*

The Mosquitia ecosystem of NE Honduras is a critical region for understanding past patterns of socio-political development and interaction between Mesoamerica and Central America. Caches of ground stone and other objects have long been noted for the region but have never before been systematically examined. Here we report on the recent partial excavation and consolidation of one of these deposits from the newly documented city of the Jaguar, Gracias a Dios, Honduras, constituting a deposit of several hundred stone, ceramic, and other objects. We find that 1) the objects were deposited in a single episode within a cleared ritual space, 2) objects were arranged into groups representing vulture, death, and were-jaguar motifs, 3) many objects were ritually broken, 4) ceramics and other materials placed on and around the central group may represent recurring veneration at this location. The Jaguar ofrenda represents an example of ritual behavior, sacred space, and material culture that may be related to the abandonment of the city sometime in the 16th century.

Solis, Kristina (University of Texas at San Antonio)

[105] *Late Holocene Climate Change and the Emergence of Hunter-Gatherer Territoriality in the Late Archaic Texas Coastal Plains: An Analysis Using Bioavailable Strontium*

The Late Holocene was a time of sea level stability, increased moisture, and abundant resources. Existing models suggest that this environment set the stage for population packing and territoriality. In this presentation, strontium isotope ratios from the Loma Sandia mortuary site (2800–2600 BP) are used to evaluate the emergence of territoriality among hunter-gatherer populations on the Texas Coastal Plain. Assessing territoriality with human strontium data is facilitated by determining the strontium ratios in the local geology. While it is common to obtain strontium isotope ratios from geologic regions through plants or substrate, they tend to show heterogeneity in a given area. Strontium ratios from animal skeletal tissue, known as bioavailable strontium, are more homogenous because they provide an average of an area. I present both strontium bioavailability data from modern fauna as well as the ancient human data to illustrate how strontium ratios from diverse geological areas are a useful tool for the study of emergent hunter-gatherer territoriality in the context of Late Holocene climate.

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Solis, Kristina [105] see Corl, Kristin

Solis, Reyna [209] see Melgar, Emiliano

Solorzano Venegas, Maria Soledad and Olga del Pilar Woolfson Touma (Escuela Politécnica del Litoral)

[46] *Proceso Constructivo en los Montículos Circulares Prehispánicos de Urcuquí / Constructive Process at Prehispanic Circular Mounds of Urcuquí*

El paisaje cultural arqueológico de Urcuquí se caracteriza por la presencia de montículos artificiales circulares—Tolas—, de la época prehispánica. Sus dimensiones promedio fluctúan entre treinta y cincuenta metros de diámetro y entre dos y cuatro metros de altura.

El objetivo de esta ponencia es proponer el proceso de construcción de estas estructuras, a partir de una relectura de la información obtenida del registro arqueológico de superficie y subsuelo empleando técnicas mixtas: excavación de un perfil expuesto y prospección geofísica de otros dos. Los resultados revelaron que el proceso inició con la planificación del lugar de ubicación y el tamaño de los montículos, seguido de la preparación del terreno mediante una excavación tronco cónica, cuya profundidad dependió de la altura que los constructores deseaban alcanzar en la obra arquitectónica, para proceder a la restitución del suelo y el levantamiento de la misma. En estas dos últimas tareas utilizaron bloques de tierra cruda, elaborados con puzolanas.

Somerville, Andrew (Universidad Nacional Autónoma de México)

[125] *From Neutral to Mutual: A Long-Term Perspective on Human-Rabbit Relationships in Highland Mexico*

Studies of human-animal relationships provide insights into multiple issues relevant to archaeological research, including changes in human-environmental interactions, subsistence strategies, and socio-cultural dynamics. This presentation investigates the relationship between humans and rabbits (cottontails and jackrabbits), which were among the most commonly consumed animals in pre-Hispanic Mesoamerica. Focusing primarily on the settlement of Teotihuacan in the Basin of Mexico during the Preclassic to Historical periods (~150 BC to AD 1900), the presentation explores human-rabbit interactions through both archaeological data and stable isotope analysis of preserved rabbit bones. Temporal patterns and trends are interpreted through the lens of niche construction theory, an ecological concept that prioritizes the changes that organisms make to their environments, and the ways in which these changes feed back and influence the organisms themselves. Ultimately, this paper suggests that the ecological niche created by the urban development of Teotihuacan favored new types of relationships between the human residents and commensal rabbit species, which were mutualistically beneficial to both organisms and had implications for the local economic and social organization of the city.

Somerville, Andrew [21] see Schwartz, Christopher

Sonderman, Eleanor (Texas A&M University)

[290] *Revisiting Conejo Shelter: Refining Cultural Chronologies of the Lower Pecos, Texas*

The Lower Pecos region of Texas is a remarkable study area, primarily because perishable artifacts (those made of plant materials, bone, and leather) survive in near pristine conditions in its very dry caves and rockshelters. Vaughn Bryant was among the first researchers in the region to use pollen data to build paleoclimatic and ecological chronologies from this region, his dissertation is still one of the most comprehensive analyses of this region's ecological past. Following this path, my dissertation focuses on Conejo Shelter, which Bryant also worked on in his graduate student days, back in the late 1960s. This rockshelter has a substantial, but under-studied assemblage of perishable artifacts including basketry, cordage, sandals, and coprolites. Thirty new, direct dates, using material from fiber sandals and coprolites, have formed the basis of a more fine-tuned radiocarbon chronology for Conejo Shelter. Esri ArcGIS has been used to incorporate new chronological data with information from the original excavation notes, in order to visualize the site's stratigraphy, better understand changes in the perishable assemblage through time, and track potential migrations of people and ideas between the Lower Pecos and adjacent regions.

Sonderman, Robert and Stefan Woehlke (National Park Service)

[202] *Our Sites at Risk: Climate Related Threats to NPS Administered Archeological Sites*

Over the past 15 years NPS archeological sites from Texas to Maine have faced devastating impacts from hurricanes and other climate related events. During this time, Hurricanes such as Isabel, Ivan, Katrina, Sandy and most recently Harvey and Irma have caused extensive damage to NPS archeological sites. Although not subjected to direct impacts from these recent hurricanes, National Capital Region (NCR) parks have been heavily damaged by their collateral impacts, typically in the form of flooding along the Potomac Valley. It is simply a matter of time before a major hurricane strikes right at the heart of the Nation's Capital, threatening sensitive archeological resources.

Over the past three years the National Capital Region has been gathering data and developing an assessment of park cultural resource vulnerabilities due to climate related threats to our parks. This brief presentation will discuss those threats and highlight how some NCR parks are addressing those threats.

Song, Jixiang (Sichuan University)

[336] *Prehistoric Agriculture in South Tibet: Archaeobotanical Perspective from Bangga Site*

To understand the evolution of agricultural economy in south Tibet, a large number of flotation samples and phytolith samples were collected during 2015–2017 field seasons at Bangga site. Preliminary analysis on these samples shows clues to the subsistence strategy, the nature of the site (pastoral or agropastoral) and probably the seasonality of the occupation of the site. Comparison with Changguogou site which is earlier in time indicates changes in subsistence strategy over time in this region.

Sørensen, Marie Louise [245] see Earle, Timothy

Soriano, Jewell [297] see Bruno, Maria C.

Soroush, Mehrnoush (Harvard University), Alireza Mehtash (University of British Columbia AND Harvard Medical) and Emad Khazraee (Kent State University AND Harvard University)

[71] *Automated Qanat Detection: Examining the Application of Deep-Learning in Archaeological Remote Sensing*

This paper presents the preliminary results of a collaborative project that seeks to develop a deep learning model for automated detection of qanat shafts on CORONA Satellite Imagery. Increasing quantity of air and space-borne imagery available to archaeologists and advances in computational science has created an emerging interest in automated archaeological detection. Previous studies have applied machine learning algorithms for detection of archaeological sites and off-site features, with varying success rates. In the last few years, tremendous success has been achieved in image recognition through deep learning, a category of supervised machine learning which is based on hierarchical representation learning. We have chosen to examine the application of deep convolutional neural networks for automated archaeological detection focusing on qanats. The methodological merit of the project is that qanat shafts are one of the most suitable archaeological features for pattern recognition. The analytical merit

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is that conducting comparative studies of qanat systems at a regional scale is predicated on mapping massive number of qanat shafts, which is impossible manually. Processing of big data generated through machine learning would allow us to examine how this sustainable water supply technology has been adapted to a remarkably wide range of water deficit environments.

Sosa, David [223] see Barket, Theresa

Sosa Aguilar, Danny and Bernardo Archuleta

[27] *Understanding the Landscape and Material Sources through Community Partnership in Abiquiú, New Mexico*

This paper aims to discuss how the success of community partnership has led to an understanding of the way people moved across the landscape in the past. Situated in northern New Mexico, the Pueblo de Abiquiú contains a rich history that dates back at least into 2,800–4,000 BP (Before Present). Using portable x-ray fluorescence spectrometry, obsidian artifacts found at the pueblo suggests that groups are bringing obsidian from at least three known local sources. However, there is an unidentified source within the artifacts collected. Community partner, Bernardo Archuleta, is helpful and knowledgeable about the many trails and access points of the Abiquiú landscape. This reinforces a stronger interpretation of the procurement and exchange routes between the material sources and the Pueblo de Abiquiú.

Soto Maguino, Jorge Luis [282] see Lofaro, Ellen

Soulat, Jean [77] see Solazzo, Caroline

Souleles, Daniel (Copenhagen Business School)

[170] *Discussant*

Southard, Liz (University of South Florida)

[188] *A Fishy Study on Site Aggregation and Construction at Florida's Crystal River (8C11) and Roberts Island (8C140 and 41) Sites*

Fishing economies are often described as a principal form of subsistence for prehistoric Florida communities. However, seasonality analyses on fish remains, which have the potential to reveal patterns pertaining to population aggregations and the pace of construction projects, are generally underutilized. This research uses marginal increment analysis of otoliths (fish ear-stones) to investigate whether seasonal deposition events were taking place at two Woodland period sites: the Crystal River site (8C11) and Roberts Island Shell Mound Complex (8C140 and 41). Here, I present the findings on seasonal patterns observed between midden, feature, and mound contexts.

Soza, Danielle (University of Arizona)

[218] *"Is This A Thing?": Opportunities and Results of the Rock Art Ranch NSF-REU Program*

From 2011–2016 Dr. E. Charles Adams and Richard Lange have organized and directed the Rock Art Ranch field school, a National Science Foundation Research Experience for Undergraduates (NSF-REU) Program from 2013–2016. Rock Art Ranch, located just southeast of Winslow, Arizona contains evidence of use/occupation from Paleoindian to Pueblo periods, and yielded a wealth of data that has inspired dissertations, masters theses, senior theses, and student projects. As a participant of the NSF-REU at Rock Art Ranch, this paper highlights the opportunities this specific project with Chuck and Rich has provided, in terms of undergraduate student training in field and lab methods as well as academic research. Beginning as a participant in this program, I chose to further my academic career as a graduate student at the University of Arizona, continuing to work with data from Rock Art Ranch. My paper will conclude with a brief summary of the results of my continued participation in this project through my master's thesis on hunter-gatherer landscapes and land-uses inspired Chuck and Rich's training through the NSF-REU Program.

Soza, Danielle [153] see Zedeño, Maria Nieves

Spahr, Tim (Cape Porpoise Archaeological Partnership)

[199] *Cape Porpoise Archaeological Partnership*

The Cape Porpoise Archaeological Partnership is an alliance between the Kennebunkport Conservation Trust and the Brick Store Museum. Its purpose is to conduct archaeological study of the islands in Cape Porpoise harbor located just off the coast of Kennebunkport, Maine. Evidence suggests that Historic and Pre-Historic Period archaeological sites are present. Sea level rise due to global climate change, however, is causing shoreline erosion damaging or potentially destroying these locations. Important information of past cultures is being lost before study can begin. This is why the Trust, which owns and manages these islands, supports archaeological research. An example of this erosion can be found less than five miles southwest of Stage Island at what was previously Strawberry Island. In the 1940's, Strawberry Island was home to a working farm with farmhouse and barn. Today it is a pile of rocks completely submerged at high tide. Global sea level rise is increasing at a rate of 0.14 inches per year. This gradual increase equates to greater storm surges and conditions will worsen. Without prompt action, important information about this little-known period of history; contact between pre-Europeans and Europeans will be lost forever.

Sparenberg, Jennifer (Maryland Historical Trust)

[159] *Scylla or Charybdis? Prioritizing the Investigation of Sites Endangered by Natural Hazards*

Maryland has 8,000 miles of tidal shoreline associated with the Chesapeake Bay and its tributaries and more than 12-percent of its surface area in floodplains. These high risk areas for flooding and coastal erosion contain about 40-percent of Maryland's archeological sites and presumably many more that have yet to be discovered. It is not feasible or prudent to excavate every endangered site, thus choices about which sites to investigate must be made strategically. This paper lays out a reasoned approach to the identification and excavation of endangered sites based on: developing and refining historic/prehistoric contexts; identifying gaps in those contexts, and prioritizing which sites to survey and excavate based on context, archaeological sensitivity, and vulnerability. Other natural hazards and the effects of climate change that will impact archeological sites will also be identified, as the approach to prioritization is applicable to all hazards, and as sites are at risk to more than erosion and rising waters. Finally, ideas will be presented on how to work with non-traditional partners, like emergency managers, to communicate the risks natural hazards and climate change pose to archeological sites and why it is important to "mitigate" those risks to sites.

Sparks-Stokes, Dominique (University of Cincinnati), Susan Allen and Alan P. Sullivan III

[153] *Deposition, Disturbance, and Dumping: The Application of Archaeobotanical Measures to Taphonomic Questions*

This study assesses the utility of archaeobotanical measures to recognize differential site formation processes, drawing on the Bronze and Iron Age hill fort site of Zagorë, in northern Albania, as a case study. The blanket sampling strategy for collection of flotation samples applied by the Projekti Arkeologjik I Shkodres (PASH) (2010–2014) during the site's excavation provides a complete record of archaeobotanical changes across the depth of each excavation unit. The use of small mesh sizes for the light and heavy fractions, 0.25 and 1.00 mm respectively, allowed for the recovery of small weed seeds and chaff remains. The recovered archaeobotanical remains, all of which are carbonized, are typically well preserved and include several cereal and pulse crops, such as barley, einkorn wheat, emmer wheat, millet, lentils, bitter vetch, and peas.

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Here, we compare archaeobotanical assemblages from two excavation units, one of which shows an undisturbed chronostratigraphic sequence of ceramics, and another in which ceramics from different phases are mixed. The bases for comparison are three separate volume-based density measures of archaeobotanical remains. We use statistical analysis to assess relationships between these measures and their correlation with ceramic data in each unit.

Spaulding, Britta (University at Buffalo)

[85] *Forgotten or Remembered? Rural-Urban Connections in the Modern and in the Past*

In the aftermath of the United States election in 2016, it was claimed that one reason for the outcome was that voters in rural areas were tired of being “forgotten” by the rest of the country. However, this statement is problematic in putting forth a rural-urban dichotomy that may not exist in modern times in the western world, and may have rarely existed in the past in the ways that some assert in popular media. While studying different forms of rural archaeology and landscapes, I have seen that rural forms of archaeology have often been sidelined for investigations into more “significant” urban remains. However, the archaeological record itself tends to indicate that a populace in a small farming, mining, timbering, or other rural-industrial economy is often not so very isolated, and vice-versa. Historical archaeology shows that dynamic interactions between the two “sides” mean that it is incorrect to assert strongly-drawn, almost “battle” lines between sections of society based upon where they live and work. I look at several comparative rural-urban studies, concentrating on the western world, to show that while economic activities may differ within a society, their overarching cultures, mores, and actual interactions create more cultural homogeneity than not.

Speakman, Jeff [35] see Napora, Katharine

Speakman, Robert, Victor Thompson (University of Georgia), KC Jones (University of Georgia), Isabelle Lulewicz (University of Georgia) and Carla Hadden (University of Georgia)

[222] *Academic Jobs in Archaeology*

Over the past three decades, competition for archaeology faculty jobs at North American colleges and universities has risen significantly. Although the numbers of doctorates in anthropology has increased by approximately 70%, the numbers of new faculty positions has remained relatively constant. The present study examines academic job market trends using data derived from the 2014–2015 American Anthropological Association AnthroGuide. We identify which universities are the most successful at placing Ph.D. graduates into faculty positions by ranking each university based on their market-share trends at the decadal level. We also discuss trends in academic job placement according to gender divisions. Our findings suggest that success in landing a faculty position is largely based on where one ultimately chooses to attend graduate school.

Speal, C. Scott (State of Connecticut)

[88] *Socio-economic Class Status and Health on the Roman Danube: Skeletal Indicators and Mortuary Treatment at Late Antique Viminacium*

Cross-culturally and through time, anthropologists have found that—within hierarchical societies—elites tend to manage resources and allocate risk primarily to their own benefit. There is little reason to believe that Late Roman Imperial frontier elites would have behaved any differently. This paper examines the archaeological relationship between biological ‘stress’ or health—as inferred from skeletal remains—and socio-economic status / class—as evaluated on the basis of mortuary treatment—at the Roman frontier city of Viminacium, located on the Danube River in modern day Serbia. Mortality estimates, paleopathology, skeletal lesions, and stature data are all applied in a conjunctive approach to complicated issues of health and socio-economic class under historically known conditions of intense status hierarchy.

Spears, Michael (Anthropological Research L.L.C.) and Saul Hedquist (Anthropological Research L.L.C.)

[72] *Overview of Traditional Cultural Properties in Relation to the NHPA and Bulletin 38*

The publication of National Register Bulletin 38 in 1990 highlighted the importance of living communities to historic preservation by establishing traditional cultural properties as places eligible for inclusion in the National Register of Historic Places (Register). While the concept of traditionally important places was not new in 1990, locations important to living communities had received varied, and often minimal, consideration under the National Historic Preservation Act (NHPA). By specifying how traditional cultural properties meet the eligibility criteria for inclusion in the Register, Bulletin 38 provides important guidance for documenting how places are important to living communities. Perhaps most importantly, the identification and consideration of traditional cultural properties requires meaningful consultation and collaboration between federal agencies and traditional communities. This approach heralded changes in the 1992 amendment of the NHPA that require federal agencies to consult with Indian tribes during Section 106 undertakings, and provide an expanded role to ethnography and the ethnographer in historic preservation.

Speller, Camilla [43] see Manin, Aurelie

Spellman, Christina [104] see Trigg, Heather

Spenard, Jon (Cal State University San Marcos)

[264] *The Hills Are Filled with Water; the Caves Breathe Rain: An Ideational Landscape Approach to Settlement Distribution at Classic Period Pacbitun, Belize*

On an isolated, steep-sided hill in the otherwise undifferentiated foothills of the northern Maya Mountains is the site of Sak Pol Pak, a secondary center of the pre-Hispanic (900 BC—AD 900/1000) Maya site, Pacbitun. Sak Pol Pak is a small site encompassing the entire hilltop, with no room for agriculture and is difficult to access, yet it contains the largest pyramid-temple outside of Pacbitun’s epicenter. At the foot of the hill is the deepest, and most complex cave system in the Pacbitun area—a primary landscape drain for the region—as well as several other unrelated karst landmarks. In this paper, we analyze Sak Pol Pak from a Mesoamerican ideational landscape perspective, specifically that mountains, caves, and water were inextricably linked in thought, to propose the site was a significant ceremonial pilgrimage shrine for Pacbitun. Drawing on ethnographic, ethnohistoric and iconographic sources demonstrating mountains were believed to be living guardians of the wildland, and filled with water, while caves were mouths, exhaling aromatic, smoke-like breath, filling the skies with rain clouds, we conclude two of the primary uses of this hilltop shrine were rain and agricultural rituals.

[264] *Chair*

Spenard, Jon [147] see Stanchly, Norbert

Spence-Morrow, Giles (University of Toronto)

[295] *Signs of History, Signs in History: Confronting the Past in Antiquity in the Jequetepeque Valley, Peru*

As architectural interventions on the landscape, structures considered to have ceremonial or ritual significance provide a means to regulate the temporalization of practice in material form. As built objects, monumental huaca structures in the Andes served to mark the *longue durée*, as their existence mediated and legitimized political order linked to the deep cosmological history framing mythic time, ordering the present and planning for the future. As physical and subjectified artifacts embedded in the landscape, ceremonial loci were the conceptual stages on which temporality was created,

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preserved, and continually reaffirmed. Located only a few hundred metres apart in the Southern Jequetepeque Valley Peru, the Formative site of Jatanca and the Late Moche site of Huaca Colorada represent two occupations separated by 500 years of abandonment. Although temporally distinct and archaeologically separated as two discontinuous communities within a shared landscape, excavations of both sites have suggested that the ceremonial structures of the later Moche occupation were strongly influenced by the presence of the architectural remains of the Formative period community. This paper will trace how specific spatial and ideological concepts stretched across time between these two communities and how their situation in the landscape mediated the construction of identity and personhood.

[320] *Discussant*

Spencer, Kaylee [30] see Werness-Rude, Maline

Sperandio, Emeline [88] see Ardagna, Yann

Sperling, Christopher (Fairfax County Park Authority—Archaeology and Collections Branch)

[251] *A Twitch or a Wink: A Search for Meaning in Coins, Cuffs, and Pottery from a Rural Virginia Assemblage*

There are countless ways to interpret archaeological assemblages. One can take a purely functionalist approach. Plates are for eating and cups for drinking; fasteners keep clothing from falling. However, confronted with a range of symbolically charged artifacts from a Late Colonial through Early Republic period site in Northern Virginia, one is tempted to draw upon our anthropological origins to find meaning. A cuff link commemorating the fox hunt as well as coins and pottery bearing classical imagery. Are they simply the artifacts of everyday life in late eighteenth through early nineteenth century rural Virginia? Do they speak to the how citizens of the new republic saw themselves or what they aspired for others to see? Could the symbology represent an understanding among enslaved persons of the inherent contradiction between American bondage and American freedom? To paraphrase a legendary quote, is a cigar ever really just a cigar?

[194] *Discussant*

Sperling, Stephanie

[328] *The Pig Point Complex: 10,000 Years of Mid-Atlantic (Pre)History*

Excavations at the Pig Point site have redefined our understanding of Native American history in the Mid-Atlantic. The site is located near the freshwater-saltwater interface on the Patuxent River in Maryland, an area tremendously rich in biodiversity, and radiocarbon dates from stratified deposits at the site span more than 9000 years; however, artifacts uncovered more than two meters below surface suggest people have lived in this area far longer. Features discovered at Pig Point include a Late Woodland feasting midden, Adena-influenced mortuary pits, and several Early Archaic hearths, to name a few. Recently, archaeologists ventured outside of Pig Point in order to better understand how this significant site fits into a regional cultural landscape. Several intact and well-preserved sites were discovered that help us understand how people lived along the East Coast in the centuries before Contact.

Spieß, Arthur [84] see Miller, Jacquelynn

Spikins, Penny (Department of Archaeology, University of York) and Gail Hitchens (Department of Archaeology, University of York)

[329] *An Emotional Challenge: What Can We Infer about Capacities for Social Emotions in Archaic Humans?*

Social emotions are central to human social lives, however whilst there has been much discussion about archaic human cognition in terms of analytical capacities, capacities in terms of social emotions are rarely discussed. A 'null hypothesis' of a lack of pro-social motivations is often assumed to be the most rational scientific perspective on how archaic humans felt towards each other. Over recent years accumulating evidence for complex social relationships in archaic humans argues against this null hypothesis however, leaving the issue of archaic human social emotions open to debate. Here we consider how to approach an understanding of capacities for social emotions in archaic species, reflecting on how social emotions are likely to have evolved and developing an evolutionary and cultural model of capacities for social emotions in archaic humans. We draw on archaeological evidence to explore what we can and can't interpret about how Neanderthals felt about each other.

Spivey-Faulkner, S. Margaret (Harvard University)

[58] *Indigenizing the Typology*

The typology is one of the archaeologist's oldest analytical tools and it pervades nearly every facet of archaeological research, whether explicitly or implicitly. Using theories of practice, ethnographic evidence of Native American classification systems, and an interdisciplinary understanding of human perception and pattern recognition, this work attempts to deconstruct and reconstruct the typology as a tool of archaeological analysis, with an eye toward creating a newly theorized typology to be used in Native North American contexts.

[58] *Chair*

Sportman, Sarah P. (Archaeological and Historical Services, Inc.)

[217] *From Frontier to Farm Town: Subsistence and Diet in Old Wethersfield, Connecticut, 1636–1750*

Recent excavations at the Webb-Deane-Stevens (WDS) museum in Wethersfield, CT, resulted in the discovery of deeply-buried portions of the 17th- and early 18th-century landscapes. The stratified deposits contain a rich assemblage of domestic artifacts, personal items, architectural materials, food remains, and cultural features. The preservation of these deposits is excellent and the faunal assemblages include large and medium mammal bones, as well as small mammals, birds, fish, and eggshell. English colonists first arrived on the site in the 1630s as part of the initial Wethersfield settlement and were among the first Europeans to settle Connecticut. Incorporating the methods of ethnohistory and historical archaeology, this study examines the WDS faunal remains in the context of primary accounts of hunting, fishing, animal husbandry, and diet to shed light on the ways European settlers adapted to the Connecticut frontier and, in turn, impacted the local environment. The data also helps us to understand how English foodways and food procurement strategies evolved as the Connecticut Colony became more established in the 18th century.

Sportman, Sarah P. [294] see Leslie, David

Springate, Megan

[220] *A Queer Look at a Changing Vacation Landscape: Respectability and Resistance*

Using a queer lens, this research looks at respectability and resistance at a resort landscape on Lake George in New York State's Adirondack Mountains. In the late nineteenth century, this vacation resort served a mixed gender, middle-class clientele; beginning in the very early twentieth century, it has served a mixed-class, all female clientele. Respectability played a crucial role in how people navigated both of these landscapes. The flip side of respectability is resistance. Looking at artifact assemblages representing clothing, medicine, and foodways through a queer lens provides a glimpse of how respectability and resistance played out on the shores of Lake George in the 1870s-1890s and in the 1910s-1920s.

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Spurr, Kimberly (Museum of Northern Arizona / Past Peoples Consulting)**[325]** *More than Just Cliff Dwellings: Results of Survey at Navajo National Monument, Arizona*

The Museum of Northern Arizona (MNA) is collaborating with the National Park Service to complete a comprehensive survey of Navajo National Monument in northern Arizona. The spectacular cliff dwellings of Keet Seel and Betatakin have been known to science since the early 1900s, but no comprehensive inventory has been conducted of the entire monument. Survey in 2016 focused on the mesa top and canyons in the vicinity of Betatakin, resulting in the discovery of two smaller contemporaneous habitation sites, two probable Archaic camps, and several historic sites related to Navajo herding and NPS infrastructure development. The probable Archaic camps are particularly significant because no sites of this age had been identified in the Monument although Archaic sites are common in the region. Survey around Inscription House resulted in the discovery of new petroglyphs and buried cultural horizons. Early in 2017, survey in the canyon surrounding Keet Seel documented several prehistoric and historic trails cut into bedrock, historic inscriptions, and two previously unknown buried sites.

St. Amand, Ani (University of Maine Climate Change Institute), Alice R. Kelley (University of Maine) and Daniel H. Sandweiss (University of Maine)**[135]** *Assessing Destruction Risk of Cultural Resources: Primary and Secondary Impacts of Climate Change on the Archaeological Record*

Coastal archaeological and historic sites increasingly face primary impacts of climate change, including sea level rise, flooding, and erosion. As cultural sites are subjected to destructive processes, action is generally limited to mitigation and salvage of immediately threatened significant sites, while their destruction by the resettlement of affected communities has been given little attention. This secondary impact of climate change threatens sites outside of the immediate zone of flooding and erosion. Given the importance of cultural heritage sites to descendent communities, and their preservation of paleoclimatic and environmental records in association with the record of human settlements over millennia, it is imperative that we develop standard methods for assessing destruction risk of archaeological sites within a climate change framework. Using Casco Bay area in Maine as a pilot study, this study develops a methodology for integrating decadal-to-centennial climate change projections, socio-economic and demographic data, and state and federal land use and cultural resource management regulations to create a robust, user-friendly risk assessment framework. The products are multi-scalar maps at the town and parcel level that can be used by communities and government officials to identify and prioritize threatened cultural resources facing destruction by secondary impacts of climate change.

Stackelbeck, Kary (University of Oklahoma), Allison Douglas (University of Oklahoma), Shawn Lambert (University of Oklahoma), Bonnie Pitblado (University of Oklahoma) and Meghan Dudley (University of Oklahoma)**[222]** *Many Pathways to Stewardship of Oklahoma's Past and Present*

True to the title of the 2017 Oklahoma Archaeology Month poster, its creation involved an extensive collaborative effort. The theme celebrates both the long-standing education and outreach efforts of the Oklahoma Archeological Survey and the founding of the Oklahoma Public Archaeology Network (OKPAN). OKPAN sponsored the competitive recruitment for an artist to conceive the poster, which generated multiple submissions and spawned other creative partnerships. The poster displays an original, innovative design that incorporates multimedia content contributed by American Indian nations, state and federal agencies, professional archaeologists, land owners, and avocationalists. With images from over 20 federally recognized Tribes, the contributions provided by indigenous communities represent a particularly poignant example of the poster's message of inclusive archaeology. The authors emerged from this process feeling like we had been part of a unique experience worth sharing with others—thus the impetus for this presentation.

Stackelbeck, Kary [127] see Maggard, Greg

Stafford Jr., Thomas W. [74] see Devière, Thibaut

Stagg, Sarah and Jason Toohey**[240]** *Rock Art and the Creation of Landscape at Callacpuma, Peru*

Numerous rock art panels dot the landscape of the Late Intermediate Period (AD 1000-AD 1450) site of Callacpuma in the Cajamarca Basin of northern Peru. The panels are comprised of many distinct motifs and types including a variety of camelids, anthropomorphs, geometric patterns and other zoomorphs. Although the iconographic information held within these motifs is certainly important, this project attempts to move beyond the iconographic significance of individual motifs or panels and examine the use of rock art to form the landscape. At Callacpuma, art is spread across large portions of the site and more than 80 panels have been surveyed and systematically recorded to date. GIS analysis is used to examine the spatial patterning of the panels, focusing on the relationship between rock art, important physical features, and elevation. Consideration is given to the spatial relationship of rock art motifs and panels and how these patterns can be used to infer the function and meanings of rock art in shaping the physical and social landscape at the site.

Stalla, David [89] see MacDonald, Brandi Lee

Staller, John (The Field Museum)**[86]** *High Altitude Maize (*Zea mays* L.) Cultivation in the Lake Titicaca Basin and Endemism*

Scientists have long maintained the upper limits of maize (*Zea mays* L.) cultivation was 3,600 masl. Archaeological evidence has documented a particular maize variety called tunqu by indigenous speaking populations, generally cultivated on terraces around the Copacabana Peninsula between 3810 to 4100 masl, in the Lake Titicaca Basin, Bolivia. This is the first known maize variety cultivated above 3600 masl. There were wide-spread landscape modifications such as raised fields and terraces geared to the cultivation of food crops by pre-Columbian civilizations of this region. Colonial accounts emphasize this high altitude maize was primarily consumed as maize beer (aqha, or chicha) and central to ritual offerings extending back to the Yaya Mama religious tradition (ca. 800 BCE). Its phenotypic characteristic are unique, unlike any other known landrace. It appears to be an endemic maize variety, unique to this part of the Titicaca Basin. Evapotranspiration around the lake reduces the diurnal variation in temperatures just enough for maize cultivation to be possible in the Bolivian altiplano. Its prehistory, cultivation, preparation and consumption among indigenous cultures are analyzed as are its botanical and biological characteristics.

Stampanoni, Filippo [240] see Ellis, Grace

Stanchly, Norbert (AS&G Archaeological Consulting), Jon Spenard (California State University, San Marcos), Terry Powis (Kennesaw State University) and Christophe Helmke (University of Copenhagen)**[147]** *Broken Molds, Burned Wealth, and Scattered Monuments: Defining the Terminal Classic Period at Pacbitun*

The Terminal Classic period in the southern Maya Lowlands was one of great social transition, witnessing the disruption of long-standing economic systems, and the downfall of divine kingship. The manifestation of this "collapse" in the artifactual record has been well documented at many sites throughout the Belize Valley, yet how it does so at the site of Pacbitun, on the southern rim of the Belize Valley, remains poorly understood, in spite of nearly three decades of archaeological research there. This paper is the first attempt to define the Terminal Classic period at Pacbitun, focusing on

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three main aspects of this time period. The first is on changing patterns in the ritual landscape, where we have documented a marked uptick in intensity and geographic extent of the use of landmarks such as caves, rockshelters, and bedrock outcrops. The second area is related to economic exchange and rising power of secondary elites manifest in the appearance of molded-carved pottery, and lastly, we discuss the breaking, scattering, and reuse and abandonment of monuments in the site core.

Stanchly, Norbert [43] see Bentley, Heath

Standen, Vivien [87] see King, Charlotte

Standen, Vivien [87] see Snoddy, Anne Marie

Stanford, Dennis [79] see Graham, Russell

Stanley, Jeff (George Mason University), Mariela Pérez Antonio (Universidad Veracruzana) and Nawa Sugiyama (George Mason University)
[293] *Spatial Distribution of Ceramic Sherds at the Plaza of the Columns, Teotihuacan, Mexico*

During the Early Classic period (250–550 CE), Teotihuacan in what is now central Mexico was the largest city in the Western hemisphere. Occupying 76,400 m² of Teotihuacan's ceremonial center, the Plaza of the Columns, which consists of three mounds and the surrounding area, has been posited as the site of a palatial-administrative complex. The occupational history of the Plaza of the Columns is interpreted in light of a three-dimensional distribution map of ceramics, organized according to two factors: temporal phase and vessel form. Ceramic data includes over 99,000 pieces from multiple areas of the Plaza analyzed thus far, excavated during the 2015 and 2016 field seasons. Mapping the distribution of ceramic temporal phases should allow us to align the various excavation contexts chronologically and trace the usage of particular areas over time. The distribution of ceramic forms, meanwhile, can help identify the extent of household and public activities.

Stanley, Kaitlin

[50] *Bone Artifacts from Summer Bay, Unalaska*

Situated in Alaska's eastern Aleutian Islands on Unalaska Island, the Summer Bay site dates to 2,000 years BP. Over 700 osseous objects representing various manufacture and use stages have been recovered. Among these are harpoons, fish hooks, labrets, points, wedges, awls, and needles. These are primarily made from sea mammals and avifauna. Although Summer Bay represents one of the most secure dates of the Amaknak Phase (3,000 to 1,000 years BP), minimal research has been done to better understand the social organization, site function, and abundance in variation of technology. Presented here is the preliminary study from the analysis of the osseous industries of Summer Bay using the concept of chaîne opératoire. These results allow for the interpretation of the degree of recycling and rejuvenation between and within various tool types in this assemblage.

Stanton, Christopher (New Mexico State University), Jennifer Byrd (New Mexico State University) and Vanessa Carrillo (New Mexico State University)

[106] *Challenges of Archaeology in the Wilderness at South Diamond Creek Pueblo*

Archaeological excavation in the wilderness is a new frontier in archaeological data collection. With most of the documented and excavated sites being outside the wilderness, usually within driving distance of a town or city, this offers an untouched and uncorrupted view of past cultures and their material remains. Most archaeology conducted in the wilderness takes the form of surveying, with little to no excavation being done. The South Diamond Creek Pueblo Project offered us one of the first opportunities to do a complete excavation in the wilderness. Through a collaboration between the U.S. Forest Service and New Mexico State University, students and volunteers were able to completely excavate and collect data from a Classic Mimbres period Pueblo. We shall discuss the entirety of the project, from its first rediscovery in modern times through the completion of excavation, including the challenges we faced while working at an archaeological site in the wilderness.

Stanton, Travis (University of California Riverside)

[177] *Maya Ceramic Technologies for Avoiding the Catastrophic Failure of Cooking Pots*

Maya potters in the towns of Muna, Mama, and Ticul have historically used a calcite crystal to temper cooking pots due to its perceived role in mitigating the negative effects of thermal shock. When a clay cooking pot begins to be used it is exposed to extreme temperature variations which lead it to experience catastrophic failure at a higher rate than many ceramic vessels used for other activities. In this paper we discuss the results of experimental archaeology using calcite crystals in thermal shock tests and compare data to tempering materials in Preclassic and Classic period ceramics from the site of Yaxuna, Yucatan.

[258] *Discussant*

Stanton, Travis [66] see Palacios, Horvey

Stanyard, Zachary (Western State Colorado University)

[6] *Initial Experimental Analysis of Soft Hammer Techniques in the Maya Lowlands*

Lowland Maya lithic studies have traditionally focused on the rise of specialization at large urban centers. While many of these studies have focused on form and function of the tools produced, few focused on the technological means of tool production. Maya lithic studies have been assumed a priori to have been created using traditional means of hard-hammer and billet reduction. This paper reviews current evidence for the use of hardwoods in the production of stone tools, as well as provide an experimental comparison of debitage assemblages from Colha, an ancient Maya stone tool production site in northern Belize, and one created by myself using traditional reduction techniques and hammers crafted from tropical hardwood.

Stapleton, Charles (Northern Illinois University) and Maria Stapleton (Northern Illinois University)

[31] *Tlaloques, Tiemperos, and Trees: Cultural Models of Nature in Central Mexico*

Abundant water-related art and architecture produced by Teotihuacanos and Mexica-Aztecs in the central Mexican highlands coupled with the rhetoric of today's farmers from the same region regarding the catastrophic impacts of changes in local seasonal rainfall patterns make it clear that access to rainwater has always been a crucial factor for agricultural success in the semi-arid highlands of central Mexico, especially in communities that lack a reliable water source for irrigation. We collect a rich body of specialist knowledge regarding local understandings of relationships between animals, plants, hills, trees, humans, elements of weather, supernatural/spiritual beliefs, and farming practices that is widely shared in one such community of agriculturalists. Although this traditional knowledge has long been transmitted from generation to generation of agriculturalists, it is now in danger of permanent loss due to major shifts away from subsistence farming among the community's youth. We employed semi-structured interviews, free-listing, and experimental tasks to elicit specialists' conceptualizations of nature. Preliminary findings include a graded valuation of crops, natural and supernatural entities conceived as agentive in bringing rain, animals seen as bearers of knowledge of climatic change that humans can read, and human ability to predict and directly alter local rains and storms.

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Stapleton, Maria (Northern Illinois University) and Charles Stapleton (Northern Illinois University)**[36]** *Pueblo de Indios: Syncretic Art and Architecture in the Negotiation of Indigenous Identity*

In the years immediately following the conquest of the Aztec empire by the Spanish crown, there was a period of transition in which acculturation, adaptation, and/or adoption of new configurations of political powers, religion, and social structures ushered in the Colonial period in Mexico. One of the results of the encounter between indigenous and Spanish cultures is the syncretism that developed in the art and religious architecture of this region. Studies of syncretic art in colonial Mexico primarily focus on art produced in major convents built in previous pre-Hispanic cities and/or in new towns of New Spain. However, much less is known about the small indigenous towns or pueblos de indios beyond the cities states, cabeceras or major towns. How did they respond to their new circumstances? This study reveals how Tlanalapan—a Texcoco tributary town in pre-Hispanic times, an Indian town during the Colonial period in the New Spain, and an agricultural-industrial town today in the central highlands of Mexico—not only adopts and adapts to the new circumstances, but also uses the syncretic art of a Franciscan church facade, a crucifix made of corn, and local traditions as instruments to negotiate its own identity.

Stapleton, Maria [31] see Stapleton, Charles

Stark, Miriam, Peter Grave (University of New England (Australia)), Lisa Kealhofer (Santa Clara University), Darith Ea (APSARA National Authority (Kingdom of Cambodia)) and Boun Suy Tan (APSARA National Authority (Kingdom of Cambodia))**[175]** *Urban Economies and State "Peripheries": Angkorian Stoneware Ceramic Production and Distribution*

Angkor's agro-urban capital covered more than 60 square miles, and its landscape housed farmers and artisans. Constraints of the archaeological record limit our ability to document production scale of most activities; the genealogical skew of Angkor's epigraphic record in another reason. Yet Greater Angkor's gardens and fields must have fed residents in the Angkorian state's epicenter. Artisans built its temples, sculpted temple images, and cast metal goods; specialists and communities tended temples; and voracious elites broadcast political and religious affairs in stone and through pageantry. Some archaeologists studying the multiscale, multicentric nature of Angkorian production focus on ceramics as proxies for tracking state economy within and beyond Angkor's urban epicenter. Stoneware ceramics were neither wealth nor staple finance; their functions complemented earthenware and metal objects; and they were ubiquitous in Angkorian households across the kingdom. Kiln excavations in three discrete Angkorian subregions have produced in-situ ceramics; field projects across Cambodia offer samples from consumption sites. Our Khmer Production and Exchange Project dates stoneware kilns and uses NAA to characterize geochemical compositions of stonewares from production and consumption sites. Here we examine ceramic consumption in the Mekong Delta (Angkor's southern 'hinterland'), and its relationship to economic centralization the Angkorian capital.

[317] *Discussant*

Stark, Miriam [175] see Heng, Piphall

Steel, Louise (University of Wales Trinity Saint David)**[117]** *Contesting Landscapes. Hidden Histories vs. Memorialised Spaces in Cyprus*

People's relationship with place plays a significant role in shaping, contesting and (re-)negotiating identities. This paper considers place as an active agent in the mediation of modern Cypriot identity against a backdrop of centuries of colonial occupation. The focus is Arediou, south of the Green Line. Here, I explore how experiences of the past are embedded spatially but are also experienced differently according to their relationship to current narratives of being (Greek-)Cypriot and memories of occupation by the colonial other.

The slipperiness of Cypriot history, how certain spaces are remembered and memorialised while others are ignored or actively forgotten, demonstrates the intangibility of the past. Different narratives are attached to different phases of the Cypriot past: antiquity is concealed within a cloak of Hellenism, while the more recent Orthodox past is revered with great pride, and the turbulent recent past is proclaimed through the very name of the local kafeneio, the Parthenon.

Drawing upon local stories passed down over the generations, I explore how places within and around the village (local archaeological sites, copper mines, residues of British colonial activity, EOKA hideouts, abandoned villages) are variously remembered, forgotten, understood and represented, to actively create a sense of being Cypriot.

Steele, Teresa E. [89] see Martisius, Naomi L.

Steelman, Karen (Shumla Archaeological Research & Education Center), Liam Brady (Monash University), John Bradley (Monash University) and Amanda Kearney (The University of New South Wales)**[180]** *Dating the Spirit Men: Radiocarbon Dating Saltwater Rock Art of the Yanyuwa People in Northern Australia*

Working with Yanyuwa elders, we collected seven rock painting samples for radiocarbon dating from Kamadarringabaya rock shelter on Vanderlin Island in the southwest Gulf of Carpentaria (Northern Territory). Hand motifs—prints and stencils—dominate the site, covering the shelter walls and roof, and are said by Yanyuwa to be the hands of the Namurlajanyugku spirit beings. In control experiments, negligible levels of humic acid contamination were shown to be present in the unpainted rock; therefore, no chemical pretreatment was conducted on paint or background samples. To obtain direct dates on the paintings, we oxidized organic material in paint samples using plasma oxidation followed by accelerator mass spectrometry radiocarbon dating. Radiocarbon results were averaged using the R_Combine function of the OxCal computer program with ShCal13 curve data to produce calibrated age ranges. We also conducted a mineral analysis on samples using X-ray diffraction to identify mineral pigments used in the production of motifs. This project blends scientific dating of pigment-based rock art, archaeological analysis of spatial distribution patterns of rock art styles across the landscape, and ethnography through interviews to explore how people negotiate their contemporary relationships to rock art.

Steelman, Karen [180] see Roberts, Victoria

Steele, Benjamin (Western Carolina University) and Ashley Schubert (University of Michigan)**[119]** *Movement and Interaction in the Appalachian Summit circa 1300–1500 CE*

The Appalachian Summit is the southernmost and highest part of the Appalachian Mountain system, extending across western North Carolina and eastern Tennessee. Beginning in the early 1300s, evidence for Mississippian practices appear within Late Pisgah phase communities in the central portion of the Appalachian Summit. These settlements include small farmsteads, palisaded villages, and sites with platform mounds. In addition to the Pisgah culture, the late Mississippian Qualla phase (1450 -1838 CE) represents the only other Mississippian society in the Appalachian Summit. These communities are contemporaneous with Late Pisgah sites to the north, sharing similar house architecture and pottery attributes. However, Qualla sites are restricted to river valleys within the southwest while Pisgah pottery is found across a much larger area of the greater southern Appalachians. These two Mississippian complexes maintained a spatial separation within areas where both pottery types are found. With cycles of more or less integration of Mississippian groups, the period of 1300–1500 CE was a complex and dynamic period of interaction and growth in the Appalachian Summit. These

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demographic trends could be attributed to several factors, including environmental change, increased interaction with groups from neighboring regions, and increased competition for resources between neighboring communities.

Stein, Martin (Bureau of Land Management, Carlsbad Field Office) and Laura Hronec (Bureau of Land Management, Roswell Field Office, N)
[261] *Tough Love—The Permian Basin Programmatic Agreement Research Program in Southeastern New Mexico*

First implemented in 2008, the Permian Basin Programmatic Agreement (PBPA) is an alternative form of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The PBPA allows the oil and gas industry and potash mining companies in southeastern New Mexico to contribute funding for archaeological research in lieu of requiring a class III archaeological inventory within the PBPA Area, provided they avoid recorded cultural resources. This paper describes the context in which the PBPA was developed, research completed, challenges it's encountered, and suggestions for how this kind of compensatory mitigation could be implemented in future land management elsewhere.

Steinberg, John (UMass Boston)

[167] *The Viking Age Settlement of Iceland: The Change from Migrant Society to Settled Society*

The rapid settlement of Iceland has a distinct beginning, but defining the end of the settlement turns out to be difficult. While there are anecdotal stories of earlier settlers, the beginning of large-scale migration to Iceland seems to happen in about AD 870, at the start of Harald Fairhair's reign, and the time of a distinct volcanic ash layer. The landnám, or land-grab is an important template for our understanding of movements into new landscapes, from the Neolithic Revolution, to the English Pilgrims, and the California Gold Rush. Does the migrant origin of a society define its later nature? Specifically, is the end of the landnám in Iceland reflected in one or more inflection points or is the change from migrant society to settled society imperceptible? This paper argues that by about AD 1100, the last vestiges of the Viking-Age migrant society vanished, and while the Norse themselves might not have noticed, the change seen in the archaeological record is profound.

Steinbrenner, Larry (Red Deer College)

[263] *"Across the Agua to Managua" and beyond: Getting Past Migration in Nicaraguan Prehistory*

Despite being the largest country in Central America, Nicaragua's archaeological record remains the least explored and most ignored. One consequence of this is that reconstructions of Nicaragua's prehistory have tended to rely overmuch on rather sparse (and not necessarily reliable) ethnohistoric accounts in which migration from Mesoamerican homelands is heavily emphasized, generally to the detriment of other kinds of cultural phenomena, including indigenous developments that are not explicitly "Mesoamerican". Meanwhile, only sporadic attention has been paid to the archaeological record itself, and the potential evidence that it provides for (a) actual migration and/or conquest, (b) interaction and mobility between groups within Nicaragua and beyond, and (c) multiculturalism across Greater Nicoya. This paper argues that understanding of Greater Nicoya's multicultural prehistory would benefit from approaches in which archaeological interpretations are informed but not dominated by ethnohistoric evidence—approaches that not only treat migration as a cultural phenomenon that must be demonstrated in the record rather than taken for granted but which also are capable of recognizing archaeological evidence of potential interaction between diverse groups.

Stelle, Lenville (Illinois State Archaeological Survey)

[180] *Pictographs on Artery Lake, Bloodvein River System, Extreme Northwest Ontario, Canada*

The pictographs of the Bloodvein River, Artery Lake, Ontario offer an important view of rock art design and purpose during the late prehistoric period and perhaps continuing well into the nineteenth century. All images are finger applied and utilize iron oxide based pigment. The sites appear to be of varying function. The largest and most complex consists of seven or eight panels and may reveal a narrative of healing associated with the Fourth Degree of the Midewiwin or Ojibwe Grand Medicine Society. The second appears to be a signpost indicating correct travel routing. The third consists of a substantially degraded panel and is of uncertain purpose. The iconography may be dominated by a representation of Mishipeshu (Mishibijiw) or the Underwater Panther. All three sites are subject to the forces of cryoturbation peculiar to boreal North America. Additionally, while Artery Lake is extremely remote (two weeks travel by canoe from the nearest road-head) insofar as the Bloodvein is a designated Canadian Heritage River there are a measurable number of informed visitors to the sites, many of whom are motivated to extensive photo documentation of their grand adventure. This circumstance has created uncommon difficulties for site preservation.

[180] *Chair*

Stellmach, Caitlyn [223] see Munger, Tressa

Stemp, W. James (Keene State College) and Jaime Awe (Northern Arizona University)

[147] *Point Counter Point: Interpreting Chipped Chert Bifaces in a Terminal Classic "Problematic Deposit" from Structure A2 at Cahal Pech, Belize*

Sixteen small chert bifaces are part of a Terminal Classic (AD 800–900) peri-abandonment "problematic deposit" recovered just above the surface near the western base of Structure A2 at the ancient Maya site of Cahal Pech, Belize. The results of stylistic, technological, and use-wear analyses performed on these chert artifacts indicate: 1) production from locally available stone; 2) five different tool styles; 3) evidence for some tool curation/re-sharpening; and 4) wear patterns on some of the artifacts that are consistent with their use as hafted stabbing or projectile weapons. Based on this evidence, as well as the other artifacts associated with them and their context of recovery, the sixteen bifaces are evaluated in terms of different processes of deposition, including midden contents, grave goods, abandonment refuse, and ritual offerings.

Stephens, Jay (School of Anthropology, University of Arizona) and David Killick (School of Anthropology, University of Arizona)

[242] *Assessing the Suitability of Southern Africa for Archaeological Provenance Studies with Lead Isotopes*

Evidence for trade between southern Africa and the Muslim world dates back to the 8th century CE. However, it is not until the 12th and 13th centuries, with the discovery of alluvial gold in southern Africa, that entanglement between the two regions intensified. As a result, state-level societies emerged and began incorporating aspects of the Muslim identity into their own culture.

With the intensification of these trade relations, craftsmen began expanding their repertoire of iron and copper metal production to include tin and bronze materials. Thus, were these new materials imported? Is this a case of technology transfer? Or perhaps an independent invention of bronze in southern Africa? We present data from chemical and lead isotopic analyses on copper and bronze objects from Bosutswe, Great Zimbabwe, Mapungubwe, Rooiberg, Thulamela, and Verwoert, as well as a lead isotopic database of sulfide ores from the region of southern Africa. Initial ore results indicate a heterogeneous array of lead isotope data, including the major prehistoric mines of Phalaborwa, Rooiberg, Copper Queen, Tsumeb, Kimberly, and Messina. Results from the analysis of metal samples are preliminary, but elaborate on the nature of intra and inter regional trade networks in prehistoric southern Africa.

Stephens, Stephanie (National Park Service)

[276] *Discussant*

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Stephenson, Keith (USC Institute of Archaeology and Anthropology) and Karen Smith (University of South Carolina)**[228]** *A Retrospect of Deptford in South Carolina*

The label Deptford has long been synonymous with both a Woodland Period pottery type and a coastally oriented subsistence-residential adaptation. The former culture-historical terminology dates to 1939, while the latter concept is attributed to Milanich following his work on the Georgia coast in the early 1970s. Deptford also has been construed as a phase with a time-space-content connotation that incorporates aspects of both pottery and adaptation. Regardless of the specific meaning the term Deptford may hold, much of the foundational literature on Deptford comes from sites on the Southern Atlantic Coast, particularly those on or near the lower Savannah River. A synthesis of Deptford for the whole of South Carolina was not seen until much later, when Trinkley included Deptford in his volume on the Woodland Period in South Carolina, completed in 1990. While it seems like yesterday, it was, in fact, almost 30 years ago. What do we know now that we did not know then? How far has our understanding of this Woodland Period manifestation come? We build on the work of Trinkley and others in a reassessment of some key aspects of space and time for South Carolina Deptford.

Steponaitis, Vincas (UNC-Chapel Hill)**[291]** *The Location of the Historic Natchez Villages, Revisited*

In the 1720s the Natchez nation, as described in contemporary French accounts, consisted of at least six towns: Grand, Farine, Pomme, Tioux, Griga, and Jenzenaque. Building on the work of Andrew Albrecht, Ian Brown, and James Barnett, and taking into account eighteenth-century manuscript maps that have recently come to light, I re-examine the evidence for the nature of these towns and where they were located on the modern landscape. Apparent inconsistencies between narrative accounts and maps are reconciled by showing that the French applied different names to the same towns. Thus, the names Farine and Carnard referred to the same community, as did Grand and Valeur. Contemporary maps indicate that the layout of the civic-ceremonial capital was more complex than previously assumed.

Sternberg, Robert**[152]** *Moderator***Sterner, Katherine (University of Wisconsin-Milwaukee), Robert Ahlrichs (University of Wisconsin-Milwaukee), Dan Wendt (Minnesota Historical Society) and Larry Furo****[89]** *Testing Adaptive Efficiency: A Comparison of the Durability of Stone and Copper Projectile Points*

The Old Copper Complex represents a unique temporally and geographically bounded technological phenomenon. Binford (1962) challenged the idea that copper tools were adopted by Native Americans solely because they were technologically more efficient. He argued that Archaic copper served a primarily socio-technic function based on two assumptions. One, that copper tools were more efficient in use performance than their stone and bone counterparts. And two, that the energy expenditure required for raw material acquisition and production of copper tools was much greater than that for other material types. This socio-technic designation has formed the baseline for interpretations of the Old Copper Complex for the past 60 years. However, no one has tested these underlying assumptions about the relative economic efficiency of stone and copper tools. This study documents the experimental production and use of copper and chipped stone projectile points in order to test these assumptions.

Sterner, Katherine [26] see Jeske, Robert

Steussy, Clara**[39]** *Mono no Aware: Challenges of Impermanence in the Archaeological Record of a WWII Japanese American Concentration Camp*

From 1942 to 1945, the third largest city in the state of Wyoming was the Heart Mountain Relocation Center, one of ten camps where Japanese immigrants and their Japanese American descendants had been forcibly relocated from their homes along the West Coast for the duration of World War II. During their residence, the incarcerated did everything they could to make the camps their home, establishing gardens and fields, building swimming pools and root cellars, and otherwise trying to make life comfortable. After the camps were closed at the end of the war, however, they vanished from the landscape, as buildings and land were both given away to new homesteaders. In this paper, I offer a broad overview of how these involuntary settlements have both vanished from sight and yet still linger. In particular, I focus on the gardens and agricultural fields of the Heart Mountain camp, neither of which were clearly documented at the time and both of which now lie beneath active agricultural fields today. I ask what, if anything, can be done to extend our understanding of these areas, and discuss plans for continued research.

Steussy, Cally [268] see Van Alst, Emily

Stevens, Craig (American University)**[67]** *Maryland's Josiah Henson: A Tale of Black Resistance*

Josiah Henson was an escaped enslaved individual and eventual Underground Railroad conductor, yet his life story has been historically overshadowed by the fictional character he inspired in Harriet Beecher Stowe's internationally renowned novel, *Uncle Tom's Cabin*. The Maryland-National Capital Park and Planning Commission (M-NCPPC) and Montgomery Parks of southern Maryland utilizes archaeological research as one of many techniques to bring to life the narrative of Josiah Henson the individual, rather than Uncle Tom the fictional character. This paper highlights the integration of archaeological and GIS methods to facilitate the investigation of Henson's life in Rockville, Maryland and public dissemination of his narrative. As a member of this archaeological project, I created a storymap of the Riley plantation where Henson was enslaved during the early 1800's. This map introduces potential donors to the site and serves as a virtual self-guided tour for the site's upcoming museum. As Henson's influential life story is brought into mainstream understanding and made available to a broader public via technology, we are able to combat the historic belittlement of African-American achievements and contribute to the larger story of Black resistance to slavery.

Stevens, Karen (University of Kentucky), Katharine Alexander (University of Kentucky) and Alexander Metz (University of Kentucky)

[84] *New Approaches to Old Questions: Current Research Objectives for the Green River Valley Shell Midden Archaic, Kentucky, USA*
The Green River Valley Archaic shell middens (ca. 10,000 to 3000 BP) located in west-central Kentucky have a long research history dating back more than 100 years to C. B. Moore's work. Previous research programs have focused on mortuary analysis, subsistence, formation processes, and settlement patterns, laying the groundwork for future researchers to conduct more detailed analyses using newly developed methods (e.g., GIS, isotopic analysis). In this paper, we expand on previous research of the Green River Valley shell middens by describing aspects of site functions and site contents, as they relate to ecological and social contexts. This ongoing work includes 1) paleoethnobotanical research considering the scarcity of Eastern Agricultural Complex crops, either as the result of prehistoric plant use, preservation, and/or recovery strategies; 2) faunal research examining freshwater resources as paleoenvironmental indicators through species composition and isotopic analysis, and 3) GIS-based spatial analysis investigating topographic and ecological features associated with patterned re-use of shell midden locations in the Green River Valley.

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Stevens, Rhiannon (University College London, Institute of Archaeology), Hazel Reade (University College London), Sophy Charlton (The Natural History Museum & University College Lo) and Jennifer Tripp (University College London)

[219] *The UpNorth Project: Environment Context of Late and Final Palaeolithic Dispersals*

Human mobility and environmental interactions at the end of the Palaeolithic were undoubtedly influenced by large-scale and rapid climate change. With the melting of ice sheets and expansion/contraction of ecosystems, new landscapes and resources became available to late and final Palaeolithic hunter-gatherers. The UP-NORTH project is examining the dispersal of people and animals into Northern Europe after the Last Glacial Maximum. Using a range of techniques, including stable isotopes, radiocarbon and ancient DNA analyses, UP-NORTH is exploring whether the process(es) of recolonisation and the increasing diversification seen in the lithic and bone industries during the late and final Palaeolithic represent responses to changing environments and resources, or if such changes were independent of one another. UP-NORTH is developing an integrated chronological, palaeoclimatic and palaeoecological framework to explore changing landscapes, and human activity within them. By developing multiple integrated lines of evidence the project provides an insight into the Late-glacial landscape and environment change that Palaeolithic people experienced and evaluates how these may have influenced the decisions they made, particularly in relation to their mobility.

Stevenson, Christopher [20] see Ladefoged, Thegn

Stewart, Ashley (University of Alabama), J. Lynn Funkhouser (University of Alabama), Avery McNeece (University of Alabama), Christopher Lynn (University of Alabama) and Omega Rakotomalala (Eagles Wings Montessori School)

[168] *Anthropology Is Elemental: Teaching Children Using a Four-Field Approach*

Public outreach and education are essential for the future of archaeology. While many organizations are actively involved in informing the public on the value of archaeological knowledge and the importance of preservation, the majority of in-depth education on archaeology and anthropology as a whole remains at the university level. Anthropology is Elemental is an education and outreach program that teaches four-field anthropological concepts to elementary school students through a service-learning course. This course uses applied anthropological techniques that allows graduate and undergraduate anthropology students to learn through experience while serving the community. Doctoral students serve as course instructors while guiding master's and undergraduate students as they instruct and engage with elementary pupils. Through team-teaching and interactive lesson planning, lectures and activities are developed specifically for young children, which are then made available to the public through an open access database. Assessments conducted throughout the semester gauge lesson effectiveness and indicate what concepts need to be revisited. As anthropology is rooted in the sciences and humanities, these classes convey cross-cutting concepts and encourage critical thinking at an early age. By exposing the next generation to anthropological topics, they gain an appreciation for and understanding of culture, science, and the past.

Stewart, Brian (University of Michigan)

[174] *On the Trail of Homo through Earth's High Mountains and Plateaus*

Of Earth's habitable landscapes, mountain environments present humans with some of the most striking adaptive challenges. But they also offer unique opportunities. Cross-cultural comparative research on montane hunter-gatherers in prehistory has focused on the settlement of expanses of contiguous high-elevation terrain—the world's 'high plateaus.' Yet plateau peopling represents one chapter in a much longer evolutionary story of when, how and why ancient people engaged with upland landscapes. This was a human odyssey spanning hundreds of millennia, multiple hominin taxa and continents, the world's high plateaus, but also its much more widespread high-mountain systems. To date, little effort has gone towards investigating the full variability of montane lifeways through time and space. This symposium will bring together archaeologists studying hunter-gatherer biocultural adaptations in diverse upland settings across the globe. What were the timings, motives and modes of montane exploitation, and can we elucidate the evolutionary processes by which our genus engaged with upland landscapes with increasing frequency and intensity? With these questions at the fore, this presentation introduces the session by exploring its rationale, themes and aims.

[174] *Chair*

Stewart, Brian [174] see Zhao, Yu-chao

Stewart, Christina (University of Oklahoma)

[269] *An Analysis of Biscuit Ware Ceramic Standardization in the Lower Chama Watershed, New Mexico*

The Classic period (AD 1350–1598) in the Lower Chama Watershed of New Mexico was a time of rapid population growth and coalescence. Despite these dynamic population shifts, this time remains largely understudied. In this research, I examine the social dynamics of coalescence in the Lower Chama Watershed by analyzing changes in biscuit ware production at Sapa'uinge (LA 306), the largest Classic period pueblo in the region. Biscuit ware is a locally produced whiteware common at Sapa'uinge which makes it a good proxy for local changes in production. Archaeologists have proposed that biscuit ware ceramic become more standardized over the Classic period. In this study, I use an attribute analysis to investigate changes in biscuit ware production and standardization at Sapa'uinge over the site's occupation to test if biscuit ware indeed becomes more standardized. I argue that biscuit ware does become more standardized over time and is reflective of the broader social and economic consequences of coalescence in the Lower Chama Watershed.

Stewart, Mathew (PANGEA Research Centre, University of New South Wales, Australia)

[41] *The Unexpected Fauna of Pleistocene Saudi Arabia and the Earliest Evidence of Hominin Butchery Activity*

Work in the Nefud Desert, Saudi Arabia, has been fundamental for establishing the importance of the Arabian Peninsula for Pleistocene hominin populations and their dispersals out of Africa. Recent palaeontological and archaeological exploration in the Western Nefud Desert has uncovered numerous fossiliferous palaeolake deposits and associated archaeology. Fossil assemblages include taxa with both African and Eurasian affinities and indicate a greater diversity in large mammals than resides in the region today. Furthermore, the presence of species such as *Hippopotamus* and *Alcelaphus* strongly support an ameliorated climate with expansive grasslands and large, perennial lakes. Favourable conditions likely permitted and promoted an influx of taxa, while subsequent climatic deterioration would have resulted in faunal retreat and/or extirpation. The presence of hominins in Arabia during the Pleistocene is evidenced by fossil remains, stone tools and anthropogenically modified bone, and their dispersal into Arabia was most likely tied to the establishment of favourable conditions and concomitant influx of large herbivores. This is perhaps best exemplified by the relatively diverse large mammal assemblage at Ti's al Gadah (TAG) and the accompanying evidence for anthropogenically modified bone from various fossiliferous deposits, suggesting repeated hominin dispersal events into the Western Nefud Desert during the Pleistocene.

Stiglitz, Alfonso [14] see Van Dommelen, Peter

Stine, Linda (University of North Carolina Greensboro)

[228] *The Quaker Farm That Wasn't: Archaeology at the Smith Farmstead*

During archaeological field work at a North Carolina central Piedmont farmstead (~1870–1940) researchers collected information on numerous landscape features, a standing structure, and remnants of other log buildings. The site contained unusually well-preserved leather goods, metal

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artifacts, and metal trash piles; however very few ceramic or glass artifacts were discovered in spite of the volume of earth moved and sifted. Oral history, documents, and archaeological evidence will be explored to interpret this site.

Stock, Jay [198] see Arthur, John

Stocker, Sharon [298] see Karkanias, Panagiotis

Stone, Mary Louise

[273] *Power as Nurture: The Inkas and Their Tiwanaku Ancestors*

Religion bonded Andean societies across centuries (Moseley 1992; Kolata 1995) and archaeologists request greater focus on religious ideologies to evaluate the Andean past (Kolata 2000; Hastorf 2007)—gaping silence in the scholarship surrounds the so-called “female, spiritual” side of society. From this hurin moiety (Rostworowski 2007; Silverblatt 1987), particulars of an overarching hegemonic strategy of power-as-nurture emerged among the Inkas (and with different details among their Tiwanaku ancestors).

Women and men colleagues from the author’s twelve years living in communities around Puno and La Paz seek to share their perspective of dynamic gender balance and daily reciprocity with spirit—held in oral narratives, ritual practices, and social organization. Imperfect compliance does not negate long-lived, fundamental principles that survived changes over time—which provide more nuanced reasoning than brute force and violent arguments as the sole origins of states.

Inkas origins of Cusco and everyone were honored in paqarina pilgrimage sites that organized the empire; local/regional domination revolved around Copacabana, Pachakamaq, and Cusco’s Qurikancha. Nurture for subjects emphasized maize production and storage. Spiritual authority that tended many emanated from Cusco and Titiqaqa, Inka and Quya. Together, these hurin features characterized much of Inka fame besides colorful warriors and golden statues.

Stoner, Edward and Geoffrey Cunyar (Western Cultural Resource Management, Inc.)

[38] *The Pequop Projectile Point Type Site in Goshute Valley, Northeastern Nevada and Implications for the Long and Short Chronology Debate in the Great Basin*

In a 1995 study of the chronological patterning of Elko Series and Split-stemmed projectile points, Bryan Hockett concluded that neither type entirely matches the patterns of the Bonneville or Lahontan Basins; and the neither area represents good chronological analogues for northeastern Nevada. Dart points recently found in the well dated context of a stratified open site in the northern Goshute Valley exhibit characteristics of both early side-notched and corner-notched types. Comparison of these points those found in Early Archaic contexts in the Bonneville Basin and other regions suggest that many of them may have been routinely misidentified as Elko Series points and not an earlier transitional point type. In this paper, we propose a new temporally diagnostic projectile point type and explore the implications that the identification of what we term “Pequop points” may have on the refinement of Great Basin chronology and on the Long and Short debate.

Stoner, Edward [87] see Cunyar, Geoffrey

Stoner, Wesley (University of Arkansas)

[262] *Production and Exchange of the Earliest Ceramics in Central Mexico*

Compositional studies in central Mexico have largely focused on serving wares of the later Teotihuacan and Postclassic periods. Studies of the region’s earliest ceramics of the Formative period have been almost completely ignored. The earliest ceramics made in the region tend to be much coarser than the later serving wares, so we cannot use the existing reference databases to source them. Here we build the Formative reference database with a large sample of chemical and petrographic data generated from the earliest ceramics found in the Basin of Mexico, the Teotihuacan Valley, the Toluca Valley, western Puebla, Tlaxcala, southern Hidalgo, and eastern Morelos. We add Formative ceramics opportunistically sampled from the Soconusco, the Tehuacán Valley, and Pánuco in northern Veracruz for comparison. While the objectives of this study were not intended to highlight long-distance exchange, both regional and interregional trade of ceramics were identified. These patterns of interaction were key in producing the interregional style horizons that developed during the Early and Middle Formative periods in Mesoamerica.

[152] *Discussant*

[262] *Chair*

Storozum, Michael [198] see Goldstein, Steven

Stottman, M. Jay [94] see Henderson, A. Gwynn

Stout, Dietrich (Emory University), Justin Pargeter (Emory University), Nada Khreisheh (Emory University), Katherine Bryant (Emory University) and Erin Hecht (Georgia State University)

[227] *The “Molecular Genetics” of Social Learning: Skill Acquisition and Individual Differences in Learning*

Although commonly glossed as social “transmission,” the acquisition of knapping skills requires extended interactions between social inputs and individual practice better termed social “reproduction.” Individual differences in learning aptitude during this process provide both the raw material for neurocognitive evolution and a potentially significant source of variability in the lithic products used to infer patterns and mechanisms of Paleolithic social learning. Here we present results from an experimental neuroarchaeology study of individual variation in handaxe-making skill acquisition. Naïve subjects received ~100 hrs training over several months, accompanied by regular behavioral, psychometric, and MRI assessments. To quantify skill, knapping performance was observed after every 10 hrs training and rated using a systematic rubric. We fit a multivariate model of artifact metrics to these ratings to derive an objective “quality” score and regressed quality scores on hours practice per subject to derive individual learning curves. The multivariate model identifies morphological correlates of knapping performance whereas parameters and values from individual learning curves can be directly compared with individual differences in brain structure and psychometric performance. Our results are an initial step toward better understanding the roles of skill acquisition and differential aptitude in generating lithic variability and shaping human neurocognitive evolution.

Stout, Dietrich [227] see Beney, Megan

Stowe, Michael (Department of Defense)

[157] *Settlement Pattern Analysis at the Medicinal Trail Community, Northwestern Belize: Results of Topographic Mapping from 2013-*

This poster presents the results of five field seasons of intensive survey and total station mapping at the Medicinal Trail Community, a Maya hinterland settlement in northwestern Belize. Mapping during the summer of 2017 has further refined our understanding of the size and distribution of households and numerous landscape features that have been, or continue to be, the focus of excavations. Refinements to the topographical mapping within the

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area has revealed several complex household groups associated with ridge tops, as well as an extensive network of artificial terraces, drainages and reservoirs associated with dense settlement.

Strait, Madeleine (Barnard College of Columbia University)

[259] *Skin and Bones: The Presence and Potential Implications of Dog Skinning in the Pre-Colonial Southwest*

The presence of dogs across burial sites in the southwestern United States and worldwide has been well noted in archaeological literature. The ubiquity of canine burials attests to their historical role as complex social actors in human society, prompting actions and performances, taboos and transgressions. To access the true depth of meaning in many canine remains, then, we must examine them with the level of precision normally reserved for human burials. This paper offers a close reading of the remains of four dogs buried in Room 822, a D-shaped kiva from T'aitöna (Pot Creek Pueblo). These dogs were ritually buried and show evidence of having been skinned before interment. The cultural significance of skins and dogs is analyzed in this paper through engagements with both descendant oral histories and folklore, as well as the theory of Amerindian perspectivism best known through the writings of Viveiros de Castro. When viewed through these lenses, the taphonomic evidence of skinning provides an important new understanding of the social and ritual role of dogs in the pre-colonial Southwest and argues for the importance of dogs as culturally rich participants in the human past.

Strauss, Stephanie (The University of Texas at Austin)

[128] *The Epi-Olmec Conundrum: Looking for Answers in All the Wrong Places*

Epi-Olmec is a nebulous term, adrift in both time and space. Weakly defined by a set of slippery contrasts—isolated from what came before and what comes after—the descriptor lacks robust categorization of its own. And yet in spite of this hollow terminology, the words “Epi-Olmec” themselves are so politically fraught that certain scholars have adopted the even more obfuscatory term “Isthmian”, a label growing in popularity within the literature. This paper begins the process of defining Epi-Olmec in its own right. Whether understood primarily as a time period, geographic region, visual culture program, or hieroglyphic system, Epi-Olmec art and writing have much to offer the study of early Mesoamerican material culture. Rather than setting Epi-Olmec apart from more robustly-defined predecessors, neighbors, and successors, this paper will use Epi-Olmec visual culture to inform upon them. What connections can be drawn, for example, between Epi-Olmec forms and Classic Veracruz deities? How might an understanding of Classic Veracruz iconography illuminate the complexities of Epi-Olmec supernaturals? By upending the historic practice of “reading” Epi-Olmec art through a Maya/Izapan lens, this paper will instead turn toward the west, opening a new avenue for the study and definition of Epi-Olmec visual culture.

Strawhacker, Colleen (National Snow and Ice Data Center), Peter Pulsifer (National Snow and Ice Data Center), Noor Johnson (National Snow and Ice Data Center) and Shari Gearheard (National Snow and Ice Data Center)

[195] *Data Sovereignty for Indigenous Communities in the Arctic: Ensuring Ethical Control of Information and Knowledge for Indigenous Partners through Digital Tools*

The Exchange for Local Observations and Knowledge of the Arctic (ELOKA, eloka-arctic.org) partners with Indigenous communities in the Arctic to create online products that facilitate the collection, preservation, exchange, and use of local observations and Indigenous Knowledge of the Arctic.

ELOKA has created numerous digital products guided by Indigenous partners, ranging from atlases preserving and visualizing Indigenous Knowledge and information, to online databases allowing for Arctic residents to upload local observations to share among other individuals, villages, and organizations. This paper will overview various online tools, prototypes, and partnerships that demonstrate how digital tools can enable information, data, and knowledge sovereignty for Indigenous communities in the Arctic to ensure full control over their information. These efforts include extensive consultation with communities, technical strategies to restrict or open sharing based on community needs, and plans to build infrastructure to ensure community control over information. Our focus on data sovereignty ensures that deeply embedded local and Indigenous Knowledge cannot be used in ways that can bring harm to the communities and their Knowledge holders and that the communities have full control over how the information is used and shared.

Strayer, Jessica [134] see Layco, Wendy

Street, Megan [335] see Rosenfeld, Silvana

Stretton, Sean [210] see Arthur, Kathryn

Striebel MacLean, Jessica (Boston University)

[220] *Destabilizing the Planters Prospect: The Embedded Landscapes of White Creole Masculinity at an 18th-Century Plantation House in Montserrat, West Indies*

At the close of the 18th century, a planter's dwelling overlooking the Caribbean Sea on the northwest coast of Montserrat was destroyed by fire, and never reoccupied. Archaeological excavations yielded an intimate portrait of the domesticity of the British Empire materialized in fragments of everyday life. Little Bay was a small-scale sugar plantation with a physical landscape that conformed to the logic of sugar production—planting fields, sugar works, and the dwellings of the laboring enslaved. The location of the planter's dwelling, atop a high promontory, achieved the “planters ideal”, allowing for the simultaneous surveillance of the sugar works and the plantation's enslaved reinforcing the social hierarchy and control of the resident planter. The archaeology of Little Bay, bounded by context and historical contingency, provides a means to tease out the situational aspects of white Creole masculinity revealing the intersectional and relational axes of whiteness and Creole social identity that problematize the hegemonic masculine narrative inscribed in the plantation landscape. Examining the planter's house, and artifacts of hospitality and dress, this paper will explore the multi-relational entanglements of masculine social discourse embedded within the Little Bay Plantation landscape.

Striker, Bridget [183] see Striker, Michael

Striker, Michael (Gray & Pape), Bridget Striker (Boone County Public Library) and Eric Jackson (Northern Kentucky University)

[183] *Documenting Association of Properties with the Underground Railroad*

Activities related to the Underground Railroad were both ephemeral and illicit. As a result, the little direct evidence that might have existed was often destroyed or hidden. How then, can the association of a property with the Underground Railroad be established, and what does it mean for a property to have integrity? Using case studies from Boone County, Kentucky, we demonstrate how the accumulation of indirect evidence can document this association and what integrity might mean for different property types such as archaeological sites, buildings, routes of travel, and river crossing locations.

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Striker, Sarah (Arizona State University)[95] *Applications of Microscopy and Thin Section Petrography in Iroquoian Ceramic Analysis*

Iroquoian ceramic analysts typically focus on decorative style, in part because this approach maximizes the amount of information that can be obtained from an assemblage in a short amount of time. Decorative attributes can be rapidly identified and recorded, and a significant literature links patterns in decorative styles to social, temporal, and cultural trends. Characteristics of ceramic fabrics including clays and tempers are rarely examined, but adding these elements to the standard Iroquoian ceramic analysis would address important unanswered questions about Iroquoian ceramic production.

I present a methodology for the efficient and cost-effective analysis of Iroquoian ceramic fabrics applicable to ceramic pots and pipes. The attributes selected and methods for recording them are developed using insights from petrographic analysis of ceramic thin sections using a polarizing microscope following Whitbread's (1989) methodology. By focusing on characteristics diagnostic of specific technological and provenance related characteristics of ceramic fabrics that are evident using a standard binocular microscope, this methodology is designed to be used and refined in conjunction with selective petrographic analysis. I test my methodology by comparing this method with thin section petrography using ceramics from three ancestral Wendat village sites located near Toronto, Ontario spanning roughly 1400–1550 C.E.

Stroh Messerole, Megan (Sanford Museum and Planetarium) and Mark Anderson (Iowa Office of the State Archaeologist)[5] *Only Soil Deep: Geophysical Contributions to an Excavation at an Oneota Village in Northwest Iowa*

Data recovery excavations were conducted during 2016–2017 at the Dixon site (13WD8) a large Oneota village located along the Little Sioux River in northwest Iowa. The University of Iowa Office of the State Archaeologist contracted Megan Stroh, archaeologist at the Sanford Museum and Planetarium, to conduct geophysical surveys before initiation of Phase III excavations. A Geoscan Research FM256 fluxgate gradiometer was employed at three different mitigation locations under both pre- and post-top soil stripped conditions. Maps created from the survey data revealed both historic and prehistoric anomalies, including numerous potential prehistoric features. Excavations showed that a high percent of anticipated prehistoric anomalies were positively identified prehistoric features. This research proved invaluable for the excavators in recognizing historic disturbance, anticipating potential prehistoric features, and estimating excavation time for those prehistoric features and the surrounding areas. This research provides an excellent example of the efficacy of gradiometer survey in the loess derived soils of northwestern Iowa.

Stromberg, Kirie (UCLA Cotsen Institute of Archaeology)[309] *Shang Soundscapes*

Shang (c. 1600–1046 BCE) elites were expert manipulators of soundscape. The intimacy of the relationship between music and authority during Bronze Age China has been well established, bronze bells having served as crucial markers of status and political prestige. Before the codification of the ritual orchestra, however, and beyond the performance of “music” per se, soundscapes were defined by factors such as climate and local ecological context, by animals, by the noise of human activity at large. As early as the Shang, soundscape was a defining component of the Chinese habitus, evidenced by the prevalence of birds imagery in ornamentation as well as the rich array of noisemakers. This paper argues that Shang elites—and particularly ritual experts—wielded knowledge of local auditory contexts and utilized noisemakers such as rattles and jades in order to mediate between man, nature, and the ancestors. The resolution of natural cacophony through the orchestration of soundscape is an integral part of social evolution, or if one prefers, urban planning. Exploring Shang soundscapes is an opportunity to bridge scientific and humanistic approaches by combining analysis of the ecological record as well as man-made objects.

Stroth, Luke (University of California, San Diego), Rebekah Truhan (University of Iowa) and Jacob Foubert (University of Iowa)[89] *A Change of Hearth: Stages of Production in Hot-Rock Technology at a Late Woodland Rockshelter*

This paper applies the chaîne opératoire analytical framework to hearth maintenance behavior. There are distinct phases of production involved in creating and maintaining a hearth, as new hearthstones are introduced, exhausted, and discarded. These stages may be identified through spatial distribution of new and exhausted hearthstones. The authors argue that these stages may also be identified geochemically. We use pXRF to compare a series of experimental burnings to those from a hearth feature from the Late Woodland component of a multicomponent rockshelter. Group membership analysis had some success in distinguishing between stages of burning. When combined with spatial analysis, the distribution of new and exhausted rocks supported our hypothesis that the northern periphery of the hearth was disturbed by a previous excavation and distributed in its backdirt atop the original hearth feature.

Stroth, Luke [299] see Otto, Raquel

Stuart, David (The University of Texas at Austin) and Marc Zender (Tulane University)[337] *Epigraphy and History at La Corona*

The ancient Maya ruins of La Corona (ancient Saknikte') has an unusually large textual and historical record. The site's inscriptions, despite their highly fragmented and incomplete state, present epigraphers and archaeologists with a detailed account of a royal family that ruled there at least from the 6th to 8th centuries. Excavations in the last several years have revealed many more inscribed sculptures. This paper will focus on the distinctive characteristics of La Corona as a literate community of the Classic period, highlighting aspects of dynastic history, ritual subject matter, textual presentation, and language, all of which provide important cultural and political contexts for understanding La Corona in the wider world of the lowland Classic Maya. More broadly, we discuss the continuing emergence of a historical methodology in the theory and practice of Maya archaeology.

Stubbs, John (Peabody Museum, Harvard University)[291] *Discoveries on Campus: Archaeology in Harvard Yard*

While many may immediately associate Stephen Williams with his work and interest in the prehistory of the Lower Mississippi Valley, the historic period also caught his attention. His interests ranged from historic aboriginal groups of North America to a variety of topics and periods within historical archaeology. Williams had a notable enthusiasm and concern for the archaeology of the immediate Cambridge area and was often a first point of contact when it came to local discoveries. He took particular interest in artifacts originating from the Harvard campus and was instrumental in advocating for and establishing systematic excavations within Harvard Yard. The excavations, begun in earnest in 1986, still continue today and serve to introduce a wide range of students to the excitement of archaeological field work while advancing our understanding of Harvard's past. In addition to providing a glimpse of student and campus life through the centuries, the Harvard Yard excavations continue to yield valuable information about the location and construction of early college buildings. This paper highlights some of those discoveries.

Stull, Scott (SUNY Cortland)[89] *Experimental Archaeology of Medieval Food as Participant Observation*

Central to anthropology is the concept of participant observation, where a researcher engages in immersive learning through ethnographic fieldwork. This concept is also important for archaeologists as immersive learning provides an avenue for more robust interpretation and the development of better research questions. Participant observation is not directly possible in the study of medieval archaeology, but replication studies of food culture can serve as one avenue toward immersive learning in archaeology. Replication studies of medieval food, notably the use of medieval cookbooks and

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replicated medieval vessels, offer insights into medieval life and everyday practice. This paper will discuss the replication and use of both cooking vessels and tableware as part of the process of immersive learning.

Sturm, Camilla (University of Pittsburgh)

[246] *Moderator*

[246] *Discussant*

Sturm, Jennie (University of New Mexico)

[286] *Making Quality Interpretations in the Ever-Expanding World of Digital Data*

Digital data collection is often efficient, cost-effective, and a tremendous accompaniment to other archaeological collection methods like excavation. Furthermore, digital data can be used to generate measurements that are simply not possible with analog data. However, as computing technology continues to become faster, more powerful, and cheaper, and the ease of collecting massive amounts of data increases, it is fair to ask: Are our abilities to analyze and interpret these data keeping up? This paper addresses this question at a time in archaeology when digital methods are more accessible than ever, and where processing data requires little more than the push of a button to run “black box” functions without really understanding the theory behind it. In turn, the interpretation of such data often takes a back seat and little is ultimately added to the anthropological understanding of a site. By refocusing efforts to use digital data the way analog data was once used (i.e., intentionally applied with full knowledge of the method and theory behind such data), archaeologists will be in a better position to use digital data that supports efficient and well-informed research.

[235] *Discussant*

Sturt, Fraser and Duncan Garrow (University of Reading)

[113] *Real and Imagined Islands: Wet Ontologies in the Neolithic of North Western Europe*

Researchers across the breadth of academia, from oceanographers to political scientists and archaeologists, have all begun to redress the critique of ‘sea-blindness’ leveled at modern society in recent years. The result has been a re-positioning of activity on the water within our accounts of human lives and thought processes—add water and stir. The results have been inspirational, controversial, and at times utterly inoperable beyond the broadest of heuristic devices, when it comes to relating them to prehistory and the questions we have as archaeologists.

In this paper we take a different tack, building an approach to both land and water that is rooted in human activity archaeological data and the imagination. Recent results from work on the land and water of the Western seaways of North-west Europe will be used to re-evaluate how we approach space, place and narrative within the context of the Neolithic.

For context: <https://www.youtube.com/watch?v=HnQ2Lk20n3U>

Styles, Bonnie (Director Emeritus, Illinois State Museum)

[90] *Discussant*

Suarez, Amanda (University of Pittsburgh)

[260] *Pre-Columbian Conflict and Early Social Complexity in Java, Southern Costa Rica*

Based on the Spanish chronicles from the Contact period (Sixteenth century), we know that the inhabitants of what is now Southern Costa Rica were in constant violent conflict, at least during the last pre-Columbian years. On the other side, warriors, captives and trophy heads are a recurrent theme in the sculptures and other artistic representations from this archaeological area. Although the importance of warfare and conflict during the pre-Columbian period has been considered in archaeological investigations in this zone, it has been always as a side topic or only a potential explanation. In this context, the site Java presents an excellent opportunity to explore the relation between warfare and the emergence of inequality. Its topographic characteristics, size and material remains indicate that it might be one of the communities engaged in conflict that the Spaniards found upon their arrival to this region. This research will evaluate the role that warfare might have played in the social dynamics at Java, by looking at indications of the relevance of conflict and social differentiation through time.

Suárez, Rafael [2] see Okumura, Mercedes

Subiaul, Francys [227] see Ranhorn, Kathryn

Sucec, Rosemary (Intermountain Region—National Park Service)

[72] *Working at Our Edges: Managing Traditional Cultural Properties in the Desert Southwest*

The most challenging work begins with federal management of these “historic properties.” The term belies that TCPs are managed not only for their physical integrity, but for their intangible, associative values vital to maintaining the contemporary identities of indigenous and other traditional communities. Consequently, rather than merely relying on determinations by agency professionals of issues related to boundaries, integrity, adverse/cumulative effects and mitigation, it becomes imperative that TCP management involve routine consultation and collaboration within the context of agency control of that federal landscape. TCP management also challenges our assumptions about what constitutes “cultural” versus “natural,” and our tacit struggle to search for scientific truth or validity within the context of religion. Overlaying and further challenging TCP management are the economic and political interests of diverse stakeholders related to the physical location of the TCP. Illustrative examples include the Colorado River Corridor below Glen Canyon Dam; Rainbow Bridge National Monument; and the Hole-in-the-Rock Trail in Southeast Utah. The power of anthropological research in facilitating understanding is discussed, along with ideas for constructive resolutions that allow for the accommodation by and human rights of indigenous and other traditional communities.

Sugandhi, Namita [121] see Raczek, Teresa

Sugiyama, Nawa (George Mason University)

[293] *Methods of LiDAR Mapping in Urban Landscapes: Introducing the Teotihuacan LiDAR Map*

In the 1970s, systematic and expansive survey techniques enabled Million to create the first map of Teotihuacan, establishing the limits and density of the city. In this presentation we introduce a newly developed 2.5 dimensional map based on a LiDAR landscape model overlaid with a high-precision architectural map of the city drawn in AutoCAD covering 174 km² area that extends the Million map by 131 km². LiDAR technologies have greatly aided archaeological research in many landscapes with high vegetation cover by revealing ground surface detail at a quality and precision which would be difficult and highly costly to achieve with traditional ground-based survey techniques. We evaluate the perils and unique approaches to LiDAR mapping of the Teotihuacan Valley caused by both the continuous occupation and the highly urbanized landscape distinctly characteristic of the region. While this palimpsest landscape provides additional hurdles to LiDAR interpretation, it facilitates a hybrid LiDAR methodology of ground-truthing and digitizing through a fully online system.

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[293] *Chair*

Sugiyama, Nawa [293] see Fash, William

Sugrañes, Nuria and Gustavo Neme (IANIGLA-CONICET. Grupo vinculado San Rafael)[265] *Ceramic Diversity in Hunter-Gatherers Societies from Atuel River Basin, Argentina*

Hunter-Gatherers from Southern Mendoza started to use ceramic at 2000 years BP, and it starts to diversify rapidly in each environment. Such diversity shows a contrast between highlands and lowlands typologies. According to Lagiglia, this ceramic diversity was motivated for exchange between agricultural communities from western side of Andes and northern Mendoza.

In this poster, we present new ceramic information from six archaeological sites located in the Atuel river basin. This information combines distributional, technological and, neutron activation analysis, which's sustain that local types, as Overo/Nihuil, Atuel/Arbolito and Atuel Cepillado, are more homogenous than was previously proposed. The observed ceramic diversity only increase ca. 1000 years BP with the introduction of foreign types as Lolloe, Aconcagua, Viluco and Agrelo types, but in a lower quantities. Finally, the lowlands assemblages are more diverse than those located in the highlands.

Sulca Huarcaya, Nils [333] see Aguilar Diaz, Miguel

Sullivan, Elaine (UC Santa Cruz)[320] *Moderator***Sullivan, Kelsey (University of Oregon), Britton L. Shepardson (Northern Arizona University), Mario Tuki (Museo Antropológico Padre Sebastián Englert), Paula Valenzuela Contreras (Museo Antropológico Padre Sebastián Englert) and Francisco Torres Hochstetter (Museo Antropológico Padre Sebastián Englert)**[101] *Education, Conservation, and Research on Easter Island through Three-Dimensional Photogrammetry*

For fifteen years, Terevaka Archaeological Outreach (TAO) has provided local students from Rapa Nui (Easter Island, Chile) with hands-on experience to: (1) offer experiential learning opportunities about the local cultural and natural resources; (2) promote awareness and expertise in conservation measures and sustainable development; and (3) document and study the modern and ancient natural and cultural resources of the island. Three-dimensional ortho-corrected photogrammetry (3D OCP) is a valuable technology within archaeology, which is relatively cheap and accessible. Digital and physical models produced through 3D OCP serve as powerful educational tools, making cultural heritage more accessible to a range of interested parties, especially the local community.

Students who participated in the 2016 and 2017 TAO seasons photographed hundreds of artifacts at the island's only museum (Museo Antropológico Padre Sebastián Englert), as well as archaeological features and sites located across the landscape. TAO students are now using 3D OCP to create a collection of digital and physical 3D replicas on the island—for educational, conservation, and research purposes—accessible to the local community members, the tourism industry, and archaeologists. This research conveys the potential for archaeologists to help empower local communities, as well as enhance archaeological research potential through non-destruction, cutting-edge technology.

Sullivan, Lauren (University of Massachusetts), David Hyde (Western State University of Colorado), Robin Robertson (CATS, The University of Texas at Austin), Palma Buttles (Carnegie Mellon University, SEI) and Fred Valdez (The University of Texas at Austin)[243] *Material Culture and Chronology at Colha, Belize: Recent Findings and Future Directions*

Lithics, ceramics, and other artifacts, recovered from the 2017 Colha, Belize field season, are utilized to gain insight into chronological developments and changes at the ancient Maya site. Maya material culture recovered from excavations at Colha are presented and interpreted by context. Each artifact category is briefly defined, described, and placed into a general site context. The estimated time range for the recovered material culture extends from the Late Archaic to the Late Preclassic. While findings may be preliminary for several artifact classes, the current interpretations allow for useful and comparative research needs.

Sullivan, Lynne (University of Tennessee) and Kevin Smith (Middle Tennessee State University)[119] *Heading for the Hills: The Middle Cumberland Region to Upper Tennessee Valley Migration*

By 1300 CE, the people of the Middle Cumberland region were on the move, a migration related at least in part to climatic instability including multiple drought episodes. Numerous types of evidence suggest that some of these migrants went to East Tennessee. We discuss possible material culture evidence for this migration from several East Tennessee sites, but with an emphasis on the Long Island site, now located in the Tennessee Valley Authority's Watts Bar reservoir and near the base of the Cumberland Plateau. Excavations at the site by the Smithsonian in the late nineteenth century recovered a Middle Cumberland-style statue from a platform mound. Excavations in 1941, by Works Progress Administration crews supervised by University of Tennessee archaeologists, recovered pottery samples with some Middle Cumberland characteristics from three platform mounds and a large wall-trench structure near these mounds. Our study of the statue, pottery, and related artifacts and features from Long Island provides insights to the nature of the Middle Cumberland influence at this site and potentially at other sites in the region.

Sullivan, Lynne [286] see Lowry, Sarah

Sullivan, Vanessa[239] *Sinking into the Maritime Archaeology of the Ocean State: The Use of GIS to Analyze Rhode Island's Submerged Archaeological Sensitivity*

GIS has become a widely utilized tool for analyzing archaeological sensitivity. The state of Rhode Island has more documented shipwrecks per square mile than any other, making it an ideal place to develop an archaeological sensitivity model for submerged sites. In 2008, the Beavertail Lighthouse Museum Association started compiling a shipwreck database. The Rhode Island Historical Preservation and Heritage Commission has incorporated the database findings, documented submerged archaeological sites, and other data-sets into GIS so that information can be analyzed in a spatial manner.

Over 1,000 shipwrecks have been identified as a "total loss" and may prove to have archaeological remains present. More than 650 other documented wrecking events do not have enough information to determine if remains are likely, but with further research may prove significant. Integration of GIS data with the known shipwreck sites aims to advance knowledge of the Rhode Island submerged maritime landscape, which will ultimately assist in mitigation efforts during future development undertakings. This project investigates both the advantages and limitations of utilizing an archaeological sensitivity model for submerged cultural materials, and questions the opportunities and restrictions of a GIS based approach for analyzing shipwreck sites.

Sullivan III, Alan P. [153] see Sparks-Stokes, Dominique

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Rachel Summers, Meradeth Snow, Joshua Sackett and Duane Moser

[97] *Microbial Communities from Soil and Coprolites*

With implications involving health, nutrition, and even behavior, research into the human microbiome is a burgeoning field within the biological sciences. Less well understood is whether humans, both modern and past, share(d) a recognizable core microbiome. Archaeological materials represent a window into microbiome structure and function of ancient peoples. Assuming microorganisms or their DNA persist for many years under optimal conditions, coprolites should represent time capsules into the distal gut microbiome of ancient people; potentially providing information concerning subsistence practices and health. A vital step towards understanding how such information presents in the archaeological record would be the capacity to recognize and differentiate ancient microbiome constituents against potential contaminants, especially from soil. To test this, we performed parallel microbial 16S rRNA gene surveys using DNA extracted from co-located cave soil and coprolite samples. To verify that microbial DNA is distinct between the two sample types, principal coordinate analysis was applied to rRNA gene libraries from both. Microbial genera associated with modern humans were also tracked. Differentiation of coprolite microbial communities from those of native soil will increase our confidence that detected microbial communities are indeed derived from ancient peoples; an approach that will be applicable to other locales.

Summons, Roger [126] see Sistiaga, Ainara

Sun, Guoping (Zhejiang Provincial Institute of Archaeology, China)

[284] *The Source of the Hemudu Culture and Environmental Change during the Early-Middle Holocene: New Evidence from the Jingtoushan Site, Yuyao, East China*

The source of the Hemudu Culture has remained a key issue for more than 40 years. Recently, the coring survey at the Jingtoushan site has provided a chance to promote our understanding of this issue. Its cultural deposits are deeper than those of any other prehistoric site along the coastline of East China. It is overlain by Late Holocene marine deposits of 6 meters deep. Twenty radiocarbon dates, along with the particular depth of midden deposits and pottery sherds, indicate that the site dates to 8,000 BP, much earlier than most shell middens that have been uncovered in China. It is considered to be related to the source of the Hemudu Culture. The preservation and richness of organic materials are extraordinary. This site has great potential for understanding environment changes and sea level rise in the coastal area of East China since 10,000 years ago, as well as the interactions between human societies and environment.

Sun, Yufeng (Washington University in St. Louis)

[336] *Crop Processing in the Lower Yellow River Valley: From Known to Unknown*

As one of the most highly-developed cultural regions in China, many aspects of the lower Yellow River Valley have been systematically studied, including climatic revolutions, cultural patterns, and subsistence strategies, among others. It is now known that the diversified environments of the Valley, including flood plains, hills and coastal regions, facilitated the development of distinctive cultures and subsistence patterns in these areas. These distinctions are principally reflected in their production and processing of crops. In this paper, I will provide an overview of precedent-setting paleoethnobotanical studies in the Valley, and then place them into a framework of climatic and settlement pattern revolution. By analyzing the food structure, spatial distribution of crops, and the ways groups harvested and processed food, I will put forward a model of crop processing in the prehistoric Yellow River Valley, which may then provide a pathway to understand human adaptations and social complexity in this context.

Sunell, Scott (UCLA)

[186] *Cultural Dimensions of Toolstone Variability in the Santa Barbara Channel Region, California*

The Santa Barbara Channel region of southern California lacks reliable sources of high quality toolstone except in a few prominent locations. The nearest obsidian sources are hundreds of miles away, and local chert can be highly variable in quality and availability. Monterey chert, common to both the northern Channel Islands and the adjacent mainland, varies widely in terms of inclusions, color, and consistency; Franciscan chert from the mainland is similarly troublesome for tool-makers on a large scale. In spite of this, the Chumash and their ancestors utilized these materials for more than 10 millennia to manufacture finely worked bifaces; late in prehistory they also developed sophisticated specialized microlithic tools for shell bead production. Most research in the region has focused on these craft products while omitting the critical role played by widely available but poor quality toolstone. I evaluate the use of low quality local materials in this context, arguing that patterns of lithic production on Santa Cruz Island responded more strongly to cultural norms than to the functional properties of specific toolstones. While the intrinsic properties of given materials may have set the stage for later innovations, by the first millennium AD chert was more than just good stone.

Super, Clare, Meradeth Snow (University of Montana), Anna Prentiss (University of Montana), Ethan Ryan (University of Montana) and Nathan Goodale (Hamilton College)

[97] *Ancient DNA Analysis from Micro-fractures in Bridge River Stone Tools*

There has been little research specifically designed to examine variability in how the porosity of lithic raw materials and micro-fractures from use-wear create environments that trap and preserve residues containing DNA on lithic tools. This study examines lithic tools made from a variety of raw materials to assess the effects of variability of raw material type, use-wear, and damage on preservation of ancient DNA (aDNA). aDNA analysis of stone tools can begin to address if the tools were used to process specific species of animals. The ancient lithics used in the study were from the Bridge River Excavation site in the Middle Fraser Canyon, British Columbia. The site was occupied periodically from 1800 years ago to the mid-19th century (Prentiss et al. 2008). The protocol to extract and amplify aDNA locked in micro-cracks on the surface of tools involved treating them with chemicals and sonication (Shanks et al. 2005). Bridge River researchers have designated the tools as used in "food processing or tool manufacturing" (Prentiss 2014), and our analyses had potential to connect the tools with specific species such as elk or deer (as well as *Puma concolor*, and *Canis lupus familiaris*), and provide an interesting new avenue of investigation.

Supernant, Kisha (University of Alberta, Department of Anthropology)

[205] *Heritage, Healing, and Coming Home: An Archaeologist Encounters Her Ancestors*

Archaeologists in the Americas rarely study their own history; rather, the bulk of archaeology in this region is done on Indigenous histories. Non-Indigenous archaeologists studying Indigenous history can contribute to the erasure of Indigenous peoples from the accounting of their own past by centering the scientific study of material culture as the best or only way of knowing the truth. So what happens when an Indigenous archaeologist encounters her own ancestors in the archaeological record? In this paper, I explore how archaeology and cultural heritage help me to face and heal the intergenerational trauma of my Métis family, both on a personal and community level. The history of the Métis Nation in Canada has rarely been examined in the archaeological record and, for many decades, Canada attempted to erase Métis identity. In light of Métis resurgence, I argue for the important role archaeology can play in helping us reclaim our rights and recognition. In this context, archaeology can fill in the silences and erasures of history, bringing disconnected Métis people home to their heritage in tangible ways.

[235] *Discussant*

[205] *Chair*

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Supernant, Kisha [120] see Ives, John W.

Surface-Evans, Sarah (Central Michigan University)

[205] *Traumasces: Progress and the Erasure of the Past*

Urban landscapes, those densely populated spaces in which generations of people live, play, work, and die, are complex palimpsest of memories. But not all memories are treated the same or are even chosen to be remembered. My own experiences as an archaeologist living in a modest-sized, rust-belt city for nearly two decades has exposed the never-ending rush of “progress” to erase the past. At both my research sites and my home, I see communities harmed by the trauma of forced erasure of the past—forced forgetting. As landmarks, parks, homesteads, and factories that were once the backdrop of many people’s lives are destroyed, communities experience the disorientation and dislocation of memory. The demolition of the past is usually coated with a veneer of newness and the promise of better times ahead. But what trauma becomes embedded in the landscape once communities lose their physical connection to their past and their identities? What burdens are placed on those who are left to do the work of remembering? I propose that “traumasces” are created in the violence of gentrification. Heritage practitioners interested in social justice must consider the traumatic effects of uncritical economic development.

[205] *Chair*

Surmely, Frédéric [41] see Franklin, Jay

Surovell, Todd (University of Wyoming), Matthew O’Brien (California State University, Chico) and Randy Haas (University of California, Davis)

[124] *Gender and Space in Campsites of Dukha Reindeer Herders*

The division of labor by sex and gender among small-scale societies is well known, but how differences in gender roles are reflected in variation in human spatial behavior has received considerably less attention. Understanding how and why individuals of different gender use space is critical to the development of middle range theory linking gendered human behavior to its archaeological correlates. Over five field seasons, we have collected data on the spatial distribution of people and activities within the interior and exterior spaces of campsites of nomadic Dukha reindeer herders in Khövsgöl Province, Mongolia. In all, our sample includes more than 20,000 high precision spatial data points collected by observational mapping and photogrammetry. In this paper, we examine how cultural models, division of labor, and other factors structure the distributions of male and female activities in Dukha camps. We end with a discussion of the relevance of our findings for archaeological gender studies.

Surovell, Todd [124] see Haas, Randy

Sutherland, Kenneth (Louisiana State University) and David Chicoine (Louisiana State University)

[265] *Volumetric Analysis of Neckless Jars and Bottles in Early Horizon Nepeña, Peru*

This contribution explores feasting practices discernible from the pottery assemblage at three Early Horizon archaeological complexes in the lower Nepeña Valley, north-central coast of Peru: Caylán (800—1 BCE), a large town or city interpreted as the primary center of a multi-tiered polity; Samanco (500—1 BCE), a small coastal town involved in production and exchange of maritime resources; and Huambacho (600—200 BCE), a ceremonial center associated with agricultural production. In feasting related studies, archaeologists tend to focus on qualitative issues while quantitative issues remain understudied. Questions regarding how much beer was brewed, how much stew was served, and the relative scales of food preparation within family and household contexts compared to public feasting contexts need to be addressed. This poster reviews ceramic assemblages from different compounds at Caylán, Huambacho, and Samanco, comparing vessels used for production and consumption of foods and beverages in both public and residential areas. Particular attention is given to bottles as consumption vessels and to ollas sin cuello, or neckless jars, as production vessels. Variations in the volumetric capacities of vessels between compounds within a site and between compounds at different sites enlighten on the sociopolitical importance of feasting events.

Sutter, Richard (Indiana University-Purdue University Fort Wayne)

[249] *Variability among the Dead: Population Structure and Inferred Cultural Adaptations to the Changing Environmental and Sociopolitical Landscapes during the Late Moche (AD 650–800) Era in the Jequetepeque Valley, Peru*

Recent bioarchaeological and archaeological research regarding the environmentally influenced demise of the Moche (AD 200—800) of the Jequetepeque Valley, Perú, indicates a variety of responses, including population dispersals, political fragmentation, cultural hybridization, and new political alliances with recently arrived foreigners at ceremonial centers. Biodistance analyses suggest that adjacent highland Cajamarca peoples from the adjacent highlands arrived in the Jequetepeque and likely interbred with local inhabitants interred at San José de Moro during both the Late Moche (~AD 650–800) and subsequent Transitional (~AD 800–900) periods. Local ceramicists at San José de Moro responded by experimenting with hybrid vessels that blended both local Moche forms and designs with new ones brought by highland immigrants in a process that Kolata has referred to as orthopraxy. These data speak to social and political relationships that existed between the arrival of foreign Cajamarca and local Moche during this period of dramatic change.

Sutton, Wendy (USDA Forest Service, Gila NF)

[106] *The Gila Wilderness: Defining, Redefining, and Managing Our First Wilderness Area*

In 1924 the Gila Wilderness was established. Ideas of what wilderness is have changed since then, particularly with the passage of the Wilderness Act in 1964. On the Gila National Forest these changes are reflected in changing wilderness boundaries and management strategies. Wilderness boundaries were re-drawn to exclude man-made features, some constructed by the CCC after designation. Historic and prehistoric sites associated with the wilderness, both within and immediately outside of it (and their management through time), are physical manifestations of the national dialogue about what wilderness means to us.

Suyuc-Ley, Edgar [252] see Hansen, Richard

Suyuc-Ley, Edgar [18] see Thornton, Erin

Suzuki, Shintaro [306] see Hannigan, Elizabeth

Swain, Emily

[251] *Hidden beneath the Asphalt: Urban Archaeology in Parking Lots*

Historic maps provide tangible visual evidence of how cities evolve over time. Buildings are erected and demolished, roads are constructed, and streams are diverted or filled. To an untrained eye, the built environment of a typical city block may look like an unlikely place to find archaeological remains but to an archaeologist it is a time capsule waiting to be opened. To this end, urban archaeology often requires peeking beneath parking lots, which often provide temporary protection to buried resources until the land is slated for development. The changing dynamics of an evolving city may

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mean that beneath the parking lot archaeological resources are buried beneath extensive fill deposits. Conversely, they may have been destroyed by extensive grading. Consulting historic maps, conducting elevation change analyses, and conducting geophysical testing can provide an idea of what is buried below, but ultimately excavation is required to determine what survives. This paper will discuss several urban archaeological sites found beneath parking lots in DC, Maryland, and Virginia.

[251] *Chair*

Swain, Emily [251] see Knight-Iske, Geri

Swanston, Treena [208] see Varney, Tamara

Swantek, Laura (Arizona State University)

[146] *Reconfiguring Social Networks: The Emergence of Social Complexity before and after Urbanism on Cyprus*

Despite the lack of cities, the Prehistoric Bronze Age on Cyprus (2400–1700 cal BC), an island in the Eastern Mediterranean, witnesses high wealth inequality and spatiotemporal variation in the emergence of social complexity or hierarchical social networks. Previous research has shown that social networks are malleable and cycle between egalitarian and hierarchical in different facets of complexity (control of labor, access to resources, participation in trade networks) through the Prehistoric Bronze Age as social actors renegotiate their social and economic worlds. What remains unknown is whether cycling social networks are a phenomenon present only in pre-urban societies or if this social malleability continues after urbanization. To compare these processes, methods derived from small world network analysis and modern economics are used to explore the changes in and stability of social networks and wealth inequality as cities first emerge on Cyprus during the Protohistoric Bronze Age (1700–1200 cal BC).

Sweeney, Alex (Brockington & Associates), Kara Bridgman Sweeney (Brockington & Associates), Naoki Higa (Higa Archaeological Research Office, Inc.), Takumi Kishimoto (Palyno Survey, Inc.) and Naho Ishiki (Environmental Science Corporation)

[24] *Sustainability and Tradition in Anindo Village, Okinawa, Japan*

A recent collaborative effort by Japanese and American archaeologists and environmental scientists identified and examined the historic (ca. 1897-late 1950s) Anindo Village. Located within the stream valleys and mountainous uplands of the Kanna Watershed in central Okinawa, Japan, Anindo Village was a short-lived reclaimed land settlement dependent on both agricultural and forestry-based economic practices. This paper examines the distribution of archaeological sites and the natural and cultural landscapes related to this historic settlement. Ethnographic research with descendant communities enhanced our interpretation of cultural practices in Kindai Period (AD 1879–1945) settlements. Our investigations provide a context to a wide variety of sites, including household and farmstead remains, agricultural farming fields and complexes, habitation terraces, a cemetery and tombs, and World War II evacuation tunnel shelters. Charcoal kilns, used by the villagers for supplemental income, were also identified throughout many of the surrounding stream valleys. Ethnobotanical analysis in the environs of Anindo Village indicates intensive arboriculture, as well as the cultivation of non-arboreal plants. In addition, traditional cultural practices demonstrated at the Anindo Village sites reflect an ethos of sustainability in line with official Imperial Japan directives as well as local (prefectural) forestry society guidelines.

Swenson, Edward (University of Toronto)

[216] *Gender Complementarities and the Construction of Late Moche Political Landscapes*

Recent investigations at the Late Moche center of Huaca Colorado in the southern Jequetepeque Valleys suggests that gender complementarity constituted an overarching principle that underwrote Late Moche conceptions of ecology, cosmos, political authority, and the power of sacred places. The dualistic layout of the huaca's ceremonial nucleus resonates with general Andean philosophies that moral order was founded on the balanced if dialectical interdependence of male and female forces. However, an investigation of the ritual practices of the center along with the spatial differentiation of gender-specific activities within the larger site reveals some of the distinguishing features of Late Moche ideologies of sex and complementarity. Ideals of male, female, and their union (yanatin) were spatially inscribed and appear to have formed the common denominator of a whole series of complementary oppositions, including production and consumption, life and death, senior and junior, day and night, highland and lowlands, and possibly sky and earth. In the end, the data suggest that gender identity was not so much determined by biological sex but by the activities and rituals performed by cooperating groups at Huaca Colorado.

Swift, Jillian (Max Planck Institute for the Science of Human History)

[125] *Getting to Know the Neighbors: Commensal Insights into Human-Ecosystem Dynamics*

Advances in zooarchaeological method and theory, increased attention to the recovery and analysis of microfaunal remains, and multidisciplinary collaborative research have generated increasingly nuanced understandings of past human-animal relationships. This paper provides a brief introduction to archaeological investigations of commensal fauna, highlighting the myriad ways that research focused on the commensal niche sheds new light on past societies and ecosystems. A case study from Makangale Cave (Pango la kijiji Makangale), Pemba Island, Zanzibar illustrates the utility of small commensal fauna for understanding processes of human niche construction and paleoecological transformations. Stable carbon and nitrogen isotope data derived from the human-transported, omnivorous black rat (*Rattus rattus*) and house mouse (*Mus musculus*) reflect changes in nutrient flows throughout anthropogenic food webs, as well as resource partitioning between two species occupying the human niche. Explicit focus on these often-ignored commensal taxa provides new tools for investigating human-environment dynamics in the past.

[125] *Chair*

Swift, Jillian [9] see Maline, Sophia

Swisher, Christopher (Indiana University of Pennsylvania) and Jonathan Burns (Juniata College)

[334] *Investigations at the James Hatch Site and the Houserville Archaeological National Register District, Centre County, Pennsylvania: The Benefits of Collaboration between Institutes of Higher Learning and Government Agencies*

In 2017, the coupling of a Federally funded transportation project with an undergraduate archaeological field school, and Applied Archaeology thesis research, produced an innovative approach to archaeological mitigation. The project funded a Phase III investigation of a lithic workshop site—the James W. Hatch Site. The site was occupied during the Early Archaic Period, and attracted occupations focused on jasper reduction at a location 1.2 kilometers from a quarry. The site produced over 9,000 prehistoric artifacts from contiguous block excavation. Another part of the federally funded project included the synthesis of survey data from sites surrounding the jasper quarry, and helped re-evaluate and map the boundaries of the Houserville National Register Archaeological District. The reevaluation of the district will help guide the management of sites affected by future infrastructure projects for many years to come. This project serves as an example of an innovative and cost-effective alternative mitigation solution providing valuable experiential learning opportunities to students and young professionals while effectively managing cultural resources.

Swisher, Kimberly [266] see Coker, Adam

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Swogger, John (Archaeological Illustrator)**[108]** *Genuine Reproductions: Ethics, Practicalities and Problems in Creating a Replica of a Zemi from Carriacou*

When is a copy not a fake?

In 2014, the Carriacou Archaeology Project (University of Oregon; University of London) excavated a unique stone zemi at the Grand Bay site on the island of Carriacou, Grenada. The decision was made to create casts of the zemi in order to facilitate simultaneous display of the object in multiple island museums. It was hoped this would allow both museums to advocate the small island of Carriacou as a site of particular archaeological significance, to stimulate scientific tourism and promote the research potential of the island to post-graduates.

However, the making of the casts has raised some potentially problematic issues. The original intention was that the museums would display the casts correctly labelled as copies. This has not happened, raising the question as to whether or not the casts are moving from being mere “replicas” to being fakes: copies which deceive—however unintentionally or benignly. And because the casts increase the “visibility” of the original they are adding new layers of economic and aesthetic value to the original—with potential implications for theft, forgery and looting.

Swope, Karen K. [261] see Barnes, James

Sykes, Naomi (University of Nottingham), Greger Larson (University of Oxford), Carly Ameen (University of Liverpool), Philip Shaw (University of Leicester) and Tom Fowler (University of Nottingham)**[217]** *The Easter E.g.—Changing Perceptions of Cultural and Biological “Aliens”*

Human immigration and biological invasions are high-profile topics in modern politics but neither are modern phenomena. Migrations of people, animals and ideas were widespread in antiquity and these are frequently incorporated into expressions of cultural identity. However, the more recent the migrations, the more negative modern attitudes are towards them. In general, native is perceived as positive and ‘natural’, whereas the term ‘alien’ is attached negatively to cultural and environmental problems. This paper will explore these value-judgements through the example of Easter, the most important event in the Christian calendar.

The Easter festival and its associated animals—namely the brown hare, rabbit and chicken—are all ‘alien’ to most of the areas in where Easter is celebrated. This paper will focus on the integrated use of scientific approaches (genetics, GMM and isotopes) with evidence from traditional (zoo)archaeology, art history, and historical linguistics to investigate the human-mediated dispersal of the brown hare and rabbit in connection with the Easter cult. It will argue that the cultural and temporal context of these ‘alien’ introductions are key factors for both understanding the origins of Easter and challenging widespread negative attitudes towards cultural and biological ‘aliens’.

Synsteliën, Jennifer (University of Tennessee, Chattanooga) and Heli Maijanen (University of Oulu)**[90]** *Bone Modification by the American Cockroach*

Bone modifications by chewing insects and their larvae have been described for several families. We report extensive bone damage due to feeding of the American cockroach (*Periplaneta americana*), a close relative of termites. Roaches were seen feeding on thawing vertebrate remains in a processing room, in which skeletons were being prepared for entry into a comparative collection. A study of roach gnawing was initiated after a number of defleshed mammal bones were discovered extensively modified. Six human skeletons that were similarly processed in a neighboring suite were also surveyed for insect damage. Gnaw marks were examined under a stereomicroscope using 10–40x magnification. A feeding experiment with housed roaches demonstrated this insect’s ability to modify bone. Locations of extensive roach feeding appeared superficially similar to small rodent gnawing, but the two agents were clearly separable under low magnification. Roach mandibular scrapings and their patterns were similar to those previously reported for termites. This study shows the widely distributed American cockroach can and will modify thin cortical bone and underlying trabeculae; and suggests this highly omnivorous species favors soft tissue and bone lipids. Significantly, roaches are potential agents of bone modification of vertebrate carcasses that decay in subaerial or shallow burials.

Szabo, Vicki [16] see Frasier, Brenna

Szapak, Paul (Trent University)**[50]** *The Environmental Context of the Dorset-Thule Transition: Evidence from Stable Isotope Analysis of Archaeofauna*

Stable carbon and nitrogen isotope analyses of fauna from archaeological sites in the Central Canadian Arctic Archipelago were performed to examine the environmental context of the Dorset-Thule transition. Isotopic data from a large number of ringed seals demonstrate that there was a reduction in the importance of primary production derived from sea ice-associated algae during the Thule occupation relative to the earlier Dorset occupation; these data are consistent with an increase in open water conditions at this time. Arctic foxes from Thule sites consumed significantly more marine protein than those from Late Dorset sites, which would have been obtained from scavenged marine mammals killed by humans and polar bears. This shift was most likely driven by the deposition of bowhead whale carcasses on the landscape by the Thule, which altered the foraging ecology of the Arctic fox.

[315] *Discussant***Szremski, Kasia (University of Illinois)****[65]** *Alternative Complexities in the Central Andes: An Anarchist Approach to Chancay Political Organization in the Huanangue Valley*

Understanding the political organization of Late Intermediate Period (1000–1470 CE) societies along the central coast of Peru has remained challenging. The urban/proto-urban settlements that are characteristic of groups like the Chancay, Ichma, and the Chinca (among others) have been interpreted as material manifestations of elite power, however, many of these societies don’t fit traditional models of chiefdoms or states. Using a combination of ethnohistoric data, settlement pattern analysis, and excavation data, this presentation draws from recent trends in anarchist theory to explore the applicability of “horizontal-complexity” models for some LIP Andean societies. This paper examines the case of the Chancay, who which rose to prominence on the north-central coast of Peru between 900–1532 CE. Specifically, this paper explores the relationship between two Chancay sites in the Huanangue Valley, Cerro Blanco and Salitre, to argue that the Chancay complexity may have developed out of a resource sharing system that was created as part of a local level responses to environmental challenges. As a result, the Chancay polity may be better understood as a horizontal network of loosely affiliated nodes bound together by principals of mutual aid instead of as a centrally organized chiefdom or state.

Szymanski, Ryan (Washington State University)**[290]** *Approaching Equifinality: Pollen and Non-pollen Palynomorphs as Complementary Paleoecological Proxies*

In analyses of paleoenvironmental records, the specific effects of climate/precipitation patterns and human landscape impacts on ancient ecologies can be difficult to discern. As largely substrate-specific in nature, fungal spores may serve as proxy for a range of phenomena, such as soil erosion, landscape burning, vegetation clearance, moisture availability, and the existence of particular plant types in a given area. Microbotanicals, including pollen, fungal spores, phytoliths, and microcharcoal, isolated from a 2.5 meter sediment core recovered from Kingwal Swamp in western Kenya are used here to demonstrate the value of fungal palynomorphs as environmental indicators, particularly when employed in concert with these more traditional proxy types. I illustrate how cross-checking of palynological interpretations with fungal data can be used to refine models of landscape change and increase interpretive confidence via the elimination of equifinal trajectories potentially responsible for observed archaeological and

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paleoecological data patterning. Examination of congruence, or lack thereof, between these lines of evidence can thus render past human ecological impacts more easily visible.

Tabata, Yukitsugu (Waseda University)

[175] *Techno-morphological Approach to the Stoneware Production in Angkor*

This paper will discuss several aspects of premodern stoneware industry in Cambodia. Based on the results of recent excavation of the stoneware kilns in Angkor area, traits of the kiln structure, fuel strategy, forming techniques, glazing, and loading method of the Khmer stoneware will be discussed.

Tabata, Yukitsugu [175] see Chhay, Rachna

Tabatabaeian, Shadab

[73] *Eyes in the Dark: Explaining the Universal Ritual Function of Dark Zones via Eye-tracking Technology*

A plethora of ethnographic and archaeological evidence indicates a cross-cultural association of dark zones of caves with supernatural phenomena. In various geographic locations and time periods, human beings have been frequenting dark zones for ritual purposes. Regarding the unsuitable living conditions of dark zones, the following question arises: what drives humans to choose such places for practicing rituals? The answer to this question lies in the way human beings interact with dark cave environments. In this paper, I suggest that experiencing sensory deprivation, in particular lack of vision in dark zones, precipitates the enhancement of abstract and magical thinking. To verify this hypothesis, I employed the methods of cognitive scientists—namely, experimental research. I conducted an experiment using eye-tracking glasses to record participants' eye-movement trajectories in darkness. The results indicated that eye-movement patterns during darkness resemble that of activities involving abstract and primary process thinking (aka magical thinking). Consequently, darkness provokes and facilitates magical thinking. Thus, I suggest that in addition to social and cultural incentives, darkness, as an environmental cue, sets the stage for human beings to associate dark zones of caves with supernatural powers and therefore choose to practice rituals in such locations.

Tache, Karine (CUNY Queens College) and Roland Tremblay (Ethnoscop Inc.)

[77] *A Taste for Fish among the Saint Lawrence Iroquoians of the Montreal Region*

Iroquoian groups inhabiting the Saint Lawrence valley in the 15th and early 16th centuries were agriculturalists who complemented their diet with a variety of wild plant and animal foods. The relative importance of different food sources and their methods of preparation, however, likely varied from one community to another. To further document subsistence practices and foodways at the Iroquoian site of Dawson in Montreal, organic residue analysis was carried out on foodcrust and absorbed ceramic samples representing twenty-nine distinct containers recently excavated. Molecular characterization of lipids by gas chromatography-mass spectrometry (GCMS) show the presence of aquatic products in a great majority of samples. These data attest to the importance of freshwater fish for Iroquoians of the Montreal region and represent direct evidence of their frequent processing in ceramic containers, either alone or mixed with other ingredients. By combining these results with single compound isotope analysis (GC-c-IRMS) and the analysis of starch and phytolith microfossils, we hope to obtain a more complete picture of the range of foods prepared in pottery at the Dawson site, and ultimately shed new lights into food choices and culinary practices among the Saint Lawrence Iroquoians.

Tache, Karine [225] see Lamothe, Francis

Tafari, Aurelien (University of South Florida), Andrea Vianello (University of South Florida), Robert H. Tykot (University of South Florida) and Emanuela Gualdi (University of Ferrara)

[23] *Reconstructing Individual Life Histories in Early Medieval Italy through Serial Analysis and Compositional Analysis of Bones and Teeth*

This contribution aims at gaining on the life history of individuals buried in northeastern Italy between the fifth and the seventh centuries AD. Elemental analysis of human and animal remains provides data on the evolution of diet and mobility at a time of significant social changes. Our research strategy, based on a preliminary histological study on teeth and bones and on serial sampling, gives us the opportunity to observe these variations at the level of the individual. Thus, this research provides us with some new insights on the consequences of the fall of the Roman Empire by revealing the living conditions of the inhabitants of the Po Valley during the formative period of the Langobard, Venetian and Byzantine Empires of Italy.

Taft, Mara [138] see Benden, Danielle

Taivalkoski, Ariel (University at Buffalo)

[16] *Technological Choice and Human-Animal Relationships: A Bird's Eye View*

New theoretical attitudes in zooarchaeology have begun exploring the social dimensions of human-animal relationships. As representative of both human-environment and human-material interactions, the dynamics between people and animals go well beyond household economics. This paper presents preliminary results of the analysis of avian remains from the Aleutian Islands as part of a study characterizing the complex relationship between the Unangan people and birds as it changes over time. Here, technological choice is used as a method for parsing out the many contingencies, economic, social, cultural and environmental, that constituted the interactions between Unangan and birds. This approach melds materiality with the classic economic and ecological approaches in order to employ a more comprehensive perspective on the subject-hood, if not subjectivity, that birds and animals retained in Unangan culture.

Takahashi, Akatsuki

[78] *Underwater Cultural Heritage Protection and Management in Pacific Island States*

The waters of the Pacific Ocean contains a wealth of Underwater Cultural Heritage (UCH) encompassing the history of humanity from the Stone Age to the Atomic Age and witnessing climate change. This paper presents a summary of the outcomes of the UCH Programme in Pacific Small Island Developing States (SIDS). Notable progress includes the reference to the UNESCO Convention on the Protection of the UCH in SAMOA Pathway outcome document (2014), national and regional capacity building workshops, and Chuuk Lagoon Ocean Emergency Response—Safeguarding UCH, Addressing Environmental Hazards—Project (2017). Updates on the other UNESCO Conventions such as the Convention concerning the Protection of the World Cultural and Natural Heritage and the Convention for the Safeguarding of the Intangible Cultural Heritage (ICH) are also provided in order to illustrate the concept of Heritage of Humanity and explore linkages among tangible, intangible and natural heritage safeguarding. The paper concludes by discussing the prospective of the Marine Archaeology from the Pacific SIDS perspective, which aims to engage the people in the Pacific in UCH protection with an integrated and community-based approach not only for scientific research cooperation but also for achieving the Sustainable Development Goals (SDGs), reconciliation and peace.

Talaverano, Arlen [154] see Zimmer-Dauphinee, James

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Tamura, Ellie (Trent University)

[49] *The Two Pillars of the Kingdom of Bagan, Myanmar: How Royalty and Religion Shaped the Settlement Patterns of an Empire*
Bagan was the political, economic, and cultural centre of Myanmar during the country's Classical Period (c. 800–1400 CE). This immense empire operated primarily on two institutions: the crown and the sangha (Buddhist monkhood). Kutho (merit) was arguably one of the most important Buddhist doctrines in Bagan as it was believed to guarantee better social status upon reincarnation. Kutho, for the elite, was most commonly obtained by contributing large donations to the sangha. These donations took the form of labourers, tax-free lands, or precious materials that were used for the construction of temples and monasteries, of which thousands continue to survive today. The construction of these buildings would have displaced a sizeable amount of the commoner population whilst also establishing new settlements. Despite the extensive archaeological potential in this region, no settlement studies have been conducted in Myanmar. Through inscriptions, murals, and ground survey along with the application of entanglement theory, this study will determine how the crown and the sangha worked together influencing the settlement patterns of the commoner population. This study will bring insight into a relatively new area of research in a region that is only beginning to open for archaeological work.

Tan, Boun Suy [175] see Stark, Miriam

Tanasi, Davide (University of South Florida), Ilenia Gradante (Polo Museale della Campania) and Stephan Hassam (University of South Florida)

[130] *From Field to Screen: Best Practices for Digital Recording and Global Sharing of Catacombs from Late Roman Sicily*
Ten years after the seminal research on the digital recording of the monumental complex of The Catacombs of Saint Domitilla at Rome, undertaken by the Österreichische Akademie der Wissenschaften, the virtualization and the dissemination of 3d models of Late Roman catacombs is still a challenging research topic. While the catacombs of Rome are consistently considered for cutting edge digital archaeology projects, the underground cemeteries of Late Roman Sicily, the second in importance to those of Rome, struggles to get the digital visibility they deserve. Against this scenario, between 2013 and 2015 an Italian-American research project was undertaken at the Catacombs of St. Lucy at Siracusa. The research, including archaeological fieldwork, focuses on some very problematic parts of Region C. During the excavation, an array of 3D digital techniques was used for the daily recording of the archaeological units, but also to create high-resolution virtual replicas of certain districts of the catacombs and certain classes of materials, such as frescoes and marble architectural elements that could otherwise only be studied in the dark environment of the catacombs. The USF Digital Collections, a well-established multimedia repository of USF Libraries, has been chosen as global dissemination media.

Tankersley, Kenneth (University of Cincinnati)

[292] *Surviving Climate Change*
During the past decade, the University of Cincinnati has offered a summer archaeological field school, which focuses on periods of rapid and profound global climatic change. Students undertake detailed excavation profile descriptions, collect samples for AMS radiocarbon and OSL dating, botanical, faunal, soil, and geochemical analyses to develop an accurate chronology and paleoenvironmental framework of the depositional history for archaeological sites, which date to the Younger Dryas and Little Ice Age. From an evolutionary perspective, these are significant periods of change, which force people to economically adapt, downsize, or migrate. Data collected during these field schools have been published in co-authored articles in the journals *Nature*, *PNAS*, *Quaternary Research*, and *American Antiquity*.

Tappan, Katie K., Kelsey A. Gruntrad, G. Tucker Austin, Samantha N. Butler and Chrissina C. Burke

[187] *Rabbits, Pronghorn, Oh Deer! Oh My! A Preliminary Analysis of Subsistence Strategies at Wupatki National Monument, Northern Arizona*
Wupatki National Monument is a Puebloan site located in the Sinagua region of Northern Arizona, featuring an array of wildlife available to past populations for subsistence and technological purposes. Analyzing faunal remains from Colorado Plateau sites is an important part of developing a holistic understanding of the lifeways of agricultural communities in the Southwest. This poster focuses on the zooarchaeological analysis of materials from Wupatki National Monument housed at the Museum of Northern Arizona. By determining taxa present, minimum number of individuals, animal portions utilized, cultural modifications such as butchering, pot polish, and bone tool manufacture, and natural taphonomic signatures, we provide a thorough understanding of animal use through time at the site. We further examine the Garden-Hunting hypothesis and discuss the relative frequencies of Artiodactyls and Lagomorphs in the community's diet. Our research highlights the importance of zooarchaeology to understanding animal presence at the site and provides discussion on subsistence strategies as it relates to animal resource use in an arid environment.

Tappan, Katie K. [7] see Wisner, Gavin

Tappen, Martha [41] see Coil, Reed

Tapper, Bryn

[180] *Petroglyphs on the Periphery: Rock Art in the Canadian Maritimes*
Ongoing investigation of the Algonquian rock art of the Canadian Maritimes reveals that while some sites, such as Kejimikujik Lake, are well documented as a result of longstanding conservation strategies, these and other petroglyph sites have yet to be adequately and comprehensively framed within their archaeological, ethnohistorical and ethnographic contexts. Combining a landscape archaeology approach with theoretical positions emerging from the 'ontological turn' in archaeology, my research seeks to investigate the petroglyphs at various interrelated scales—from motif, to panel, to site, to landscape setting—in order to better understand the different functional and ideological levels at which these phenomena operated. Formal approaches using computational photography, principally Highlight Reflectance Transformation Imaging and photogrammetry, are employed to revisit known sites, test earlier interpretations, and to document new sites. Additionally, ethnohistories and ethnographies sought through collaboration with Mi'kmaq and Wolastoqiyik First Nations are used to articulate indigenous narratives alongside archaeological understandings of the petroglyphs. These complimentary approaches seek to inform how indigenous concepts of landscape, the environs of the rock art site, the material conditions of the rock surfaces, as well as the content and composition of the images engraved, combine to make socially significant places in the landscape.

Taschek, Jennifer [258] see Reents-Budet, Dorie

Taylor, Geoffrey (UC Berkeley)

[300] *Foodways and Urban Living: A Macrobotanical Analysis of Huari Homes*
Knowledge of Wari plant use has progressed significantly with analyses from sites such as Conchopata and Cerro Baul, but there has yet to be any investigation into Wari plant foodways at the capital city of Huari. This paper will investigate the botanical remains from flotation samples recovered throughout the 2017 excavations of Patipampa, a domestic sector of the site occupied during the Middle Horizon (AD 500–1000). For years, it has been assumed that the emergence of the Wari state in Ayacucho was fueled in part by maize agriculture. Preliminary results of the macrobotanical analysis will reveal what food crops people living at the site of Huari were actually consuming within their homes, and to what extent people were either using maize as a staple crop or maintaining a diverse diet. The assemblages of weed seeds and crop parts will also give insight into Wari agricultural

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practices and the organization of labor inside and outside of the house. Furthermore, using Geographic Information Systems (GIS), the densities and distributions of plant remains will be studied within a variety of architectural spaces to understand how cooking and preparation may have been organized within the urban landscape of Huari.

[300] *Chair*

Taylor, R.

[315] *Moderator*

[315] *Discussant*

Taylor, Samantha (Indiana University of Pennsylvania)

[22] *Looking Through Dirty Dishes: The Preliminary Results of a Ceramic Analysis at Pandenarium (36ME253)*

In recent years, African Diaspora archaeology has become one of the most impactful means by which archaeologists supplement our current understanding of the past. Not only does this subfield have the potential to benefit descendant and local communities, but it also enables professionals to fill in the blank gaps left by the systematic disenfranchisement and intentional illiteracy of an entire group of people. One site with the potential to enhance our understanding of the African Diaspora is Pandenarium (36ME253) a freed African American settlement in western Pennsylvania. Current research at Pandenarium focuses on a comparative ceramic analysis with nearby European American sites, other freed African American sites, and slave quarters at plantation sites. The goal of this is to determine the socio-economic status of individuals living at Pandenarium, along with preferred food preparation methods and participation in local and regional markets. The preliminary results of the analysis featured in this paper are a foundation for future comparative studies featuring Pandenarium and will aid in the recognition of Pandenarium as a dynamic African Diaspora site deserving of further archaeological attention.

Taylor, Sarah (University of South Florida) and Robert H. Tychot (University of South Florida)

[270] *The Dietary Importance of Maize and Aquatic Resources during the Regional Development Period at El Dornajo, Southwest Ecuador*

Earlier studies of subsistence at the site of El Dornajo in southwestern Ecuador examined faunal, macro- and macro-botanical remains. These studies indicated that residents consumed large quantities of shellfish and marine fish during both the Formative and Regional Development periods (2800 BC—700 AD), with a marked decrease and differential access based on socioeconomic status in the later period. It has been hypothesized that site residents increased their reliance on domesticated plant foods, especially maize, in order to compensate for decreased consumption of marine foods. While no physical evidence for maize has been found, there exists a chance for bias based on poor preservation and sampling.

In order to better address dietary practices at the site and test the maize hypothesis, stable isotope and elemental analysis of 16 elite and non-elite individuals from the Regional Development period were conducted. Bone collagen carbon and nitrogen, and bone apatite and tooth enamel carbon and oxygen isotope ratios were determined, along with calcium, strontium, and barium elemental values. The isotopic results reinforce previous conclusions concerning diet at El Dornajo, including the lack of evidence for maize. We, therefore, conclude that any increased reliance on plant foods focused on other indigenous plant resources.

Taylor, Sean [34] see Bissett, Thaddeus

Taylor, William (Max Planck Institute—SHH), Tumurbaatar Tuvshinjargal (National Museum of Mongolia), Jamsranjav Bayarsaikhan (National Museum of Mongolia) and Julia Clark (American Center for Mongolian Studies)

[304] *Zooarchaeology by Mass Spectrometry (ZooMS) and the Emergence of Nomadic Herding in Eastern Central Asia*

Identifying the timing and nature of the emergence of pastoral societies in eastern Central Asia is hampered by many key logistical challenges, including the scarcity of early nomadic habitation sites and the small and fragmented nature of related archaeofaunal assemblages. This study presents faunal identifications of animal bones from two recently discovered Bronze Age habitation sites in northern and western Mongolia using ZooMS (Zooarchaeology by Mass Spectrometry)- a technique that uses mass spectrometry to make taxonomic classifications based on peptide sequences from bone collagen. Results provide a window into diet and husbandry practices in the eastern Eurasian Steppe during the critical transition from hunting to herding societies, and indicate that ZooMS is a powerful tool for the investigation of early pastoral economies.

Teeter, Wendy [306] see Kennedy Richardson, Karimah

Tepania, Haumata [13] see Cramb, Sara Lynn

Téreygeol, Florian [23] see Géraud, Manon

Terlep, Michael L.

[27] *Cup and Channel Petroglyphs and Ancestral Puebloan Migration*

The age, origin, and function of the enigmatic cup and channel petroglyphs of the Arizona Strip have fascinated archaeologists for decades. The petroglyphs size, up to 2 m long, as well as, placement on horizontal surfaces at prominent locations, contributes to the intrigue of the glyphs. Previous hypotheses for the age and function of the petroglyphs include prehistoric navigational markers to water sources, solstice markers, historic tar burners, and ceremonial water channels. Hundreds of cup and channel petroglyphs are reported within a narrow 100 mile radius within southwest Utah and northwest Arizona. Little known evidence beyond this spatially confined distribution exists. The recent documentation of cup and channel petroglyphs at Homo'ovi, Woodruff Butte, and Awat'ovi in eastern Arizona expands this distribution and contributes new insight into temporal, spatial, and stylistic variation of cup and channel petroglyphs. This presentation offers inference into the newly documented glyphs' connection to the Arizona Strip Region. The data suggest cup and channel petroglyphs are signs of Virgin Puebloan migration to the Hopi Mesas.

Terlep, Michael L. [27] see Tsouras, Theodore

Terrell, John Edward [83] see Golitko, Mark

Terry, Richard E. (Brigham Young University), Jeffrey Blomster (George Washington University) and Daniel A. Bair

[288] *Geochemical Analysis of the Soils and Floors of Ancient Activity Areas at the Site of Etlatongo, Oaxaca, Mexico*

Soil and floor samples from the ancient activity areas of Etlatongo were sampled and concentrations of extractable P and chelate extractable heavy metals. The relative concentrations of these elements have been shown to delineate areas of food preparation, consumption, and waste disposal. Increased heavy metal concentrations are indicative of the use of paints and pigments or the working of mineral ores. Low levels of these elements are usually present at sleeping areas and at high traffic pathways.

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Terry, Samantha (Florida State University)**[102]** *A Reexamination of the Faunal Assemblage at Bird Hammock (8Wa30)*

The Bird Hammock site (8Wa30) located in Wakulla County, Florida, is a multicomponent site representing Late Swift Creek and Weeden Island occupations. The site consists of two burial mounds as well as two accompanying middens each representing one phase of occupation. Bense completed excavations in 1968 that provided a preliminary description of faunal material at the site but it was not until Nanfro's (2004) excavations that a more thorough analysis was completed. My research reexamines the faunal assemblages represented in the northern midden, the Weeden island component, as a means of modeling the subsistence patterns of peoples in Florida's Gulf Coastal Zone. I will also consider the consequences of screening biases in past analysis to determine if other species may be underrepresented in the assemblage.

Terstriep, Jeff (CyberGIS—University of Illinois)**[279]** *Discussant*

Teten'kin, Aleksei [177] see Henry, Aureade

Texis, Ariel (Proyecto Arqueológico Tlalancaleca, Puebla), Shigeru Kabata (Proyecto Arqueológico Tlalancaleca, Puebla) and Tatsuya Murakami (Proyecto Arqueológico Tlalancaleca, Puebla)**[262]** *Tlalancaleca: Ceramics and Interregional Interactions in Formative Central Mexico*

Using ceramics as a proxy for social contact, we discuss a long history of interregional interactions of Tlalancaleca with other areas during the Formative Period. We have observed some clear changes of ceramic assemblages in the transitions between the Middle, Late, and Terminal Formative (or between the Texoloc, Tezoquipan, and Late Tezoquipan phases). While we do not imply that the presence or absence of certain ceramic traditions serves as direct indicators for political control, it is likely that Tlalancaleca formed part of important interaction spheres along with other areas such as the Morelos region, the Tehuacan Valley, the Basin of Mexico, and more lately with the Valley of Teotihuacan. Some ceramics resembling those from the Patlachique-Tzacualli tradition at Teotihuacan, which were formerly seen as foreign and brought after the abandonment of Tlalancaleca around 100 A.D., have been obtained from secure contexts in recent excavations of monumental architecture at Tlalancaleca. This suggests that the manufacture of similar ceramic traditions (with different raw materials) was widely shared among different social groups in Central Mexico just before the expansion of the Teotihuacan state.

Thacker, Paul (Wake Forest University)**[41]** *Emic Knapping Perspectives and the Analytical Concept of Raw Material Similarity: Building a Contextualized Theory of Lithic Raw Material Selection*

Existing frameworks for analyzing lithic raw material economies insufficiently characterize the complex interface of reduction strategies with local raw material variability. This presentation contextualizes assemblage technological organization from the Middle and Upper Paleolithic of Portugal with occurrence frequencies and size variability in local raw material cobbles. The new analytical concept of similarity differentiates Middle Paleolithic quartz preference within a pattern of overall raw material equivalency from two radically-different and synergistic chaînes opératoire structuring EUP assemblages. At the site of Espadanal, chert and quartz were utilized for different functions and as blanks for fashioning different tool forms, demonstrating that prehistoric knappers considered them dissimilar raw materials. Focusing on evidence for prehistoric decision-making facilitates a robust theoretical framework of raw material economy that integrates both the structural and the contextual.

[41] *Chair*

Thakar, Heather [59] see Hirth, Kenneth

Tharalson, Kirsten (University of Iowa) and Leland C. Bement (University of Oklahoma)**[155]** *Late Archaic Southern Plains Bison Kills: Accumulated Analysis Results at the Certain Site, Western Oklahoma*

The Certain site is a 2000-year-old Late Archaic bison kill site consisting of multiple arroyo localities in western Oklahoma. Analysis of the site's excavated faunal assemblage identified an MNI of several hundred bison, although an MNI around 1000 is expected for the entire site. At least nine distinct kill events are represented at Certain, including multiple seasonalities, though largely targeting calf/cow herds. We present the culmination of our analysis to date, including seasonality, herd demographics, and butchering patterns. These results are viewed from a regional perspective.

Thayn, Jonathan [116] see Erickson, Clark

Thibodeau, Alyson (Dickinson College), Allison Curley (Dickinson College), Emily Kaplan (Smithsonian National Museum of the American Indian) and Ellen Howe (Metropolitan Museum of Art)**[139]** *Lead Isotopes as Chronological Markers for Colonial Period Ritual Drinking Vessels in the Andes*

Ritual drinking vessels called qeros have been produced in the Andes for millennia. In the colonial period, Andean artists produced wooden qeros, many of which were decorated using a polychrome inlay technique. Almost all extant polychromed wooden qeros attributed to the colonial period derive from museum and private collections and lack provenience and precise means of dating. Here, we investigate the chronology and production of qeros by characterizing lead white pigment (lead hydroxycarbonate or lead carbonate, introduced to the Andes by the Spanish) used in the decoration of these vessels. We analyzed the Pb isotopic composition of lead white pigments taken from 21 colonial period qeros that currently reside in the collections of the National Museum of the American Indian-Smithsonian Institution, the American Museum of Natural History, the Brooklyn Museum of Art, and in private collections. The results indicate that, during the early colonial period Andean artists initially used lead white pigment manufactured from Spanish ores. In contrast, later period qeros were decorated with lead white pigment that was likely synthesized from local ore sources. Based on these results, we suggest the isotopic composition of lead white pigment may function as a chronological marker for colonial period qeros.

[152] *Discussant***Thomas, Ben (Archaeological Institute of America)****[233]** *Discussant***Thomas, David (American Museum of Nat History)****[137]** *Discussant*

Thomas, David [154] see Edwards, Alexandra

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Thomas, Jayne-Leigh (Indiana University), Larry Zimmerman (Indiana University Purdue University Indianapolis), Felipe Estudillo Colon (Institute of American Indian Arts), Jeffrey Bendremer (College of New Rochelle) and Jennifer Meta Robinson (Indiana University)
[222] *Learning by Example: Exploring the Importance of Case Studies in Learning NAGPRA*

Although the Native American Graves Protection and Repatriation Act (NAGPRA) has existed for over a generation, educators and professionals continue to discuss the best ways to prepare learners for the complex and contextually specific process of repatriation. Every consultation and every repatriation differs, even when the same tribes and institutions are involved. Because of this, learners can benefit from seeing multiple examples of how NAGPRA is implemented and how different stakeholders effect and are affected by the process. As part of the National Science Foundation funded Learning NAGPRA Project, researchers asked students in Anthropology and Museum Studies programs to suggest helpful resources. The results of this online survey showed that learners are eager for examples beyond the Ancient One (Kennewick Man) repatriation case, but a working group aimed at collecting and creating case studies experienced several challenges in preparing new material for public access. This presentation overviews why and what types of NAGPRA case studies are beneficial and the challenges and outcomes of creating educational materials on sensitive, complex issues.

Thompson, Amy (University of New Mexico), Jillian Jordan (University of New Mexico) and Keith M. Prufer (University of New Mexico)
[82] *Household Distributions and Social Organization of the Ancient Maya in Southern Belize*

This paper examines processes of low-density urban development through geospatial analyses of households at two Classic Period (AD 250–800) Maya communities, Uxbenká and Ix Kuku'il. Located in the southern foothills of the Maya Mountains, Toledo District, Belize, these centers were situated in similar landscapes yet exhibited distinctly different household distributions. Wherein Uxbenká had geospatially discrete districts and neighborhoods while Ix Kuku'il's houses were more evenly distributed across the landscape with little evidence of social clustering. We compare several methods in a discussion of how archaeologists can model past human behaviors across a regional landscape based on both geospatial and chronological data in conjunction with material goods. Furthermore, we statistically analyze the influence of several social and ecological resources on the settlement patterns at Uxbenká and Ix Kuku'il. The results of these analyses suggest that the variations in household distributions reflect shifts in human decision-making dynamics during transitions of sociopolitical integration from autonomous, self-governing social units to top-down centralized authority influencing settlement locations.

Thompson, Charmaine
[281] *Discussant*

Thompson, Jessica (Emory University), Andrew Zipkin (University of Illinois at Urbana-Champaign), David Wright (Seoul National University), Stanley Ambrose (University of Illinois at Urbana-Champaign) and Flora Schilt (University of Tuebingen)

[198] *Out with a Whimper or a Bang? Hunter-Gatherer Response to the End of the African Humid Period in Northern Malawi*

The modern climate of the southernmost African Rift Valley is characterized by a single warm-wet season, which receives almost all annual precipitation. The other six months are arid, and surface water is confined to major river and lake features. In the northern basin of Lake Malawi, at the southern extent of the modern ITCZ, core records show a rapid increase in water surface temperatures peaking at ~5.5 ka, followed by a major expansion of grasslands. This coincides with the end of the African Humid Period (AHP) further north, but it is unknown what impact this change had on parts of the landscape away from the Lake. The Kasitu and Luwelezi Rivers in the Mzimba District of northern Malawi offer perennial water in the incised Kasitu Valley, with paleosols and terrace sequences that show past changes in precipitation regimes. We report new results from three rock shelter sites from the Valley, which contain archaeological and paleoenvironmental archives of precipitation, vegetation, and human response to resource availability before and after the AHP. We pair these results with data from a new Sr isoscape, to further resolve how hunter-gatherer mobility and social relationships were impacted by resource distributions, prey availability, and precipitation.

Thompson, Victor [35] see Lulewicz, Isabelle

Thornton, Erin (Washington State University), Richard Hansen (FARES Foundation/Mirador Basin Project) and Edgar Suyuc-Ley (FARES Foundation/Mirador Basin Project)

[18] *Ancient Maya Diet, Environment, Animal Use and Exchange at El Mirador: The Zooarchaeological Evidence*

The site of El Mirador (Petén, Guatemala) is among the largest Preclassic settlements in the Maya lowlands. The site has attracted attention due to its size and antiquity, but also for its location within a region containing few permanent or perennial water sources. This study summarizes current zooarchaeological evidence from the site to assess past diet, habitat use, environment, and exchange. Comparative analysis demonstrates that the inhabitants of El Mirador conformed to certain widespread Preclassic dietary and animal use traditions. However, other animal use patterns are unique to the site, including on-site rearing of domestic turkeys, which was not conducted on a similar scale elsewhere in the Maya lowlands until the Postclassic (post-AD 1000). Inter-site comparisons of Preclassic animal use also reveal greater reliance on terrestrial fauna at El Mirador despite the presence of extensive wetland habitats near the site. Although a large portion of the El Mirador faunal remains date to the Late Preclassic (350 BC-AD 150), remains associated with a Late/Terminal Classic (AD 600–900) re-settlement provides an additional opportunity to address diachronic variation in animal use, and how the local environment changed or recovered after nearly 500 years of human abandonment.

Thornton, Erin [7] see Phillips, Lori

Throgmorton, Kellam J. (Binghamton University)

[269] *Early Chacoan Communities of the San Juan Basin*

In the late summer of 2017, I conducted dissertation research at two Chacoan communities: Morris 40, on the Ute Mountain Ute Reservation, and Padilla Well, in Chaco Culture National Historic Park. I was assisted by a team comprised of Binghamton University graduate students and independent researchers from New Mexico and Colorado. We used remote sensing, geophysical survey, and material culture analysis to map and document these two communities. We evaluated the idea that migration from aggregated villages in the Northern San Juan region of Southwest Colorado contributed significantly to the development of Early Bonito Phase (AD 840–1020) Chacoan communities in the San Juan Basin of New Mexico. The broader goals of the project were to evaluate variability in political organization during the initial development of a complex political entity (Chacoan society) in order to understand how these kinds of social formations arise.

Thulman, David (George Washington University)

[120] *Florida's Fluted Paleoindian Points: A Reassessment of the Typology*

Paleoindian points from Florida are different from the rest of the Southeast. Instrument-assisted fluting was never adopted, and Florida produced some apparently post-Clovis forms that are unlike any elsewhere. Several attempts have been made to sort out the myriad forms. This attempt uses landmark-based geometric morphometrics to more objectively distinguish fluted point forms.

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Thurber, Hali (University of Arkansas) and Justin Uehlein (American University)**[39]** *Mapping Transience: An Archaeology of Hobo Movement and Placemaking*

GIS has become a powerful tool for visualizing cultural activity over time and space. We have found that it is invaluable in the archaeological study of movement and transient labor. In this paper, we aim to demonstrate how the use of geospatial technology in conjunction with the material record can offer a glimpse into the daily movements of transient laborers along Mid-Atlantic railway networks and industrial centers in the late 19th century through the Great Depression. Specifically, we suggest that the spatial relationships that emerge at an historic hobo jungle located just outside Delta, PA are not simply manifestations of economic or social hardship. Rather, we view transient worker movement and labor patterns as an essential aspect of early 20th century capitalism from which a unique form of resistance emerged. The distribution of artifacts within the site (revealing patterns of behavior by occupants coming and going from the camp over time), and the modeling of the physical location of the camp in proximity to the railroad, slate quarry, creek, and town center, are necessarily conjoined spatial and temporal units, which reveal a social structure dialectically entangled with the nearby town and broader regional economy.

[235] *Discussant*

Thurber, Hali [68] see Vining, Benjamin

Thurston, T. L. (SUNY Buffalo)**[220]** *Andra tider, andra seder: Shifting Taskscapes of Gender, Age and Class in Early Sweden*

Anecdotal evidence for rural gender and age-based divisions of labor are known for Medieval and Post-Medieval Sweden, and a handful of historians have discussed their implications in terms of the 'slices of time' they represent. Other more continuous geographic and archaeological data address the status of agricultural populations through increased or diminished affordances, economic opportunities, taxation and laws, as well as climate change and demographic transitions. How were these varying conditions experienced as changing gender- and lifecycle-based taskscapes, as landscapes of shifting labor and organization, and as substrata for the emergent ideas of modernity regarding life, work, and leisure? While these transformations can be followed among lowland cereal farmers, they are perhaps most starkly highlighted within upland communities in marginal contexts where older traditions, adjusted skills, and novel practices were constantly and simultaneously in play.

Thurston, T. L. [144] see Whalen, Kathryn

Tibbits, Tawny (Broward College)**[256]** *Sourcing Stones: PXRf Use at Pacbitun*

The Maya site of Pacbitun in Belize has produced large amounts of granite ground stone tools, debitage, and debris. Determining provenance is integral to reconstructing the chaîne opératoire of ground stone tool production at the site. Portable X-Ray fluorescence (pXRF) is becoming widely used in the field for quick and accurate geochemical assessments. Most prior archaeological work has focused on fine-grained materials, rather than coarse-grained rocks like granite. This project used geologic reference materials to assess the accuracy and validity of pXRF on coarse-grained rocks such as granite. It was determined that by using multiple data points per granite sample it is possible to generate an average composition that is statistically indistinguishable from traditional powdered samples. This method was used to compare the chemical signature of granite artifacts from Pacbitun to collected granite outcrop samples from throughout the Maya Mountains. The results of this project indicate that Mountain Pine Ridge is the likely source pluton for the granite being utilized at Pacbitun.

Tibesasa, Ruth [198] see Jones, Mica

Tidwell, Wade (The University of Alabama)**[302]** *Artifact Ubiquity as an Index of Ancient Maya Socioeconomic Variability at Actuncan, Belize*

The Actuncan Archaeological Project has conducted ten field seasons of research at this ancient lowland Maya site in Belize, Central America and inventoried all artifact classes including ceramics, lithics, marine shell, jade, daub, etc. from excavation contexts. One of my research goals was to consolidate this information into a relational Access database so that project members could more easily analyze artifacts across contexts and time periods. The database allowed me to construct archaeological indices for documenting the ubiquity of artifact classes as a measure of socioeconomic variability across households or civic spaces. To achieve this goal, I explore which index is the most valid or useful, including the ratio of artifact classes potentially controlled by elites such as groundstone, jade and marine shell to the most commonly occurring ones (ceramics or lithics) or to excavation volume. Once these indices are created, I can identify structures or spaces that have disproportionately high or low ratios of materials and hypothesize how these areas were utilized by elite and common members of the society.

Tiesler, Vera (Universidad Autónoma de Yucatán)**[177]** *Embodying the Sun. Pyrotechniques as Part of Human Sacrifice in Ancient Mesoamerica*

In Mesoamerica, sacrificial ceremonies for the sake of religious merit-making tended to bridge polarities between action and symbols. Some of the ritual practices were mediated by mythical narratives surrounding domestic hearths, divine fire, and the sun itself. Among ancient Mesoamericans with their hierophagic cosmic understanding, the fiery protagonists to which sacrifices were destined to were deemed necessary complements of all life and had to be fed. This talk combines graphic and textual information with new findings of heat-exposed skeletal remains from Central and Eastern Mesoamerica to discuss different choreographies of sacrificial fire consumption of human bodies and their associated meanings in religion and political transaction.

Tiesler, Vera [330] see Rodriguez, Monica

Tiffany, Joseph and Shirley J. Schermer (Office of the State Archaeologist of Iowa)**[166]** *The Glenwood Phase Settlement System Revisited*

One of Larry Zimmerman's lasting contributions to archaeology is his research on the Central Plains tradition Glenwood culture in southwest Iowa. New site seriations, AMS radiocarbon dating, and site modeling utilizing GIS, all address fundamental assumptions derived from Zimmerman's research in the 1970s. The current model proposes a short-term occupation consisting primarily of dispersed farmsteads and possibly two or three unfortified house clusters in the Glenwood locality. Site location is resource driven; resource stress in the locality led to its abandonment.

Todd, Lawrence (GRSLE) and Kyle Wright (Shoshone National Forest)**[106]** *Structured Wilderness: Managing 19th and Early 20th Century Heritage Resources, Shoshone National Forest, Wyoming*

As the first National Forest that abuts Yellowstone Park, the Shoshone National Forest, northwestern Wyoming has a rich and diverse history of changing use and management. Over the last several years several projects that highlight this history have been conducted by the Shoshone and several partners. Two projects at Anderson Lodge (constructed ~1890) and Simpson Lake Lodge (1926) represent stabilization efforts at cabins representing both administrative and private uses of the back county before the Wilderness designation. The third project, the Gallaher Survey party

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tree, documents the efforts of an 1893 team mapping the east and southern boundaries of the Yellowstone Forest Reserve. Efforts at these unusual Wilderness properties face numerous logistical and management difficulties, but the enthusiastic support of local, regional, and national partners clearly demonstrates the importance that the public places on these types of sites and highlights the need to a more richly nuanced perspective on evidences of human presence in our Nation's Wildernesses.

Todd, Lawrence [106] see Wright, Kyle

Tokanai, Fuyuki [18] see Tsukamoto, Kenichiro

Tokovinine, Alexandre (The University of Alabama)

[109] *Giving Back: Debt in Classic Maya Narratives*

This paper considers textual and visual evidence of debt among Classic Maya nobles. It begins with an overview of lexical data and summarizes specific references to payment and accounting. The argument proceeds to some less obvious contexts such as 'just-so' myths, which reveal a notion of primordial transactions and gifts to be repaid in perpetuity. Finally, the paper considers the movement of inscribed objects. The argument is that giving those essentially inalienable possessions marked unredeemable obligations, which, nonetheless, could be transferred further down the social ladder along with the inscribed items.

Tokovinine, Alexandre [33] see Beliaev, Dmitri

Tomaskova, Silvia (UNC Chapel Hill) and Muzi Msimanga (Independent consultant, Johannesburg, South Africa)

[180] *Different Methods for Different Strokes: Petroglyphs in the Northern Cape, South Africa*

Our 2017 fieldwork in the Northern Cape, South Africa presented us with a dilemma: how do methods of rock art research aimed at studying image making help us understand petroglyphs that may not be "images". The site Wildebeest Kuil near Kimberley, Northern Cape has two discrete areas of engravings: an area covered with distinct images of animals, humans, "geometric patterns" (80% of engravings), and a second adjacent area covered with peckings and stone modifications that do not easily translate into images (90% of engravings). The presentation addresses (and interrogates) archaeological methods as guiding principles that may have to be broadened or adjusted in the face of different kinds of data.

[220] *Discussant*

Tomka, Steve (Raba Kistner Environmental Inc.,)

[275] *From "Nation" to "Indio" and "Español": Transitions in Indigenous Culture in the Missions of San Antonio*

The Spanish colonial advance into Texas during the late 17th century resulted in the establishment of several missions to house members of dozens of indigenous groups and a handful of presidios to protect the missions from raiding bands of Comanches and Apaches. The Padres that were in charge of the missions enforced systematic policies and procedures to affect change in the identity of the resident indigenous nations. The policies and procedures specifically targeted religious beliefs, language, dress, and daily practice to re-shape the identity of the neophytes. To a large extent, elements of the indigenous material culture were not targeted for change. Descriptions of the behavior, appearance, and language-use of indigenous groups living in the missions depict a de-emphasis on one's own group identity in favor of the demographically dominant indigenous groups in each mission. Over time, indigenous leaders and children come to undertake the most rapid change to the Spanish cultural norms. The material culture reflects few of these rapid and dramatic changes in the identity of the mission Indians. This paper explores these processes of identity change, their reflection in the written record, and how and why some aspects of material culture remained a signature of Indigenous identity.

Tonoike, Yukiko (Yale University) and Andrea Torvinen (Arizona State University)

[95] *Ceramic Petrographers in the Americas: An Introduction to Our Mission and Goals*

Founded in June 2017, the mission of the Ceramic Petrographers in the Americas (CPA) group is the promotion, discussion, and development of ceramic petrography in archaeology. Of principal interest is providing resources for those interested in employing ceramic petrography for their research and those who would like to pursue this method as a specialty. The group consists of archaeologists residing in the Americas who use optical petrography and other characterization techniques to infer the geological provenance of pottery and to study ceramic technology all around the world. This poster describes how the CPA formed, our goals, and information on how to connect with us and other petrographers based in the Americas.

Toohey, Jason (University of Wyoming)

[207] *Diverging Patterns of Community Organization in the Late Intermediate Period Cajamarca Region of Northern Peru*

The organizational concept of ayllu has been central to many discussions of community generation and organization in the Andes, but the blanket application of ayllu is also problematic. In the Cajamarca region of northern Peru, the beginning of the Late Intermediate Period (A.D. 1000—A.D. 1450) saw a demographic shift, with many settlements forming or relocating to higher elevation defensible and occasionally fortified positions indicating possible increases in competition and conflict between local groups. This shift in the location of some communities might also reflect increasing economic specialization between farming and herding communities, as has been seen in some other Andean zones at this time. Recent research at the communities of Callacpuma and Yanaorco in Cajamarca is beginning to shed light on possible organizational differences between higher and lower elevation communities. Variability in spatial patterning, foodways, and ceramic production and use points to diverging patterns of organization among local Cajamarca communities at this time. I will argue for the development of community at the large scale, speaking to possibly increasing inter-settlement interaction and interdependency even in the face of increased local tensions during the LIP.

Toohey, Jason [240] see Stagg, Sarah

Torpy, James [274] see Kardulias, Paul Nick

Torquato, Melissa

[103] *Why Do We Farm?: Risk Assessment of the Foraging Farming Transition in North America*

The evolution of the genus *Homo* is characterized by the emergence of numerous biological and cultural traits including bipedalism, encephalization, and language. A more recent adaptation led humans to transition from a foraging subsistence strategy to one based on farming. This is significant because foraging persisted for approximately 95% of human existence until farming emerged about 12,000 years ago. For nearly a century, anthropologists have studied the foraging-farming transition and proposed several hypotheses to explain its occurrence. Naturally, current research has prioritized ultimate explanations emphasizing long-term causality with limited research focusing on proximate explanations representing immediate causal mechanisms. This study evaluates the potential of "foraging risk" to have functioned as a proximate mechanism facilitating the transition to agriculture using a small sample within the North American Eastern Agriculture Complex, where independent domestication of numerous plants

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occurred during the Late Archaic period (4500–4000 BP). This study uses species distribution models, archaeological diet data, and paleoenvironmental proxies to reconstruct the paleoenvironment, assess the availability of prehistoric resources, and compare expected and observed diets. Results of this research lead to a better understanding of the effect of foraging risk on the independent development of and ultimate foraging-farming transition in North America.

Torrence, Robin (Australian Museum)

[137] *Chair*

Torrens, Shannon

[156] *Moving Earth at Poverty Point: Investigating “Perforators” as Specialized Basket Making Tools*

Studying the development of technological specialization in cultural groups has been an interest of archaeologists for many years because specialization lends itself to the development of specialized labor. Technological specialization was a necessary factor in the building of the mounds and ridges at the late Archaic site at Poverty Point. Yet most of the research done to this point has been focused on the symbolic significance of the mounds and ridges, leaving our understanding of the development of the infrastructure necessary to create these structures surprisingly blank, even though 1.2 million cubic meters of soil must have been moved from other locations in some sort of containers. Imprints of baskets found in the excavations of Mound B indicate that baskets were the containers used. Little is known about how or where these baskets were made; I argue that the numerous perforators found at Poverty Point could have been used to create the massive quantity of baskets required to create the mounds. In this research, I explore the question of whether the perforators of Poverty Point were used in the production of basketry.

Torres, Jimena [34] see Flores-Fernandez, Carola

Torres, Josh (National Park Service)

[202] *The Old Stone House Revisited*

The Old Stone House was built in 1765, making it the oldest standing building in Washington, DC. The house has been used throughout its history as a residence or residence/shop. This presentation provides an overview of archeological research conducted at the site and the results of recent investigations. This paper also addresses how historical narratives are produced and consumed and the role of archaeology in public heritage.

[202] *Chair*

Torres Castro, Martín [116] see Watling, Jennifer

Torres Hochstetter, Francisco [101] see Sullivan, Kelsey

Torres Morales, Genesis, Celeste Gagnon and Gabriel Prieto

[270] *Violence among the Gallinazo: New Insights from Pampa la Cruz, Moche Valley*

The Moche of the North Coast of Peru, are well known for their ritualized culture of violence. Warriors, prisoners, weapon bundles, and sacrifice are commonly depicted in a variety of Moche media, and archaeological evidence from urban centers suggests such acts were practiced. What is not known is if the Early Intermediate Period ancestors of the Moche also engaged in such acts of violence. Pre-Moche, Gallinazo phase urban sites were often located in defensible settings and some show evidence of fortification. However, until now the archaeological record of the Moche Valley has not yielded bioarchaeological evidence of Gallinazo violence. We present the case of a multiple burial recovered from the rural fishing village of Pampa La Cruz, Huanchaco (50 BC/AD100-AD 500). The remains recovered show evidence of severe trauma. These individuals provide us with insight into the practices of violence during this time and allow us to explore the role that violence may have played both in Gallinazo society and in the rise of Moche hegemony.

Torres-Cubillas, Luz Alicia [131] see Martínez-Tagüeña, Natalia

Torvinen, Andrea (Arizona State University)

[95] *Defining Petrographic Fabrics among Regional Wares at La Quemada, Zacatecas, Mexico*

Situated in the Malpaso Valley of Zacatecas, Mexico, the site of La Quemada was one of a series of polities that developed along the northern frontier of Mesoamerica during the Epiclassic period (A.D. 500–900). Widely distributed ceramic wares suggest interaction among northern frontier polities, but it remains unknown whether they are the product of widely recognized social categories (i.e., shared style) or direct, face-to-face interaction among individuals (i.e., shared composition). Answering this question requires distinguishing between local and nonlocal pottery found at La Quemada.

Despite geologic homogeneity observed across the northern frontier region due to an extensive ignimbrite province, previous characterization studies involving La Quemada pottery types have observed compositional variability among sherds and clays sampled from the Malpaso Valley. This poster builds upon these studies to define the set of ceramic fabrics observed in the La Quemada assemblage using a three-tier approach: (1) qualitative sorting and description of petrographic fabrics; (2) quantitative point counting of a proportional subsample of petrographic fabrics to test their mutual exclusivity; and (3) analysis of elemental data acquired from the clay matrix of point counted sherds and a set of briquettes made from natural Malpaso clays to establish local or nonlocal provenance.

[95] *Chair*

Torvinen, Andrea [95] see Tonoike, Yukiko

Tostevin, Gilbert (University of Minnesota), Luke Premo (Washington State University, Pullman, Washington) and William Wimsatt (University of Chicago)

[227] *Using Agent-Based Modeling to Study Constraints on the Social Learning of Lithic Technology*

Social learning is universally believed to be critical to the hominin adaptation. Yet when this becomes evident in our oldest cultural proxy, lithic artifacts, is hotly debated. Much of the variation in how archaeologists study this question is caused by differing assumptions related to the constraints on the performance, and thus the learning, of the flintknapping process. This paper explores the consequences of the physical constraints within lithic technology on its cultural transmission, using a spatially-explicit agent-based model. Building off of our previous work (PLoSOne 2016), we examine the incomplete social learning of the technological knowledge to produce curated lithic tool kits. We measure the number of learning events produced under the different constraints within flintknapping that reside at the heart of this debate. These constraints include where the learning occurred on the taskscape, the significance of the cognitive difference between strategic knowledge and tactical know-how, the degree of equifinality of products from different sequences, the generative entrenchment between products and sequences, and the size of the parameter space of lithic technology. Using

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the developmental utility of our model, we discuss ways to improve both experimental and artifactual studies designed to test for social learning during the Stone Age.

Tovar Saldana, Walter [18] see Cortes-Rincon, Marisol

Townsend, Russell [101] see Yerka, Stephen

Toyne, Jennifer Marla (University of Central Florida)

[216] *Victims or Venerated? A Bioarchaeological Examination of Gendered Ritual Violence and Social Identity of the Possible Aqlla at Túcume, Peru*

Human sacrifices are frequently referred to as 'victims' of ritual violence, which presupposes that the sacrificed had no control over their fate or were unjustly harmed. Many examples of human sacrifice have been identified recently across the north coast of Peru involving a range of time periods and bodily treatment to suggest that there was incredible variation in practice, including in the identity of those sacrificed. Both males and females have been identified as sacrifices, but rarely are both found within the same sacrifice tradition suggesting that gender identity often played a role. This paper explores the various human sacrificial contexts at Túcume (1000–1532 CE) specifically focusing on the 19 young females from Huaca Larga who were inferred as an Inca Aqlla; supposedly killed to accompany the principal ruler at his death. While no direct perimortem trauma is evident, they do conform to mortuary treatments of human offerings. The osteological analysis of pathological stress markers suggests that these women did not necessarily lead lives of honored status, but suffered cranial trauma, dental disease, and episodic stress during childhood. Even if they came from lower social strata, their 'death' may have elevated their status, regardless of if they had a choice.

Toyne, Jennifer Marla [7] see Michell, Samantha

Trabanino, Felipe

[323] *Starch Evidence of Nixtamalization in the Maya Region from Dental Calculus*

Human dental calculus or tooth tartar is used in to the reconstruction of ancient diet and plant consumption. In the Mayan region of Guatemala, archaeological starch granules were identified as corn. But this corn were nixtamalized or not? This paper presents the initial results of analysing several changes in the starch structure in the different processes of nixtamalization (dry, fermented, ground, nixtamalized, boiled).

[76] *Discussant*

Trabanino, Felipe [306] see Hannigan, Elizabeth

Trabert, Sarah (University of Oklahoma), Stephen M. Perkins (Oklahoma State University), Richard R. Drass (Oklahoma Archaeological Survey (Retired)) and Susan Vehik (University of Oklahoma (Retired))

[268] *New Investigations of the Deer Creek Site, an Early Eighteenth Century Ancestral Wichita Village*

Deer Creek (34KA3) is one of few known fortified villages on the Southern Plains and was occupied during a critical point in Wichita tribal history. While researchers have been interested in this site for almost one hundred years, it was only two years ago that archaeologists were allowed to formally excavate the site. Following removal of dense brush cover in 2014, archaeologists with the University of Oklahoma, Oklahoma State University, Oklahoma Archaeological Survey, and the Oklahoma Anthropological Society conducted limited excavations at the site in 2016 and 2017. This poster presents preliminary results from this project which included the excavation of an interior fortification ditch, two trash mounds, and two storage/trash pits. Some highlights of our work include the recovery of articulated horse remains, a lithics cache, a number of French trade goods, quantities of bison and turtle bones, and paleofeces.

Tracey, Rachel (Queen's University Belfast)

[296] *Interpreting 'Irishness' in the Archaeological Record: A Northern Ireland Perspective*

The northern Irish town of Carrickfergus, in the seventeenth century, was a thriving settlement; home to a mixed population of English and Scottish settlers, in addition to a local Gaelic-Irish population. As such, the excavated material evidence is particularly suited to considerations of how we interpret, and eventually ascribe, identity in the archaeological record. Cultural identity, and expressions of such identity—be that Irishness, Britishness, or Ulster Scottishness—lie at the heart of existing sectarian divides and political histories in Northern Ireland, stemming from contested interpretations of British expansion into Ireland in the late sixteenth/early seventeenth century. A selection of artefacts from Carrickfergus will be presented to discuss the identification of 'Irishness' in material assemblages and our understanding of Irish society in the early modern period, particularly in relation to the role of choice in the use and adoption of material culture, and in terms of cross-class, cross-ethnicity material hybridity.

Tranberg, Annemari [9] see Lipkin, Sanna

Traslaviña, Abel, James Zimmer-Dauphinee and Steven A. Wernke

[68] *Historical Photogrammetry: Bringing a New Dimension to Historic Landscape Reconstruction*

Archaeologists always strive to use every available source of information when conducting research, and historic imagery and aerial photography are nothing new to the field. However, new technical developments are bringing another dimension to these old sources of information. Many historic aerial photos were taken in a series of densely overlapping photos to minimize the effects of lens distortion for use in surveillance, cartography, or other purposes where accuracy in measurement was important. While useful, the resulting photos also create stereoscopic sets that are ideal for analysis using photogrammetric methods. These techniques allow researchers to generate three-dimensional reconstructions of the landscape as it existed when the photos were taken. The resulting models can then be compared to models generated from modern imagery to examine landscape dynamics on a regional or local scale at extraordinarily high resolutions. Very small changes to the landscape, and to individual archaeological sites can be mapped, measured and analyzed. In some cases, it is even possible to explore sites that have ceased to exist today.

This article presents selected case studies from North and South America demonstrating some of the unique capabilities of this innovative approach to quickly and efficiently address archaeological questions.

Travassos, Daiana [213] see Iriarte, Jose

Trein, Debora (University of Washington) and Thomas Hart (Franklin and Marshall College)

[37] *Not Your Backyard Garden: Terraces in the Shadow of La Milpa's Temples*

Terrace construction for agriculture was integral to the survival and growth of ancient Maya centers in the Lowland Neotropics. Terraces supplied communities with food for consumption and trade, materials for construction and goods production, and plants of medicinal and ritual significance.

Research into ancient Maya agricultural practices has been largely situated in wetlands contexts, known to be sites of extensive landscape modification for agricultural purposes. Nevertheless, terraces are also identified as being integrated into the architectural arrangement of the cores of large urban

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centers throughout the Maya Lowlands. This paper discusses one such set of terraces, built and maintained adjacent to the public monumental core of Classic-period La Milpa, the third largest ancient Maya urban center in Belize. Excavations conducted on this system of terraces, positioned in the shadow of the three largest monumental temples at La Milpa, uncovered a series of modestly constructed retaining walls spanning the crest and shoulders of a 7 m-high limestone outcrop. This presentation examines some of the preliminary results from these excavations, and provides a discussion of the methods that will be used to identify the types of plants that were cultivated on these urban terraces, emphasizing macro-botanical, phytolith, and starch analyses.

Tremain, Cara (Langara College)

[139] *Taking Ancient Maya Vases off their Pedestals: A Case Study in Optical Microscopy and Ultra Violet Light Examination*
Ancient Maya polychrome vases, especially those that are decorated with elaborately painted scenes, fill the display cases and collection drawers of museums and galleries around the world. Unfortunately, the majority of these are unprovenanced and many also lack clear provenance. Furthermore, modern restorations and/ or falsifications further muddy our understanding and blur the line between authentic and inauthentic. In order to learn more about these ceramics, and help to restore some of their life histories, detailed visual inspection and tactile examination is necessary. Situating such research within conservation departments is wholly appropriate because it allows for the application of specialized, non-invasive, equipment such as optical microscopy and ultra violet light. This paper discusses research undertaken by the author while a Smithsonian Pre-Doctoral Fellow at the National Museum of the American Indian, where more than 25 ancient Maya ceramics were investigated at the Cultural Resources Centre conservation department.

Tremblay, Roland [77] see Tache, Karine

Triadan, Daniela (University of Arizona) and Takeshi Inomata (University of Arizona)

[80] *The Roots of Urbanization: Early Middle Preclassic Transformations to a Sedentary Lifestyle at Ceibal, Guatemala*
Our research at the Maya site of Ceibal, Guatemala, has led to new insights into processes involved in the transition of mobile hunting and horticultural populations to a more sedentary lifestyle and emergent social inequalities. Like in other areas of the world, the first architectural constructions at Ceibal, were public-ritual configurations, built communally by a still mobile population around 950 BC. Sedentism developed gradually and may have first involved people with higher social status and who may have been involved with carrying out public ritual performances. These early ritual constructions, often called an E-Group assemblage, set the stage for the first settlements and the accelerating urbanization of Maya settlements in the Preclassic.

Triadan, Daniela [147] see Inomata, Takeshi

Tricarico, Anthony (University of South Florida)

[208] *Chair*

Tricarico, Anthony [208] see Waters, Christopher

Trigg, Heather (Univ Massachusetts Boston)

[104] *Space and Architecture at LA 20,000, a 17th Century Spanish Ranch*
Domestic space both reflects the social order and contributes to its construction. In early colonial New Mexico, houses and other architecture created arenas in which social interactions among Spanish colonizers and indigenous peoples played out and ethnogenesis took place. Moreover Spanish economic production was household based, occurring primarily at rural ranches and mission compounds; consequently, the built environment at households also framed economic activity. Here, we explore the architecture at LA 20,000, a 17th-century Spanish ranch located southwest of Santa Fe. LA 20,000 was the home of colonizers and their workers and slaves, and produced basic subsistence goods. In this poster we reconstruct the physical layout of the ranch, exploring the creation of the architecture, the buildings' functions, and remodeling and destruction episodes. Archaeological investigations of this site have identified a series of corrals, a large multi-room domestic structure, a large barn, and other buildings. Artifacts and environmental samples complete the picture of economic activities taking place at the site. As the social context of cross-cultural interactions on a micro-scale, the physical context of this site was an important location for the exchange of information among Spanish colonizers and indigenous peoples.

[259] *Discussant*

[104] *Chair*

Trigg, Heather [104] see Huerta, Danielle

Trimble, Michael (U.S. Army Corps of Engineers)

[326] *Introduction to the USACE Veterans Curation Program*

For the last 100 years, the U.S. Army Corps of Engineers (USACE) has been accumulating archeological materials that require, by laws and regulations, adequate care that ensures continued preservation. USACE administers one of the largest archaeological collections in the country. However, these materials are in less than optimal condition. Overseas contingency operations have increased the number of veterans that lack the essential skills for the current job market. The Veterans Curation Program (VCP) was created to address these two needs with a single and effective solution. The VCP invests in service members by providing competitive pay and technical training to bolster existing skillsets. At VCP laboratories, the irreplaceable archaeological assets administered by USACE are repackaged and recorded using the most current techniques to ensure the safekeeping of our nation's cultural resources for future generations. To date, over 400 veterans have benefited from the program, of which 90% have either obtained employment or matriculated to colleges, universities, or certificate programs following program completion. With the passage of Public Law 114–189 in 2016, the VCP was codified, ensuring the program can continue to hire, train, and employ veterans and members of the Armed Forces while assisting in the curation efforts of USACE.

[326] *Chair*

Tringham, Ruth (Univ of California-Berkeley)

[172] *Discussant*

Tringham, Ruth [309] see Danis, Ann

Trinidad-Rivera, Gelenia (University of Puerto Rico—Rio Piedras Campus)

[57] *Altering the Walls of Domesticity: Late 19th Century Modifications to Households in San Juan, Puerto Rico*

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Urban archaeology can help us understand the evolution of specific habitational spaces and shed light to investigations related to domestic life and issues related to daily life necessities. This paper will trace the modifications completed to buildings within the walled city of San Juan in the late 19th century. A selection of structures was made based primarily on the permit requests and blueprints submitted to the local government which can be consulted at the Archivo General de Puerto Rico. Each case was supplemented with information taken from a variety of sources that include maps, photographs, census data and ownership records to develop a virtual map. Taking into consideration that space is an important component in the process of daily life choices, and the development of a domestic environment, this study will provide a connection between the people who occupied these buildings in the past and today.

Trinkl, Elisabeth [118] see Rieke-Zapp, Dirk

Triozi, Nicholas

[35] *Competing with the Crown: Early Spanish Mission Settlement Decisions in a Human Behavioral Ecology Model*

Models developed from principles in human behavioral ecology have long benefited archaeological research. Drawing on natural features in the modern landscape, locations of prehistoric settlements can be evaluated in terms of calculable suitability. Such models also have predictive potential, as they can rank loci in terms of any combination of environmental conditions appropriate to the archaeological context being investigated. Where available, careful examination of ethnohistoric and cartographic documentation have pointed to parsimonious locations validated by excavation. When this documentation is unavailable, surface collections or remote sensing will afford some surveyed areas a second look. Such has been the case for the archaeology of many 16th- and 17th-century Spanish missions in the Southeast U.S. This paper considers environmental conditions and cultural landscapes encountered by Spanish missionaries, confirmed mission loci, and the royal directives for new mission towns as criteria for a testable, predictive model of early Spanish mission settlement locations. Using the ideal despotic distribution as a scaffold, criteria in this model are affected by the competition between royal ordinances and the "realities" of the natural and social landscape experienced by 16th-century Spaniards as they navigated the Atlantic coast of La Florida.

[35] *Chair*

Tripp, Jennifer [219] see Stevens, Rhiannon

Tritsch, Michael (The Johns Hopkins University)

[32] *Banqueting with Tutankhamun: A Case Study in Determining the Function and Meaning of an Unprovenanced Artifact*

A striking example of the sophistication of the vitreous materials industry at the time it was produced, a faience bead depicting Tutankhamun drinking from a white lotus chalice possesses tremendous symbolic meaning that reflects the mores of the ancient Egyptian culture of the time. Although a published piece from the Eton College Collection, this is the first time extensive research has been performed on this unprovenanced artifact bought on the antiquities market in the late 1800s. Production of the bead occurred at the end of the Amarna Period during the reign of Tutankhamun and the return to orthodoxy of Egyptian culture. A comprehensive physical analysis of the bead confirmed its material composition as faience and indicated the process utilized in its production. Through the in-depth analysis of the components of the image, the iconography established it as a potent fertility symbol representative of royal regeneration. Then, based on the findings, the original appearance of the bead and its associated collar has been reconstructed, followed by a suggestion of its function in Egyptian society. The method of analyzing this complex artifact undertaken herein allows for the interpretation of an unprovenanced find in determining its meaning, use, and cultural significance.

Trivedi, Mudit (University of Chicago, Graduate student)

[56] *The Archaeology of Religious Conversion: Virtue and Tradition in the Indor Valley, North India*

This paper presents the results of an extended project directed at an archaeological investigation of religious conversion to Islam in South Asia. The project combined extensive regional survey, excavations and architectural documentation focused upon the site and valley of Indor, located in the region of Mewat on the borders of Rajasthan, North India.

The medieval residents of Mewat were stereotyped in contemporary imperial chronicles as primitive rebels, living in a forested hilly backwater, beyond the pale of civilized politics. After conversion to Islam in the fourteenth century CE, one group amongst them came to be known as the Khanzada lineage. The Khanzada founded Indor, a fortified city as monumental as any other in the region, and over the next five centuries, a salient attachment to place and a distinctive material repertoire were intrinsic to the Khanzada tradition.

This paper presents a contextualization of the site, its rapid emergence and the variable decline of its urbane capacities over 5 demonstrable phases of settlement in the Indor valley. Through analysis of the unprecedentedly rich assemblages of monumental sepulchral architecture and ornaments from Indor, it argues for the salience of the categories of tradition and virtue for the archaeology of religion.

Troccoli, Ruth (D.C. City Archaeologist) and Josh Silver (Lead Planner for Strategic Initiatives and Partner)

[251] *A New Frontier: Archaeology and Heritage Management Meet Urban Planning and Creative Placemaking*

Heritage Placemaking is a thing—embrace it! Learn from our mistakes. The DC Office of Planning received a grant from the Kresge Foundation to engage in creative placemaking by artist/curators with the goal of activating underused public spaces. The DC Archaeology Program saw this as an opportunity to engage in a novel form of public outreach funded by someone else. Despite best intentions, false starts, permitting issues, need for cultural sensitivity, and last-minute directives, the archaeology- and heritage-themed intervention "If YOU Lived Here" was a smashing success. Incorporating African American archaeology and history of the post-Civil War Barry Farm Freedman community, the artist/curator came up with a moving public art installation, and pushed us out of our comfort zone into a new and scary realm with its own vocabulary, processes, metrics, and requirements. Our partners included the Smithsonian's Anacostia Community Museum and the NPS.

Troncoso, Andrés [74] see Méndez, César

Troskosky, Christopher (University at Buffalo), Erika Ruhl (University at Buffalo), Sarah E. Hoffman (University at Buffalo), Torill Christine Lindström (University of Bergen) and Ezra Zubrow (University at Buffalo)

[34] *A Small Rock Holding Back the Waves*

Islands are both understudied and spatially constrained, with often turbulent colonial histories. This paper reconsiders the conceptual basis of intra- and inter-island relationships in the context of archaeology. We argue that islands need not be isolated as geographic, ecologic or cultural entities and have not been so during the proto-historic and prehistoric periods. Using 21st century equilibrium theory and gateway theory we suggest that islands may be

in some contexts central places. We conclude that if one views the complex and dynamic interconnections of settler and indigenous identity through the lenses of locality, steady state sustainability, heterogeneity, gradualism, and interdependence, that a supply side analysis indicates that there are strong forces which influence the colonialism of islands towards vertical relationships of the trade dynamic if not the processes of production

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themselves. Examples are provided from the Northern Latitudes including the islands as Osterøy and Radøy in Norway along with analogous examples from Aland and Lofoten and the Kiril and Aleutian island chains.

Troufflard, Joanna (University of Florida)

[116] *Understanding the Tapajó Socio-political System through the Study of Landscapes and Material Culture*

The socio-political organization of the Tapajó people living in the Lower Amazon region during late precolonial times has been studied through two main sources: contact chronicles and archaeological data coming from the Santarém site located at the mouth of the Tapajós River. Based on these sources, researchers have formulated three models to explain the socio-political organization of the Tapajó. However, recent surveys and excavations conducted in the upland Belterra plateau provide new data on ceremonial and domestic contexts and call for a re-evaluation of these models of social complexity. My project compares landscapes and material culture of riverine and upland settlements in order to challenge previous models of social complexity and formulate a new model that looks at the Tapajó occupation at a broader regional scale. Based on results of the upland Cedro site ceramic analysis and the comparison between riverine and upland sites, I argue that the Santarém and Cedro sites were organized as primary and secondary centers and maintained a heterarchical relationship during the late precolonial period.

Trousedale, William B. [3] see Allen, Mitch

Troutman, Michele (Binghamton University)

[41] *Spatial Distribution of Stone Tools at Peyre Blanque*

Ancient people's organization of their social space can inform us about the kinds of activities that take place on a site. However, before making any cultural interpretations, the site's stratigraphic and formation processes need to be considered. The goal of this research is to examine how lithic tools are spatially arranged at Peyre Blanque to gain a better understanding of the site organization and how stratigraphic processes may have affected the artifacts. Peyre Blanque is an open-air camp related to an early phase in the Middle Magdalenian—roughly between 18,000 BP and 20,000 BP—located in southern France, north of Fabas, Ariège (Lacombe et al. 2012). Most artifacts are plot-pointed using a total station, so their horizontal and vertical location is known. Information about the stone tools, including their spatial location, classification “type” (such as a burin or scraper for example), maximum width, maximum length, weight, and contextual notes of nearby objects and features (such as roots and burrows) were examined. The artifacts are mapped in ArcGIS and some statistical analyses were used. There are several clusters of tools that show a differentiation of space at Peyre Blanque that appear to be more cultural than post-depositional in nature.

Truhan, Rebekah (University of Iowa)

[239] *The Grateful Dead: A GIS Approach to Determining the Correlation between Habitation Sites and Burial Sites in the Woodland Period in Iowa*

A powerful function of GIS is to look at spatial distributions of different components of settlement systems. During the Woodland Period, there appears to have been fundamental changes in economic and social organization, during the transition from hunting and gathering to substantial dependence on maize agriculture. Increasing dependence on maize agriculture appears to be correlated with increases in population and number of sites in the Late Woodland. What is less clear is the relationship between the number of burial mounds and the decreasing prominence of elite burials. While there has been an abundant amount of research conducted in locating mounds and burial sites using Geographic Information Systems (GIS) technology, there has been very little research done in looking at the correlation between burial sites and habitation sites in the Midwest region of North America. This project focuses on the Woodland period in the state of Iowa, which lasted from 500 B.C. to 1000 A.D., and will look at how the spatial distribution of these sites changes from the Early, Middle, and Late Woodland periods. This will be done by using the program Arc GIS, and the 1412 distinct habitation and burial sites in Iowa.

Truhan, Rebekah [89] see Stroth, Luke

Tsartsidou, Georgia [298] see McNamee, Calla

Tsosie, Lenora [138] see McBrinn, Maxine

Tsouras, Theodore (Logan Simpson), William Bryce (Logan Simpson) and Michael L. Terlep (Logan Simpson)

[27] *Becoming Virgin in Jenny Clay: An Analysis of Settlement Evolution and Kayenta Intrusion in Southern Utah*

Based on recent pedestrian survey of approximately 1,500 acres of BLM-managed land in the Grand Staircase-Escalante National Monument of southern Utah, this paper examines new evidence from 129 archaeological sites that demonstrates a deep settlement history as well as both expected and unexpected changes resulting from the so called “Kayenta Intrusion” of the Pueblo II period. The Jenny Clay study area is located in a broad alluvial valley surrounded by the Vermillion Cliffs, and contains several key resources that likely contributed to significant prehistoric settlement. Deep alluvium overlaid with thin to substantial aeolian sediments provided a range of opportunities for dry-farming agriculturalists; naturally occurring and often high quality petrified wood is readily available throughout the study area; water is available from perennial springs; and the study area is part of a deer migration corridor. While evidence of prehistoric use ranges from the late Paleoindian through to early Pueblo III periods, the primary settlement of the study area consists of substantial Virgin Anasazi occupation during the Pueblo II period. Through examination of architecture, ceramics, and site layout, this paper examines how the predominately Virgin Anasazi pattern is punctuated and potentially negotiated by migrants from the Kayenta region to the south.

Tsukamoto, Kenichiro (Department of Anthropology, University of California, Riverside), Fuyuki Tokanai (The Center for Accelerator Mass Spectrometry, Yama) and Toru Moriya (The Center for Accelerator Mass Spectrometry, Yama)

[18] *Building a High-Resolution Chronology: A Case from the Maya Archaeological Site of El Palmar, Mexico*

This paper aims to refine the Maya chronology during the Classic period (A.D. 250–950) through the development of Bayesian models. In so doing, we combined radiocarbon dates with stratigraphic information, ceramic data, burials, and calendric dates from stone monuments. At the Center for Accelerator Mass Spectrometry of Yamagata University, we ran 78 radiocarbon samples recovered from the Guzmán Group, an outlying group located 1.3km north of El Palmar in southeastern Campeche, Mexico. To establish the ceramic sequence of the Guzmán Group, we used the type:variety-mode system that enables us to detect subtle changes in their forms and technologies. Furthermore, we reinforced the ceramic analyses through petrographic microscope. While the results of radiocarbon samples date from the Preclassic to the Terminal Classic period, this paper focuses on the second half of the Classic period (A.D. 600–950), a time of political turbulence in which the inhabitants of the Guzmán Group became involved.

Tsukamoto, Kenichiro [37] see Cerezo-Román, Jessica

Tsurumi, Eisei (The University of Tokyo), Cesar Sara (Pontificia Universidad Católica del Perú) and Yuichi Matsumoto (Yamagata University)

[178] *Settlement Pattern Study on the Early Occupations in the Upper Huallaga Basin, Northern Peru*

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The excavations at Kotosh by Japanese team during the 1960s demonstrated that in the Upper Huallaga Basin there are many archaeological sites corresponding to the time of the early development of Andean Civilization. One of the most important contributions of these studies is a fine-grained regional chronology from the Late Preceramic Period to the end of Early Horizon. The subsequent investigations in Cajamarca region of northern highland since the 1970s successfully elucidate diachronic process of early socio-economic transformations. This led us to re-examine the early cultural sequence the Upper Huallaga Basin after a half century from the excavations at Kotosh by incorporating new data set obtained from our most recent excavations there in 2016.

Tsurumi, Eisei [64] see Sara, Cesar

Tucker, Carrie, Jeffrey B. Glover (Georgia State University) and Dominique Rissolo (University of California, San Diego)

[330] *A Tale of Two Ports: A Preliminary Assessment of Ceramic and Artifactual Assemblages from Conil and Vista Alegre*
Coastal communities in the Maya Lowlands played a myriad of roles in the ebb and flow of political, economic, and social formations over the past 3000 years, yet these roles have remained along the periphery of Maya studies. Though ever present, Maya coastal sites were atypical—perhaps even idiosyncratic—in terms of how they were imagined and lived-in by the Maya. Critical to our understanding of these coastal settlements is the material culture traded and utilized by the occupants of these sites. In this paper we present our preliminary analysis of the ceramic and artifactual assemblages collected at the neighboring ancient Maya port sites of Vista Alegre and Conil during the 2016 and 2017 field seasons. Research at both sites included survey work and surface collection, off-structure test excavations, and architectural excavations. Aside from the strikingly high concentration and deeper deposits of material culture at Vista Alegre in comparison to Conil, these excavations have provided a better understanding of both sites' chronologies and their relations with other parts of the Maya and Mesoamerican world.

Tuki, Mario [101] see Sullivan, Kelsey

Tuller, Hugh [282] see Elgerud, Lucia

Tun Lynn, Saw [56] see Iannone, Gyles

Tune, Jesse (Department of Anthropology, Fort Lewis College)

[120] *Assessing Biface Reduction and the Ideal Use-Life of Fluted Bifaces*
Various methods have been developed to assess the use-life of Paleoindian bifaces by focusing on morphological attributes. Comparative studies have often proven difficult in part because of the diverse nature of Paleoindian biface technologies in North America. While morphological ratios such as length-to-width vary considerably throughout biface use-lives, technological ratios related to fluting and lateral grinding typically remain more constant. In turn, technological variables may be more meaningful, and have the potential to inform us about decision making processes related to lithic technologies, i.e. when bifaces were discarded versus refurbished. The study sample analyzed here was selected to minimize external factors that could influence biface manufacture, such as raw material availability and package size. Fluted Clovis and Cumberland bifaces from the Lower Tennessee River Valley were selected because of the abundance of toolstone that is readily accessible throughout the region. Technological ratios and biface conditions were used to develop a general model for the ideal use-life of fluted Clovis and Cumberland bifaces.

[120] *Chair*

Tune, Jesse [182] see Miller, D. Shane

Tung, Tiffany A. [270] see Smith, Emily

Turchin, Peter [105] see Johnson, Amber

Turley, Cameron (The Graduate Center, CUNY)

[196] *Centering Alluitsoq: The Potential for an Indigenous Archaeology in Greenland*
Postcolonial and Indigenous archaeologies have changed the theoretical, methodological, and political landscapes of our discipline's engagement with regions and peoples once conceptualized as peripheral to the European core. However, some regions, and the subjects that move within them, still occupy the conceptual margins. This paper considers the position of archaeological praxes in Greenland, a constituent of the Kingdom of Denmark, and the late arrival of the postcolonial critique to Greenlandic archaeology. A new research project at Alluitsoq, formerly the German Moravian mission of Lichtenau, is taking up the agenda of the postcolonial critique and the movement toward an Indigenous archaeology. Using Alluitsoq as a case study, this paper discusses the implementation of theoretical and methodological strategies to center new subjects in a region dominated by Euro- and Paleo-focused studies. The author and a Greenlandic scholar are working together to collect oral histories from the now-dispersed descendant population of Alluitsoq to bring the community to the interpretive table. It is our hope that collaborative efforts in project design, fieldwork, and interpretation will all contribute to a decolonized archaeological practice in Greenland and produce usable narratives of the past for and by Greenlanders, who today struggle with the question of complete independence.

Turley, Cameron [34] see Madsen, Christian K.

Turnbow, Christopher (New Mexico Gas Company) and Robert Forrester

[91] *The XSX Ranch Site: Excavations of a Late Classic Mimbres to Early Post Classic Pueblo in the Upper Gila Forks, New Mexico*
The XSX Ranch site (LA 50702) is a multicomponent occupation located on the East Fork of the Gila River in Grant County, New Mexico. Between 1980 and 1992, Robert E. Forrester, a chemist from Texas, excavated 10 pithouses, 32 pueblo rooms in five roomblocks, and 91 burials at the site. In his little-known excavation reports, Forrester suggested the site was a Classic Mimbres occupation reoccupied by a Reserve/Tularosa population; however, in a review of his data, the site may best be interpreted as a medium-sized transitional late Classic Mimbres to Early Post Classic pueblo. This poster examines the site's architectural remains, mortuary patterns, and related funerary ceramics in comparison to other excavated Classic Mimbres occupations in the Forks region and using those data, suggests other sites that may have been occupied in the Gila Forks between circa AD 1130 and 1200.

Turner, Andrew D. (Yale University)

[209] *Weapons of the Sun: Centipedes and Fire Serpents in the Art and Symbolism of Ancient Mesoamerica*
In a myth that provided a charter for Mexica domination of Central Mexico, the deity Huitzilopochtli defeated his foes with a spear-thrower in the form of a fire serpent, or Xiuhcoatl. While Huitzilopochtli was a being unique to the Mexica, the Xiuhcoatl is generally considered to derive from an earlier entity referred to as the Teotihuacan War Serpent. Although the influence of Teotihuacan symbolism on later cultures of Central Mexico is undeniable, the portrayal of solar deities with supernatural zoomorphic weapons is more readily apparent in art of the Late Classic Maya Lowlands. Classic Maya solar

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deities and rulers often wield lances in the form of skeletal centipedes with protruding tongues made of flint. This paper explores the relationship between supernatural centipedes and fire serpents and argues that Maya conceptions of solar weaponry contributed to the development of the bellicose sun gods of Late Postclassic Central Mexico.

Turner, Andrew D. [264] see Guernsey, Julia

Turner, Grace (The Antiquities, Monuments & Museum Corporation)

[337b] *The Struggle to Maintain an African Cultural Identity: The Case of the Bahamas*

Once the British Parliament abolished the trans-Atlantic trade in African captives the Bahamas became a primary locale for the re-settlement of these persons. Between 1811 and 1860 some 6,000 liberated Africans, as they were called, were re-settled in the Bahamas. These Africans served apprenticeship periods of six to sixteen years, at the end of which they were to be free. Archival documents and archaeological evidence suggest that these indentured Africans were able to maintain a stronger African cultural identity as they settled into their new lives in these tiny islands in the Americas. However, an 18th century black cemetery in Nassau indicates that, long before this population of 'unacculturated' Africans were being settled in the Bahamas, earlier communities such as this one were devising means for allowing members of their communities to express and maintain their African cultural identity. These examples provide insight on the processes through which African peoples in the Americas managed to adjust to new lives in new environments.

Turner, Michelle (Binghamton University)

[27] *The Politics of Mud, Masonry and Landscape at the Aztec North Great House*

The Aztec North great house is a monumental Chaco-era building at Aztec Ruins National Monument, in northern New Mexico. Its size, its shape and its dramatic hilltop siting all echo construction norms for other great houses at Chaco Canyon and its outliers, but excavation revealed a surprising set of architectural features. In addition to a fairly typical great house artifact assemblage, we found Chaco-style wall foundations and masonry veneers, but non-Chacoan adobe wall cores. Drawing on ideas of social landscape and the materiality of mud and masonry construction, this paper explores the cultural and sociopolitical meaning of these architectural choices. Building with both adobe and stone implies a different organization of labor than a masonry structure, and perhaps participation by a wider subset of the community. Moreover, the adobe and its extravagant use of water differentiate this building from other Chaco-era structures. How might questions of labor and construction choices illuminate our understanding of political forces? Within the context of Aztec Ruins as a riverside community in an arid region, this paper considers the phenomenology of stone and mud construction, explores ideas of home and tradition, and connects the site to a greater social and political landscape.

[27] Chair

Turney, Kathryn (University of Oklahoma)

[42] *Land and the Social Consequences of Land Loss: Navajo Oral History, Ethnoarchaeology, and Spatial Analysis at Wupatki National Monument, Arizona*

There is a contentious history between Navajo families living in the Wupatki Basin, ranchers, and the National Park Service. The creation of the monument in 1924 gradually displaced indigenous residents from ancestral homelands leading to loss of territory and connection to family. Here I focus on change in Euroamerican demands for land and federal management policies, as well as Navajo kinship, family dynamics, and oral history as told by descendants of the first Navajo settlers in the Wupatki Basin.

Using spatial analysis of settlements to discern Wupatki Navajo land use patterns before and after the establishment of the monument, I demonstrate the historic and ongoing importance of land and the social consequences of land loss for Navajo people. My findings are that the intersection of external pressures and internal factors led to disruption of traditional lifeways, values, and family, as well as loss of connection to culture.

Tuvshinjargal, Tumurbaatar [304] see Taylor, William

Twiss, Katheryn (Stony Brook University), Melina Seabrook (Stony Brook University) and Michael Charles (Oxford University)

[71] *Plant and Animal Remains from Old Babylonian Ur*

Archaeologists have been examining the great cities of ancient southern Mesopotamia for well over a century now, but as yet we have limited understanding of their subsistence economies. For decades researchers more or less ignored the wealth of faunal and botanical remains in and around ancient Mesopotamian architecture. Over the course of the twentieth century researchers began to recover animal bones and teeth, but as few digs dry-screened or floated their soils the resulting assemblages could not reveal the realities of ancient animal and plant management and exploitation. We present on fully screened and floated deposits from Old Babylonian (first half of the second millennium BCE) levels at the famed site of Ur. We compare and contrast remains from household middens inside the ancient city. We summarize plant and animal taxonomic proportions as well as animal skeletal element distributions and taphonomic characteristics. We provide a brief overview of the revealed Old Babylonian economy and discuss the extent of economic differentiation at Ur.

Two Bears, Davina (Dartmouth College Charles Eastman Fellow)

[337c] *Discussant*

Tykot, Robert H. (U. of South Florida) and Andrea Vianello (U. of South Florida)

[77] *Prehistoric Obsidian Use in Southern Italy: Primary Acquisition and Down-the-Line Exchange in Calabria, Basilicata, and Campania*

Obsidian was a significant component of daily life in southern Italy during the Neolithic period (ca. 6000–3000 BC). Intensive surveys by Ammerman and colleagues in the 1970s identified a widespread presence of Neolithic obsidian in Calabria, generally thought to have come from the island of Lipari, mostly on the basis of its being the closest, along with general visual characteristics. While it was also thought possible to have small amounts of obsidian from the further away tiny island of Palmarola, only Lipari obsidian was present in the ~50 artifacts chemically analyzed.

Since then, extensive geological study of Lipari and the other Mediterranean obsidian sources has been conducted, while in the last ten years thousands of obsidian artifacts have been tested using non-destructive, portable X-ray fluorescence (pXRF) spectrometers. Specifically, about 2400 obsidian artifacts from the regions of Calabria, Basilicata, and Campania were analyzed from 2014–2017. The results fully support Lipari as the major resource, but obsidian from Palmarola, Pantelleria, and from multiple Sardinia subsources have also been identified in the region. The location and type of archaeological artifacts has been incorporated into our interpretation of the social dynamics of production and exchange during the Italian Neolithic revealing a vibrant exchange network.

[112] *Discussant*

Tykot, Robert H. [23] see Tafani, Aurelien

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Uchida, Junko [24] see Mizoguchi, Koji

Uehlein, Justin [39] see Thurber, Hali

Ugalde, Paula (School of Anthropology, University of Arizona), Calogero Santoro (Universidad de Tarapaca (IAI)) and Eugenia M. Gayo (Universidad de Concepcion & (CR)2)

[200] *Weathering of Surficial Lithic Assemblages in the Hyperarid Core of the Atacama Desert, Chile*

Surficial archaeological sites are widespread in arid environments. However, due to the difficulties in numerically dating them, they are usually considered as coarse indicators of past behaviors. Here, we explore the use of lithic weathering to develop local relative chronologies, and to better incorporate these assemblages into archaeological research. We test whether the most weathered artifacts should be considered the oldest; an assumption that has informally served to compare assemblages. Through macroscopic analyses, we compared seven surficial mid-to-late Holocene lithic assemblages from different micro-environments of the Atacama Desert, northern Chile. By recording changes in polish, texture, shine and color, we established that weathering varied significantly between two main locations: interfluvial and canyon sites. Lithics from interfluvial sites showed a dark coating and were moderately to highly weathered, whereas canyon lithics were mildly weathered and uncoated. This means that even within the hyperarid core of the Atacama, lithics of roughly the same age, are differentially weathered. We conclude that wind is the main weathering agent, mostly affecting artifacts deposited on inactive terraces or interfluvial sites, where they remain persistently at the surface. Consequently, we stress the importance of considering taphonomic, geomorphologic and archaeological factors together when trying to establish relative chronologies.

Ugan, Andrew [44] see Morales, Jessica

Ullah, Isaac (San Diego State University), Yesenia Garcia (San Diego State University), Paula Kay Lazrus (St. John's University), Nicholas Ames (University of Notre Dame) and Meredith S. Chesson (University of Notre Dame)

[54] *Historic Water Management Infrastructure in the San Pasquale Valley, Calabria, Italy*

Over the last several field seasons, the Bova Marina Archaeological Project has been documenting the timing of construction and the physical characteristics of the original water management infrastructure as well as documenting the changes in the natural and social systems of the San Pasquale Valley in Calabria, Italy. The Valley was recolonized in the 19th and early 20th centuries for both large scale bergamot plantations and by peasant farmers. With large scale population exodus from the Valley in the post-war period, much of this infrastructure is now also falling into disrepair, and the frequency and severity of damage from flash flood hazards is increasing. We have documented these processes through geoarchaeological and archaeological survey, interviews with the few remaining landowners in the region, and archival research. This poster showcases what we have learned about the social and natural processes at play in this community with regards to water management, and discusses the extent of damage that is now occurring each rainy season.

[161] *Discussant*

[258] *Chair*

Ullah, Isaac [54] see Chesson, Meredith S.

Ulloa Hung, Jorge (Postdoctoral Researcher ERC Synergy-NEXUS 1492)

[123] *Cultural Diversity and Transculturation in the Pre-Columbian Indigenous Universe of Northern Hispaniola*

The island of Hispaniola has been considered an initial place by the formation of creole cultures in the Caribbean and the Americas. This consideration has been founded on the study of the socio-economic dynamics and cultural transformation generated by the European colonial irruption, especially the creation of first Spanish colonial settlement on the island. At the same time, generate an excessive dependency of archaeological data of ethnohistorical sources, and formalized a reductionist interpretation and a historical division in the study of the creolization process. This point of view has ignored essential aspects of cultural diversity, socio-cultural interactions, and the transculturation among indigenous communities since pre-Columbian times.

This presentation addresses, from archeological data and historical criticism, cultural plurality and transculturation among indigenous communities that inhabited northern Hispaniola prior to the European colonial invasion. It also evaluates its possible impacts on the emergence of a Creole culture in that region.

Ulloa Hung, Jorge [275] see Hofman, Corinne L.

Ummenhofer, Caroline [213] see Buckley, Brendan

Unger, Jiri [118] see Kvetina, Petr

Upton, Andrew (Michigan State University)

[26] *Conflict, Migration, and the Transformation of Network Interrelationships in Mississippian West-Central Illinois: A Multilayer Social Network Analysis*

Prior scholarship on intercultural contacts emphasizes interaction spheres, hybridization, technological transfer, or models of exchange as measures for constructing borders and defining societal membership. This presentation assesses how network relationships among complex and smaller-scale societies structured, and were restructured by, migration. Network models of social interaction and social identification are examined both prior to and following a migration process in a uniquely bellicose frontier region. In particular, the presentation addresses the role of ceramic industry in the transformation of communal scale interaction and identification networks across the middle to late Mississippian transition in the Late Prehistoric central Illinois River valley (ca. A.D. 1200–1450). Network models are analyzed to better understand how a circa 1300 A.D. in-migration of an Oneota tribal group restructured social relationships in a Mississippian chiefly environment and how communities of agents negotiated multicultural cohabitation in a region fraught with violence. A database of stylistic decorations elucidates categorical identification networks. Technological characterization data related to vessel form reveals interaction network models. Taken together, these networks create a multiple relations, or multilayer, network that is interrogated to demonstrate the role of network interrelationships as indicators of how both indigenous societies and migrant peoples approach intercultural social and economic relations.

Upton, Samantha

[188] *Archaeology on the Half Shell: Preliminary Analysis of Shellfish Consumption at Coan Hall (44NB11), Virginia*

Coan Hall is the site of the first English settlement on the Northern Neck of Virginia, established by John Mottrom, an English merchant-planter, around 1640. Mottrom resided there with his family, servants, and slaves until his death in 1655. His descendants occupied the house until the early 18th century. It was situated on the banks of the Coan River, a brackish tributary of the Potomac River that empties into the Chesapeake Bay.

Representative samples of shellfish, predominantly those of eastern oyster (*Crassostrea virginica*), will be analyzed from primary contexts at Coan Hall

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that represent three temporal periods: 1640s-1660s, 1670s-1680s, and 1710s-1720s. These periods correlate with phases of household occupation and with the demolition and filling of a large basement beneath the dwelling with domestic refuse from the nearby early 18th-century house that replaced Coan Hall.

Quantitative analyses will demonstrate whether there are measurable differences in the shellfish remains between contexts. We will establish whether shellfish were exploited from single versus multiple habitats and whether shellfish deposits represent single versus multiple harvesting episodes. This research will demonstrate the importance of shellfish to the diets of early settlers and explore the relationship between early colonists and the landscape of the Chesapeake Bay.

[90] *Chair*

Ure, Scott [68] see Searcy, Michael

Uribe, Mauricio

[257] *Incas, locales y otras identidades: Dinámicas materiales en el norte de Chile en tiempos del Tawantinsuyo*

Los estudios arqueológicos en Chile plantearon la ausencia de una conquista incaica propiamente tal en esta parte del Desierto de Atacama, puesto que sus poblaciones se hallaban insertas dentro de sistemas de complementariedad ecológica preincaicos, cuyas cabeceras o "señoríos" se encontraban en el altiplano del lago Titicaca. Y las que, una vez anexadas al Tawantinsuyo, implicaron un dominio casi automático de las restantes entidades ubicadas en lugares más alejados como las del norte chileno, situándolas en una condición periférica e incluso al margen del control cusqueño. Lo anterior ha redundado en plantearse la expansión y/o formación del Tawantinsuyo de manera dicotómica como una dinámica de presencia o ausencia, de incas y locales, centro o periferia, hegemonía o territorialidad, especialmente determinada por indicadores cerámicos y arquitectónicos. Esta situación, nos parece que invisibiliza la complejidad y heterogeneidad de los procesos expansivos e imperiales, sobre todo en sus dinámicas étnicas, identitarias y de clase, entendidas hoy como múltiples, ambiguas e incluso de resistencia. Gracias a los avances en la arqueología chilena, aprovechamos el marco de este simposio para discutir estas categorías desde el mismo análisis cerámico y arquitectónico a partir de distintos casos del Norte Grande, avanzando en la comprensión del fenómeno panandino.

Uribe, Mauricio [100] see Santoro, Calogero

Uriquizú, Mónica [163] see Scherer, Andrew

Urquhart, Kyle

[169] *Ireta: An Ethnohistoric and Archaeological Model of P'urépecha Urban Polities*

New archaeological research at the site of Angamuco, Michoacán, Mexico demonstrates unequivocally that the P'urépecha (Tarascans) had cities that before the formation of the Late Postclassic empire. This paper will reexamine the ethnohistoric and ethnographic evidence for the organizational structure of P'urépecha urban polities in light of the new archaeological evidence. The evidence presented here suggests a form of political organization superficially similar to the altepetl model of Nahua (Aztec) urban polities with nested political subdivisions that included both rural and urban areas. The descriptions presented in ethnohistoric documents are similar to archaeological patterns at Angamuco dating to at least the Early Postclassic. This indicates that many of the complex social institutions embedded within urban polities predate the formation of the Late Postclassic empire.

Urton, Gary (Harvard University)

[132] *The Tension between Standardization and Regionalism in Cord-Keeping in Tawantinsuyu*

Studies of the extant corpus of some 1,000 khipus from different regions around the former territory of the Inka Empire—Tawantinsuyu—show evidence of contradictory forces at work in terms of the forms and degree of standardization of recording structures and techniques. While, on one hand, there are marked differences in certain features of khipus from one region to the next throughout the empire, there are, on the other hand, notable similarities in other features. This paper examines the similarities and differences in khipus from archives around the empire—from the far north of Peru to northern Chile—to address the question of how cord-keeping represented a field of cultural and administrative practices that served state interests in the surveillance and control of subject populations in Tawantinsuyu.

Uruñuela, Gabriela (Universidad de las Americas Puebla), Patricia Plunket (Universidad de las Américas Puebla) and Héctor Aguilar (Universidad de las Américas Puebla)

[262] *"La del estribo": The Formative Funerary Goblets from Tetimpa, Puebla, Mexico*

A Mexican slang expression, "la del estribo" (one for the stirrup) refers to the extra glass before departing, the one that you take to continue your path. In many cultures, social drinking reinforces the collective fabric: to seal an accord, to pledge peace, or to celebrate the start or the end of an event. As death is the most crucial instance that both signals closure and new beginnings, today, as in the past, funerals often include libations. In the village of Tetimpa, some beverage was fitting for the last journey, since several of over a hundred burials have goblets. Their content is unknown, but as each house had, besides ollas for water, amphorae similar to those later used in Cholula for pulque, it might have been this or another fermented brew. Here we explore two aspects of the goblets: a) Do they show a modal distribution reflecting a unit of measurement?; and b) Is the volume of liquid they represent related to the deceased's importance as estimated by the mortuary expenditure (e.g., kind of deposit, specific location, "value" of the other offerings) or with the family's prominence as judged by residential investment (e.g., acreage, building dimensions and construction quality)?

Urwin, Chris (Monash University)

[114] *Excavating and Interpreting Ancestral Action—Stories from the Subsurface of Orokolo Bay, Papua New Guinea*

Orokolo Bay is a rapidly changing geomorphic and cultural landscape in which the ancestral past is constantly being interpreted and negotiated. This paper examines the importance of subsurface archaeological and geomorphological features for the various communities of Orokolo Bay as they maintain and re-construct cosmological and migration narratives. Everyday activities of gardening and digging at antecedent village locations bring

Orokolo Bay locals into regular engagement with buried ceramics (deposited during the ancestral 'hiri' trade) and thin strata of 'black sand' (iron sand). These deposits—both dating to within the past 700 years—provide material evidence for various spatio-temporal interpretations of the ancestor's actions and the structure of ancestral settlements. I conclude by examining how Orokolo understandings of their tangible past might interact with my own archaeological methods and results, and with proposed iron-sand mining on the south coast of Papua New Guinea.

[114] *Chair*

Usman, Aribidesi (Arizona State University)

[337b] *A Report of 2017 Archaeological Investigation at Okete-Kakini Palace Precinct, Idah, Niger-Benue Confluence, Nigeria*

This paper will report the 2017 excavation at Okete-Kakini site near the king's (Attah) palace in Idah. Okete-Kakini was the residential area of Attah's eunuchs (amonoji), one of the two major palace officials who carried out various functions for the Attah. The aim of the investigation is to identify the

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activities of the palatine elites through an examination of their material culture found in archaeological excavations. It is thought that the members of the palatine groups, like the formal elites, used their settlements and their day-to-day consumption to exhibit their status. The overall goal of the research was to have a better understanding of the social, political, and economic organization of Igalá and the intrasite distribution of materials.

Uzzle, Stephen (Cochise Community College) and Karen Schollmeyer (Archaeology Southwest)

[91] *Insights into the Salado Phenomenon from the Gila River Farm Site*

During the 2016–2017 Upper Gila Preservation Archaeology Field School, test excavations focused on the Gila River Farm Site [LA39315], located near Cliff, New Mexico. These excavations allow us to gain new insights into the Cliff phase (AD 1300–1450) in the upper Gila region. Despite evidence of looting and other disturbance, artifacts and data recovered here allow us to better understand several aspects of the Salado occupation of the site, including architectural styles, room function, resource procurement strategies, production and consumption, and possible trade and migration patterns. Comparisons of these patterns with other excavated sites in the Upper Gila area (including Dinwiddie and Ormand Village) carry interesting implications for understanding variability among Salado sites and the interactions of fourteenth-century site residents with contemporaneous groups.

Vacca, Kirsten (University of California, Berkeley) and Lisa Maher (University of California, Berkeley)

[295] *Exploring the Interpretative Roles of Microarchaeology, Ethnohistory and Ethnoarchaeology for Structuring Daily Life in Pre-contact Hawaiian Houses*

Ethnoarchaeology provides a useful tool for understanding material patterns in the archaeological record. However, caution must be exercised in the application of this method to avoid projecting data onto times and places that are no longer represented by contemporary practices. In this paper, the authors argue that ethnoarchaeology is most useful for projects that focus on the longue durée when used in conjunction with a combination of micro and macro archaeological methods. Specifically, the use of microartifacts and micromorphology in conjunction with analysis of excavated artifacts allow one to piece together site formation processes and material patterns that relate to specific activities. A case study utilizing Hawaiian house sites exemplifies this approach. The case study presented here analyzes data from 16th century house complexes, a time when daily practices were developing in ways not reflected in the (later) ethnohistories. However, this paper illustrates that utilizing complimentary micro and macro artifact analytical methods allows for a reconstruction of daily practices by comparing the data with the ethnohistorically-derived predictive models. The model for integration of ethnohistory is followed by a model for ethnoarchaeological work in Hawai'i that will further elucidate how repeated daily activities leave traces on the built landscape.

Vadala, Jeffrey (Five College Consortium—Hampshire College)

[320] *Discussant*

Vail, Gabrielle (UNC-Chapel Hill)

[209] *Cultural Legacies of the Classic Maya: The Postclassic Northern Maya Lowlands and Beyond*

Analysis of the iconography, hieroglyphic captions, and calendrical component of the Postclassic Maya codices, believed to derive from the Northern Maya Lowlands, provides important information about their possible antecedents. Portions of the Dresden Codex, for example, suggest clear links to the mural program painted on the interior of the Los Sabios structure from the site of Xultun, Guatemala, which includes a section with detailed calculations of a lunar cycle and another that may depict a yearbearer ceremony. Similarly, the Paris Codex includes calendrical tables that can be dated to the Classic period on the basis of astronomical referents, with hieroglyphic captions that likewise reflect this earlier time period. On the other hand, the Madrid Codex, likely produced in the eastern portion of the Northern Maya Lowlands, evidences broader networks of interchange, spanning the highlands of Puebla, Tlaxcala, and the central Mexican plateau. Commonalities include the structure of almanacs (including the in extenso and Formée Cross formats) and an emphasis on the 52-year Calendar Round with its quadripartite division of time and space.

Valamoti, Soutana-Maria [298] see Ntinou, Maria

Valcárcel Rojas, Roberto (Faculty of Archaeology, Leiden University)

[123] *Colonial Cuba: From Indian to Creole*

The construction of the Indian as a colonial category was one of the first resources of domination implemented by the Spaniards in the Antilles. The term with its social, economic and cultural implications served to homogenize and differentiate populations, to eliminate identities of origin and to build a destiny of subordination and disappearance. In Cuba this category was transformed over the last five centuries and adjusted to various historical circumstances. The historical and archaeological data of the Island indicate that the Indians did not maintain a passive attitude against the colonial power. They confronted or learned to interact with him and sought mechanisms of survival. Although mestizaje and acriollamiento have been seen as processes of ethnic and cultural neutralization of the Indian, and as part of the causes of their disappearance, they were also channels for their integration into the colonial world and have a determining role in the current survival of their legacy.

Valcárcel Rojas, Roberto [275] see Hofman, Corinne L.

Valde-Nowak, Pawel [29] see Brunswig, Robert

Valdes, Alejandro (INAH Michoacán) and Lissandra González

[55] *El Arte Rupestre en el Paisaje de la Tierra Caliente Michoacana*

La llamada Tierra Caliente, se ubica al sur del estado de Michoacán y abarca una extensa región que estuvo continuamente habitada desde hace miles de años. A pesar de las condiciones climáticas donde llegan a registrarse algunas de las temperaturas más altas del país, es una tierra llena de recursos naturales y fértiles tierras dentro de un paisaje de valles y sierras que han sido aprovechadas por los grupos humanos. Las fuertes condiciones y contrastes de la Tierra Caliente han llevado a desarrollar una forma de vida y expresiones culturales muy particulares. Dentro de esas expresiones culturales, se encuentran las manifestaciones gráfico-rupestres, donde las personas han dejado constancia de su morar en este espacio, siempre en estrecha relación con los elementos del paisaje. El objetivo del presente trabajo se centra en el uso de técnicas Fotogramétricas y de Sistemas de Información Geográficas, para llevarnos a una interpretación integral de los motivos representados, las distribuciones espaciales entre ellos, su interacción con el entorno natural y las intenciones de las personas que los grabaron.

Valdez, Fred (University of Texas At Austin)

[142] *Homogeneity, Diversity, and Complexity between Hinterland Communities of NW Belize*

The "hinterland" communities of northwest Belize are among the most diverse and complex across the Maya lowlands. The Rio Bravo Management and Conservation area of NW Belize serves as the region of interest with more than 25 seasons of Maya archaeological research. Utilizing survey and mapping strategies, material culture analyses, and theoretical concerns, the Programme for Belize Archaeological Project (PFBAP) defines new ways of looking at and interpreting ancient Maya interactions for the region. The social-political-economic reconstructions for prehistoric Maya relationships

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between communities of varying size and complexity are based on data and functional concerns of polity survival(s). It is with the considerations of complex relationships within and between communities that issues of production, identity, and equality are placed and defined.

[243] *Discussant*

[243] *Chair*

Valdez, Fred [173] see Krause, Samantha

Valdez, Francisco (IRD / France—Ecuador)

[178] *Mayo Chinchipe-Marañón Complex, the Unexpected Spirits of the Ceja*

The fringes of the eastern Andean slopes that conform Ecuador's Ceja de Montaña are a steep transitional zone between the cordillera highlands and the Amazonian lowlands, where altitude varies from 1800 to ca. 400 masl. The ceja is covered by a dense humid tropical forest that has been traditionally seen as unfit for the development of social complexity. In spite of the apparent adverse ecological conditions this region became an important cultural area around 5000 years ago. A precocious ceremonial center has been discovered recently in the area of the headwaters of the Mayo Chinchipe hydraulic drainage. The site, called Santa Ana—La Florida, shows a complicated stone architectural layout, where two opposing platform mounds mark the extremes of a sunken circular plaza. One of the platforms held a circular structure that has been interpreted as a temple. Under this platform several elite tombs were found. The funerary paraphernalia shows the importance of the regional interactions that connected the Pacific coast the Andean highlands and the Amazonian lowlands. The iconography depicted in the stone and ceramic vessels suggest a strong ideological structure that led and managed the population on a regional scale ideological

Valdez, Lidio (MacEwan University)

[132] *The Inca State and the Valley of Acari, Peru*

The south coast of Peru was one of the regions conquered relatively early by the expanding Inca state. Following its incorporation, a series of Inca administrative centers were established, all linked by a branch of the Inca road. Tambo Viejo was established in the Acari Valley. The south coast was, in general, incorporated peacefully into the imperial system; the administrative control exercised by the Inca state was likely to have been exerted through local authorities. However, Inca control was brief and probably lasted no more than fifty years. As a result, the residents of valleys such as Acari experienced little change in their daily life. The architecture of Tambo Viejo and the associated ceramics do not exhibit strong external influence, but rather a low impact of Inca traditions. Though material items display only minor changes, Inca ideology is more apparent in the manner in which the layout of the center was planned. Tambo Viejo, although built with architecture in the local tradition, was conceived following the standardized Inca structural pattern that included a large rectangular plaza and an enormous mound that very likely served as an ushnu.

Valdez, Velma (Tribal Historic Preservation Officer), Angela Neller (Curator, Wanapum Heritage Center) and Lourdes Henebry-DeLeon (NAGPRA Program Director)

[253] *Tribal Agency and Federal Hegemony: NAGPRA in Action*

Our knowledge and traditions tell us that the Ancient One is our Ancestor. We have requested repatriation for nearly twenty years only to be blocked at every turn. The final judgment made at the United States Court of Appeals for the 9th Circuit placed the Claimant Tribes in the status of "interested party" in the minds of the federal agency. This is the hegemonic framework the tribes found themselves in when the US Army of Engineers made the official determination that the Ancient One is Native American and is subject to the processes and procedures outlined in the NAGPRA. The Claimant Tribes took a proactive approach by putting forth a Request for the Disposition of the Ancient One and conducting a supporting cultural affiliation study. The court's decision continued to influence the Corps' application, or misapplication, of the preponderance of evidence standard holding the tribes to a higher legal standard than is required by law and creating an uneven playing field.

Valenzuela Contreras, Paula [101] see Sullivan, Kelsey

Valenzuela-Toro, Ana (Dept. of Ecology and Evolutionary Biology, University of California Santa Cruz) and Meghan K. Yap-Chiongco (Department of Ecology and Evolutionary Biology, Un)

[187] *Pinniped Taphonomy: Observations from a Northern Elephant Seal Breeding Colony Provide New Insights into the Taphonomic Processes on Pinnipeds*

Actualistic studies on vertebrate taphonomy have been focused on terrestrial mammals, and little is known about the taphonomic processes affecting marine mammals. Pinnipeds (seals, sea lions, fur seals) exhibit an extensive fossil and archaeological record, the interpretation of which is often impeded by the lack of research on their taphonomic processes. We present the preliminary results of a taphonomic study performed in a modern breeding colony of Northern elephant seal (NES; *Mirounga angustirostris*) located at Año Nuevo State Park, San Mateo County, California. Direct observations along linear transects were performed, and more than 350 isolated bones and 30 pinniped carcasses in variable states of decomposition, were recorded. Remains of rodents, birds, and fishes were also noted. Most of the remains were of NES pups, followed by adult and subadult California sea lions (*Zalophus californianus*). The study documented the predominance of disarticulated limb bones and the existence of geographic gradients in the bone distributions. Overall, these results underline the need for new and more exhaustive studies incorporating knowledge of the functional anatomy and natural history of the species, to elucidate the taphonomic processes involved in modern, archaeological, and fossil assemblages containing pinnipeds.

Vallebuena, Miguel [97] see Waller, Kyle

Vallejo-Caliz, Daniel (University of Kentucky, Lexington) and Scott Hutson (University of Kentucky)

[173] *Regional Integration during the Late Preclassic in Uci, Yucatán*

Regional integration as materialized by the connections created through sacbeob can widely transform political, economic and social institutions in the participant communities. Perceiving the process through dichotomies such as center-periphery or paramount-subordinate clouds the agency of the multiple stakeholders involved in the matter. Active manipulation of social systems by intermediate elites and the commoner population seems to have had a great influence on the general process of integration. During the complex negotiations between the various sectors involved it seems likely that the activities carried out through the sacbeob (e.g., processions, exchange of products) would have greatly mitigated the frictions which would have been created. Studies at the communities connected by the Uci-Cansahcab sacbeob, in the NW plains of the Yucatan, are geared towards exploring these negotiations by considering multiple social sectors. Looking more closely at Uci as the proposed center for the micro-region during the Late Preclassic, we can assess the benefits and hindrances of regional integration. By using the concept of "disjuncture" we are able to contemplate the nature of the connections which linked the communities and how they varied within the region.

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Van Alst, Emily (Indiana University)

[268] *Into the West(ern Plains): Results of the 2017 Bighorn Archaeology Field School, Park and Fremont Counties, Wyoming*

This presentation highlights several aspects of archaeological research and training undertaken by the Indiana University Bighorn Archaeology field school in its thirteenth year. Areas of study include documentation of Native residential campsites (stone circles) at the Heart Mountain Nature Conservancy; research at the Heart Mountain WWII Japanese American Confinement Site; photogrammetry of stone architecture (stone circles and cairns) and rock art around the Bighorn Basin; comparative rock art research at Legend Rock, Ten Sleep Nature Preserve, and the Oregon Basin; and post-fire inventory and site monitoring in the Washakie Wilderness of the Shoshone National Forest. Staff and students also engage with the public through traditional means and social media. Using different methodologies, Bighorn Archaeology's overarching research goals remain focused on exploring historical and social landscapes of the Greater Yellowstone Ecosystem and to communicate our results to professional audiences and the public. Through additional readings on the region's history and culture, we teach students to understand the West from multiple perspectives and to apply them to their personal interactions and experiences. Discussion of unfamiliar concepts communicated through familiar channels allows students more quickly to grasp complexities of the West and to think about them critically, especially in rural conservative American communities.

[61] *Discussant*

Van Alstyne, Benjamin (UNLV)

[269] *Developing an Immersive Experience of the Past*

As archaeologists, we are looking for ways to engage the public and help them learn about the past and human diversity. Using photogrammetry, photospheres, and digital 3D modelling, this project creates an immersive experience through Virtual Reality (VR) for the public to learn about the Ancestral Puebloan people. This poster demonstrates an interactive public outreach effort that can be replicated by universities and museums, with limited budgets, to convey their research. It is a straightforward endeavor of utilizing the proliferation of accessible smartphones, the increasingly popular and affordable VR technology (i.e., \$15 google cardboard), and social media. Therefore, archaeologists can utilize this technology to provide information to a broader audience.

Van Der Leeuw, Sander (SHESC)

[213] *Sustainability: The Next 100 Years*

This paper argues that much sustainability research, which sees the challenge as an environmental one rather than as a societal one, misses the fact that the societal changes that are occurring are so fundamental, as part of the Information and Communication Technology (ICT) revolution, that our societies will be unrecognizable before the impact of the environmental changes hits our world most heavily, in the second half of the current century. The paper will argue that developing a societal perspective on socio-environmental sustainability is essential to come to grips with our future. The Maya area is an interesting one to do this for, as its society is undergoing accelerated societal changes as part of globalization and development.

[1] *Discussant*

Van Dommelen, Peter (Brown University) and Alfonso Stiglitz (Museo civico di San Vero Milis)

[14] *The S'Urachi Project: Cultural Encounters and Everyday Life around a Nuraghe in Phoenician and Punic Sardinia*

Nuraghi, the famous dry-stone walled towers of Sardinia, are usually just regarded as prehistoric monuments of the Bronze Age. They continued to be inhabited long after, however, and were transformed into often substantial settlements of later periods. Nuraghi are key sites for the investigation of the colonial encounters and cultural interactions between local Sardinians, Phoenician traders and Punic settlers, because they are the only places that were continuously inhabited before and during the colonial presence of Phoenicians and Carthaginians in Sardinia.

Nuraghe S'Urachi is situated in the Upper Campidano and Gulf of Oristano regions of west central Sardinia. Standing halfway between the Monti Ferru to the north and the Cabras salt marshes to the south, S'Urachi is located in a resource-rich landscape at just 15 miles away from the Phoenician colonial settlement of Tharros. Numerous imports and local adaptations testify to a long history of cultural and colonial entanglements.

In this poster, key results of the past five years of excavation at S'Urachi, are presented, showing first of all the continuity of occupation throughout the first millennium BCE, and the extent and depth of cultural interactions at the site between Phoenicians and Iron Age 'Nuragic' Sardinians.

[117] *Discussant*

Van Dyke, Ruth (Binghamton University)

[218] *In Homage to Homol'ovi: Architecture and Ceremony in Chaco Canyon*

As Adams significantly argued, there are clear relationships between the configuration of public Pueblo spaces and the nature of Pueblo ceremonialism. In this paper, I build on Adams' work to explore the relationships among architecture, public spaces, and ceremony at Chaco Canyon. Architectural spaces may be seen not only as functional containers for human activities, but also as resonant participants in affective human experiences. The visual and acoustic properties of public architecture in Chaco may assist us in understanding the Chacoan ceremonial experience from the vantage point of the human body. These insights can help support or refute particular models for Chacoan social and political organization through time.

Van Etten, Heidi

[74] *Reinvestigating the Chronostratigraphy of the Early Paleoindian Components of Hell Gap, Locality 1*

Hell Gap in eastern Wyoming contains the most complete Paleoindian cultural sequence in North America, providing insight into long-term landscape use and available resources exploited by early Americans. A well-developed chronology allows for clearer and more accurate comparisons of both cultural information and geologic data. Although Hell Gap is well studied and has provided archaeologists a wealth of information regarding the Paleoindian period, questions remain regarding the timing of events and geomorphology due to discrepancies with 14C dates and a complex stratigraphy. Some cultural components and sedimentary units remain undated. Discrepancies in the chronological record of Hell Gap may be better understood by improving the dating resolution using techniques not reliant on charcoal or cultural material such as that provided by OSL Dating. OSL samples were recently collected from Hell Gap, thus rendering a greater understanding of the timing of sediment deposition in relation to cultural sequences at the site.

Van Gelder, Leslie [118] see Huang, Cindy Hsin-ye

Van Gijn, Annelou (Leiden University)

[137] *Back to Basics: Next Generation Experimental Archaeology*

Experimental archaeology plays a critical role in the development of new ideas and techniques within the discipline, for example, within studies of artifact manufacture and use, butchery practices, taphonomy, etc. Despite a difference in the nature of 'controls,' out-of-the-lab experiments play a crucial role in scientific archaeology because they often shed new and different light on a range of complex issues, as demonstrated by recent house building experiments conducted with the assistance of local communities. These experiments illustrate the advantages of reaching outside the circle of

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professional (lab-based) archaeologists and removing the barrier between re-enactors and craftspeople, on the one hand, and professional archaeologists, on the other. A critical limitation for many experiments, a lack of expertise in specialised tasks such as wood working, knapping, or thatching, can be overcome by involving experts outside academia. Not only are these experiments highly fruitful for scientific research, because they reveal and document lifeways foreign to the modern world, they are enjoyable and enable academics to get out of the ivory tower and reach out to a broader public.

Van Hagen, Logan (Department of Anthropology, University of Georgia), Douglas Dvoracek (University of Georgia), Laurie Reitsema (University) and Carol Colaninno-Meeks (Southern Illinois University Edwardsville)

[188] *Sulfur Isotope Ratios of Terrestrial and Coastal Fauna on the Southeastern Coast: A Step toward Resolving Equifinality in Human Paleodiet Reconstructions*

Sulfur isotope ratios in human bone collagen are used in paleodiet reconstructions to distinguish between marine- and terrestrial-based diets, because sulfur isotope ratios in marine organisms are typically higher. However, natural phenomena such as sea spray, rain, and flooding can deposit sea water sulfates on land that are bioavailable to plants and terrestrial animals. Comparing sulfur from archaeological deer and fish-eating raccoons from sites both in close proximity to the coast and further inland, this study examines whether sulfur isotope ratios have the potential to discern between marine and terrestrial foods in past human diets on the southeastern coast.

Van Keuren, Scott (University of Vermont)

[287] *How Long Did It Take to Paint Ancestral Pueblo Pottery?*

One of the basic goals of ceramic analysis is to reconstruct the manufacturing process. The sequence of production may be easy to infer but the duration of each step is elusive. For instance, archaeologists have yet to devise a method for estimating how long potters spent painting vessels. In the American Southwest, Ancestral Pueblo potters seem to have invested considerable time in these pursuits. Drawing on ethnoarchaeological scholarship, Pueblo ethnographies, and experimental archaeology, I present a new method that estimates minimum painting duration based on the organization and structure of brushstrokes. The latter mark discrete movements of the ancient potter's hand as s/he crafted, step-by-step, the overall design layout. Using examples from the Ancestral Pueblo world, I discuss what these estimates of painting time tell us about the social dimensions of ceramic production.

Van Oyen, Astrid (Cornell University)

[181] *Storage and Empire: Choreographies of Time and Matter at Rome's Harbours*

The capacity for storing surplus has been a key parameter in the hierarchical rankings of socio-political evolution, with empire at the apex. With its large-scale ports and massive warehouses, the Roman empire easily fits this bill. Models of socio-political evolution, however, not only build on top-down templates of power, but also adopt a view of things (i.e. stored goods) as passive resources. But in the light of recent material culture theory, storage becomes a more complex mediation of time and matter than the 'surplus model' could fathom, with power emerging from localized mediations of assemblages of humans and things, although with historical implications that were no less far-reaching.

This paper empirically traces the temporal and material choreographies of storage practices at Ostia and Portus, the main ports of the city of Rome. It investigates how things' trajectories through these ports and their warehouses articulated control and calculability, and it traces the resulting landscape of power. In so doing, it challenges old readings of an opposition between state control and private interests at these centres, and instead proposes a kaleidoscopic model of power, rooted in the material and metaphorical assemblage of the family.

Van Pelt, Paul [32] see Walsh, Carl

Van Thienen, Vince

[95] *Rethinking Migration and Mobility in the Late Roman West with Ceramic Petrography*

For some time the study of migration with ceramics was considered unreliable or unuseful after the ethnic discourse applied by cultural historians. The idea of 'pots=people' was heavily criticized, and rightly so: for similarities in style can result from mobility in people, goods and ideas. Yet, discarding the ceramic evidence altogether is not the solution. With a proper understanding of the limitations and issues, and ideally supplemented with other datasets, the distribution of ceramics and ceramic technology can be very useful in studying migration and even distinguishing between different kinds of mobility. This poster aims to demonstrate the use of ceramic petrography to investigate migration and mobility in the Late Roman West. By identifying fabrics of traditional house-made pottery from Roman Gaul (local) and several Germanic territories outside the Roman Empire (non-local), the results demonstrate continued traditions, the arrival of new immigrants with 'foreign' traditions and new or redefined ceramic productions. On the one hand, these new techniques are the result of technological changes due to restrictions and changes in natural resources, and on the other hand can be linked to choices resulted from the merging of various cultural and ethnic groups.

Van Vlack, Hannah (San Jose State University, California), Jamie A. Civitello (Bandelier National Monument, National Park Service), Rory P. Gauthier (Bandelier National Monument, National Park Service) and Robert Powers (University of New Mexico, Anthropology Department)

[269] *Ancestral Pueblo Agriculture on the Pajarito Plateau: A Geoscience Investigation of Field Terraces in the Northern Mountains of New Mexico*
In honor of Robert Powers, Bandelier National Monument (BNM) presents research on his final project investigating agricultural potential in the arid highlands of the American Southwest. Powers' research was conducted on behalf of the University of New Mexico's anthropology doctoral program for archaeology. The Park is well-known for its ancestral Pueblo archaeological sites and the unique, natural ecotones throughout the Eastern Jemez Mountains. The region is topographically dynamic; the landscape is shaped by tuff and talus deposits formed from early Quaternary volcanic eruptions, carved by ancient watersheds into a mesa plateau now punctuated by an intricate canyon system. The Pajarito Plateau refers to the mesa tops, where the ancestral Pueblo agricultural terraces are situated and laced among the pinyon and juniper woodland. The peopling of the Pajarito Plateau has been well-studied; however, the emergence of agricultural practice and stability in this arid region is relatively unexplored. The terrace contexts Powers' sampled likely date between the Classic and Coalition periods (Pueblo III and IV; AD 1150–1400). Conclusively, this project evaluates the information potential of legacy collections and interagency collaboration in the application of archaeological science for resource management.

Van Vlack, Kathleen [305] see Yaquinto, Jessica

Van Wormer, Heather (Grand Valley State University)

[205] *Memory and Materiality at Mary's City of David*

Mary's City of David is a millenarian commune in Michigan, founded in 1903 and re-organized in 1930. As with all intentional communities, material culture (i.e., architecture, clothing, landscapes) serves as an active medium to both reflect and reinforce social ideals, and community members are keenly aware of the symbolic meanings represented. At their peak, the Benton Harbor colony sent out preachers to spread the word, bands to spread the music, and baseball teams to spread the game. These journeys are marked in various ways in the colony landscape and architecture. Additionally, social and collective memories serve to reinforce their beliefs. Individuals that are no longer living or events that happened long ago are commonly

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remembered—often triggered by material objects, landscapes, plantings, or specific places at the colony. This serves to not only reinforce social and religious ideology in the present, but is also a theological promise for the future. In this paper I explore these material expressions of “home” and “community” in both the past and present colony and their central place in promoting and reinforcing community through social memory.

Vance, Samuel [238] see Baxter, Carey

VanDam, Seth [268] see Newman, Tiffany

Vander Heiden, Robert (University of Wisconsin- Milwaukee)

[296] *Glass Bottles at the McHugh Site: Patent Medicines, Frontier Health, and 19th Century Popular Culture*

Patent medicine bottles offer a window into the popular culture of 19th Century America and highlight the ways in which otherwise isolated populations were connected into broader social and economic networks. Settlers on the Wisconsin frontier in the mid-to-late 19th century had limited access to formal health care. Physicians who did provide services to remote populations were often poorly trained and had a limited understanding of the causes of many diseases. Thus, self-medication and alternative forms of health care became an attractive option for many frontier occupants. As a result of rapid industrialization during this period, many groups of immigrants were forced to abandon their ancestral ethnic identities and assimilate to a more homogeneous capitalistic American culture. This paper illustrates how patent medicine bottles recovered from the McHugh site provide an indication of how the McHugh family responded to the need for health care under the harsh conditions of frontier life in northeastern Wisconsin during the mid-to-late 19th century. Moreover, this analysis shows how broadly changing social conditions as well as the emergence of American popular culture may have shaped how the McHughs conceptualized ideas of sickness and disease.

Vander Linden, Marc (University of Cambridge)

[144] *“British”, “Irish” and “Continentish”: Practising Comparative in the Later Prehistory of North-Western Europe*

Projecting back notions of “British”, “Irish” or “European” back into prehistory does not go without problems as, explicitly or not, these concepts are closely associated with the rise of nation-states, and still echoed in yesterday’s and today’s turbulent politics. And yet, even advocating a simple geographic meaning for these terms does not prevent any problems, as it raises theoretical and methodological issues regarding the choice of location and scale of case-studies to be analysed. In the case of North-Western Europe, these problems are even more challenging given the insular character of several areas: does the Channel for instance work as a connecting fluid or as a water barrier? Are periods of cross-Channel interactions associated with increased connectivity within islands and the nearby continent?

In order to provide first elements of answer to these many questions, two distinct Later European case-studies will be explored; firstly, the early 4th mill. cal BC and, secondly, the introduction of animal and plant domesticates, and the late 3rd mill BC and the Bell Beaker Phenomenon. In both instance, long-standing debates have argued the contemporary association of extensive cross-Channel contacts, whilst recent aDNA studies have stressed the role of human migrations.

Vanderslice, Allison (San Francisco Planning Department)

[179] *Discussant*

VanDerwarker, Amber (UCSB)

[310] *Farming, Warfare, Drought, and Soil Fertility in the Mississippian Central Illinois River Valley: Carbon and Nitrogen Isotopes on Maize Kernels from Five Sites Spanning Two Centuries*

We report on carbon and nitrogen isotope results from a total of 60 maize kernels from five sequentially-occupied sites in the Central Illinois River Valley that span the Mississippian period (AD 1100–1300). The sites span: (1) the onset of and intensification of warfare in the region; and (2) a long period of drought that eventually gave way to wetter conditions during the last 50 years of the sequence. C13 and N15 isotope values from these maize kernels provide independent support for the cessation of drought conditions during the final occupation, but also provide evidence for deteriorating soil fertility associated with intensive infield production.

[150] *Discussant*

[310] *Chair*

Vandiver, Pamela (Materials Science and Engrg., University of Arizona)

[246] *Discussant*

Vandrei, Charles

[148] *Discussant*

Vangstad, Hilde (Researcher)

[78] *Man and Machine—New Methods for Excavation, Documentation and Reconstruction of 29 Medieval and Renaissance Boat Wrecks from Oslo Harbour, Norway*

Since 2003, the Norwegian Maritime Museum has had several extensive excavations in the area of Bjørvika in the harbour of Oslo as a measure to document archaeological remains before being removed or covered during the rapid urban development of the area. This paper will discuss two of the major sites that have yielded 29 well-preserved boat wrecks and large areas of previously unknown harbour constructions of timber. Boats and constructions date to the 16th and early 17th century and varies from small boats of around five meters length to 20 meters long ships. All but one are built in the Nordic clinker technique.

The museum made the decision early to retrieve all boats and document every boat part with a digital 3D Faro-arm. We have chosen to use a combination of digital and traditional methods of documentation including cardboard models of the boats using 3D prints. In the process of building replicas of the boats, we have experienced the subjective contribution and practical knowledge of the older generation of boat archaeologists and skilled boat builders to be of great value to compliment the “objective” digital methods.

VanPool, Christine [154] see Noneman, Heidi

Vargas, Amilcar (University of Barcelona) and Álvaro Brizuela Absalón (Universidad Veracruzana)

[42] *REAP in El Tajin: Looking towards Social Participation in a World Heritage Site*

The Pre-Hispanic city of El Tajin (Mexico) was inscribed on the UNESCO World Heritage List in 1992. Late on in the same decade UNESCO encouraged State Parties to foster “informed awareness on the part of the population... whose active participation [in conservation]...is essential”. Using the Rapid Ethnographic Assessment Procedures method (REAP) on fieldwork in Mexico, this paper aims to contrast global and local policies to improve participation of local communities generally and in particular of indigenous peoples in El Tajin. The inscription as Intangible Heritage in 2009 and 2012 of two cultural expressions of nearby Tajin village has added complexities to social participation that will also be discussed.

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Vargas Ruiz, Juan (Universidad Externado de Colombia)**[75]** *Prehispanic Warfare, Leadership and Demography in the Llanos of the Orinoco, Northern South America*

Although for northern South America it has been proposed that warfare was an important mechanism that elites used to promote their authority and the institutionalization of their leadership during precolonial times, the evaluation of the available evidence is still not systematic. This presentation offers a comparative discussion about warfare in the Llanos of the Orinoco. The archaeological evidence suggests that warfare in the Llanos played a differential role in the historical and evolutionary sequences of the complex societies in the Llanos. In contrast to the Barinas (Venezuela) complex societies, in the Casanare (Colombia) region warfare was not a main factor that affected the emergence of central leadership or its consolidation at least during the first stages of the occupational sequence. The archaeological evidence recovered during the regional survey conducted in the Barinas and Casanare regions supports the ethnohistorical accounts of the varying extents of centralized power and the varying strategies used by emerging elites according to the capabilities and the possibilities at the disposal of aspiring rulers in different times and places.

[75] *Chair*

Varien, Mark [226] see Coffey, Grant

Varillas, Rosa Maria (Proyecto Arqueológico Cerro de Oro) and Francesca Fernandini (Pontificia Universidad Católica del Perú)**[211]** *Wari Textiles for the Everyday and the Afterlife*

Some pre-Hispanic textiles were complex masterpieces made with labor-intensive techniques and high quality raw materials. Nevertheless, the vast majority of textiles, those used by the population at large, were plain, simple and without any decoration. This study will present a comparative analysis between a sample of plain weaves obtained from domestic contexts and a sample of high quality textiles excavated in an elaborated Wari tomb, all of them registered at the pre-Hispanic settlement of Cerro de Oro. This comparison will explore parameters to evaluate their quality and aesthetics as well as the cultural practices involved in their production. These lines of investigation will be incorporated within broader questions regarding the presence of Wari elements in the coast, and particularly within the site of Cerro de Oro.

Varlan, Abigail (The College of Wooster) and Olivia Navaro-Farr**[242]** *Trade Winds: A Study of Roman Ceramic Trade in the Balearic Islands*

The Balearic Islands, located off the coast of Spain, were occupied by the Romans beginning in 123 B.C.E. Under Roman occupation, the islands saw the development of Roman-style infrastructure and architecture in place of the pre-existing megalithic style of groups such as the Talayotic people. Sanisera and Pollentia are examples of Roman cities developed to facilitate trade and support the military needs of the empire. While excavations of the Balearic Islands have provided a wealth of data, this information is often underrepresented in Classical scholarship. An emphasis in Classical scholarship on documentary sources over the archaeological record results in the marginalizing of places like the Balearics, whose archaeological records are far more robust than Classical texts convey. We argue a comprehensive contextual analysis of ceramics from these sites not only underscores the importance of the islands in Roman trade, but contributes substantially to a more holistic understanding of the Classical Roman political economy.

Varney, R. A. [74] see Scott Cummings, Linda

Varney, Tamara, Treena Swanston (2Department of Anthropology, Economics and Politic), Ian Coulthard (Canadian Light Source), A. Reginald Murphy (National Parks Antigua) and David M. L. Cooper (1Department of Anatomy and Cell Biology, Universit)**[208]** *Unravelling the Social Determinants of Lead Exposure in 19th Century British Royal Navy Stationed in Antigua, W.I.*

An exploration into various aspects of lead exposure in the British Royal Navy stationed in 19th Century Antigua, West Indies has contributed to some unexpected insights. This research was facilitated by study of human remains mitigated from a Naval Hospital cemetery in response to modern development. The interred at the site were lower ranking naval personnel including enslaved individuals. Other work on lead exposure in the region focused on enslaved plantation laborers revealed high levels of the toxic metal in skeletal elements which was attributed to exposure in sugar processing. The work presented here focuses on enslaved African laborers in a military context. The patterns of lead exposure for this group are compared and contrasted with those of both the regular naval personnel and enslaved Africans in a plantation context. Similarities and differences seen in the lead burden of the bony remains between these three groups that were connected to the sugar industry in different capacities highlight into the variability in lived experiences of enslaved Africans in the colonial Caribbean.

Vasquez, Josefina (Universidad San Francisco de Quito)**[132]** *Puruwá Polity under Inka Rule in Colta, Chimborazo Province (Ecuador)*

The Inka incorporated the territory of today's Ecuador to the Tawantinsuyu around 1420. This conquest is well documented from South to North by recording the expansion of monumental features such as pukaras, tambos, bridges, terraces, collkas, wakas, patios and plazas, built in traditional Inka style. The political transformation of northern Andes landscape by the Inka was very profound in the Loja and Azuay provinces of southern Ecuador. While it was a milder transformative factor around Quito and other northern suyus. In the Chimborazo province, the Puruwá territory at the time of Inka expansion was transformed into an agricultural production area, as witnessed by the constructions of dozens of monumental terraces associated to nucleated houses that seem to be erected using Inka techniques. Both terrestrial and aerial survey data has been used to reconstruct the history of occupations of Colta region within the Chimborazo province to track changes in landscape that correspond to these sociopolitical events, as well as to natural catastrophes that modeled Puruwá patterns of economy before, during, and after Inka rule.

Vasquez, Victor [7] see Michell, Samantha

Vaughn, Kevin (UCLA), Christina Conlee (Texas State University), Sarah Kerchusky (UCSB) and Verity Whalen**[165]** *Household Spaces in Nasca: A Comparison through Time*

In this paper we evaluate household spaces in the Nasca region through time. We consider household structures in domestic contexts from the Formative, the Early and Late Nasca epochs, the Middle Horizon and the Late Intermediate Period. We look at the changes that took place in the use of residential space and consider how broader regional changes in sociopolitical structure, economy and religious ideology may have contributed to the changing nature of local dwellings.

Vavisoa, Voahirana [114] see Douglass, Kristina

Vavrsek, Jessica (The University at Albany)**[301]** *St. Lawrence Iroquoian Pottery Motifs and Dog Isotopes as Indicators of Population Movement in Jefferson County, NY*

Pottery motifs are known to change across time, space, and group affiliation, and are something that can be observed archaeologically. Rim sherds recovered from archaeological sites in and around Jefferson County, NY, are observed in an attempt to better understand the occupation by the St.

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Lawrence Iroquoians. Each of the observed sherds displays some form of decorative motif that can potentially inform researchers about when and where it came from. It is hypothesized that these sherds can determine whether individual motif components are indicative of location and/or time. In addition, I am also looking at carbon, nitrogen, oxygen, and strontium isotopes from domestic dog remains as compared to white-tailed deer remains recovered from the same site to see whether domesticated dogs can be used as proxies for humans when considering movement patterns in a small area. The combination of these two data sets will strengthen any results from either individual data set and provide a more comprehensive interpretation of movement patterns in Jefferson County during the Late Woodland Period.

Vawser, Anne (National Park Service)

[276] *Moderator*

Vega, Enrique [175] see Hendrickson, Mitch

Vehik, Susan [268] see Trabert, Sarah

Vela González, Claudia Marie [142] see Eberl, Markus

Velarde, María Inés and Pamela Castro de la Mata (Museo de Arte de Lima)

[141] *Producción metalúrgica en la Costa Sur: de Paracas a Nasca*

Las sociedades de Paracas y Nasca que habitaban el actual territorio de Ica, desarrollaron una tradición metalúrgica con características locales particulares dentro de los Andes Centrales. Los orígenes de la producción metalúrgica en esta zona se relacionan con la presencia de Chavín durante el Horizonte Temprano, y se caracteriza por el predominante uso de oro laminado y trabajado en formas y diseños simples. Esta tradición metalúrgica se mantuvo durante varios siglos en el sur, casi a espaldas del auge tecnológico que ocurría en el norte, donde existía una proliferación en técnicas, formas y estilos de producción de diferentes minerales y metales.

Para determinar continuidades y cambios a lo largo del tiempo, se vienen estudiando patrones de uso, estilístico o tecnológico de ambos desarrollos culturales Paracas-Nasca durante el período de transición entre ambos y en adelante. Las excavaciones científicas y la revisión de colecciones de museos, algunas con procedencia, incluyendo las inéditas piezas de metal de Rubini y Soldi procedentes de la Hacienda Ocucaje, los objetos metálicos recuperados por Tello en Wari Kayan y los hallazgos metálicos de los valles de Nasca y Palpa.

Velasquez, Adrienne

[42] *Treasure within the Fortress: Opportunities for Partnership in DoD Archaeology*

Some of the least known and best preserved archaeological resources in North America exist within the confines of federal property in the Department of Defense (DoD). The US military acquired large land holdings for the purposes of military training in the early nineteenth century, prior to suburban sprawl in the Northeast. The Army and subsequently the Air Force in a snapshot encapsulated whole communities that evolved in place since colonial times. Those archaeological resources, held in public trust by the federal agency, are protected under the National Historic Preservation Act from potential adverse effects of military activities and the DoD has cultural resource management programs that do so. Though a vast resource for American archaeology, few of those resources are known outside the federal agency. In this paper, I present two examples of untapped archaeological resources from Air Force installations in the eastern United States, the efforts to identify and hold those resources in trust, as well as the potential for collaboration in exploration of those resources beyond the DoD.

Velásquez, Antolín [142] see Barrios, Edy

Vellanoweth, Rene [225] see Lopez, Escee

Venegas, Joaquin [173] see Hernandez, Hector

Veness, Megan (Fairfax County Park Authority)

[251] *Rocks and a Box: Data Recovery of a Rural Domestic Complex*

Patriot Park North, located in the western side of Fairfax County, is a 67-acre park in which the Fairfax County Park Authority is planning to construct a baseball complex. Fairfax County Park Authority Archaeology and Collections Branch (ACB) conducted a comprehensive Phase I and II survey in Summer 2016, and began Phase III excavation in Fall 2016. An area in the northeastern section of project area contained artifacts from the late third quarter of the eighteenth century. A large feature, Feature 5, a 25 foot by 9 foot cellar, contained artifacts ranging from black glazed earthenware to green shell-edged pearlware and brass buttons. Other artifacts and features in the vicinity are suggestive of associated outbuildings. With further testing and continued analysis of the artifacts recovered, archaeologists can reconstruct the areas of use within the structure, and shed more light on the inhabitants of Fairfax County in the eighteenth century.

Venter, Marcie (Murray State University), Sean Carr (Independent Researcher) and Shayna Lindquist (University of Kentucky)

[285] *A Comparison of XRF and Visual Sourcing Methods in the Identification of Guadalupe Victoria Obsidian at Matacanela, Sierra de los Tuxtles*
Several Pre-Classic assemblages in the Mesoamerican Gulf lowlands are characterized by obsidian from the Guadalupe Victoria source. Tools produced are characterized by flake-core reduction strategies. The combined visual characteristics of the source material and technology employed are important chronological indicators. But, general similarities in the appearance of the raw material and factors such as variable thickness create the potential for overlap with other sources, such as Pico de Orizaba, though the latter tends to have fewer inclusions, making it more suitable for the production of prismatic blades than Guadalupe Victoria obsidian. Thus, the presence of clear-to-light-gray material in flake form is typically assigned to the Guadalupe Victoria source, whereas clear-to-light-gray material in blade form is often attributed to Pico de Orizaba. The presence of clear-to-light gray material in flake form throughout the occupational sequence of Pre-Classic and Classic period Matacanela challenged existing ideas about the efficacy of visual designation. As a result, we used pXRF to examine the entire assemblage of visually sourced Guadalupe Victoria material from excavated contexts to evaluate our accuracy in predicting source material. We present these findings, and offer suggestions for refinements of the analysis of materials and interaction patterns in the southern Gulf lowlands.

Vento, F. J. [35] see Adovasio, J. M.

Ventresca Miller, Alicia (Max Planck Institute for the Science of Human History)

[310] *Evidence for Close Management of Sheep in Ancient Central Asia: Foddering Techniques and Transhumance in the Final Bronze Age*
Ancient animal management strategies have important implications for debates on modern pastoral landscape use in Eurasia. As livestock production intensifies in semi-arid regions there is a need to identify the diverse set of strategies employed by pastoralists. Sequential carbon ($\delta^{13}C$) and

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oxygen ($\delta^{18}\text{O}$) isotope analysis of teeth from domesticated sheep at Bronze Age sites in Kazakhstan exhibit varied isotopic sequences. Sheep from Kent exhibit an inverse relationship where low $\delta^{18}\text{O}$ values coincide with high $\delta^{13}\text{C}$ values indicating that they ingested ^{13}C -enriched graze during the winter season. This pattern is consistent with the foddering of caprines during the winter months when they are living in sheltered valleys near the site. In contrast, sheep from Turgen exhibit diverse isotopic sequences indicating variation in husbandry practices and landscape use. This is expected, as the site is located in a mountainous landscape with access to high elevation summer pastures, forested areas, and the semi-arid steppe. The patterns evident at Turgen suggest that in the early period transhumance was practiced, while in later periods sheep were foddered throughout the year.

Ventura Santos, Roberto [69] see Pugliese, Francisco

Verdugo, Cristina (University of California, Santa Cruz)

[134] *Cenote Xtoloc: Paying Attention to the Ignored Cenote*

A truism was established very early in Maya studies that the Cenote of Sacrifice at Chichen Itza had a religious function while the nearby Cenote Xtoloc was the source for domestic drinking water. Part of the attraction of this idea was no doubt its close paralleling of the popular Western dichotomy, sacred vs. profane. The problem with truisms, statements so obviously true that they say nothing new or interesting, is that they direct attention elsewhere. This is probably why the Temple of Xtoloc was never placed on the Carnegie map of Chichen Itza even though Ann Axtell Morris excavated there in the 1920s. When a truism is not true the impact can be disastrous for our understanding of the subject.

The Gran Aquifero Maya undertook a reexamination of the area surrounding the cenote as part of its assessment of all water sources at the site. The project found architectural enhancements that included stairways leading from sacbe to the water and constructed masonry platforms formalized this space. In addition, three caves in the northwest wall of the cenote were documented and mapped.

[134] *Chair*

Verdugo, Cristina [134] see Saldana, Melanie

Vermillion, Alexander [190] see Daugherty, Sean

Vernon, Kenneth (University of Utah Department of Anthropology), Kate Magargal (University of Utah Department of Anthropology), D. Craig Young (Far Western), David Zeanah (Sacramento State University Department of Anthropology) and Brian Coddling (University of Utah Department of Anthropology)

[92] *Prearchaic Land Use in Grass Valley, NV: A Novel Statistical Implementation of Optimal Distribution Models*

Despite decades of work, debate persists regarding the nature and extent of Prearchaic land use patterns in the North American Great Basin. While some archaeologists argue that Prearchaic hunter-gatherers favored a broad diet and, therefore, relied on a generalist land use strategy, others insist that they favored a narrow diet, thus relying instead on a specialist land use strategy. To help resolve these debates, here we ask the simple question: what environmental parameters drive variation in Prearchaic settlement decisions? To answer this question, we undertake a modelling exercise that evaluates Prearchaic settlement locations in Grass Valley, NV relative to measures of habitat suitability informed by Ideal Free Distribution and implemented using a Maximum Entropy approach to species distribution modeling. The results of this case study provide a quantitative measure of factors that structured land use decisions in the Great Basin prior to 9000 BP.

Viana, Sibeli [2] see Silva, Rosicler

Vianello, Andrea (University of South Florida) and Robert H. Tykot (University of South Florida)

[88] *Mobility in North-eastern Italy between the Late Roman and Byzantine Periods*

The upheaval caused by the fall of the Roman Empire brought armies and new settlers in Italy in chaotic ways, producing significant changes to the socio-economic and political organization of the Empire. Material evidence has been irresolute in determining the actual significance of migratory movements due to the fast adoption of foreign customs to attain social power in the new political landscape. An interdisciplinary research using strontium isotope analyses on Late Roman and Byzantine individuals buried in southern Veneto and Emilia-Romagna in Italy is investigating mobility and migration directly. At a time when Italy seems a gateway to chaotic migratory fluxes, the research has the dual importance to investigate a past transition that is directly responsible for medieval and modern Europe, and understand mechanisms that might affect the perception of migratory movements. The preliminary results to be presented will attempt to quantify migration in a highly contested area and compare those values with the perception resulting from the study of material culture. This study compares isotopic data from bones against the perception detectable in historical sources and material culture, focusing on multiple funerary contexts within a small region.

Vianello, Andrea [23] see Tafani, Aurelien

Vicenzi, Edward [77] see Foecke, Kimberly

Victor, Bart (Vanderbilt University), Arthur Demarest (Vanderbilt University) and Chloé Andrieu (Le Centre National de la Recherche Scientifique)

[121] *Changing Patterns of Production and Exchange in "Borderland" Economies: The Case of the Classic Maya Civilization*

Following the trajectory of the work of Rita Wright, recent research has focused on production, producers, and exchange in a "borderland" zone, the "frontier" between Classic Maya lowland city-states and less complex, but more diverse, polities of the resource-rich highlands to the south. These "borderland" studies led to insights concerning exchange, production, and the roles of elite managers and non-elite "labor". Archaeologists and economists examined the material culture of dozens of sites to assess changing borderland partnership networks. This evidence revealed innovations in management and production strategies. Those innovations led rapidly to spectacular wealth, yet growing inequality, in a new economic system, while more conservative central lowland Maya states to the north were declining.

As in Wright's approach, this material culture history of these "borderlands" provided a foundation for application of social and economic theory including Innovation Network theories and Network Failure theories from economics. This research is directed upward to examine the "big picture" of changing state economic structure and "downward" to identify the agents and forms of agency involved. This work confirms Wright's conviction that borderlands production and its agents and material products provide keys to understanding ancient economic systems and the people that acted within them.

Vicze, Magdolna [245] see Earle, Timothy

Vidal-Guzman, Cuauhtemoc [288] see Salazar Chavez, Victor Emmanuel

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Vidal-Montero, Estefanía (Department of Anthropology, University of Chicago), Itací Correa (Universidad Alberto Hurtado, Chile), Liz Vilches, Francisco Gallardo (CIIR-Universidad Católica de Chile) and Mauricio Uribe (Universidad de Chile)

[141] *Technologies of Clay: Pottery, Architecture, and the Transformation of Mud in the Atacama Desert (South-Central Andes)*

In the Atacama Desert, pottery is one of the main technological changes of the Formative Period (ca. 2700 BP). The initial industry (LCA type) is characterized by a stylistic homogeneity coupled with a wide geographical distribution. Compositional analyses, however, have shown a significant regularity in pastes, suggesting the use of localized sources of raw materials and/or specific production centers—indicative of a well-defined recipe and style. Provenance studies have identified a locus of production in the Guatacondo valley, in the hyper-arid core of the Atacama. In this valley the production and consumption of LCA pottery coincides with the emergence of mud architecture. Both technologies were developed in a geomorphological environment characterized by multiple outcrops of clay, making this material easily accessible.

Using archaeometric methods, we approach both traditions as technological practices that required specific technical gestures, bodily engagements, labor organization, and temporal rhythms, mobilizing a collective that was partially constituted as such through the repeated and enduring transformation of mud. Considering the networks of materials, practices, and spheres of circulation wrought by these technologies, we offer an interpretation of the Formative process that centers on the qualities of clay in order to understand the material trajectories of this social landscape.

Viera, Ricardo [57] see Hernandez-de-Lara, Odlaner

Vigne, Jean-Denis [125] see Cucchi, Thomas

Vilar, Miguel [283] see Alfonso-Durruty, Marta

Vilches, Liz [141] see Vidal-Montero, Estefanía

Villalba, Ricardo [105] see Gil, Adolfo

Villarreal, Alessandra (University of Texas, San Antonio)

[37] *Preclassic Maya Ceramic Production and Distribution: Preliminary Petrographic Analysis from the Mopan Valley, Belize*

Understanding the organization of ancient ceramic production and distribution patterns can provide archaeologists a means of exploring past economies. Recent studies have shown that petrographic analysis can be operationalized to detect variability in production recipes, distribution of production groups across a landscape, and even producer-specific material choices. Ceramicists working in the Maya lowlands have demonstrated the benefit of using petrographic analysis in conjunction with other methods including type/variety. Few studies, however, have focused on the Preclassic period to address questions related to early economic organization through ceramic production and distribution. Fewer still have engaged with traditional potters whose knowledge of local clay sources prove invaluable to the broader discussion of ceramic production. This paper presents the preliminary results of a study from the Mopan Valley, Belize, comparing ceramics from domestic and public contexts to clay sources from the greater Xunantunich area. The study incorporates the petrographic analysis of three locally known clay sources and two buried sources discovered during excavation, as well as Middle Preclassic ceramics from both domestic and public contexts. The initial results have important implications for archaeologists' understanding of the organization of production and distribution of early ceramics in this region.

Vining, Benjamin (University of Arkansas, Fayetteville) and Hali Thurber (University of Arkansas, Fayetteville)

[68] *Detecting el Niño's Disasters: Remote Sensing of Recent ENSO Events in Northern Peru and Implications for Prehispanic Societies*

Several models have discussed links between warm (el Niño) phases of the el Niño Southern Oscillation (ENSO) and cultural developments on Peru's north coast. In particular, the abandonment of Moche settlements and agricultural systems and periods of social stress in both Moche and Chimu societies have been interpreted through the lens of ENSO disasters. ENSOs during the years 1982–83, 1997–98, and most recently 2016–17 offer the opportunity to better understand the spatial development of el Niño-driven events through remote sensing, and hence to better understand potential implications of ENSO for past and current communities. Here, we use data from the Landsat and Sentinel families of earth observation satellites to describe the extent and severity of these ENSO's impacts on the Chicama and Jequetepeque Valleys (Department of La Libertad, Peru). We estimate the areas that are impacted by mass wasting and sediment entrainment, and describe the recovery time from past events. Comparisons of similar events across individual ENSO years show spatial patterning in the areas that are impacted by various ENSO-driven phenomena. We discuss the implications these findings have in light of archaeological land use, including identifying several vulnerabilities that may have affected prehispanic agriculture and settlement.

Vis, Benjamin

[80] *An Inhabitant's Perspective of Material Urban Structure at Chunchucmil*

Maya urban archaeology is progressively addressing how to 'people the past', using data exploration techniques. The Chunchucmil map (Hutson and Magnoni 2017) offers an exemplary spatial data resource. Chunchucmil features here as a testing ground for showcasing the interpretive research advances enabled by Boundary Line Type (BLT) Mapping.

BLT Mapping resulted from establishing a common frame of reference to make radical comparisons between Maya and contemporary urban patterns. The anticipation of the step increase in knowledge about the spatial layout of Maya cities achieved by LiDAR surveys, makes comparative research on Maya urbanism highly relevant. Here I will examine sections of Chunchucmil's built environment to evaluate the interpretive contribution of BLT Mapping analyses to internal comparisons of urban configurations.

The methodology explores an inhabitant's perspective on urban life and development. BLT Mapping conceptualises urban built environments as compositions of materialised boundaries. The boundaries fix focus on the small scale urban morphology of spatial-material properties, which are mapped as socio-spatial characteristics. Topographical information is not used to explain top-down how general patterns came to exist, but to explore how everyday inhabitation of Chunchucmil's urban space is structured by opportunities and experiences afforded by spatial morphology.

Vitale, Salvatore (University of Pisa), Calla McNamee (Wiener Laboratory for Archaeological Science), Toulia Marketou (Ephorate of Antiquities of Dodecanese), Denitsa Nenova (University College London) and Jerolyn E. Morrison (INSTAP Study Center for East Crete)

[298] *Changing Landscapes: Settlement Strategies, Cultural Dynamics, and Material Evidence on Kos, Dodecanese, during the Final Neolithic and the Bronze Age*

Landscape as a concept incorporates not simply the geographic and environmental characteristics of an area, but also the cultural and symbolic value vested in places. Understanding the relationship of these factors, which are often closely linked, to past societies remains a challenge in archaeology. In this paper, we attempt to reconstruct the Final Neolithic (FN) through Bronze Age landscape on the island of Kos, Dodecanese, and investigate its cultural meaning to the prehistoric peoples. We combine environmental methodologies, using GIS to examine the relationship of topography, viewsheds, vegetation, and resource distribution to site location, with the analysis of significant changes in the material cultural assemblage. Our

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results identify shifts in occupation patterns from sparse upland settings in the FN and the Early Bronze Age (EBA) 1–2 phases to a nucleated center in the coastal plain beginning in EBA 3. In addition, changes in ceramic repertoire, fabric mixes, and technology, as well as in ceremonial and burial practices, demonstrate a parallel shift in the perception of landscape through time. Cultural contact and a growing participation in wider regional trade networks are considered factors contributing to this changing view and use of the Koan landscape.

Vlcek, David [18] see Ringle, William

Vogel, Melissa [82] see Pacifico, David

Vogelsang, Ralf (Institute of Prehistoric Archaeology, University of Cologne)

[174] *The Mountain Exile Hypothesis: How Humans Benefited from African High Altitude Ecosystems in Ethiopia*

Although high-altitude mountain habitats are often regarded as unfavorable for human occupation; on the other hand tropical highlands in Africa are suggested as potential refugia during times of environmental stress. The presentation gives a review of new evidence of human occupation in the tropical highlands of Ethiopia from the Late Pleistocene to the Holocene period. A first correlation of the archaeological data with the climate record suggests a complex interplay between humans and their environment during the last 20 ka. Finally, we speculate about potential land-use patterns on Mount Dendi in the southwestern highlands of Ethiopia.

Volk, Kyle [135] see Ollendorf, Amy

Volta, Beniamino [268] see Leonard, Daniel

von Tersch, Matthew [50] see Admiraal, Marjolein

Voorhies, Barbara (University of California, Santa Barbara) and Douglas J. Kennett (Penn State University)

[59] *Archaic Period Lifeways on the South Pacific Coast of Mexico*

Insights concerning human lifeways during the Archaic Period on the South Pacific coast come principally from archaeological investigations in Chiapas and Guerrero. These data are supplemented by coring programs that permit independent reconstructions of human-plant interactions. We present an overview of what we know and what compelling questions remain.

Vorenhout, Michel [135] see Martens, Vibeke Vandrup

Vovides, Andrew (Instituto de Ecología, A.C.)

[150] *Discussant*

Vrba, Eric [260] see Isaza, Ilean

Wackett, Josh [326] see Shepherd, Alison

Wade, Mariah

[229] *The Penumbra of Castro Archaeology: Evidence and Questions*

The archaeology and socio-cultural practices of Iron Age hilltop fortified settlements (castros) in Northwest Portugal and Galicia present usual and unusual specific problems. From the recognition of the uniqueness of castro cultural practices in the late nineteenth century to the last decades of the twentieth century, castro archaeology has suffered from the inadequate methodologies of earlier excavations, poor temporal controls, a parochial stance toward entertaining unanswered questions, and from the overall absence of burial contexts. These factors have often resulted in broad-stroke analyses that normalize castro cultural practices. This paper will discuss what is actually known about castro practices in littoral Portugal on the basis of recent evidence, and examine issues and evidence the archaeological excavations at the Cividade de Bagunte have uncovered.

[229] *Chair*

Wagensonner, Klaus

[149] *Discussant*

Waggle, Tawnya (Eastern New Mexico University), Laura Hronec (Bureau of Land Management), Jasmine Kidwell (Eastern New Mexico University), Donald Purdon (Eastern New Mexico University) and Jenna Domeischel (Eastern New Mexico University)

[222] *Blackwater Draw: Turning Student Research into Public Outreach*

Blackwater Draw is known world-wide as the type-site for Clovis culture—the first demonstrable evidence of humans hunting mammoths in the New World. However, as a resource of Eastern New Mexico University, Blackwater Draw is also a valuable tool for creating connections between student research and community engagement. Students participate in internships, directed studies, and use the varied components of the site to write their undergraduate capstone papers and graduate theses. Through these original research initiatives students have built a compelling archive of material that is being offered to the community in new and exciting ways. With projects as diverse as teaching trunk programs, re-imagined visual media, and geoarchaeological studies ranging from stream channel to wind tunnel, these students are changing the way that we connect with our community. Their work comprises a large component of the new initiative of Blackwater Draw, an initiative focused on emphasizing to the world outside our professional circles that the study of archaeology is not some arcane and exclusive profession. Rather, archaeology is an inclusive study of what makes us all human, a study that allows us to draw connections between the past and the present.

Wagner, Daniel P. [328] see Goode, Charles

Wagner, Dustin (New Mexico State University) and Trevor Lea (New Mexico State University)

[106] *Preliminary Results from Excavations of a Communal Pit Structure in the Gila National Forest*

As part of the recent salvage recovery effort at the South Diamond Creek Pueblo (LA 181765), a small Classic Mimbres pueblo (1000–1150 CE) in the Aldo Leopold Wilderness of the Gila National Forest, excavation was performed on a large pit structure that appears to be associated with an earlier occupation of the area. Sample excavation was performed as part of a field school directed by Dr. Fumiyasu Arakawa of New Mexico State University under. Very few archaeological investigations have been conducted in this area. The data recovered from this structure will contribute to a sparse data set on communal pit structures from this northern edge of the Mimbres boundary. With the work performed in the summer of 2017, numerous artifacts were discovered that will aid in the dating of the pit structure. This poster will provide a glimpse into the excavation and will present preliminary results

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of the excavation effort. Continued work on this site offers a new perspective into the northern Mimbres during the Late Pithouse period (550–1000 CE).

Wagner, Mark and Ryan Campbell (Southern Illinois University Carbondale)

[39] *Bound to the Western Waters: Searching for Lewis and Clark at Ft. Kaskaskia, Illinois*

Lewis and Clark recruited 11 soldiers from the small US Army outpost of Ft. Kaskaskia (1802–1807), Illinois, in 1803 to join their expedition to explore the American west. This event traditionally has been identified as having occurred at a 1750s French fort of the same name. The 2017 SIU summer field school investigations within the fort walls including the use of LIDAR, GPR, and hand excavations revealed that the fort is primarily a single component French construction dating to the mid-1700s that contains a small number of colonial French artifacts as well as a barracks and bakehouse. No evidence was found that the United States Army later rebuilt and reoccupied the fort in the early 1800s. LIDAR, GPR, and hand investigation of a nearby hilltop known as “Garrison Hill” located an extensive brick scatter intermixed with early 1800s military items that clearly interpreted as representing the remains of the 1802–1807 American Ft. Kaskaskia. This rediscovery of one of the pivotal sites of the Lewis and Clark Expedition not only corrects history but affords an opportunity to recover information on the daily lives and material possessions of American soldiers immediately prior to the start of the Lewis and Clark expedition.

Wake, Thomas (Cotsen Institute of Archaeology at UCLA), Lana Martin (UCLA Department of Anthropology) and Tomas Mendizabal (Patronato Panama Viejo)

[260] *Settlement, Subsistence, Culture Change and Networking: New Perspectives on Bocas del Toro's Integration with Greater Central America*
Understanding the settlement chronology and degree of interaction and integration of Caribbean western Panama within “Gran Chiriqui” and greater Central America has driven archaeological research in the region since the 1950's. Hernan Colon's accounts of Bocas and adjacent Costa Rica depict a populous region, with vast fields of maize, people traveling about in numerous canoes and wearing more gold objects than ever seen in the New World. Lothrop's 1947 synopsis of the “myth” of the Sigua settlement of Panama/Costa Rica Caribbean coastal plain suggests an enduring influence of Nahua, perhaps even Mexica, speakers moving into the region from the North. Linares' and Ranere's 1980 foundational study of western Panama raised perhaps more questions than it provided answers. Together these works have inspired a new generation of archaeological study in the region, the results of which have radically altered the perception of the area's pre-colonial history. A synthesis of new data more clearly illustrates the time-depth of greater Bocas del Toro's settlement, subsistence system, and interaction with greater Central America.

Walden, John (University of Pittsburgh)

[82] *Neighborhood Integration in Low Density Cities Which Follow a Divergent ('Outside-In') Urban Trajectory*

One relatively understudied aspect of neighborhood integration in ancient cities relates to the divergent trajectories along which cities form. In some ancient cities, the urban periphery appeared as autonomous communities prior to the development of a center, representing an ‘outside-in’ model of urbanism. Such contexts provide a valuable case study for investigating neighborhood integration into cities, due to a clear comparative temporal threshold (before and after incorporation). This presentation explores how a small community transitioned into a low density urban neighborhood in a larger city, and how the local elites at its apex transformed into intermediate elites in an emergent three tier political system. The Late-Terminal Classic (AD 700–900) Maya polity of Lower Dover, Belize offers potential for examining this issue because the center arose in the midst of several long-established, Middle Preclassic (1000–400 BC) communities. This presentation identifies the ways in which the lives of the inhabitants of the Tutu Uitz Na neighborhood changed during the Late Classic as it transitioned from an autonomous community to become amalgamated into a polity. A focus on the changing wealth, status and behavior of inhabitants permits an understanding of how the neighborhood became incorporated politically, economically, ritually and socially.

[82] *Chair*

Walden, John [28] see Levin, Anais

Walden, John [40] see Watkins, Tia B.

Walder, Heather (Northern Illinois University)

[332] *Phase III Investigations of Three Archaeological Sites at Stillwell Crossing, Fort McCoy, Wisconsin*

In summer of 2017, CEMML archaeologists at Fort McCoy, in Tomah, Wisconsin conducted Phase III investigations of three NRHP-eligible sites 47MO054, 47MO360, and 47MO660 near a tank trail crossing Stillwell Creek. This location was continually re-occupied for the last 3,000 years, by Late Archaic to historic-era Native American (probably Ho-Chunk) communities. Bioturbation, military activities, and other cultural and natural processes easily disturb the sandy soils at Stillwell Crossing, resulting in substantial mixing of the archaeological components, so the Phase III research design tested two questions: 1) How effective is subsurface geophysical prospecting in such contexts? and 2) How do spatial distributions of artifacts reflect both depositional and post-depositional processes at the site? Investigations demonstrated that the effectiveness of geophysical prospecting is limited, especially for identifying ephemeral pre-contact features. Vertical distribution of artifacts showed no distinctly stratified deposits, though horizontal distributions of lithic raw material varied across the three sites. Mineralogical analysis of soil samples, radiocarbon dates, and compositional analysis of a glass trade bead all yielded informative results about the extent and nature of past human activities at Stillwell Crossing. These mitigation efforts, which also included construction of a mock cultural site, enhance the military training facility at Fort McCoy.

[246] *Discussant*

Waldo, Brian (California State University, Los Angeles), Samantha Lorenz (Contested Caves Archaeological Project) and Toni Gonzales (U.C. Santa Barbara)

[157] *Investigating the Spatial Analysis of Chultuneob at Mul Ch'en Witz, Belize*

Mul Ch'en Witz (Hill with Many Caves) was first excavated in the summer of 2017 by the Contested Caves Archaeological Project (CCAP), a subproject of the Three Rivers Archaeological Project (TRAP). The area, located just below the escarpment on which the core architecture of the ancient site of La Milpa, Belize is situated, was chosen for excavation because of the high density of chultunes encountered within a restricted area. The chultunes have similar entrance styles and diameters, and five of the six investigated were located less than ten meters apart and display a strong north-south alignment. This poster will discuss the relation of the Mul Ch'en Witz chultunes to other landscape and architectural features at La Milpa and will advance preliminary inferences of these relationships.

Wales, Nathan (University of California, Berkeley), Kristen Gremillion (Ohio State University), Bruce D. Smith (Smithsonian Institution National Museum of Natural), Melis Akman (University of California, Berkeley) and Benjamin K. Blackman (University of California, Berkeley)

[137] *The Future of Paleogenomics in Archaeology: Insights from a Multidisciplinary Study on Sunflower Domestication*

Ancient DNA (aDNA) methodologies have rapidly developed over the past three decades, and today these tools provide a powerful means to investigate a wide range of archaeological inquiries, including human evolution, animal and plant domestication, and paleoenvironmental reconstructions. In this talk, I will summarize general approaches in paleogenomics research, focusing on concerns and questions from archaeologists.

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To demonstrate how state-of-the-art paleogenomic techniques can contribute to archaeological research, I will present new research on sunflower domestication that integrates aDNA, radiometric dating, and archaeobotany. Given the speed at which genomic technologies are becoming more cost effective, I will conclude with predictions about the future of paleogenomic research and offer suggestions for how aDNA studies can be integrated into archaeological research programs.

Walker, Debra (University of Florida), Kathryn Reese-Taylor (University of Calgary), Meaghan Peuramaki-Brown (Athabasca University) and Shawn Morton (Northern Arizona University)

[258] *A Middle Classic Horizon? Tracking Calakmul's Rise in the Ceramics of the Central Karstic Uplands*

Joe Ball's seminal work on the ceramics of Becan, Campeche, Mexico, anchored two generations of research on the ancient Maya. His analysis, for the most part, has stood the test of time, and his recent revisions to it reflect the breadth of his knowledge, and his ability to re-conceptualize a problem in light of subsequent research.

One aspect of his Becan work that has proved elusive to other researchers is the definition of a Middle Classic. Although some have isolated a Middle Classic component similar to Ball's Sabucan Complex, most find the period problematic. The recent identification of Middle Classic Macanxu Group ceramics in stratified residential debris at Yaxnohcah is described here, in the context of an expanding Calakmul polity.

Walker, John (UCF Department of Anthropology)

[333] *Donald Lathrap, the Tropical Forest, and Hemispheric Archaeology*

Donald Lathrap was a visionary anthropologist and archaeologist. His contributions always reflected the "big picture": an understanding that all pre-Columbian culture history was intertwined, and that these connections went back through time to origins in the lowland tropics, or the Tropical Forest. He practiced an archaeology that gave equal weight to iconography and religious thought, and rim sherds and energetics. The most significant issues for Lathrap's version of American Archaeology, is not an argument over the significance of the Amazon Basin in comparison to the Andes, or as a center for cultural innovation. The legacy of Lathrap is Hemispheric Archaeology, that there are deep cultural-historical connections across the Americas, particularly between the Andes and the Amazon that have explanatory value. The big picture is relevant both for maize farmers in the Mississippi Valley, tuber gardeners in the Pacific Northwest, and raised field builders in the Southwest Amazon. Such hemispheric explanations could be just-so-stories, but correcting for this danger is worth the effort, because as the evidence for earlier developments continues to accumulate, the big picture is getting bigger.

[80] *Discussant*

Walker, Karen (Florida Museum of Natural History), Jennifer Haney (Pennsylvania State University), William Marquardt (Florida Museum of Natural History), Rachael Kangas (Florida Public Archaeology Network) and Sara Ayers-Rigsby (Florida Public Archaeology Network)

[135] *Archaeological Shoreline Monitoring in a Climate-Changing SW Florida: The Case of a Rapidly Eroding, Rare, Late-Archaic Shell Midden at Calusa Island*

There are only a very few Archaic period sites in the Charlotte Harbor/Pine Island Sound region of southwest Florida. One of these, composing a large portion of Calusa Island, is an oyster-shell dominated midden. According to a landowner, since ca. 1973–1974 the site has suffered a horizontal loss of 11 m along parts (if not all) of its 80+meter, eroding archaeological shoreline. Based on a 1944 aerial photograph, it is likely that as much as 28 m has been eroded away. We began a monitoring program at this site in April of 2016, and in July began partnering with the Florida Public Archaeology Network's Southwest and Southeast regional archaeologists to assist and then continue the work. We describe our initial, simple method, its problems, and the improvements made by our FPAN colleagues. Currently, FPAN incorporates Calusa Island's monitoring into its statewide program which is, in large part, staffed by citizen volunteers who visit and re-visit sites in jeopardy and report their observations.

Walker, Martin (University of Tennessee, Knoxville) and David Anderson (University of Tennessee, Knoxville)

[35] *Examining the Subsistence and Social Landscapes of the Late Precontact Occupations at the Topper Site (38AL23), Allendale, South Carolina*

The Late Woodland to Early Mississippian transition within the Atlantic Coastal Plain is characterized by widespread and dynamic changes from more dispersed and politically decentralized organizational practices into highly centralized, stratified, and complex sociopolitical organization. This period also experiences changes in both hunting technologies and horticultural food production. The timing of the linkages among these developments are not well established locally, something that this project hopes to remedy. Three field seasons directed to the extensive Precontact occupations at the Topper site (38AL23), Allendale, South Carolina, have documented hundreds of features and a rich material record dominated by cross-cord-marked pottery and small triangular arrow points, as well as the widespread presence of maize. What was occurring on the site and when it occurred is the subject of a suite of specialized analyses, which are helping to reshape thinking about late prehistoric occupations in the central Savannah River Valley, and on a site formerly best known for its extensive Paleoindian archaeological record.

Walker, Martin [34] see Bissett, Thaddeus

Walker, Samantha (McGill University), Kathryn Kotar (McGill University), James Savelle (McGill University) and Arthur Dyke (McGill University)

[16] *Regional Analysis in Perspective: An Epistemological Assessment for Paleo-Inuit Archaeology*

The increasing accessibility of archaeological data from the Canadian Arctic has promoted a recent influx of macro-scale analyses. Drawing insights from our ongoing research project in the Foxe Basin region, we address some challenges regarding the synthesis of archaeological information, especially as it pertains to Paleo-Inuit studies. We discuss the importance of data quality and address issues of variability in occupation density, duration, and seasonality, both at the household and community levels. We propose potential solutions to these challenges. First, a relational bottom-up approach that utilizes multiple social scales of analysis in a fluid and continuous way, moving from household identities to the region-wide synthesis of archaeological activity. Second, the integration of both remote sensing and traditional ground survey technologies provide higher resolutions of analysis for local scales. It is subsequently evident that macro-scale approaches to Paleo-Inuit archaeology require a re-evaluation of both household and community contexts and chronologies prior to regional analysis.

Walker, William (New Mexico State University) and Axel Nielsen (C.O.N.I.C.E.T., Instituto Nacional de Antropología)

[218] *Prophets of the Ancient Southwest*

How do prophecy and new religious movements impact life histories of artifacts and architecture? Ethnographic evidence indicates that prophets realize their visions, in part, by transforming relationships between people and material objects. They shun, embrace, or reorient technologies, artifacts, and architecture. Not surprisingly, in cultures where spiritual forces already animate artifacts and architecture, such reorganizations can produce dramatic changes in material culture. Much of the revitalization and crisis cult literature has logically focused on the role that colonialism played in creating new religious movements. Prehistoric contexts, however, exhibit a broader range of underexplored contexts such as environmental stress, disease, and war. The ethnographic and historical records of the American Southwest suggest revitalization movements extend far into the past. We

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argue that widespread changes in material culture associated with significant inflection points in southwestern prehistory (circa A.D. 700s, 1000s, and 1300s) document the work of ancient prophets.

Walker Cunningham, Marilyn [261] see Frederick, Jennifer

Wall, Robert [22] see Gollup, Jasmine

Wallduck, Rosalind (Natural History Museum, London) and Silvia M. Bello (Natural History Museum, London)

[89] *Cut Marks and Decaying Bodies: An Experimental Study*

It has been suggested that cutting into decaying bodies occurred in the past, for instance during the cleaning or dismemberment of corpses during protracted funerary rituals. However it can be difficult to confirm the timings of such interactions, particularly for secondarily deposited bones. An experimental study was therefore conceived to test whether the frequency, location and micro-morphometric characteristics of cut marks might differ on fresh compared to decaying bodies. In order words, whether cut marks can be used to verify the stage of carcass decay. Incisions were regularly made into pig body parts as they decomposed over a period of three months. For metric evaluations of the experimentally produced cut marks, Focus Variation Microscopy was used. The effects of different hand pressures and different tools were also studied. Our results show that micro-morphometric analyses of cut-marks have the potential to enable the timing of cutting to better hypothesized with regards to defleshing and disarticulation practices in the past.

Waller, Joseph (PAL)

[159] *History on the Edge: Loss of the Ocean State's Past*

Hurricane Sandy impacted Rhode Island's south coast on October 29, 2012. Storm surge and wind-driven waves eroded considerable sections of the shore damaging historical and archaeological sites located at the contact between the land and sea. Emergency response and preservation planning archaeological surveys conducted in response to Hurricane Sandy represent the first large scale, systematic attempts to identify and evaluate vulnerable archaeological sites situated along the Rhode Island coast. These surveys also underscored the long-term threats that rising seas and future tropical storms pose to ancient, as well as, more recent cultural deposits. Continued erosion of the Rhode Island shore imposes current and future financial and logistical challenges to preservationists wishing to preserve the Ocean States' unique maritime history.

Waller, Kyle (University of Missouri), José Luis Punzo Díaz (Instituto Nacional de Antropología), Ana Morales-Arce (University of Calgary), Meradeth Snow (University of Montana) and Miguel Vallebuena (Laboratorio Nacional de Genómica para la Biodivers)

[97] *Ancient DNA Investigations of Possible Casas Grandes—Chalchihuites Interactions*

Paquimé, the political and religious center of the Casas Grandes culture, demonstrates extensive evidence of Mesoamerican influence, including macaws, architectural characteristics such as ballcourts and platform mounds, and mortuary practices in the form of modified trophy skulls and human sacrifice. The role of Mesoamerican influence on the development and florescence of the Casas Grandes culture remains an important but contentious research question for the late prehistoric Northwest/Southwest. While there is general agreement that some degree of Mesoamerican interaction occurred, the sources of this interaction, and their significance, remain an open question. In this study, we compare mtDNA haplogroup and sequence data from Paquimé to a series of Southwestern and Mesoamerican samples. The results suggest that samples from the Chalchihuites region of Durango, Mexico, are more similar to Paquimé than geographic distance would suggest. We conclude by discussing the potential role of the Chalchihuites culture in the spread of Mesoamerican traits into Chihuahua and the US Southwest.

Waller, Kyle [225] see Krug, Andrew

Waller-Cotterhill, Charlotte (The University of Sheffield)

[87] *Child Disability and Prostheses in Nineteenth-Century Britain*

Introduction of dedicated paediatric medicine, was an advancement arriving in Britain late compared to its neighbours such as France's 'Enfant Malades' in 1802. Paediatric hospitals were a consequence of physicians' financial aspirations rather than falsely portrayed 'community need' (Lomax, 1998). Their establishment contradicted longstanding attitudes surrounding children as 'incomplete beings...whom it was wasteful to devote attention to' (Porter, 1989). Oddly, amputation saw children harness the same attention as adults, and despite being overused, crudely performed with poor survival rates and aftercare, evidence exists of child amputees surviving into adulthood and of child prostheses. This paper will discuss complicated beliefs surrounding paediatric care in nineteenth-century Britain, concentrating on archaeological evidence of prostheses available for juvenile amputees. It asks why, in a society with poor paediatric care, was amputation and prosthesis provisioned for? What sparked the changes to children's healthcare which saw institutions such as Great Ormond Street Hospital, London, introduced in 1852? Analysis of Victorian prosthetic devices and medical procedures will help demonstrate that whilst children occupied the role of 'society's future', lingering attitudes, contributed to high infant mortality rates, overcrowded workhouses and an enduring class system. However, medical improvements and enlightenment, created an optimism, triggering a re-evaluation in paediatric healthcare.

Wallgrün, Jan Oliver [101] see Huang, Jiawei

Walling, Stanley (Community College of Philadelphia)

[142] *Late Classic Maya Commoner Myth, Ritual, and Landscape at Chawak But'o'ob, Belize*

Recent research at the ball court complex and other areas of the ancient hinterland community of Chawak But'o'ob in the Rio Bravo Conservation and Management Area in northwestern Belize indicates the existence of a sophisticated interplay of environment and ideology at this agrarian site. The intersection of landscape, hydrology, and architecture here hints at mythological underpinnings of Maya commoner ritual that only partially overlap those in evidence in ancient urban contexts.

Wallis, Neill (Florida Museum of Natural History), John Krigbaum (University of Florida), George Kamenov (University of Florida) and Michael D. Glascock (University of Missouri Research Reactor)

[9] *Pots and People in Motion in Woodland Period Florida*

Populations across northern Florida during the first millennium CE were highly interconnected as evidenced by shared patterns of mortuary practices, material culture, and settlement patterns. Social networks evidently were predicated on common ritual practices that found purchase in diverse and far-flung communities, especially those associated with "Swift Creek" and "Weeden Island" archaeological cultures. Through time, and with an expanding suite of religious practices and paraphernalia, populations across the region became increasingly aggregated in villages and possibly exhibited differentiated social status. Did Woodland period religious movements fuel village aggregations and incipient social inequality?

We test these apparent correlations through a multifaceted study of nearly a dozen burial mound assemblages from across northern peninsular Florida,

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seeking to infer patterns of human mobility, social interaction and community formation in the context of mortuary rituals. Isotopic analysis of skeletal populations are combined with demographic and life history information from individual secondary interments to model patterns of diet and mobility. Neutron Activation Analysis of pottery, compared with data from clays across the region, is used to source ornate mortuary wares. Results indicate that frequent transport of mortuary pots and possible integration of disparate populations were fundamental to religious expansion and social change.

Wallis, Neill [35] see Lulewicz, Isabelle

Wallman, Diane (University of South Florida)

[278] *Moderator*

[278] *Discussant*

Wallrodt, John and Denitsa Nenova (UCL Institute of Archaeology)

[130] *Beyond Research Design: Digital Resource Management for the Next Generation*

Digital technologies in the field of archaeology have often been promoted as a tool enhancing productivity and efficiency, usually implying that the immediate digital recording of data would allow for the excavation of greater volumes and covering larger areas. Moreover, the strength of Paperless Archaeology comes with the enabling of immediate dissemination of observable data while breaking up the 'sealed' relationship between the raw data and the First Interpreter.

What remains less addressed, however, is the long-term impact of digital recording. Because field projects often last several decades, there is a large gap between the initial methodological outlay and research design on one hand, and the final publication on the other. The true value of such digital resources becomes apparent only with the need of contextualizing and illustrating large volumes of artifacts, architectural or skeletal remains and other types of archaeological data, many years after the initiation of an archaeological project. The authors will use the example of the current Pylos excavations in Greece to emphasize the collection, storage, and dissemination of an avalanche of digital information with an emphasis on the integration of a complex database design, Geographical Information Systems (GIS), photogrammetry and aerial photography.

Walls, Matthew (University of Calgary)

[277] *Discussant*

Walsh, Carl (Brown University), Justin Yoo (Kings College London) and Paul van Pelt (Independent Researcher)

[32] *The Current State of Egyptology: An International Survey and Discussion*

This paper suggests that Egyptology has reached a critical juncture in which the opening of the field to other areas, such as anthropology and sociology, is critical in revitalising and safeguarding the future of the discipline. Discourse beyond disciplinary boundaries is becoming increasingly important in academia, due to wider changes in university structures, employment, and funding opportunities. Given the current importance of these issues, the authors wanted to determine how these aspects have impacted the identities, research, and careers of those who are currently entering the discipline. The authors designed and implemented an international survey to gauge the current state of Egyptology from the point of view of PhD students and early career researchers. The aim of this survey was to determine how these individuals perceived the scope and role of Egyptology, its prospects as a discipline, its integration in the humanities and social sciences, and the role of their own research and experience. The survey results are discussed alongside the authors proposal that a more reflexive Egyptology, one that engages critically with other disciplines, is needed to help reinvigorate the field and open new lines of enquiry for future research.

Walsh, Justin (Chapman University), Alice Gorman (Flinders University) and Erik Linstead (Chapman University)

[118] *A New Methodology for Archaeological Investigation of Human Activity in Space: The International Space Station Archaeological Project*

Our project is the first major archaeological study of a space habitat: the International Space Station. It is a locus of intercultural interaction at the level of both individuals and states, "a micro-society in a miniworld" (National Academy of Sciences 1972).

Remoteness and cost are obstacles to employing traditional archaeological techniques in Earth orbit, so we are developing new methodologies. Chief among these is the use of the millions of images generated by space agencies showing life onboard the station. We will classify the associations between objects, spaces, and crewmembers by cataloguing them from the images into a database, indexing them for time using the images' metadata. The enormous number of images makes classification by human researchers time- and cost-prohibitive. We are exploiting recent advances in machine-learning algorithms and crowdsourcing for classification of non-machine-readable data to solve this problem.

Ultimately, we will be able to choose any moment and study the station's development and occupation. We can then map changes in the function of spaces, or the associations of people and objects with particular spaces, over time. Such insights into how crew members adapt to the microgravity environment have never been available before, and have applications for future mission design.

Walsh, Rory (University of Oregon)

[246] *Moderator*

[246] *Discussant*

Walter, Doris (independent researcher) and Rebecca Bria (University of Minnesota-Twin Cities)

[292] *Multiple Ways of Understanding Peru's Changing Climate: Bridging Ethnographic, Archaeological, and Other Scientific Perspectives in Student Learning*

This paper discusses the importance of combining ethnographic, archaeological, and "hard" scientific knowledge when teaching about climate change. Archaeology courses that discuss climate change typically bring together data from the physical sciences, such as from ice or lake cores, with archaeological evidence of social change, such as shifting settlement patterns or food strategies. Though an understanding of these links is critical to scientific literacy and knowledge about the past, we suggest that an ethnographic perspective can deeply enrich student learning by revealing social processes beyond subsistence-based adaptations. Drawing on ethnographic fieldwork conducted in rural communities in Peru, we first review how local people perceive the causes and effects of climate change, including through the lens of religious belief. Second, we draw on archaeological and available ice core evidence from the region that reveal how ancient people adapted to shifting flows of water: an ongoing process that continues today. Ultimately, we suggest that the diverse kinds of knowledge that ethnography, archaeology, and paleoclimatology produce—and the multiple ways of knowing the world that each provides—is essential for students to consider when learning about not only what happened during moments of climate change in the past, but how societies creatively responded.

Walters, Patrick [22] see Gollup, Jasmine

Walthew, Jessica [265] see Carpiaux, Natalie

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Wandsnider, LuAnn (University of Nebraska)**[241]** *Heritage Enhances Resilience?: The Solomon Butcher History Project of Custer County, Nebraska*

Solomon Butcher was a citizen photographer smitten with what he referred to as the "history project," to photodocument the citizens of Custer County, Nebraska as the frontier receded further west. From 1886–1892, he imaged perhaps one third of the occupants, staging them in front of occupied or recently abandoned sod houses and making them party to his commemoration of a constructed pioneer heritage. When severe droughts hit in the mid-1890s, did this shared pioneer "can-do" heritage sustain Custer County residents? I report on a comparative analysis addressing this question.

[200] *Discussant***Wang, Jiajing****[284]** *Making Plant Foods in the Early Neolithic: Microbotanical Evidence from Shangshan Pottery*

The Lower Yangtze Valley of China is renowned for the origin of rice agriculture. Previous research based on archaeobotanical analysis and genetic data indicates that the evolution from wild rice to domestic rice was a continuous process that occurred between 11,000—6,000 BP. The Shangshan culture (11,400 BP—86,00) has revealed the earliest evidence of rice cultivation in the region and abundant pottery vessels. These vessels are diverse in form but their functions still remain unclear. By applying starch analysis on different types of Shangshan pottery, this presentation explores how plant foods were made and their associated social activities. By integrating plants into the social organization of human life, this study aims to develop an explanatory model to better understand the transition to agriculture in the Lower Yangtze.

Wantschik, Magdalena [15] see Crews, Christopher

Ward, James (University of Central Lancashire) and David Robinson (University of Central Lancashire)**[214]** *Sonic Landscapes, Past and Present: An Archaeoacoustical Study of Pleito*

Located on the Wind Wolves wildlife preserve in South Central California, there are several spectacular rock art sites. Created by the Native Californians who inhabited the landscape, they have been the focus of a number of studies over the years, but none of these studies concentrated on the sound quality of these spaces. The correlation between the placement of rock/cave art, and the acoustic properties of the space in which it is found, is increasingly being studied under the rubric of 'archaeoacoustics'. In this study, we employ both 'standard' and novel approaches to the study of the spectacular painted site called Pleito (CA-KER-77). This paper details the methodology and results of the 'standard' method, which employs a sine sweep and impulse analysis in order to determine the sonic properties of the local landforms in relation to where the art was placed. More importantly, a frequency response analysis of a traditional song performed by a member of the local Tejon Indian illustrates the deep importance of sonic landscapes within contemporary Native society.

Ware, Roselyn [143] see Kistler, Logan

Warinner, Christina [143] see Mann, Allison

Warmlander, Sebastian (Cotsen Institute of Archaeology, UCLA)**[46]** *Three Case Studies of Andean Metalworking*

The history of South American metalworking still presents a number of unresolved questions, despite decades of archaeological and historical research. This is especially true for the Andean region, where in prehistoric times alloys of copper as well as precious metals were crafted into intricate objects. Here, analytical metallographic techniques such as scanning electron microscopy (SEM), X-ray diffraction (XRD), and infra-red (IR) spectroscopy are used to investigate different aspects of Andean metalworking in three case studies. The first study investigates the technology used to produce gold wire in the pre-Columbian Quimbaya culture (Colombia). The second study concerns Inka period copper and silver production in the Tarapacá valley in northern Chile. The third study characterizes the composition, manufacture, and deterioration of metal embroidery from Chilean and Peruvian church objects dating to the colonial period. The broad geographic and temporal range of these case studies illustrates the diversity of the outstanding research questions of South American archaeometallurgy.

Warnacutt, Camille [39] see Myster, James

Warren, Matthew (University of Texas at San Antonio)**[257]** *Inka Colonialism without Inkas: Uncovering the Role of Lowland-Affiliated Populations in the Consolidation of the Eastern Andean Frontier*

As the Inkas expanded their imperial hegemony over the valleys of the eastern Andes, their armies fought and then forged political and military alliances with the various cultural groups comprising the Charkas confederacy. While the Spanish chronicles and local ethnohistoric sources attest to these events and to the important role the local indigenous populations played in Inka colonization efforts along the eastern imperial frontier, they are all curiously silent on another important population which inhabited the eastern Andean valleys into the Inka period. Abundant archaeological evidence from the Inka site of Pulquina Arriba and surrounding settlements demonstrates that the earliest settlers of this region had arrived not from the altiplano, but instead from the eastern tropical lowlands. Further, instead of being administered by Inka elites, Pulquina Arriba seems to have been inhabited by a combination of Charkas- and lowland-affiliated peoples. As such, this seems to represent a case in which a historically unacknowledged indigenous population was nevertheless critical to the success of imperial activities and administration in a critical frontier region. At least within the loosely incorporated easternmost Andes, a strategy of "Inka colonialism without Inkas" seems to have represented a viable means of imperial expansion and colonization.

Waters, Christopher (Syracuse University) and Anthony Tricarico (University of South Florida)**[208]** *Socio-spatiality of an Antigua Plantationscape*

Caribbean Sugar production during the 18th and 19th centuries expanded rapidly, fueled by increasing proletariat consumption across the globe. In response, sugar planters in 18th century Antigua, West Indies, deforested over 90 percent of the landscape, carving the island into proto-industrialized plantations defined by sugarcane monoculture and labored by enslaved Africans. New World plantation organization was once ascribed as a balance between profit and surveillance: simultaneously maximizing control over the landscape and enslaved labor. However, evidence from Antigua questions aspects of these earlier notions. This paper examines the socio-spatiality of the late 18th century Antigua plantationscape. Specifically, this research builds upon the analysis of Bates (2015) in Jamaica and Nevis, conducting a diachronic and synchronic analysis of seven different plantations in Antigua owned by the Codrington family, including Betty's Hope [1655–1944], New Works [before 1710], Cotton Estate [before 1710], Tuitts Estate [before 1750], Rooms Estate [1717–1852], Clare Hall [1814–1848 (at least)], Jennings Estate [1772–1815], and Bolans Estate [1772–1815] to determine whether plantation layout sought to maximize profit or surveillance. Our research shows that Antigua plantations underwent several transformations aimed at profit extraction at the expense of surveillance, reflecting a much more heterogeneous 18th century island landscape.

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Waters, Michael (Texas A&M University) and Jessi Halligan (Florida State University)

[78] *Page-Ladson and Submerged Late Pleistocene Sites along the Aucilla River, Florida, and Their Importance to First Americans Archaeology*
Late Pleistocene terrestrial archaeological sites now lie submerged in the karstic river systems of Florida. Nowhere is this more apparent than along the Aucilla River where dozens of inundated prehistoric sites are known. One of the most important sites is Page-Ladson, which has yielded some of the earliest unequivocal evidence for pre-Clovis occupation in North America, dating back to 14,550 cal yr B.P. At that time, sea levels had fallen approximately 100 m and people utilized a pond in the bottom of a sinkhole that was located ca. 250 km inland from the coast. Subsequent sea level rise slowly submerged the site, 4 m of sediment buried the site, and the sinkhole became part of the Aucilla River channel. This scenario was repeated at multiple sites, creating a rich underwater record of archaeological sites dating to the Late Pleistocene in Northwest Florida. These submerged sites are critically important to First American studies because they occur in a secure geological context that can be dated by the radiocarbon method. Further, floral and faunal remains are well preserved at these sites which can provide detailed paleoenvironmental records related to climate change and megafaunal extinctions.

Waters, Michael [8] see Keene, Joshua

Watkins, Rachel (American University)

[107] *Ethics, Epistemology and Multiple Consciousness: Some Considerations*

This paper centers the ethical epistemology (EE) of the New York African Burial ground—as well as the scholar-activist traditions that informed it—in this important session discussion on ethics. I argue that both are overlooked resources for conceptualizing and operationalizing an ethics of multiple consciousness such as the one that the organizers propose. The intellectual and political work associated with the EE of the New York African Burial Ground Project is discussed along with the specific structural inequalities to which it responds. The recent application of the New York African Burial Ground's ethical epistemology to a case involving real estate development and the desecration of an African American burial site in Washington, DC is also discussed. The historical, social and political factors involved in both the New York African Burial Ground and the local cemetery case lead to 2 important conclusions: 1) developing an ethics of multiple consciousness must involve a critical examination of both our research practices and researchers as social actors; and, 2) the social and contemporary relevance of our research is both an intellectual and moral imperative.

Watkins, Tia B. (Northern Arizona University) and John Walden (University of Pittsburgh)

[40] *A Comparative Spatial Analysis of Ancient Palaces*

Ancient palatial complexes offer opportunities to understand the actors at the apex of prehistoric polities. With careful and complex design, these structures were built to represent the affluence of those who resided within their confines. While the external façade of a palace represents the defining barrier between the elite and the public, the architectural layouts of ancient palaces reveal multiple levels of exclusivity. The varying levels of privacy in different palaces may relate to the differing roles and functions that palaces fulfilled across the ancient world. In some contexts palaces were simply a grandiose residence for the ruling elite, whereas elsewhere they fulfilled political, religious, administrative, economic and military functions. Furthermore, the accessibility of the inner areas of palaces might reflect the gulf between rulers and subjects, or the overall safety of the elite. We apply a space syntax analysis to several ancient palatial complexes to measure privacy and accessibility. We compare the results to identify patterned variability in the level of restriction between palaces, which might be structured by the presumed function of the palaces (military, economic, religious, residential, and administrative), the broader bases of political power in the society, or the level of societal complexity.

Watling, Jennifer (University of São Paulo), Myrtle Shock (Federal University of Western Pará), Martín Torres Castro (University of São Paulo) and Eduardo Góes Neves (University of São Paulo)

[116] *From the First to the Last Amazonian Dark Earths: The Longue-Durée of Landscape Management at the Teotônio Site, Upper Madeira River, SW Amazonia*

The Teotônio site, situated on the right bank of the Madeira river near Porto Velho, Rondônia, is a key location for understanding the deep history of human-environment interactions and landscape management in southwest Amazonia. Its archaeological record stretches back to the early-mid Holocene and includes vestiges of 6,000-year old Amazonian Dark Earths (ADE) belonging to the Massangana Phase, hypothesised as marking the beginning of widespread landscape transformations in the Upper Madeira region. From around 3,000 BP, more intense occupations are visible with the arrival of ceramic-producing groups, while the accumulation of darker ADEs packed with ceramics from ca. 1,000 BP may reflect a peak in site occupation during this period. In this paper, we present new data from on-site and off-site archaeobotanical and palaeoecological analyses currently underway at Teotônio and discuss their preliminary implications for subsistence, land use and climate-vegetation dynamics throughout the site's rich history.

Watrall, Ethan (Michigan State University)

[215] *Towards an Approach to Building Mobile Digital Experiences for Campus Heritage & Archaeology*

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 often don't allow for the kind of interactive, place-based, and individually driven exploration so often craved by the public. In recent years, many archaeological projects, cultural landscapes, and heritage institutions have turned to mobile technology to help address these challenges.

It is within this context that this paper will explore a deeply collaborative effort at Michigan State University that leverages mobile technology to build an interactive and place-based interpretive layer for campus heritage and archaeology. Driven by the work of the Campus Archaeology Program, these efforts have unfolded across a number of years and evolved to meet the ever changing need to present the rich and well-studied heritage and archaeology of MSU's campus.

Ultimately, the goal of this paper is not only to present and discuss the efforts at Michigan State University, but to provide a potential model for other university campuses interested in leveraging mobile technology to produce engaging digital heritage and archaeology experiences.

[160] *Discussant*

Watson, Adam (American Museum of Natural History)

[322] *Discussant*

Watson, James [88] see Krummel, Jordan

Watson, Jessica (University at Albany)

[34] *Martha's Vineyard Beach Economy: Scavenged Seals and Washed-up Whales at the Frisby Butler Site*

Marine mammals, including whales and seals, were a source of meat, blubber, baleen, and bone to the settlers of Martha's Vineyard from the earliest occupation until the historic period. Numerous species of whales have been observed in New England's shallow waters, including migratory species

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like the North Atlantic Right Whale (*Eubalaena glacialis*) and other marine mammals like the Harbor seal (*Phoca vitulina*). During the 17th and 18th centuries, the Wampanoag on Martha's Vineyard and neighboring islands negotiated drift whale rights with the English, reserving claims to dead whales on sold lands, particularly along the southwestern coast. Stranded whales were also trapped and driven ashore at nearby coasts.

In this paper, the role of drift whales and other beached finds is assessed at the Frisby Butler site, located along the southwestern shore of Martha's Vineyard. Marine mammals account for less than 1% of the total assemblage but represent at least four separate species. How can we explain the diversity of these taxa at a site otherwise focused on deer and inshore fishing? In particular, this research questions whether infrequent whale bones are indicative of scavenging drift whales, offshore hunting, or perhaps dispersed trade practices.

Watson, Rachel (Louisiana Division of Archaeology)

[231] *Can You Make Me a Map? Making Louisiana's Cultural Resources Records Accessible*

This paper will outline the processes and decisions that the Louisiana Division of Archaeology made to create an efficient, comprehensive GIS system that could be utilized by both professionals and the citizenry of Louisiana to help promote both progress and preservation. I will discuss how we partnered with La Department of Transportation & Development, La Governor's Office of Homeland Security & Emergency Preparedness, the New Orleans Corp Engineers, and the Federal Emergency Management Agency to fund the project. Furthermore, I will discuss how we handled gaps in data and converting paper files into a digital format. Finally, I will outline future endeavors to raise public awareness of Louisiana's rich cultural history utilizing open access maps, story boards, and applications for smartphones and tablets.

Wattenmaker, Patricia (University of Virginia)

[170] *Wealth Building in Early Urban Mesopotamia: Strategies and Ideologies*

Stratified occupational remains at mounded sites of third millennium Mesopotamia afford a temporal perspective on houses and institutions, as well as fluctuations in their resources. This paper draws on such data to evaluate the ways that houses and institutions accrued wealth and enhanced inequalities. Evidence for the production, circulation and storage of food and craft goods in early Mesopotamia informs about the kinds of resources used for wealth building, the processes through which goods took on value, and the role of risk in resource accumulation. Findings provide the basis for assessing the value and limitations of anthropological approaches to monetary economies in understanding resource accumulation and exchange networks in early urban Mesopotamian societies.

Wdowinski, Shimon [116] see Erickson, Clark

Weaver, Brendan (Berea College)

[271] *Diachronic and Spatial Perspectives for Exploring the Ethnogenesis of Afro-Andean Populations in Southern Coastal Peru*

Ecclesiastical records suggest that the Ingenio Valley in Nasca's northern Rio Grande Drainage has been defined by a predominantly black population since the early 17th century, most of whom worked as enslaved laborers on the two large Jesuit wine haciendas and a number of smaller secular estates in the valley. In this paper I approximate Afro-Andean ethnogenesis in the coastal valleys of Nasca from multiple temporal and spatial scales, considering both historical documentation and archaeological evidence. A close examination of documentation across the subsequent two centuries opens a window onto the complexities and contradiction of mapping casta categories onto the valley's social geography. Archaeology offers a means to explore slave-dominated spaces on the Jesuit wine estates and the production of an hacienda aesthetic which contentiously incorporated a host of African, European, and Andean signs, revealing of both dissensus and social cohesion among the heterogeneous enslaved and free Afro-Andean hacienda population.

Weber, Sadie (Harvard University)

[249] *Pulling Abundance out of Thin Air: The Role of Pastoralism in 1000 BC Peru*

Andean camelid pastoralism—with its origins in the puna of the South-Central Andes—plays a key role in risk management and transformation of low-energy, high-abundance resources. Camelids not only help pastoralists mitigate risk by acting as literal “wealth on the hoof,” but they also maintain cohesion of intergroup relationships across vast distances by facilitating mobility within and among diverse environmental zones. Here, I examine intensified camelid pastoral systems as an adaptation to scarcity in the Andean highlands. I employ a multiproxy analysis including zooarchaeology, microbotany, and stable isotopes to examine the extent to which intensified pastoralism was key in proliferating the widespread cultural phenomena we see in the highlands at approximately 1000BC in the Central Andes. I propose that environmental wealth—or a lack thereof in some areas—at 1000BC prompted an intensification economic and cultural systems that were heavily dependent on pastoralists.

[249] *Chair*

Weber, Sadie [6] see Schroll, Andrew

Webster, Andrew (University of Maryland)

[296] *Intersectional Irish Identity and the Rise of Globalization*

Archaeologists have long struggled with assigning specific artifacts to particular ethnic identity categories. This paper uses the artifacts of the nineteenth-century rural Irish poor to argue that identity is best considered intersectionally, in which questions of ethnic or national identity are combined with class, gender, religion, and other identity categories. This intersectionality becomes increasingly important for archaeologists to consider with the rise of globalization, in which mass-produced objects originating from production centers both near and far are used to construct identities.

[296] *Chair*

Webster, Chris (APN—@ArchPodNet)

[321] *Discussant*

Webster, David (Penn State University)

[258] *Becan Reconsidered*

Joe Ball's early career centered strongly on Becan, which during the early 1970's figured prominently in many interpretations of Classic Maya society and culture history. The initial Becan research predated our effective understanding of Maya inscriptions, the large-scale conflicts and alliances that affected the southern lowlands, and also the now-widespread data for climate change and the Classic “collapse”. Because of its lack of inscriptions Becan has been unfortunately marginalized or ignored in the later literature on these topics. Reconsideration of its significance on the Maya political and agrarian landscape is long overdue.

[163] *Discussant*

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Webster, Jane (Newcastle University (UK))**[308]** *From Rome to Charleston: A Comparative Perspective on the Archaeology of Forced Migration*

My title is borrowed from a groundbreaking volume of papers published in 1997. Eltis and Richardson's *Routes to Slavery: Direction, Ethnicity and Mortality in the Transatlantic Slave Trade* marked the first flowering of a hugely ambitious project to synthesize archival data on known Transatlantic slave trading voyages from ca. 1500–1900. The resultant database is now widely used by archaeologists in both Africa and the Americas. But there were many other routes to slavery in different times and in other places: not least the many routes which brought millions of enslaved persons to ancient Rome and its provinces in the Classical era. Can archaeological work on forced migration, ethnicity and ethnogenesis in the early modern world really inform research centered on the Roman Republic and Empire? Yes it can, as this paper aims to show. Moreover, diachronic comparison—and the nuanced methodologies which underpin the archaeology of the Diaspora in the Americas—could provide the (far less developed) archaeology of Roman slavery with a new road map for the identification of the unfree, and recovery of their life experiences.

Webster, Laurie (University of Arizona)**[218]** *Cotton as Commodity in the Prehispanic Southwest*

With its strong symbolic reference to moisture and clouds, cotton has long been considered a precious textile fiber in the Americas. Adopted from Mexico as a tropical crop, it was well-established in the Salt-Gila drainage by 500 A.D., and by 1000–1100 A.D. it was adapted to the wetter microenvironments of the Colorado Plateau. Because cotton could not be grown everywhere, it became a prized element of trade and craft specialization. In this paper I examine the agricultural intensification, commodity production, and exchange of cotton and cotton textiles in the prehispanic Southwest with a focus on the Western Pueblos, including the important Homol'ovi villages.

Wedemeyer, Rachael, Arthur Joyce (Advisor), Jeffrey Brzezinski (Colleague) and Sarah Barber (Colleague)**[9]** *Fragments of Identity: A Comparative Study of Terminal Formative Figurines from Coastal Oaxaca, MX*

The Terminal Formative period (150BCE-250CE) in Coastal Oaxaca, Mexico was a time of urbanization and increasing political interaction. The Terminal Formative included the emergence of an urban center at the site of Río Viejo, which may have extended political influence over surrounding communities. During this period, on the coast of Oaxaca, ceramic figurines were a ubiquitous medium for expression and identity in political/cultural exchanges. By comparing ceramic figurines from the site of Río Viejo, a primary center, to Cerro de la Virgen, a secondary community, relations between these two communities can be better understood. Through both qualitative and quantitative analyses, including INAA, much can be postulated about the manufacture and use of the ceramic figurines. The figurines from both sites have proven to be diverse in their iconography as well as sharing many other aesthetic similarities. With Terminal Formative figurines here some iconographic trends that seem to exist as categories such as anthropomorphic and zoomorphic, which are expressed by a number of well-preserved artifacts. The ceramic figurines have also proven to be diverse in their use: some are musical instruments, some are able to stand, and others were able to be worn.

Wegner, Paul (Institute for American Indian Studies)**[203]** *Connecticut's First Fishermen: The LeBeau Fishing Camp*

Located on the Quinebaug River, the LeBeau fishing camp and weir is the oldest known weir in Connecticut. Approximately 8,700 artifacts were recovered from the site, primarily lithic tools made from locally sourced materials such as quartzite. These tools indicate the specific activity of fishing and processing. Diagnostic artifacts recovered from the site indicate that it was utilized by indigenous people over the course of thousands of years, from the Middle Archaic to the Early Woodland.

Among the site's notable features is the presence of the diagonal weir, which is particularly useful compared to the traditional V shaped weir. This pattern allows for trapping activities to take place at lower water levels along the shore, whereas the V pattern concentrates the actions on the deeper, center portions of the waterway.

This presentation will explore not only how the LeBeau site differs from other fishing sites found throughout Southern New England, but also how its artifacts provide a unique window into the past and how Native American people utilized the Quinebaug River as part of their seasonal subsistence strategy. And why these unique features included it to be listed as a State Archaeological Preserve.

Weidele, Daniel [83] see Borck, Lewis

Weik, Terrance**[271]** *Discussant***Weinberg, Camille (University of Texas at Austin), Jo Osborn (University of Michigan), Rachael Penfil (University of Illinois at Chicago) and Kelita Pérez Cubas (Pontificia Universidad Católica del Perú)****[240]** *New Evidence of Late Intermediate and Inca Occupation at Jahuay, Quebrada de Topará, Peru*

Located at the mouth of the Quebrada Topará on the Peruvian South Coast, Jahuay is a multicomponent site key to understanding the rise and spread of the Topará cultural tradition—and the Paracas decline—during the Early Horizon. Limited systematic archaeological work in the mid-20th century defined Jahuay as the type-site for Topará ceramics, and also reported the existence of tombs on the site's upper terraces that were initially dated to the Late Horizon (AD 1450–1532). However, 2017 investigations revealed the existence of a previously unreported Late Intermediate (AD 1100–1450) and Late Horizon occupation at Jahuay's beachside edge. Although this sector has been severely damaged by both human and environmental forces, we recovered well-preserved material culture, including ceramics, plant remains, marine shell, and animal bone. This poster presents this body of evidence and considers the implications of this newly identified later occupation within the regional settlement pattern for the Peruvian South Coast.

Weinberg, Camille [46] see Osborn, Jo

Weinstein, Richard (Coastal Environments, Inc.), Amanda Evans (Coastal Environments, Inc.) and Jessica Kowalski (University of Alabama)**[84]** *Investigating Subsided and Drowned Shell Middens in Coastal Louisiana: Research at Sites 16SB47 and 16SB153*

Archaeologists from Coastal Environments, Inc., (CEI) reassessed the National Register eligibility of the Bayou St. Malo site (16SB47) and site 16SB153, located adjacent to one another on the southeastern shore of Lake Borgne in St. Bernard Parish, Louisiana. Previous investigations at the two sites suggested that cultural remains occurred only on the marsh surface adjacent to the lake, primarily as redeposited, wave-washed materials, and that neither site was eligible for inclusion in the National Register of Historic Places. CEI's investigations utilized terrestrial subsurface probing, hand-turned augering, and controlled testing, plus offshore vibracoring and sub-bottom profiling, to identify intact shell mounds and extensive associated areas of subsidized and drowned shell middens. It also was possible to reconstruct the occupation sequence of the two sites, identify the now-subsided and submerged landforms on which the locales initially developed, and to offer a methodology for examining similar sites in similar settings, particularly through an interpretation of the remote-sensing data within the established geologic and geomorphic contexts of the region.

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Weir, Donald (Commonwealth Cultural Resources Group Inc.)

[151] *Discussant*

Weise, Jeffrey [106] see Dillingham, Frederic

Weissbrod, Lior (University of Haifa) and Yaron Dekel (Shamir Research Institute)

[125] *Insights from Commensal Pathways into Domestication Origins*

Research on the origins of animal domestication has relied heavily on the use of morphometric characteristics of skeletal remains as diagnostic markers for important shape and size changes, which supposedly signaled the beginnings of domestication processes. However, the utility of this approach for pinpointing the timing and geographic and cultural context of initial domestication has been recently questioned. This approach has been undermined by empirical findings from geometric morphometric studies of phenotypic variation in key diagnostic traits in dogs and pigs, DNA research, and theoretical thinking from the perspective of niche construction and the extended synthesis of evolution. These developments call for rethinking of current approaches to documenting early domestication pathways, and suggest a way forward to addressing pressing issues in the how and why human societies began to domesticate animals. A step in this direction is provided by recent work on the house mouse and the context of its initial commensal bond with pre-agricultural hunter-gatherers in the southern Levant. This work offers important insights into early human-animal interactions, which did not yet involve the kind of conscious directed human intervention which was likely to have furnished the triggering mechanism for later changes in skeletal morphometry of animal domesticates.

Weissbrod, Lior [125] see Cucchi, Thomas

Weitzel, Celeste [120] see Flegenheimer, Nora

Weitzel, Elic (University of Connecticut), Brian Codding (University of Utah), Stephen Carmody (Troy University) and David Zeanah (California State University, Sacramento)

[5] *Site Clustering Parallels Initial Domestication in Eastern North America*

Dense human settlements often emerge following a shift to agricultural economies, yet researchers still debate the underlying cause of this pattern. One driver may be what is known in ecology as an Allee effect, a positive relationship between population density and per capita utility. Allee effects may emerge with economies of scale such as those created by some forms of intensified food acquisition and production. Thus, in an Allee-like setting, individuals belonging to larger groups enjoy the benefits of greater efficiency and productivity of subsistence, as well as group defense, mating opportunities, cooperative parenting, etc. Here we evaluate this hypothesis by examining the process of initial plant domestication in Eastern North America, where we expect the process of intensification should co-occur with a shift from more dispersed to more clustered settlement patterns as individuals begin to benefit from aggregation. Application of the Clark-Evans Nearest Neighbor Index to dated site locations available from the Canadian Archaeological Radiocarbon Database support our predictions, revealing a shift from dispersed to clustered settlements that coincides with the initial domestication of plants in the region. This result supports the hypothesis that subsistence intensification in Holocene Eastern North America was associated with Allee effects and incipient territoriality.

Welch, Jacob (Yale University) and Scott Hutson (University of Kentucky)

[82] *Neighborhoods and the Constitution of Authority*

Archaeologists working on the question of integration of neighborhoods within cities or polities often begin by assuming the existence of centralized authority. Next, they move to consider the relationship between neighborhoods and such authorities. Researchers typically see this relationship as one of domination, independence, or something in between. The case of Chunchucmil, a large Maya site located in northwest Yucatan, Mexico, challenges this common approach to neighborhood integration. At Chunchucmil, neighborhoods are clearly defined but centralized authority is not. Thus, we must set aside the question of neighborhoods being weakly or strongly integrated with centralized authority and instead ask how neighborhoods constitute authority itself. In a densely populated, decentralized city, how can neighborhoods be seen as factions whose competition and cooperation produce authority? This paper explores this question while also discussing everyday processes that hold neighborhoods together, cases in which households could switch ties from one neighborhood to another, and the foundations of inequality within neighborhoods and hierarchy between them.

Welch, Jacob [162] see Kidder, Barry

Welch, John (Simon Fraser University)

[289] *Discussant*

Welch O'Connor, Lauren (University of Massachusetts Boston) and Douglas J. Bolender (University of Massachusetts Boston)

[167] *Environmental Variation and the Sustainability of Farms: Investigating Effects of Erosion in Northern Iceland*

The initial colonization of Iceland in the late 9th century had a profound impact on the fragile environment of the North Atlantic island. Settlement and the introduction of livestock resulted in widespread erosion and the replacement of woodlands with meadows and heaths. Changes in the environment are assumed to have played a role in determining settlement patterning and subsistence strategies. While marginal highland areas were most seriously affected, resulting in farmstead abandonment, the nature of changes in lowland areas and their impact on the productivity of individual farms is poorly understood. Local patterns of landscape change in Iceland could be highly varied as erosion in one area often resulted in soil accumulation in another. Focusing on the lowland region of Hegranes in northern Iceland, we examine the timing of erosive events in relation to fluctuations in farmstead size during three periods of occupation: pre-1104 A.D., 1104–1300 A.D., and post-1300 A.D. We consider when and where these events occurred and their implications for the viability and productivity of individual farms and households.

Welker, Martin [189] see Zavodny, Emily

Wellman, Hannah (University of Oregon)

[10] *Avifaunal Remains from the Palmrose Site (35CT47): Establishing Seasonality and Investigating Endangered Species*

Avifaunal remains have great potential to improve archaeological understanding of the economy and subsistence of peoples who lived in the past, as well as to yield information about local ecology, environmental change, and past bird species distribution. The large assemblage of faunal remains from the three archaeological sites comprising the Seaside Collection from Seaside, OR, contains significant quantities of bird bone. Previous analyses of vertebrate remains (including birds) by Greenspan and Crockford (1992) and Colten (2015) suggested occupation occurred at the site year round. While these studies provide baselines for interpreting seasonality and species representation, approximately half the Palmrose faunal remains from the initial 1970s excavation are unanalyzed. Consequently, zooarchaeological analysis has been performed on a previously unanalyzed subsample (NISP=200) as part of a larger avifaunal project. This project seeks to understand not only patterns of site occupation, but to also gain greater insight on strategic hunting practices (i.e., seasonal and geographic targeting/acquisition of specific avian species). Such information is critical for

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understanding human subsistence behavior and landscape use. This investigation also seeks to provide data on the local historical ecology of two currently endangered bird species in Oregon: the marbled murrelet (*Brachyramphus marmoratus*) and the short-tailed albatross (*Phoebastria albatrus*).

Wells, E. Christian (University of South Florida), Kara A. Fulton (University of South Florida), David Mixter (Binghamton University) and Borislava Simova (Tulane University)

[129] *The View from the Ground: How Geochemistry Informs Our Understanding of the Regal, Ritual, and Residential Character of Actuncan*
The archaeological investigation of Actuncan in western Belize included the geochemical analysis of one of the largest and most diverse sets of activity surfaces in the Maya world. Over 1200 soil, sediment, and plaster samples from four major architectural complexes representing regal, ritual, and residential locations were assayed using ICP-MS. The results allow a uniquely "atomic" perspective on the changing use of urban space over roughly 900 years, ca. AD 100–1000. This research identifies feasting, ancestor veneration, and other diacritical performances as key practices that marked exclusivity or inclusivity in the political, religious, and social lives of the city's residents.

[208] *Discussant*

Wells, Joshua J. (Indiana University South Bend)

[231] *Principles of Open Government Archaeology: Lessons from the Digital Index of North American Archaeology (DINAA)*
American archaeology is conducted under cultural resources protection laws, but how does archaeology meet the challenge of openness? The past decade saw development of the "open government" digital information paradigm for public availability of information that underpins the functions of governance. Open government data provide a base for the interested public to offer expertise in aspects of necessary analyses, and to derive further public value from reuse of government data in novel ways. The open government concept has affected the practice and communication of scientific data in regulatory regimes as far flung as climate science, health science, and archaeology, among many others. In 2007 the "eight principles of open government" were coined by a group of public advocates, followed rapidly by a mosaic of federal, state, and local initiatives. The Digital Index of North American Archaeology (DINAA) is a completely free, big data, open government data project, centered at several public institutions; DINAA embodies open government practices to develop a novel linked-open data network of archaeological site primary data and related records across the internet. Our disciplinary capacity to engage with the principles of open government will be addressed through DINAA interoperability assessments and experiments with open government data.

[321] *Moderator*

[101] *Chair*

Wells, Joshua J. [53] see Noack Myers, Kelsey

Wemanya, Sylvia [99] see Curley, Angelina

Wendel, Martha (University of Cincinnati), David L. Lentz (University of Cincinnati), Timothy Beach (University of Texas—Austin) and Sheryl Luzzadder-Beach (University of Texas—Austin)

[153] *Raised Field Agriculture in the Maya Lowlands: Archaeobotanical Remains from Birds of Paradise*
Up until the late 1990s, researchers believed the Maya were solely reliant on slash and burn agricultural practices. However, discoveries of rectangular canal patterns in the margins of wetlands in the Maya lowlands of Guatemala, Belize, and Mexico shined light on a new agricultural practice: raised wetland fields. One example of wetland fields is found at the site Birds of Paradise (BOP) in the Rio Bravo region of northwestern Belize. The macrobotanicals recovered from the raised fields and canals at BOP are compared to the four stages of occupation as outlined in the Birds of Paradise model on the basis of previous research. Since no previous macrobotanical analysis has been done at BOP, this research will make an important contribution to understanding what the Maya were growing in wetland canals and how the land changed over time with the implementation of agricultural practices.

Wendrich, Willeke (UCLA)

[172] *At Risk Cultural Heritage and the Power of Communities*

In the years of willful destruction of cultural heritage as part of an extremist obliteration of the past, there have been several instances in the news of local populations taking stance against these destructive forces. In some cases protection of cultural heritage has become a voice against suppression and the reconstruction of destroyed monuments, e.g. through 3D printing and resurrecting lost parts, an act of defiance. Most destruction of cultural heritage, however, takes place much more quietly, through urbanization, the expansion of agriculture and modern mining. The destruction of unexcavated archaeological sites results in the complete erasure of the social history of large areas of the world. Here too, a close collaboration with communities living around and on top of the archaeology can provide access and protection of important cultural heritage, that cannot be reconstructed through 3D printing, because we simply would not know of its existence and importance.

[316] *Moderator*

[286] *Discussant*

Wendrich, Willeke [172] see Whitmore, Deidre

Wendt, Carl (Cal State University—Fullerton), Edgar Huerta (Cal State University—Fullerton), Hector Neff (Cal State University—Long Beach) and Michael D. Glascock (University of Missouri)

[285] *Source Analysis of Obsidian from the Late Olmec Site of Los Soldados*

Recent compositional analyses of obsidian from Formative Period Mesoamerican sites have been used to trace obsidian to a number of Highland Mexican and Guatemalan sources, and documented shifts in sources through time. In this presentation, we report the results of a study that analyzed 401 obsidian samples excavated from the Middle/Late Formative period habitation site of Los Soldados, located 11 km from the Olmec capital of La Venta. Using three high precision techniques (LA-ICP-MS, XRF, and pXRF) we attempt a reconstruction of obsidian procurement and long-distant trade at Middle Formative/Epi-Olmec Los Soldados. Specifically, 102 small obsidian chips (ave. 1–2 sq cm) were analyzed at IIRMES using LA-ICP-MS and pXRF, and another 299 larger obsidian chips (ave. 2–5 sq cm) were analyzed at MURR using XRF. Results show that the inhabitants of Los Soldados utilized obsidian from both Highland Mexican and Highland Guatemalan outcrops. In addition, results indicate that these three techniques produce comparable results. Finally, our results demonstrate that obsidian color is not a reliable indicator of procurement source, and we argue that color should not be used to infer source.

Wendt, Dan [89] see Sterner, Katherine

Werkheiser, Marion

[236] *Discussant*

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Werlein, Amanda (University of Missouri, Columbia), Joan Coltrain (University of Utah), Jeffrey Ferguson (University of Missouri Research Reactor), Virginie Renon (University of Missouri Research Reactor) and Karen Schollmeyer (Archaeology Southwest, Tucson, AZ)
[187] *Developing Regional Isotopic Baselines to Trace Resource Acquisition Patterns in the Mesa Verde Area of the American Southwest*

The analysis of strontium and oxygen isotopes in archaeological bone is commonly used to trace human mobility and migrations. We are using this isotopic approach to reconstruct changes in human access to large animal resources acquired through trading and hunting in the Mesa Verde area between 750–1280 AD. Current work is focused on determining the isotopic variability of the complex geology surrounding the primary study area. Isotopic analyses have been conducted on non-cultural archaeological rodent bones from surrounding regions, which, due to their limited home ranges, can be used as indicators of the bioavailable strontium isotopic signature of their local environment. Modern plant leaves have been used as a corresponding source for local isotopic signatures and in locations where rodent bones could not be acquired. While focusing on strontium analysis, we also address oxygen isotopic signatures of collected plant materials, faunal bone and local water sources providing additional complementary provenance information. The baselines determined from this work will be used to address the provenance of archaeofaunal bones in Mesa Verde assemblages, including those of rabbits, turkey, and deer.

Werness-Rude, Maline (Ventura College) and Kaylee Spencer (University of Wisconsin-River Falls)

[30] *A Good Footing: The Importance of Plaza Design in the Northern Maya Lowlands*

Ancient Maya architecture tends to follow predictable patterns. Many structures have a single, clear façade, for instance, conceptualized as a literal face. Northern sites, with their toothy-jawed monster buildings, express this idea with particular directness. Stairways and sculptural adjuncts, like altars and stelae, are integral elements that contribute to the idea of facing, both literally and metaphorically, and, as such, are critical to the visual identity of many Maya sites. With a few notable exceptions, scholarly attention often focuses on isolating and analyzing associated texts and patronage as they relate to dynastic agendas, historical chronologies, or infrastructure supporting elaborate ceremonies. The present work acknowledges the importance, and interrelated nature, of Northern Lowland plaza features like stairs, altars, and three-dimensional sculpture. In doing so, we begin to explore how discrete formatting choices, combined with object selection and placement, impact viewers' spatial experiences. Ultimately our work strongly supports the reading of Maya architecture as a performative framework. While Maya sites have long been understood as loci for ritual and other kinds of activity, the unusual aspects of specifically Northern constructs further demonstrate how such selection privileges certain behaviors in particular locations, coordinated with the functionality of those spaces.

Wernke, Steven A. [65] see Ore Menendez, Gabriela

Wesolowski, Veronica [2] see Bachelet, Caroline

Wesp, Julie (American University), Chelsi Slotten (American University) and Felipe Gaitan Ammann (Universidad de Los Andes)

[14] *Colonial Funerary Rituals at the Templo San Ignacio in Bogotá, Colombia*

This research analyzes the funerary customs in the sixteenth to nineteenth centuries as recovered through archaeological exploration in the Jesuit church named Templo San Ignacio in downtown Bogotá, Colombia. These skeletal remains illustrate how from the moment the church was constructed in 1610, the deposition of the deceased beneath the floor was an integral part of the occupation of this sacred space on the periphery of the Spanish colonial empire. While we recovered human remains from nearly all areas of the church, there is a meaningful difference in funerary practice, particularly between primary burials that were treated with a layer of lime and secondary burials in wooden or metal boxes of skeletonized remains. Here, we explore how age and sex correlate with differences in the organization, orientation, and method of burial, as well as the kind and amount of associated artifacts. We suggest that the variety of funerary rituals within the church reflects differences in social status or affiliation with the Jesuit order.

Wesp, Julie [66] see Palacios, Horvey

Wesson, Alex [36] see Campbell, Wade

West, Frankie [14] see Fleskes, Raquel

Wester, Carlos (Carlos Wester La Torre)

[216] *Chornancap: Palacio y Mausoleo de la Gobernante y de la Cultura Lambayeque, Perú*

Las investigaciones en Chotuna Chornancap—Lambayeque—Perú, pusieron a la luz el hallazgo de contextos funerarios de personajes de élite, uno de ellos correspondiente a una “Gobernante y Sacerdotisa” de la fase Tardía de la cultura Lambayeque (XII-XIII d.C.). El fardo funerario de la gobernante/sacerdotisa enterrado con ocho acompañantes, ornamentos de alto rango, poder y autoridad, han permitido documentar una de las más conspicuas autoridades políticas y religiosas de la cultura Lambayeque. La gobernante/sacerdotisa es claramente una mujer importante en Chotuna, pero también parece establecer un amplio dominio en el territorio macro regional, al comprobarse vínculos con otras sociedades complejas (Cajamarca, Chimú, Ecuador). El ajuar de la gobernante/sacerdotisa demuestra un variado, rico y complejo corpus iconográfico, que refleja su autoridad política y religiosa. Este episodio funerario permite plantear mayores argumentos para entender la dinámica del poder y religiosidad en la cultura Lambayeque, y construir un nuevo mapa sobre su territorialidad, así como reflexionar sobre la participación de mujeres en la vida política y religiosa, y reconocer un vértice importante en la organización sociopolítica que es la dualidad en el poder político y religioso así como en la ancestralidad de la sociedades andinas.

Weyrich, Laura (University of Adelaide), Alan Cooper (University of Adelaide) and Keith Dobney (University of Liverpool)

[137] *Ancient DNA Analysis of Microbes Preserved in Dental Calculus: Challenges and Opportunities*

Sequencing ancient microorganisms using next generation sequencing approaches have truly revolutionized our view of the past. While past paleomicrobiological research was largely restricted to coprolites and sediments, the recent analyses of ancient calcified dental plaque has provided novel insights into ancient human diets, disease, behaviors, and lifestyles. Despite the benefits, obtaining DNA from diverse microbial communities is difficult and is fraught with issues for first time researchers. Site, museum, and laboratory contamination can easily swamp out ancient microorganisms, even in clean facilities and in samples devoid of human DNA contamination. To circumvent future issues, the approaches recently applied to Neandertal dental calculus will be discussed in detail, including sample selection and decontamination, DNA extraction, next generation sequencing library preparation, and downstream bioinformatic analyses. As this application of these techniques is still in its infancy, both the benefits and limitations will be presented, and current problems within the field will be highlighted. Specifically, the potential downfalls of reagent background DNA and cutting-edge methodologies applied in the ancient human DNA research will be discussed in the context of ancient microbial community analysis. Through this discussion, the methodologies applied in paleomicrobiology will continue to be refined and improved for future research.

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Whalen, Kathryn (University at Buffalo) and T. L. Thurston (University at Buffalo)**[144]** *"Milk sweet and sower, bread in cakes": United and Divided Foodways in Post-Medieval Northern Ireland*

Post-Medieval ethnic identities in the British Isles display similarities and differences. Across the landscape of Northern Ireland, where indigenous people were subject to English, Scottish, and Welsh colonization, a sharing of material culture is evident across all groups. For example, English fine earthenwares, locally produced coarse earthenwares and locally made tobacco pipes are equally distributed, regardless of property owners' ethnicity. This suggests that a culturally blended presentation had been adopted for the performative aspects of the foodway. However, a more varied pattern of consumption is revealed by landscape-scale geochemical survey, largely reflecting disposal of food waste: colonial and indigenous signatures differ, perhaps in line with Early Modern English textual reports on local diet. Comparing these two datasets yields a more nuanced understanding of identity: tea drinking and other English traditions were adopted throughout the Empire, while food itself continued to vary through time.

[148] *Discussant*

Whalen, Kathryn [22] see Snyder, Daniel

Wheeler, Kathleen (IAC, LLC)**[317]** *Discussant***Wheeler, Sandra (University of Central Florida), Lana Williams (University of Central Florida) and Tosha Dupras (University of Central Florida)****[87]** *Entering the "Valley of Death": Isotopic Evidence of Vulnerable Survivors at Roman Period Kellis, Egypt*

Breast-fed infants living in communities with adequate food access experience particularly high health risks during complementary feeding between ages 6 to 36 months. The most vulnerable of these die in this period, characterized as the "valley of death," which represents a biocultural reality. The majority of those who survive are "vulnerable survivors." The Kellis 2 cemetery sample (Dakhleh Oasis, Egypt, AD 50–450) provides a unique opportunity to analyze effects of biocultural disruptions occurring during this critical period of physiological adjustment. Maternal, fetal, and infant (N=210) 13C and 15N profiles were produced from hair, dentin collagen, and bone collagen to evaluate adverse biological factors simultaneously present during weaning and illness. Results indicate there are three situations where feeding practices and health interact: first, the mother's ability to meet nutritional demands of infants during prolonged breastfeeding; second, undernutrition due to a health insult when the child is losing passive immunity; third, children being weaned on foods lacking protein quality and content when they may already be undernourished. This strongly suggests risks of malnutrition start shortly after birth, and vulnerable survivors who escape the valley of death at this age may be even more susceptible and predisposed to environmental stressors than previously considered.

Whelan, Carly (California State University, Chico)**[38]** *Obsidian Trade vs. Direct Acquisition: A View from Central California*

Geochemical sourcing of lithic artifacts has proven to be a useful analytical tool for the studies of trade and mobility in the archaeological record. However, it is difficult to distinguish lithic material acquired through exchange from material acquired directly from the source. Economic models of lithic reduction suggest that material procured for the purpose of exchange may be treated differently than material procured for personal consumption. I compare obsidian source profiles and lithic reduction strategies from several dozen sites in central California that span the entire Holocene record of occupation. I find that residential mobility was likely high during the early Holocene, when it appears that obsidian procurement was embedded into the foraging round. Obsidian was probably procured logistically during the middle Holocene when residential mobility decreased. While opportunistic obsidian trade likely occurred throughout the sequence, it appears that regularized exchange via far-flung trade networks did not begin until after 1,100 cal B.P., when residential mobility reaches its lowest point. This contrasts with previous studies, which have concluded that obsidian trade peaked in the region prior to this period.

Whelton, Helen (University of Bristol), Lisa-Marie Shillito (Newcastle University) and Ian Bull (University of Bristol)**[126]** *Investigating the Nature and Timing of the Earliest Human Occupation of North America Using a Lipid Biomarker Approach*

Coprolites contain a suite of lipid biomolecules and are an invaluable source of palaeobiological and palaeoecological information. The identification of faecal matter through the presence of highly-specific lipid biomarkers (5 β -stanols and bile acids) has been used to identify and characterise faecal input from a range of different sources. Differentiation of these faecal markers is enabled through the diet, digestion and metabolism of the source animal. Lipid analysis of coprolites has also been used to identify dietary biomarkers, providing information regarding available plant resources. The question of how, when and why people first settled the Americas is a subject of intense debate. Evidence of human occupation in North America obtained through DNA analysis of coprolites from the Paisley Caves, south-central Oregon, has dated the earliest occupation to 14,300B.P., one thousand years earlier than previous evidence suggests. Here, a lipid biomarker approach will be applied to sediment and coprolite samples from the Paisley Caves with the aim of identifying the timing of the earliest occupation of North America by characterising the origin of coprolites found in well-stratified archaeological deposits. Biomarker analysis will also be applied to investigate diet which will enhance our understanding of the relationship between early humans and their environment.

Whisenhunt, John [91] see Whisenhunt, Mary

Whisenhunt, Mary (University of Texas at San Antonio), Kristin Corl (University of Texas at San Antonio), John Whisenhunt, Robert Hard (University of Texas at San Antonio) and John Roney (Colinas Cultural Resource Consulting)**[91]** *Archaeological Survey in Southeastern Arizona: Partnering with Landowners and Local Informants*

Southeastern Arizona's upper Gila River Valley is an understudied area once heavily occupied by prehistoric people from the Early Agriculture to Salado periods. Over time, many important archaeological sites in the Duncan-York Valley, particularly those of large, aggregated communities, were extensively looted or destroyed due to agricultural and construction leveling. To document and, ideally, preserve the remains of these vulnerable sites, we have emphasized establishing relationships of trust with valley residents. In working with valley landowners and local informants, we have identified and recorded 43 sites over the past four years. In 2017, working with a single local informant, we identified 10 previously unrecorded sites in the Duncan-Virden Valley, including two from the Mimbres Classic period, five from the Salado period, and one with both Mimbres Classic and Salado components. An additional three large sites in New Mexico were found. Most of the aggregated sites include multiple components, attesting to the attractiveness of the upper Gila River Valley locale from a resource perspective, and its long-term resilience to environmental perturbation. The valley's archaeology remains highly vulnerable to human disturbance, heightening the need for strong local partnerships to secure and preserve the sites that make up this remarkable occupational pattern.

Whitaker, Jason**[37]** *Hinterland Domestic Economies: A Summary of Recent Investigations at the San Lorenzo Settlement Cluster*

This paper summarizes recent archaeological investigations at the San Lorenzo settlement cluster in the Mopan River Valley of Western Belize. Current research at this ancient hinterland settlement is concerned with better understanding household economic organization and integration during

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the Late and Terminal Classic (A.D. 670–890) occupations of this site.

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. Investigations at San Lorenzo focus on the areas associated with four structure groups. In accord with previous research at this site, analyses of collected data from these groups show similarities in terms of basic domestic activities. Ongoing analysis of lithic macroartifacts indicates differences among households in terms of reliance on local raw materials. The ancient residents of SL-21 and SL-22 produced informal tools with locally available chert. Conversely, lithic debitage collected from structure group SL-25 indicates importation of raw materials from outside the San Lorenzo settlement cluster.

White, Andrew

[127] *Patterns of Artifact Variability and Changes in the Social Networks of Paleoindian and Early Archaic Hunter-Gatherers in the Eastern Woodlands: A Critical Appraisal and Call for a Reboot*

Inferences about the social networks of Paleoindian and Early Archaic hunter-gatherer societies in the Eastern Woodlands are generally underlain by the assumption that there are simple, logical relationships between (1) patterns of social interaction within and between those societies and (2) patterns of variability in their material culture. Formalized bifacial projectile points are certainly the residues of systems of social interaction, and therefore have the potential to tell us something about social networks. The idea that relationships between artifact variability and social networks are simple, however, can be challenged on both theoretical and empirical grounds: complex systems science and ethnographic data strongly suggest that patterns of person-level interaction do not directly correspond to patterns of material culture visible at archaeological scales. A model-based approach can be used to better understand how changes in human-level behaviors “map up” to changes in both the system-level characteristics of social networks and the patterns of artifact variability that we can describe using archaeological data. Such an approach will allow us to more confidently interpret changes in patterns of artifact variability in terms of changes in the characteristics and spatial continuity/discontinuity of social networks during the Pleistocene-Holocene transition in the Eastern Woodlands.

[160] *Discussant*

White, Jonathan

[25] *Disability and Accommodation in the Eastern Mediterranean: Case Studies from New Kingdom Egypt and Classical Greece*

Although the archaeology of marginalized groups has been increasingly discussed in recent scholarship, people with disabilities remain largely unstudied. Recent works on this topic have paved the way for a dedicated examination of people with disabilities in the archaeological record. This paper reviews published material to critically examine physical evidence for disability and accommodation in New Kingdom Egypt and Classical Greece, both areas and periods with rich material culture, extensive architecture, a wealth of bioarchaeological samples, and comparative records. These areas are therefore a useful starting point for an in-depth cross-cultural study of people with disabilities in the ancient world. Mummies and other remains that display pathologies diagnostic of disabilities in life, artifacts and material culture made to accommodate individuals with disabilities, and even artistic depictions offer the beginnings of understanding what life was like for people with disabilities on the banks of the Nile and amongst the cities of Greece. In addition to material culture, an architectural analysis of public buildings reveals the difficulties people with mobility issues might have faced when trying to access landmarks such as the temple of Amun or the Athenian Acropolis.

White, Joyce (Univ of Pennsylvania Museum), Michael Griffiths (William Patterson University), Cyler N. Conrad (University of New Mexico) and Kathleen Johnson (University of California Irvine)

[307] *Climate Change and the Middle Holocene “missing millennia” in the Southeast Asian Archaeological Record*

Archaeological research in mainland Southeast Asia is a relatively recent endeavor, but as the region’s culture history has become more fully known, a gap in evidence called the “missing millennia” has emerged. The gap falls during the middle Holocene c. 6000–4000 BP when few sites have dated deposits. Yet from evidence dating before and after those millennia, important changes must have occurred, including changes in settlement systems, lithics and ceramic technologies, the appearance of cereal agriculture, and new burial practices. Recent palaeoclimate research under the auspices of the Middle Mekong Archaeological Project in northern Laos is providing possible clues related to the gap in archaeological evidence. Four new speleothem records document an abrupt trend of weakened monsoons beginning at approximately 5–4.5- ka initiating the onset of a mega-drought that peaked at approximately 4.0 ka. The drought climax near the “4.2 ka event” is when other parts of Eurasia and Africa experienced sharp climate shifts and associated human dislocations and societal adjustments. This paper reviews the emerging evidence and proposes an initial interpretation of societal responses to this significant period of climate change

White, Tommi [89] see MacDonald, Brandi Lee

Whitehead, Mike, Matt Bjorkman (Indiana University of Pennsylvania) and Ben Ford (Indiana University of Pennsylvania)

[334] *Recent Archaeology at Fort Necessity National Battlefield: A Cooperative Approach to Cultural Resource Management*

A series of archaeological projects have recently been conducted at Fort Necessity National Battlefield through a Cooperative Agreement between the National Park Service and Indiana University of Pennsylvania. These projects have incorporated geophysical survey, metal detection, systematic shovel testing, and test unit excavation, as well as artifact curation and reporting. Through this partnership, the National Park Service has received an avenue for cost-effective cultural resource management, and has gained new data and new insights for managing and interpreting Fort Necessity and other historic sites located at the park. In return, Indiana University of Pennsylvania has been able to provide new opportunities for its undergraduate and graduate archaeology students to acquire practical field and lab experience beyond the standard field school setting. Indiana University of Pennsylvania has also benefitted by increasing the visibility of its archaeology programs through conference presentations, report publications, and public outreach, and has fostered a relationship with the National Park Service that is conducive for future student research projects at Fort Necessity National Battlefield. This paper summarizes the archaeology projects performed through this Cooperative Agreement, and describes the benefits, opportunities, and challenges presented by this partnership between a Federal agency and State University.

Whitehead, William (SWCA Environmental Consultants)

[68] *Using Drones for Exploring the Links between Vegetation and Traditional Archaeological Survey: An Example from Arizona*

The use of drone based photogrammetry is now well established in archaeology for surface modeling and mapping of archaeological sites. The Arizona Department of Emergency and Military Affairs (AZDEMA) is sponsoring a number of long-term projects on their properties. One project will be using traditional drone photogrammetry to create high resolution maps to assess plant communities, plant health, and canopy structure as a way of exploring links between vegetation and other survey methods. A pedestrian survey, geophysical survey, and biological survey will be combined to show the interconnections between these frequently used techniques and the newer techniques of drone photography for surface modeling and vegetation modeling. With sub-centimeter accuracy, surface modeling along with canopy modeling is able to find subtle features on the landscape that are normally missed during pedestrian survey. Emergent photosynthetic populations, canopy variation, and biological dead zones can also be used to establish high probability anomaly areas that can be further investigated with traditional testing techniques. The results of the 2017–2018 field seasons will be summarized and the best practices for using these techniques will be presented. In areas with deeply buried features or in areas with few artifacts these techniques seem to be the most promising.

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Whiteman, Erik (USFS—Payette National Forest) and Morgan Zedalis (USFS—Payette National Forest)**[106]** *Can You Hear Me Now?—The History of a Telephone Booth in the Frank Church-River of No Return Wilderness*

The Frank Church—River of No Return Wilderness is an area that allows its visitors to experience solitude in the nation's largest wilderness in the lower 48. Often unrealized, is that historically, this rugged landscape had quite an extensive communication network while it was managed as the Idaho Primitive Area. One related historic feature managed by the Payette National Forest is the Coyote Springs Telephone Booth. Telephone communications were developed in the area from the late 1920's through to the 1930's. During this time, telephones were installed, often at major trail junctions, on a tree. However, at this location the smoke chasers built a booth. The telephones were used by rangers, fire fighters, and others to contact dispatch on matters regarding daily administrative operations, fire activity, and emergencies. Such a system facilitated the development and management of the Idaho Primitive Area and the Wilderness on the Payette National Forest. Without the phone systems, managing the area would have been a different experience altogether, with firefighting operations being greatly impacted. This poster will present the results of field monitoring and archival research concerning the telephone booth.

Whitley, David (ASM Affiliates, Inc.) and Tony Quach (ASM Affiliates, Inc.)**[180]** *In-Situ pXRF Analysis of Episodic Pictograph Production*

Yokuts ethnography indicates that pictograph sites passed from father to son to grandson within shamanic lineages, suggesting episodic painting at these locations. This practice is archaeologically supported by motif superimpositions and minor stylistic differences at sites. An in-situ pXRF study of red motifs was conducted at site CA-TUL-2871, Springville, CA, in the hopes of analytically distinguishing painting episodes, based on the assumption that chemically dissimilar pigments may have been used that are otherwise visually indistinguishable. Six hypothesized painting episodes were identified based on motif type and panel position. pXRF measurements were taken on 8 motifs and 3 rock surfaces. Multivariate statistical analyses showed no significant differences in the hypothesized groupings and, in 2 cases, between motifs and unpainted rock, suggesting that variations in paint thickness, weathering and rock coatings affected the elemental measurements. An experimental study was then conducted to evaluate the effect of paint thickness, confirming its significance in measured results. Though pXRF remains a useful tool for examining in-situ geochemical variability, numerous variables must be controlled if it is to be applied to distinguish pictograph painting episodes or determining elemental composition.

Whitley, Thomas (Sonoma State University), Michael Konzak (Anthropological Studies Center, Sonoma State Univ), Bryan Mischke (Anthropological Studies Center, Sonoma State Univ), Robert Watson (Anthropological Studies Center, Sonoma State Univ) and Paul Engel (National Park Service)**[221]** *20,000 Years under the Sea: Dynamically Visualizing the Past and Future of Shorelines, Ecosystems, and Climate Change at Point Reyes, California*

Geospatial analysts are now capable of developing increasingly accurate models of past and future 'shorelines' and the predicted impacts they might have on archaeological sites or cultural landscapes. But GIS alone cannot realistically simulate hydrodynamic effects, terrain displacements, or changes in vegetation communities, water bodies, and atmospheres. Funded by the NCPTT, this study combines GIS analysis of LiDAR terrain and bathymetric models with the photorealistic 3D modeling capabilities of Terragen 4.1 (a scenery generator used in the film industry) to produce visualizations and animations of the past 18,000 years, and future 2000 years, of landscape evolution at Point Reyes, California. The objective is to not just measure the potential impacts of climate change on known cultural resources, but to develop a simulation of how geomorphological effects have changed the terrain itself, while climatic variables have dramatically altered ecosystems. These visuals and animations are situated at low earth orbit, oblique aerial, and ground level perspectives. The results are presented in digital immersive environments as well as analogue 3D printed models for visitors to experience at the Point Reyes National Seashore. The ultimate objective is to expand these techniques to the rest of the California, and potentially other parts of the world.

[320] *Discussant***Whitlock, Allison (New York University)****[144]** *Medieval Agricultural Practices in the "Champion" Region*

During the early medieval state formation process, England's political organization transformed from localized tribal groups to large and consolidated kingdoms. Farmers at early medieval settlements experienced a related increase in agricultural production demands, and they introduced improved agricultural technology such as replacing the light ard with the heavier moldboard plow. The midlands counties (commonly referred to as the core of the "Central Province" or "Champion" region) are often credited as the source of early medieval agricultural innovation.

Macrobotanical indicators of crop production practices are underutilized in medieval rural settlement studies. Archaeobotanists working in the British Iron Age have developed directly relevant models of identifying the crop processing phase, the lighter ard plow from the heavier moldboard plow, and environmental stress indicators due to intensification. I will present the preliminary analysis of macrobotanical samples from the medieval manor site at Harpswell, Lincolnshire. I will apply the archaeobotanical models to these samples and additional samples reported in other Lincolnshire "Central Province" settlements to identify agricultural changes and question the applicability of "Champion" to this region.

Whitlock, Bethany (Brown University), Kevin Lane, Charles French, David Beresford-Jones and Oliver Huaman Oros**[224]** *Identifying Strategies of Integration and Cooperation during the Late Intermediate Period (AD 1000–1480) at Sangayaico, South-Central Andes, Peru*

The Late Intermediate Period (LIP) in the highlands of the Central Peruvian Andes was characterized by a marked intensification in economic specialization. In contrast to the preceding periods, in which mixed agro-pastoral groups appear to have dominated highland Peru, many LIP populations seem to have adopted increasingly specialized pastoral or agricultural strategies. This increased economic specialization would likely have fostered inter-group cooperation, as subsistence generally required the products of both herding and agriculture. In tandem with this, the LIP also saw the development of new forms and scales of ritual, as groups sought to extend their geographic reach and influence.

Drawing on excavation data and analysis of micromorphological samples from Sangayaico, in the Upper Ica drainage of the south-central Peruvian Andes, we examine how one LIP community established and maintained bonds of cooperation in a time of major political and economic transitions. Initial excavation data—such as the plaza dated to the LIP—suggests that ritual activity at Sangayaico increased in scale and intensity during this period. Micromorphological analysis of these ritual contexts has helped to illuminate how these features were constructed and used, thus furthering our understanding of how communities used ritual to mediate community relations.

Whitmore, Deidre and Willeke Wendrich (Cotsen Institute of Archaeology at UCLA)**[172]** *DIG: Digital Information Gateway to Sustainable Reuse*

Archaeological data are a form of at-risk cultural heritage, because they are the only record of an excavation. As a research community that deals with often irreplaceable datasets and continuing threats to records and sources, archaeologists regularly reuse data, despite these datasets frequently being locked in printed tables and appendices. DIG, the Digital Information Gateway from the Cotsen Institute of Archaeology Press, aims to facilitate

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reuse by publishing research data within the context of monographs and in sharable formats with the information needed to understand and reuse these data. Creating a sustainable workflow is imperative to DIG. The team has developed a handful of tools to assist with the collection and review of metadata and documentation while authors are engaged with the Press in preparing their manuscript. Additionally, this project builds on the community's increasing interest to preserve datasets (i.e. tDAR, ADS) in an effort to incorporate emerging preservation practices into the evolving scholarly publication framework. All data published on DIG are deposited in repositories. The platform's architecture is designed to support interoperability with existing repositories while modular metadata schemata and Linked Open Data standards provide the flexibility to adapt to new technologies and changes in the research community.

Whitridge, Peter (Memorial University of Newfoundland)

[220] *Arctic Heterotopias: Qariyit as Queer Spaces in Precontact Inuit Communities*

Gender and landscape have each proved to be such powerful archaeological tropes that thinking them together seems sure to yield interesting results. In the precontact Inuit world, gender and related dimensions of embodiment were key axes of spatial practice and place-based identification. Women's and men's activities were differently distributed across the landscape—in general, women occupying and managing domestic and near-community spaces, and men employing watercraft and dogs to operate within a wider landscape—but these varied and evolved over the lifecourse along with gendered identities themselves. Angakkuit (shamans) extended this range in every direction, to encompass ethereal and submarine realms and ambiguously queer human and nonhuman identities. The qariyit (ceremonial structures) that were the principal sites of their community performances and the points of departure for otherworldly travels constituted the heterotopic non-centers of large winter villages.

Whittington, Stephen (National Mining Hall of Fame & Museum)

[11] *Mapping and Spatial Analysis of an Ancient Mixtec Capital in Oaxaca*

Chiyo Cahnu, a Mixtec mountaintop capital, is unusual in relation to the archaeology of Oaxaca. Mapping one square kilometer of the capital using powerful GPS devices between 2013 and 2017 revealed about 370 building sites, almost 2,400 agricultural and residential terraces, and ancient roads constructed on the steep slopes of Cerro Amole. The building sites range in complexity from single rooms to compounds with temples and dozens of rooms surrounding patios. The ball court is 45 meters long, making it one of the largest structures of its kind in Oaxaca. The capital is depicted on the famous Mapa de Teozacoalco, a document painted by a Mixtec artist and explained by a Spanish colonial administrator around 1580. Interpretation of images on the Mapa and in related pre-Hispanic and early colonial codices suggests that the principal occupation of the capital occurred over a period of only 236 years (AD 1085–1321) during the Postclassic period. Chiyo Cahnu is remarkable in the Mixtec area because it is larger than normal for Postclassic settlements and because it was inhabited for such a short length of time. The capital has implications for understanding the amount of construction a population can accomplish rapidly and its possible impetus.

Wholey, Heather (West Chester University)

[328] *Population in the Middle Atlantic Archaic: The Middle Atlantic Transect Approach*

Middle Atlantic archaeology is unique due the tremendous ecological and cultural diversity present within a relatively small, compressed region. The ecological transect model has been widely applied in regional archaeological research for the past thirty years. It is essentially a landscape approach that traverses several major physiographic provinces to encompass the range a discrete and interconnected cultural activities across a broad region. This work employs the transect model to explore how factors such as settlement preference, mobility, social organization, resources, and subsistence practices influence group size and population throughout the Archaic period. This appears to be a tale of population resilience through responsiveness to changing external and internal circumstances that has fostered the growth of cultural diversity across the region.

Wichlacz, Caitlin (Arizona State University)

[287] *An Efficient and Reliable Mechanism: The Human Experience of Hohokam Ceramic Exchange during the Middle Sacaton Period (A.D. 1000–1070)*

The human labor involved in physically carrying goods across the landscape underpins all artifact provenance studies in the prehispanic American Southwest, yet this labor is all too often left unacknowledged and unconsidered, even as detailed and sometimes remarkable patterns of artifact production and distribution are brought to light. This is especially true for the Phoenix Basin Hohokam, where ceramic provenance studies have revolutionized archaeologists' abilities to understand the organization of pottery production and distribution, but the human labor involved in ceramic transport has been mostly only implied or obliquely referenced.

In this paper, I employ an Archaeology of the Human Experience (AHE) framework to explore the labor involved in ceramic exchange among the Phoenix Basin Hohokam during the middle Sacaton period (ca. A.D. 1000–1070), when the volume and extent of this exchange were at their peak. Through a case study from the site of Las Colinas, I focus on situating and investigating the labor of ceramic exchange as a condition of life for the middle Sacaton period Hohokam, considering how this labor was part of and affected broader social contexts, and exploring bodily, social, and temporal aspects of the experience of ceramic transport, drawing upon archaeological and ethnographic examples.

[287] *Chair*

Wichlacz, Caitlin [267] see Abbott, David

Widga, Chris [212] see Perri, Angela

Widmayer, Elise (University of Exeter)

[223] *An Experimental Approach to Understanding Paleoindian Bipolar Lithic Artifacts*

Bipolar lithic artifacts can be challenging for researchers to understand in the archaeological record. Although these artifacts were first noted in North American literature half a century ago, archaeologists continue to debate over terminology and considerations of morphological and functional distinctions of bipolar objects. This experimental approach aims to shed light on these disparities whilst re-examining morphological and functional characteristics attributed to manufacture and use-wear. Recent experimental work with the Mockhorn Island Clovis assemblage, by the Smithsonian Institution Paleoindian/Paleoecology Program, served as a model for this study. This poster presents the results of manufacturing, feasibility, and use-wear experiments on quartzite beach pebbles split through bipolar reduction.

Wieckowski, Wieslaw (University of Warsaw)

[211] *Embodied Empire: Life and Death of Wari Elites from Castillo de Huarmey*

The discovery of an undisturbed burial context at Castillo de Huarmey, bringing to light remains of Wari immediate elite members, finally embodied long discussed highest social levels of Wari Imperial elites. Until that time they characteristic was derived almost exclusively from indirect sources, mainly material remains of high quality material culture and architecture. Now, there is a chance to get a glimpse on their actual life stories, occupation, and to see their faces. Analysis of the burial context proves also there was an important change in the perception of female role in the society that occurred sometime during the Middle Horizon. Reconstructing lives and mortuary rites on basis of Castillo de Huarmey is also an important addition to the

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discussion about the Wari presence not only on the North Coast of Peru, but also to the interpretation of Wari expansion, and forming of the Empire. To see its multidimensional aspect, a comparison with other Wari provinces is necessary.

Wiersema, Juliet (University of Texas, San Antonio)

[275] *Far from the Crown: Currents of Opportunism along the Dagua River during the Late Spanish Colonial Period (Nueva Granada)*

Throughout the late Spanish colonial period, the Dagua River in Colombia's Cauca Valley was a multi-cultural backwater. Its shores were inhabited by mestizos, mulattos, slaves, and free slaves, with a minority of Indians and Spaniards. While this area was mined for gold and offered one of few routes to the Pacific from Colombia's interior, the Dagua River region was largely cut off from global trade and colonial currents due to its geographical remoteness. 50 days distant from Cartagena and 14 from the nearest town, Cali, it was just beyond the reach of Spanish colonial authorities. For the Dagua's largely self-governing and self-sustaining inhabitants, including African slaves, topographical challenges such as steep cordilleras, dense tropical jungles, and torrential rivers gave rise to social, cultural, and economic opportunities. Spaniards, who theoretically were in control as hacendados, merchants, and miners, depended on forasteros—French doctors, Italian notaries, and African slaves. African slaves in the Dagua region came to wield great power and autonomy, controlling terrestrial and river commerce, effectively fighting royal aguardiente and tobacco monopolies, buying their freedom, and building free slave communities. Their descendants would inhabit this area into the early twentieth century. Methods are art historical, historical, cartographic, and ethnographic.

Wiewel, Adam and Rebecca Wiewel (Arkansas Tech University)

[5] *Remote Sensing Investigations of the Arzberger Site (39HU6)*

Arzberger is a fifteenth- or sixteenth-century fortified Plains Village site located near present-day Pierre, South Dakota. Although it is an important example of an Initial Coalescent settlement in the Middle Missouri subarea of the Plains, its most intensive study occurred in 1939 when the village was accurately mapped and test excavations were made of four lodges and the fortification. This early work identified a surprisingly low number of houses for such a large settlement. In recent decades, quarrying activities have destroyed substantial portions of the settlement, despite its 1964 designation as a National Historic Landmark. To better understand the site's content and assess its current condition, archeologists from the Midwest Archeological Center (National Park Service) recently deployed a six channel SENSYS MAGNETO MX V3 gradiometer system. Besides the magnetic data, the unit's integrated GPS yields accurate topographic information. When combined with historical aerial photographs, these datasets provide a clear view of the remaining portion of the village's fortification, its many lodges, and probable storage pits. We will discuss these significant findings as well as review several benefits and difficulties of surveying with the SENSYS gradiometer system.

Wiewel, Rebecca (Arkansas Tech University)

[94] *Making Active Learning Practical*

This poster presents the outcomes of my efforts to make active learning activities an integral component of undergraduate courses in archaeology. For the past three years I have taken my Southeastern Archaeology course from a typical lecture-based class to a more active learning environment that includes hands-on lab activities, participation in fieldwork, field trips to archaeological sites, and service learning opportunities at our campus museum and local research station of the Arkansas Archeological Survey. Beyond assessing learning outcomes, I discuss practical challenges and lessons learned from implementing these measures with limited resources at a mid-sized teaching institution in which I am the sole archaeologist.

Wiewel, Rebecca [5] see Wiewel, Adam

Wilcox, Daniel (The College of Wooster) and Paul Nick Kardulias (The College of Wooster)

[225] *Trade and Production of Steatite Vessels in New England*

This research examines the trade and production of steatite vessels during the Archaic Period in New England. The study focuses specifically on a quarry Located in Barkhamsted, Connecticut where recent excavation has supplemented prior investigations from 1949 to 1951. The material from this site is located at Yale's Peabody Museum and the archaeology lab at Central Connecticut State University. We also examine the artifact assemblages from other sites in Connecticut and Massachusetts. Along with the archaeological assemblages, this work looks at the geology and geography of Connecticut, to obtain a better understanding of how the environment provided the key resources that inhabitants exploited. Finally in order to examine the trade of vessels and utensils this research examines the geochemistry of steatite through XRF analysis to determine the sources of artifacts within New England. Using models proposed by Renfrew and Binford we propose an exchange system between areas in New England with and without a local source of steatite. The Study provides an examination of Archaic lifestyle along the Atlantic seaboard, with elements of both local and interregional interaction.

Wilcox, Timothy (Stanford University)

[272] *Gobernador Polychrome as a Material Expression of Survivance*

The production of Gobernador Polychrome Pottery by the Navajo people, is entangled in many social and material negotiations of survivance. Its production in the Dinétah Region of New Mexico, during the late Seventeenth and early Eighteenth century place it in a time of Native resistance to Spanish colonization in Northern New Mexico. This resistance, in the form of a pan-Indian uprising, the Pueblo Revolt of 1680, sets the stage in which the production of Gobernador Polychrome emerged and ceased. This event, along with other contexts of colonization, influenced the practices of the Navajo people in this period. While western science has painted the Navajo as recent immigrants to the SW, indigenous understandings of place and identity contradict this view. For instance, an Indigenous braided model of interrelatedness does not fit with the theoretical bases of genetic and linguistic evidence, which favor dendritic models. Contemporary Indigenous communities have been forced to internalize concepts such as blood quantum and accept western style governments that promote difference and competition for resources. This case study highlights the emergence and rejection of practices that define contemporary Navajo culture and remind us of a time when cooperation accomplished common goals.

Wildenstein, Roxanne (McMaster University), Aubrey Cannon (McMaster University) and David Burley (Simon Fraser University)

[189] *Utilization of Fish Resources at the Hupoate Site on Tongatapu, Kingdom of Tonga*

Analysis of archaeological fish remains from the Hupoate site, on Tongatapu in the Pacific Island Kingdom of Tonga, identified 18 different families. Significant change in relative abundance was evident in Lethrinidae (emperors) and Acanthuridae (surgeonfish, unicornfish), two families common as food fish in Tonga. Frequencies of the families were compared between the early settlement period (~2850–2900 cal BP) and the subsequent Plainware/Aceramic period. Larger-bodied Lethrinidae, which are common in both periods, show a decline in relative abundance, while smaller-bodied Acanthuridae show a corresponding increase in abundance. Although this pattern might be viewed as evidence for resource depression, potentially linked to intensive fishing of Lethrinidae, bone measurements show no decrease in the size of Lethrinidae over time. A number of factors can account for the change in taxonomic abundance. While the relative abundance patterns may be a result of change in reef productivity caused by increased pressure on Lethrinidae, they could also indicate a shift in fishing techniques, or intensification of fishing involving the addition of a wider range of species to the food inventory.

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Wiley, Kevin (New York University) and Joseph Schuldenrein (Geoarcheology Research Associates)**[39]** *Riverside 2: Urban Archaeology, Landscape Reconstruction, and Public Engagement*

The Riverside 2 site, situated along the original shoreline of the island of Manhattan, presents a unique opportunity for landscape reconstruction within an urban archaeological context. Drawing upon geoarchaeological borings, excavation units, and historical sources, we created a 3D GIS model of the site highlighting its role in the development and transformation of the emerging neighborhood of the Upper West Side in the 19th century. The results of these research efforts have recently been put on view in a permanent gallery housed within the development project whose construction precipitated the archaeological excavation.

Wilkie, Laurie (University of California Berkeley)**[278]** *Discussant***Wilkinson, Darryl (University of Cambridge)****[181]** *Not Becoming Inka: Anarchism as a Set of Human-Thing Relationships*

Power depends on certain modes of relation between people and things; a fact archaeologists have recognized for some time. Thus there can be no states or rulers without monuments, elite regalia, official iconographies and the like—although traditionally it is only the human component that has been seen as the active element in this equation. More recently, archaeologists have sought to reconsider humans not as the users of things, but as their partners and co-participants in the social. In this paper I draw on such approaches to rethink anarchism as a particular mode of human-thing relations, rather than as an ideological stance or political philosophy. As a case study, I will examine a set of village communities of the Andean Late Intermediate Period (c.1000–1450) who resided on the heavily forested eastern piedmont to the northwest of Cuzco. Drawing on two seasons of excavation data, I will show how these settlements were founded by people who were attempting to flee the Inka Empire and all it represented. The rise of the Inka Empire entailed complex new forms of human-thing relations, and for the ancient anarchists presented in this paper, not becoming Inka was a process of actively rejecting those relationships.

Wilkinson, Keith [177] see Brittingham, Alexander

Will, Manuel [124] see Conard, Nicholas

Willey, P. (Chico State)**[179]** *Stature of Adult Human Remains from Point San Jose*

Stature provides insights into the lives and wellbeing of individuals and populations. In living groups, stature is employed to evaluate differences associated with time (secular trend), geographic distribution, sexual dimorphism, socioeconomic differences, and from other living conditions. Poor living situations hinder growth and yield shortened statures; advantageous conditions enhance growth and result in greater heights. Similar influences are inferred for past populations and the skeletal samples that represent them, including human remains from a pit at Point San Jose (PSJ), San Francisco. Employing all possible PSJ adult stature estimations in this analysis, they average 64.3 inches. The PSJ statures display a bimodal distribution, with peaks at 62 inches and 66 inches. That bimodality may result from a number of causes: small sample size, over-representation of a few individuals, ancestral differences, or sexual dimorphism. When compared with worldwide adult statures, the PSJ material display average stature. On the other hand, compared to a 19th century U.S. military sample, most members from PSJ stand shorter than that group by an average of 3.5 inches. This result suggests that the PSJ individuals faced impoverishment, deprivations and other challenges during their growth period.

[179] *Chair*

Willey, P. [179] see Sgheiza, Valerie

Willhite, Brenton (University of Missouri)**[267]** *Understanding the Emergence and Spread of Chupadero Black-on-white Ceramics through Network Analysis*

It has been hypothesized that social ties between the Salinas Pueblo Province and the Jornada Mogollon sparked cultural change in both regions. In this study, I use Social Network Analysis to characterize these interactions from A.D. 900 to 1450 via the spread of Chupadero Black-on-white pottery. Integral to the study of social interaction and the emergence of Chupadero Black-on-white ceramics is the nature of the pithouse-to-pueblo transition in each region. Prior to the emergence of pueblo architecture, populations in Salinas lived in pithouses and used predominantly brownware ceramics. The gradual shift to above-ground architecture in the area coincided with a marked increase in the abundances of Chupadero Black-on-white. Similarly, while the shift out of pithouses occurred sporadically in the Jornada Mogollon world, those sites that eventually shifted to above-ground architecture frequently display higher quantities of Chupadero Black-on-white. By creating ties between archaeological sites based on ceramics and architecture, Social Network Analysis produces networks of hypothesized interaction between sites in a large portion of the Mogollon culture area.

William, Justine Tuatai [13] see Cramb, Sara Lynn

Williams, James (Renmin University of China)**[75]** *Communities, Violence and Fortification: A Study of Longshan Landscapes*

The Late Neolithic period in Central China, known as the Longshan period, has long been associated with violence and warfare. There have been several theories as to what are the catalysts for this period of increased violence. This paper will review the evidence of warfare and violence during this period. Using disparate spatial data this paper will investigate the implications of warfare and violence on the settlement patterning of the Central Plains of China. Through this investigation we can directly test several of the theories which have been proposed for the region. It has been long understood that warfare and violence can shape a regional landscape this paper offers methods into investigating specific motivations and catalysts for warfare. In doing so it also provides new insights into how warfare may have affected changes in the settlement patterning during the Late Neolithic in Central China.

Williams, Justin (Wheelock College) and Richard M. Niquette (University of Kansas)**[186]** *From Clovis to Dalton: Key Differences in Hafted Biface Resharpener*

In order to further understand Paleoindian lithic technological organization, we examined blade and haft elements of Clovis, Gainey, and Dalton hafted bifaces. Samples inspected were from across the Midwest, the Southeast, and the Northeast. Due to the rarity of these hafted bifaces, images of individual bifaces were used to take traditional linear measurements on the hafted bifaces in this study. Results indicate key differences in retouch and resharpener patterns throughout the Paleoindian period, likely due to factors such as variability in raw material resources, prey choice, and technological requirements. The findings of this study have large-scale implications for pan-regional studies of Paleoindian hafted bifaces.

Williams, Lana [87] see Wheeler, Sandra

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Williams, Patrick Ryan (Chicago Field Museum) and John Janusek (Vanderbilt University)**[181]** *Wari Huamani, Tiwanaku Apu, and the Political Work of Things*

In this paper, we focus on the relationships between landscape places viewed as ancestors to Andean communities and things that further political agendas in imperial contexts. We explore how objects and people work together to create or deconstruct political power in Wari and Tiwanaku societies. In particular, we focus on objects, including ceremonial ceramics and lithic monuments, as examples of things that participate in building power relationships with local communities. We argue that distinctive agencies exist within objects in Wari and Tiwanaku contexts, despite the contemporaneity and shared iconography of the Middle Horizon states. Part of this distinction lies in the way in which Wari political power emanates from relationships between sacred places, objects, and humans in divergent ways from the ways Tiwanaku relationships between these entities are constituted. Our work draws on examples of archaeological data from Wari and Tiwanaku provincial centers like Cerro Baul and Khonko Wankane, as well as investigations in the monumental core of Tiwanaku to assess the political work of things in the highland Andes' first imperial formations between 600 and 1000 CE.

[211] *Chair***Williams, Veronica (CONICET- UBA)****[207]** *Farmers and Herders in the High Quebradas of the Valle Calchaquí Medio (Salta, Argentine) between the 11th and Early 17th Century*

For Northwestern Argentina (NWA) the period between AD 1000 and 1400 represented a state of political fragmentation, conflict situations, and the emergence of hierarchies materialized in the presence of defensive settlements, iconography, war paraphernalia, and evidence of trauma on human remains. Climatic change that occurred in the Andes starting in the 13th century is one of the main causes of this regional disruption. The archaeological data from the high quebradas (ravines) of the Valle Calchaquí Medio, in the present-day Province of Salta, NWA between the 11th and 17th century, allows us to hypothesize about a continuity in the occupation of this area. This occupation, presented a continuum of social logic and practices from earlier Prehispanic periods linked to subsistence strategies and social reproduction, such as seasonal and altitudinal management by farmers and herders.

Williams Sr., Paul [250] see Skinner, Dougless

Williams-Beck, Lorraine (Universidad Autonoma de Campeche)**[28]** *Ballcourts, Towers, and Urbanism in the Chenes Region, Campeche*

In the geographic heartlands of the Yucatan Peninsula, academic literature describes the Chenes region as an "archaeological province" with a particular regional cultural character, in which sculpted monuments with glyphs or ballcourts are scarce components in urban systems, and even less frequent in most monumental cores. To date only three ballcourts had been recorded. After field seasons in 2016 and 2017 I confirm another example in Tabasqueño, the only site also to exhibit a free-standing tower adjacent to the ballcourt. This paper discusses ballcourt position and orientation within the four monumental core layouts, and how all four peers share urban design schemes that include structures, sculptures, mural painting, and other elements. I also will discuss what ballcourt presence means within this regional context. Two working hypotheses are proposed: a) one of a functional nature that deals with isolated tower structures found in three additional sites, and b) a combined structural symbolic premise guiding geographic location: ballcourts and the ballcourt—tower complex play significant roles in ancient urbanism that create foundations for an emic perception of culture area.

Willis, Kelsey, Destiny Crider (Anthropology Department, Luther College) and Clifford Brown (Anthropology Department, Florida Atlantic University)**[263]** *Ceramic Evidence of Normal and Anomalous Diffusion from Mesoamerica into Northwest Nicaragua*

The ceramic record of Pacific Nicaragua can be interpreted as showing evidence of migration in the form of both normal and anomalous diffusion. Normal diffusion is seen in the Department of Chinandega through the ceramics of the early facet of the Late Preclassic Cosigüina complex, which derive from the Providencia Sphere. This ceramic sphere originates from the southern highlands of Guatemala and western El Salvador and now extends at least to northwest Nicaragua. The evidence of superdiffusion lies with a type known as Delirio Red-on-white, which is found at scattered sites in Mexico, Guatemala, El Salvador, Honduras, and Nicaragua. We argue that its patchy and discontinuous distribution is evidence for superdiffusion because, as we show through design analysis and comparison of forms and pastes, Delirio is related to Coyotlatelctlo types from Late Classic Central Mexico. We suggest that Delirio and associated types may serve as a marker for the historically attested Chorotega migrations to Nicaragua, Chiapas, and nearby areas.

Willis, Mark [324] see Brown, David

Willis, Staci**[290]** *Pollen in Nautical Archaeology*

The inclusion of pollen analysis into the excavations of shipwreck sites has improved our understanding of the cargoes these vessels carried, the timing of the wrecking event, and, in some cases, the processes of ship construction. Vaughn Bryant spearheaded many of these advances in the palynology of nautical archaeology through his mentorship of nautical archaeologists at Texas A&M, of which, the author here is one. This paper will highlight the important steps Bryant and his students have taken to promote the use of pollen analysis in nautical archaeology, including a case study of the author's research on Roman-era sewn boats of the upper Adriatic Sea.

Willis, William (University of Nevada Las Vegas)**[164]** *Reexamining Environmental Stress in Settlement Transitions: Implications for Understanding Settlement Patterns and Socio-environmental Response on the Shivwits Plateau*

Where people choose to settle can be thought of in part as a behavioral response to the ecological constraints placed on a society's ability to meet its needs through interacting with its environment. While humans are indeed not always completely rational actors, their endeavors require either basic raw materials or environmental conditions that, when absent, either force them to seek out other regions for exploitation or adapt to new conditions. Because of this, archaeologists have long been interested in the human response to the environment, particularly in areas of elevated risk. This research seeks to address the variability in Virgin Branch Puebloan settlement patterns on the Shivwits Plateau though time as a response to socio-environmental stress. Environmental data, ceramic seriation, habitation site variation and locations, and paleo-climatic reconstruction are used to spatially examine land use patterns over time. Additionally, this paper reports on assemblage patterns that are suggestive of identifying a core production area for Shivwits Ware ceramics, and discusses the future of current research undertakings on the southern portion of the Shivwits Plateau.

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Wills, Chip (University of New Mexico)**[283]** *Settlement Re-occupation at Chaco Canyon: Evidence for Migration and Serial Plurality*

Places where people invest significant human capital and resources in architecture and landscape engineering may nevertheless be abandoned in response to environmental or social factors. Those places might eventually be re-occupied by the original builders, or in some cases, appropriated by others. During migrations, abandoned or largely abandoned places may become destinations for people on the move. Chaco Canyon, New Mexico, has archaeological evidence for episodes of abandonment or termination, followed by re-occupation, linked to migration processes. It is possible that there was greater cultural diversity during periods of re-occupation, suggesting mixing of populations from different sources.

Wills, Wirt [115] see Hamilton, Marian

Wilson, David (University of Connecticut) and Kevin McBride (University of Connecticut)**[294]** *Analysis of Sturgeon Fishing Encampments from Block Island, Rhode Island*

Several archaeological deposits along the shores of Block Island, RI were exposed by the destructive wave action of Hurricane Sandy in 2012. Once exposed, these deposits were threatened by continual coastal erosion and excavated by the Mashantucket Pequot Museum and Research Center as part of the 2013 Hurricane Sandy Disaster Relief Grant (P13AF00176); several of the excavated sites contained significant faunal assemblages. Faunal analyses of these sites included relative abundance and Number of Identifiable Specimens, as well as comparisons with previously excavated inland sites. Based on these analyses, two of the coastal sites identified were likely used primarily as sturgeon fishing camps during the Woodland and Contact periods. Selected ethnographic reports and historical accounts support these conclusions, yet alternate explanations for the sites' context are also explored and discussed.

Wilson, Jeremy (Indiana University-Purdue University, Indianapolis)**[166]** *"First, Be Humble": Reflections on Larry Zimmerman's Impact on IUPUI and Indianapolis*

Arriving in 2004, Larry Zimmerman made an immediate impact on our department, university, and the surrounding community, serving as one of the first public scholars of civic engagement at Indiana University-Purdue University, Indianapolis. In this talk we reflect on his influence on our research programs and students, the fostering of collaborations with the community and local organizations, and the establishment of our institution's Native American Studies Program. Over 14 years, Larry consistently emphasized an ethos of mutual respect in principle and practice, while also remaining dedicated to the scientific investigation of the distant and more recent past. We conclude by reviewing Larry's contributions to the archaeology of homelessness and this marginalized population in Indianapolis, contending that our discipline, as long recognized by Larry, has yet to seize its full potential as advocates for the disenfranchised, influencers of social policy, and practitioners working towards a brighter future.

[166] *Chair*

Wilson, Michael [89] see Bebbler, Michelle

Wilson, Nathan (Universidad Nacional Autónoma de México (UNAM))**[285]** *Obsidian Importation and Use at Teotepec, Veracruz, Mexico: Situating Site-Level Lithic Activities within a Regional Context*

In this paper, I present new data on lithic production, consumption, and importation from the site of Teotepec, a large pre-Hispanic settlement located in the Sierra de los Tuxtlas region of Veracruz, Mexico. Like much of the Mexican Gulf Coast, the Prehispanic inhabitants of the Sierra de los Tuxtlas relied on non-local obsidian for most of their lithic needs. Using the results of recently completed technological and visual source analyses, I identify differences in production and consumption behavior across the site and over time to situate these behaviors within regional and interregional contexts. The combination of regional-scale data from previous projects and site-level data (both from surface collection and excavated contexts) derived from the Proyecto Arqueológico Teotepec (PAT) allow for the assessment of importation and use of obsidian at the site and to gauge Teotepec's participation in larger regional processes.

[285] *Chair*

Wimsatt, William [227] see Tostevin, Gilbert

Winemiller, Terance (Auburn University at Montgomery) and Virginia Ochoa-Winemiller (New Jersey City University)**[40]** *The Imitation Game: Hybridization of Styles and Trade Goods in Ancient Eastern Honduras*

This paper discusses the spatial, typological, and stylistic analyses of obsidian and ceramic artifacts recovered from El Chichicaste and Dos Quebradas, two prehistoric sites in the department of Olancho, Eastern Honduras. Using geographic information systems and 3D laser scanning technology, analyses revealed the extent of trade relationships that these two ancient communities maintained with sites in Mesoamerica and their southern neighbors in Central America. We argue that integration of foreign trade goods and ceramic stylistic decoration into local lifeways at these two eastern Honduran sites shaped subsequent hybrid cultures that included ideologically perceived status symbols from nearby communities and at the same time infused them with local interpretation and uniqueness.

Wingfield, Laura (Contract Curator, Art of the Americas, Nasher Museum of Art at Duke University)**[263]** *A Tale of Two Cities: Quelepa, El Salvador and Guayabo de Turrialba, Costa Rica*

The art and structures of the ancient Central American sites of Quelepa in El Salvador and Guayabo de Turrialba in Costa Rica both suggest influence from afar by the late first millennium CE. Quelepa was restructured from what was likely a Lenca foundation to reflect possibly invasive Veracruz tastes, yet some Lenca elements were retained. Did both Lenca and Veracruz immigrants live together peacefully? What can art and architecture tell us of this possible merger, an instance of multiculturalism? Farther south in the highlands of Caribbean Costa Rica, the site of Guayabo de Turrialba was sculpted in the image of Colombian cities farther to the south or possibly vice versa. Yet Guayabo art retains traits of what is likely deep-seated ancient Huetar culture in this region, newly blended with Tairona styles. What can a comparison of these two sites reveal of mobility and multiculturalism in pre-Hispanic Central America?

Winter, Marcus (Centro INAH Oaxaca) and Teresa Alarcón (Centro INAH Oaxaca)**[59]** *Preceramic Occupations in the Valley of Oaxaca and the Southern Isthmus*

Surveys and excavations during the past 12 years in the Valley of Oaxaca and the southern Isthmus of Tehuantepec provide new data on lithic assemblages and settlement distributions in these Oaxaca regions and facilitate comparison with contemporaneous sites in central and southern Mexico.

[288] *Discussant*

Winter, Marcus [248] see Levine, Marc

Winthrop, Robert [247] see Hritz, Carrie

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Wise, Dan [46] see Sagripanti, Jose-Luis

Wise, S. Andrew

[266] *Game On: Ceramic Discoidals from the Lamar Site*

Ceramic discoidals represent a commonplace but often overlooked artifact found at many Mississippian sites. Generally, these important cultural objects are classified by archaeologists as gaming pieces. This assumption is based on European descriptions of Native American games. However, uncertainty remains regarding the function and significance of this class of artifact with no conclusive evidence that discoidals were used exclusively for games. Additionally, comparing ceramic discoidals with stone discoidals, chunky stones, or similar artifacts is problematic. An analysis of artifacts from the Lamar site near Macon, Georgia uncovered a large number of ceramic discoidals. Excavated in the 1930s, a study of discoidals from this collection provides information regarding their distribution and variety. This research contributes to our understanding of daily life during the Lamar period as well as discoidals from Mississippian contexts. Furthermore, it is important to understand how these ceramic discoidals correspond with historic descriptions of Native American game pieces. By assessing the physical properties of discoidals from the Lamar site, this study sheds light on a neglected class of artifacts.

Wisner, Meredith (University of Iowa)

[43] *Pocket Gophers as Food? The Zooarchaeological Investigation of an Unusual Woodland Period Assemblage*

The Rainbow site (13PM91) is a multi-component Middle to Late Woodland period site situated within the tallgrass prairie of northwest Iowa. Excavated in the late 1970's, the site remains an important example due to its well excavated and substantial faunal collection. The current study focuses on the reanalysis of a concentration of pocket gopher (*Geomys bursarius*) remains found within the Early-Late Woodland horizon C (AD 550–620). The surprising number and spatial concentration of pocket gopher specimens suggests that humans were responsible for their accumulation. Individual pocket gophers may have had little to offer nutritionally, however, collectively their predictable habits, visibility on the landscape, and fat content may have made them a valuable supplement during lean winter months.

Wisner, Gavin (Northern Arizona University), Katie K. Tappan (Northern Arizona University), Aimee I. Alvarado (Northern Arizona University) and Chrissina C. Burke (Northern Arizona University)

[7] *The Zooarchaeology of Problematic Deposits: Ancient Maya Use of Fauna in Ritual Contexts at Group B, Xunantunich*

Zooarchaeological data provides details on the social processes related to ritual artifact deposits in the Maya area. This poster provides the results of faunal analysis on materials collected during the 2016 and 2017 Belize Valley Archaeological Reconnaissance project excavations of Group B at the site of Xunantunich. Our excavations focused on structures B1, B2, and B4, where multiple, and often layered, deposits of artifacts were located outside of the structures. Data collected includes, skeletal elements recovered, taxa present, cultural signatures such as butchery, bone tool manufacture, and bone implements or personal adornments, and natural taphonomic signatures. These data and our analyses contextualize these deposits by providing information as to whether they are middens, domestic occurrences, or rituals. We conclude by comparing the Group B deposits with similar deposits excavated in the Belize Valley at the sites of Baking Pot and Lower Dover to identify whether similar patterns are present.

Wisner, Gavin [147] see Burke, Chrissina C.

Wistuk, Bronson (Binghamton University)

[300] *A Preliminary Analysis of Flaked Stone Tools at Patipampa*

The 2017 fieldwork at Huari, arguably the largest pre-contact city in South America, yielded in excess of 1800 lithic artifacts—excluding microliths found via soil floatation. These artifacts include whole bifaces, unifaces, tool fragments, and debitage. This analysis focuses on the morphologically distinct tool types excavated, such as bifacial points with lanceolate bodies, fluted points, and drills. These tool types offer insight into daily life at Patipampa and the city of Huari, potentially indicative of areas of manufacture. In one season, the frequency of flaked stone implements exceeds that found in excavating Conchopata, another Wari city in the Ayacucho Basin. Statistical and spatial analyses are used in visualizing potential significances of specific tool types.

Witschey, Walter [159] see Farrell, Mary

Witt, David (NYS Department of Environmental Conservation)

[148] Moderator

[148] Discussant

Witt, David [40] see Goodwin, Graham

Witt, Kelsey (School of Natural Sciences, University of California-Merced), Laurent Frantz (The Palaeogenomics & Bio-Archaeology Research Netw), Greger Larson (The Palaeogenomics & Bio-Archaeology Research Netw), Angela Perri (Department of Archaeology, Durham University) and Ripan Malhi (Department of Anthropology, University of Illinois)

[212] *Genome Sequencing of Ancient Dogs in the Americas to Understand Their Demographic History*

Several ancient DNA studies have been conducted on dogs in the Americas, yet all have focused on the mitochondrial genome. In this study, we sequenced 79 complete mitochondrial genomes (mitogenomes) and seven nuclear genomes of ancient dogs from more than twenty archaeological sites, ranging in age from 10,000 to 800 years before present (ybp) to gain insight into the population history of dogs in the Americas. We compared the ancient dogs' mitogenomes and nuclear genomes to those of modern dogs and wolves, and modeled demographic changes in the population over time. We found that all pre-contact dogs share a common ancestor roughly 15,000 ybp, and diverged from a closely-related Siberian dog population 1,000 years prior. Pre-contact dogs also show a closer affinity to modern dogs than to Eurasian or American wolves, further supporting the hypothesis that dogs migrated to the Americas with humans. Only a small number of American and East Asian dogs share mitochondrial haplotypes with the pre-contact dogs, suggesting that the majority of pre-contact dog diversity was lost as a result of European contact and the arrival of European breeds to the Americas.

Wittig, Jon [224] see Krueger, Erica

Woehlke, Stefan [202] see Sonderman, Robert

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Woelkers, Lauren (East Tennessee State University) and Jay Franklin (East Tennessee State University)

[127] *First Foragers on the Upper Cumberland Plateau of Tennessee: Transitional Late Pleistocene and Early Holocene Lithic Technology at Rock Creek Mortar Shelter (40Pt209)*

We analyze lithic flaking debris from transitional terminal Pleistocene and early Holocene layers at Rock Creek Mortar Shelter, a multicomponent site on the Upper Cumberland Plateau (UCP), Pickett County, Tennessee. Blades, blade-like flakes, and two blade core fragments are among the lithics recovered from these contexts. Because these transitional-looking assemblages were recovered from early Holocene contexts, we believe they potentially represent groups of early Archaic peoples who were separated from other groups that also practiced blade technology, possibly before they reached the UCP. The transitional nature of the assemblages suggests that blade technology gradually went away as people became increasingly familiar with the local environment, and therefore raw material sources. We further believe that these were family foraging groups that were seasonally occupying these shelters. Thus far, lithic technological analyses reveal that older or more experienced members of the groups were teaching less experienced people stone tool production. Additionally, we seek to determine if the flake debris analysis reveals significant differences from later Holocene contexts on the UCP.

Woelkers, Lauren [41] see Franklin, Jay

Woldekiros, Helina (Washington University in Saint Louis)

[242] *Human and Animal Foodways on the Afar Salt Route, North Ethiopia*

Caravans form an important component of ancient trade routes world-wide. They were lifelines to settlements and connected diverse landscapes. They also encouraged complex transport networks. Our understanding of ancient ways of life along these trade routes is, however, hampered by an incomplete picture of the participants or caravaners themselves. This study uses quantitative and qualitative data from ethnoarchaeological and archaeological research on the Afar salt caravan route in northern Ethiopia to recreate human and animal foodways on the route. The Afar trade route transverses the North Ethiopian highlands during the Aksumite period (400 BCE-900 CE) and the Afar desert. Today pack-based caravans transport c. 70,000 tons of salt annually. Archaeological data indicate that people at caravan campsites consumed more plant than animal based diets. Sheep, goats, and cattle were used to supplement caravan diets but were only found at logistical support settlement sites such as border towns. Caravan campsites were dominated by plant remains such as wheat and barley, grains used for making bread. The chaff of these plants, on the other hand, was used as animal feed. Fired bread making stones were also found at the site of Ona Adi Agway in Agula.

Wolff, Alice

[197] *Where Are the Brewers? Feasting and Operational Chains in Anglo-Saxon England*

The importance of alcohol in the landscape of feasting has been well documented across cultures, and early medieval Europe is no exception. The mead-hall in Anglo-Saxon Britain functioned as a location where social bonds were strengthened both vertically and horizontally; Vikings in Iceland relied on barley beer to demonstrate the power and generosity of chieftains. Production of alcohol in the large quantities required for feasting necessitates some degree of specialization, but to what degree did this specialization take on a ritual significance for the individuals involved? This paper investigates the role of brewing as part of the ritualized landscape of feasting in early medieval Europe, focusing particularly on Anglo-Saxon Britain, and considers the intersection of individual (or community) ritual practice with the use of public technology.

Wolff, Barbara

[300] *Post-Fire Incisions on Wari Pottery*

Whole ceramic vessels and sherds incised after firing are known from Middle Horizon sites in the Wari heartland and periphery, associated with offering, burial and ceramic production contexts. Incisions include a wide variety of forms and have been interpreted as graffiti, makers or owners marks, and score marks to control breakage. The presence and forms of post-fired incisions were recorded during inventory of all ceramics excavated at Huari by the Huari Urban Prehistory Program in 2017. Their motifs, vessels and contexts are described and compared with finds from Conchopata in Wari's Ayacucho heartland, Tenehaha in Arequipa, and other published examples. Significant attributes and a typology to facilitate further study are proposed.

Wolff, Christopher (University at Albany) and Donald Holly (Eastern Illinois University)

[34] *Colonizing the Edge: The Maritime Archaic Settlement and Occupation of Eastern Newfoundland*

This paper presents evidence from a new Maritime Archaic habitation site located on the island of Newfoundland, Canada. Unlike the adjacent mainland of Labrador, very few Archaic habitation sites are known from the island, which makes this work critical to understanding Archaic settlement and social organization across the broader region. Excavations have produced hundreds of lithic artifacts and geomorphological data suggesting that a variety of subsistence and domestic activities occurred at the site. A suite of AMS dates also indicates that the site was occupied during the pioneering phase of Archaic settlement on the island and revisited for several centuries. In this paper, we discuss the artifact assemblage, spatial organization, and chronology of the Archaic occupation of Stock Cove and situate it within the broader context of the colonization and settlement of far eastern North America.

[277] *Discussant*

Wolff, Christopher [50] see Garbellano, John Michael

Wolfhagen, Jesse (Stony Brook University)

[103] *Zooarchaeological Survivorship Models Using Ordered Logistic Regression*

Archaeologists investigate past hunting and herding strategies using models of animal survivorship derived from long bone fusion and/or mandibular tooth wear patterns. As biological and behavioral variation makes estimating precise biological ages problematic, researchers typically assign "age stages" that describe ranked age groups. Ordered logistic regression models take advantage of the information in these rankings to estimate and analyze patterns in ranked/ordered data based on other variables. This poster describes fitting ordered logistic regression models to zooarchaeological survivorship data using Bayesian inference (via Stan) to (a) estimate uncertainty in survivorship estimates due to sample size and (b) compare survivorship between different sites and sub-assemblages within sites. The model is also able to incorporate uncertain stage assignments using aoristic analysis; as most zooarchaeological assemblages contain specimens that cannot be assigned to a single "age stage". The ability to use uncertain stages allows aoristic survivorship analyses to combine patterns of long bone fusion and mandibular tooth wear data, despite their variable specificity. The models shown here can be adapted to any archaeological situation that uses ordered or ranked variables.

[103] *Chair*

Wolfhagen, Jesse [103] see Rapes, John

Wollstonecroft, Michele [86] see Garay-Vazquez, Jose

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Womack, Andrew (McGill University), Peter Coutros (Yale University) and Mamadou Cissé (Chef de la Mission Culturelle de Kangaba)

[210] *Initial Results from Magnetometer Survey at the Sacred Site of Dakajalan, Mali*

In the spring of 2017 geophysical remote sensing surveys were conducted across three locations at and around the Dakajalan sacred site, Commune Rurale de Sanankoroba, Mali in order to detect anomalies associated with archaeological features. This site has been described in oral tradition as the location where the battle that preceded the formation of the Mali Empire took place, and also where the village that acted as the first capital of the newly formed empire was located. Surface survey of various locales, including the proposed military camp, battlefield, sacred overlook, iron smelting sites, and surrounding areas was carried out. Then, small-scale magnetometry surveys were undertaken at the most promising locations. Results of these surveys not only provide information on potential archaeological features in some areas, but also reveal the benefits and difficulties of using this survey technique on the laterite-rich soils of southwestern Mali.

[246] *Discussant*

Woo, Eun Jin [56] see Kim, Yong Jun

Woo, Katherine (The University of Sydney)

[20] *Shifting Palaeoeconomies at the Rockshelter Site Madjedbebe, Australia*

The East Alligator River Region has undergone considerable environmental change throughout the Pleistocene and Holocene, with changing sea levels dramatically altering the ecosystems of this region. Current archaeological models for this area indicate that people adapted their economic activities to successfully exploit these shifting environments. Throughout these changes molluscs have played an important role in the economic activities of these groups and often comprise large portions of the regional assemblages, but they have not been subject to in-depth studies. Detailed analyses of midden material from Madjedbebe, a rockshelter site, will develop a more comprehensive understanding of the changing economic role of molluscs. Additionally, this project will use the known biological and ecological information available for these organisms as environmental proxies, in combination with existing data, to reconstruct the past environments at this site and to examine and build on current models of long-term human behaviour and use of coastal resources. These detailed analyses of the molluscan material provides new lines of evidence enabling re-examination of pre-existing models for the region.

Wood, J. Scott [267] see Abbott, David

Woodard, Brady [135] see Ollendorf, Amy

Woodfill, Brent (Georgia State University)

[264] *Sacred Places as Battlefields: The Role of the Ritual Landscape in Struggles for Conquest and Resistance in the Northern Transversal*

The Northern Transversal Region in central Guatemala is one of the most fertile regions of the Maya world in addition to being a key strategic point in the past and present. The rivers flowing out of the highlands provide fertile, volcanic soil in addition to natural communication routes. As a result, it has been subject to multiple waves of colonization over the past two millennia, from Classic period Tikal and Calakmul to contemporary narcotraffickers and transnational corporations. In this paper, I will summarize the ebb and flow of foreign powers and local autonomy in the region as seen through the caves, mountains, and archaeological sites that are a fundamental source of local identity and play an active role in the lives of the Maya who live around them in the past and present. As a result, they serve as microcosms of the entire region, and by understanding the history of conquest and independence of the sacred landscape one can understand the history of the region itself.

Woodfill, Brent [37] see Burgos Morakawa, Walter

Woods, Alexander (Colorado State University)

[232] *Discussant*

Woods, Heather [90] see Baumann, Timothy

Woodson, M. Kyle [72] see Darling, J Andrew

Woolfson Touma, Olga del Pilar [46] see Solorzano Venegas, Maria Soledad

Woollett, James (Université Laval—Centre d'études nordiques), Céline Dupont-Hébert (Université Laval—Centre d'études nordiques), Paul Adderley (Centre for Environment, Heritage and Policy, Unive), Guðrun Alda Gísladóttir (Fornleifastofnun Íslands, Iceland) and Natasha Roy (Université Laval—Centre d'études nordiques)

[167] *The Variable Resilience of Large and Small Holdings on the Svalbard Estate, NE Iceland: A Multidisciplinary Study of Farm Abandonments circa AD 1300*

Recent studies have identified an important reorganization of the Svalbarð estate, north-east Iceland around AD 1300. The initial coastal-focused settlement of the region was followed by the founding of new farms in the deep interior. Most were not sustained and some farm sites on the coast were also reduced. Initially, the magnate's farm of Svalbarð had a herding economy supplemented by fishing while Hjälmarsvík, its coastal neighbor, exploited a diversity of marine resources. Around AD 1300 Svalbarð became the chief consumer of the region's marine resources and Hjälmarsvík become a more specialized sheep-herding farm resembling other small farms. While this switch occurred during a period in which wool production was on the increase in Iceland, it also corresponds to a phase of climatic cooling. New geoarchaeological and remote sensing data provide a means of resolving the roles of these trends on the Svalbarð estate. These local-scale data enable us to assess inter-site variation in growing season and other landscape productivities and hence to model past landscape productivities, in reference to paleoclimate records and satellite data. In this paper, « predicted » productive potential and vulnerabilities of these farms are compared to archaeological records of occupation, land use and resiliency.

Woollett, James [16] see Frasier, Brenna

Worman, F. Scott (Missouri State University)

[94] *Risk and Failure in the Classroom: Exploration, Scholarship, and Active Learning*

For at least the past decade, college campuses have been inundated with buzzwords like active learning, flipped classroom, metacognition, and learning-centered teaching. While these concepts and the related pedagogical techniques can be highly successful there are many barriers to effective implementation, particularly in large introductory-level classes. Two of the most significant barriers are enculturation of both students and instructors to expect certain forms of classroom interaction and the content rich nature of most introductory courses. These barriers make experimentation with active learning seem particularly risky for both students and instructors. I discuss general approaches to overcoming these obstacles, including modeling the exploratory nature of scholarship and encouraging student-led inquiry that builds knowledge of basic content. In addition, I provide

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examples of four specific techniques I use that encourage active learning: in-class activities, debates, group presentations, and targeted written assignments. I evaluate the costs of each in terms of both class time and instructor effort, and discuss their benefits in relation to student learning outcomes. While I created these activities for my college classes, I have used variations successfully in several settings and with students as young as first grade.

Worthey, Kayla (University of Arizona)

[304] *Stable Isotope Analysis Applied to the Reconstruction of Paleoenvironment and Landscape Use during the Middle and Early Upper Paleolithic at Üçağızlı I and II, South-Central Turkey*

Stable isotope analysis of $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ in herbivore tooth enamel from the archaeological sites of Üçağızlı I and II in south-central Turkey is used to explore human responses to environmental change during MIS 3 in the eastern Mediterranean. Although changes through time in local ambient moisture are associated with changes in the local animal communities, they generally do not correlate with proxies for site occupation intensity, and thus do not indicate depopulation or shorter site stays during times of aridity. The Ahmarian occupation at Üçağızlı I, however, is identified as an anomalous interval due to its high levels of environmental moisture, intense site occupations, prey animal representation, and unique exploitation strategies for lithic raw materials indicating a change from residential to logistical mobility. The reorganization of mobility strategies during the Ahmarian may relate to a local expansion of forested habitats.

Worthey, Kayla [155] see Sánchez-Morales, Ismael

Wren, Colin (University of Colorado—Colorado Springs)

[219] *Landscape Connectivity, Habitat Suitability and Cultural Transmission during the Last Glacial Maximum in Western Europe*

During the Last Glacial Maximum the population of Western Europe contracted its range as the climate became less hospitable and more unpredictable. Mobility decisions must have been a key part of human adaptation during this time but are notoriously difficult to extract from archaeological data. Agent-based modelling offers one way to explore human mobility heuristically, producing test implications that can be tested using the archaeological record. We use a model of habitat suitability derived from archaeological site distributions, paleo-climate simulation data and environmental predictors to derive a GIS landscape (Burke et al. 2017). We then use an agent-based model to explore how this heterogeneous landscape affected patterns of inter-regional mobility and cultural transmission. We look at the impact of different mobility strategies, mobility radius, and the dynamics of cultural transmission to better understand the social context of the LGM's archaeological record.

[234] *Moderator*

[219] *Chair*

Wright, Aaron (Archaeology Southwest), John Jones (Archaeological Consulting Services, Ltd.), Todd Bostwick (Verde Valley Archaeology Center) and Arleyn Simon (Arizona State University)

[91] *Hohokam Dry Farming along the South Mountains Bajada, South-Central Arizona*

Hohokam communities who resided alongside the perennial rivers in south-central Arizona are renowned for the massive canals they engineered and operated, representing some of the largest preindustrial irrigation systems in the world. In light of such achievement, dry farming technologies and practices remain a lesser known component of the Hohokam agricultural landscape. This paper takes a close look at recent fieldwork around the South Mountains, an upland setting at the confluence of the Salt and Gila Rivers. Surface survey has identified a range of dry farming features and associated plant processing facilities along the northeast and southwest bajadas. Pollen and phytolith analyses of soils from several of the farming features identified maize and agave as cultivars. They also suggest Hohokam agriculturalists used these facilities to encourage certain economically important wild plants. Macrobotanical analysis of material from associated roasting pits implies some of the agave was processed and possibly consumed on-site, a ritualized practice carried on by historic and modern-day O'odham communities. Diagnostic artifacts associated with the farming features and recovered from within the cooking facilities indicate Hohokam agriculturalists in the Phoenix Basin were dry farming agave, and potentially maize, by AD 950, and possibly as early as AD 750.

Wright, Alice (Appalachian State University) and Colin Quinn (Hamilton College)

[196] *Confronting Myths of Isolation in Pre-Columbian Appalachia*

In recent decades, ethnographers, historians, and historical archaeologists have refuted popular myths about southern Appalachia that characterize the region as an isolated geographic periphery and, by extension, a cultural backwater. However, these perceptions continue to color interpretations of Appalachia's deeper past, despite the region's long tradition of rigorous archaeological research. Some scholars have suggested that pre-Columbian Appalachia has remained peripheral in archaeological discourse because it comprised the geographic edge of different cultural expressions (e.g., Mississippian, Morrow Mountain) or interaction spheres. In this paper, we argue that Appalachia's recurring position as a cultural boundary renders it uniquely suited for studying pre-Columbian interaction and connectivity. Drawing on spatial and contextual data from the New River headwaters of northwestern North Carolina, we attempt to reframe the southern Appalachians as socially and symbolically central to Woodland period events and histories, and we propose new lines of archaeological research to further interrogate erroneous impressions of the region's inaccessibility, isolation, and cultural inertia.

Wright, David (Seoul National University)

[161] *Archaeology in the Age of the Anthropocene: How I Learned to Stop Worrying and Love the Bomb*

The 2016 decision by the Working Group on the Anthropocene of the International Commission on Stratigraphy (ICS) to designate an Epoch based on a Global boundary Stratotype Section and Point (GSSP) fixed at AD1950 is significant for managing global ecological systems moving forward. There is no serious scientific debate on whether humans have impacted the global ecology, but regardless of the ICS decision to anchor the so-called "Golden Spike" to the advent of the nuclear age, humans are known to have profoundly altered landscapes at deep timescales. Three examples are presented from the African continent: the Middle Stone Age (Pleistocene) of northern Malawi, the Neolithic (early Holocene) of the Sahara and Iron Age (late Holocene) of northern Cameroon in which the concepts of boundaries and potential impacts of human activity are challenged. Human impacts on ecological systems are qualitatively analogous to other keystone species, but quantifiably larger based on our control of fire and other forms of coppicing as landscape management tools. Although coppicing may not meet the GSSP standard, its accumulated global effect on landscape species composition has altered earth's environmental matrix as significantly as nuclear weapons.

[161] *Chair*

Wright, Kevin (The University of Alabama) and Elliot H. Blair (The University of Alabama)

[154] *Using XRF Analysis on Historic Choctaw Ceramics from Chickasawhay Creek, Kemper County, MS*

In partnership with Tennessee Valley Archaeological Research (TVAR), this poster presents the results of an x-ray fluorescence spectrometry (XRF) analysis of ceramics recovered from historic Choctaw (Late 17th—Early 19th century) contexts at sites (22KE630 and 22KE718) located along Chickasawhay Creek, Kemper County, MS. In the fall of 2017, a sample of ceramic sherds was selected for chemical sourcing at the University of Alabama. XRF was used to non-destructively identify ceramic compositional groups from the sample. In this poster, we discuss our methodology and

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present preliminary interpretations of how these chemical profiles demonstrate changing choices in clay exploitation based on differences in vessel form, function, and chronology.

Wright, Kyle (USDA Forest Service—Shoshone National Forest, Wyoming) and Lawrence Todd (Research Associate, Draper Museum of Natural History)

[106] *Bounding Uncertainty and Ignorance: Archaeology and Human Paleoecology in Washakie Wilderness, Shoshone National Forest, Wyoming*
In the early 21st Century, the Washakie Wilderness, which encompasses roughly 2850 km² of the Greater Yellowstone Ecosystem, was a virtual blank spot on the map of prehistoric archaeology with only three sites reported and no systematic inventories having been completed. By 2017 cooperative investigation between the Shoshone National Forest and Greybull River Sustainable Landscape Ecology (GRSLE) has completed 16 field seasons in the Washakie and documented 388 previously unknown prehistoric sites in nearly 1700 ha block inventory areas. The GRSLE project focuses on artifact-based documentation and has recorded locational and descriptive data on over 120,000 pieces of chipped stone as our base dataset. Artifacts range in age from Paleoindian through Protohistoric and are found as both small scatters and extensive occupation sites. With only about 0.6% of the Wilderness having been systematically examined, we are just beginning to glimpse the range of variation in artifact locations, attributes, and regional assemblage properties. In addition to a small sample size, recent climate driven changes including large wildland fires and melting alpine ice patches add to our interpretive uncertainty in reconstructing prehistoric use of the Washakie other than to say it was neither marginal nor subject to limited short-term human use.

Wright, Patti [9] see Pierce, Daniel

Wright, Sterling (University of Oklahoma), Cara Monroe (Laboratories of Molecular Anthropology and Microbi), Mary Furlong (James Madison's Montpelier), James Reeves (James Madison's Montpelier) and Courtney Hoffman (Laboratories of Molecular Anthropology and Microbi)

[14] *Collaborating with Descendant Communities to Explore the Biological Heritage of Enslaved People at James Madison's Montpelier through Ancient DNA Analysis*

Over the past 30 years, historical archaeologists have studied the sites and material remains of enslaved people from across the American South. Recently, archaeologists have actively worked with descendants in this research, including excavation and archaeological interpretation. However, little has been done to build the connection between biological and historical heritages of enslaved people and their descendants. In this study, we utilized ancient DNA methodology to contextualize the maternal ancestry of three teeth that were discovered at James Madison's Montpelier. The teeth were recovered from non-burial contexts associated with enslaved people living and working at Montpelier during the 18th and 19th centuries. Before DNA extraction, the teeth were 3-D scanned and printed to preserve their morphology in digital form. The genetic analysis of the tooth remains not only expands the breadth of knowledge about slavery in the US, but also provides an opportunity for archaeologists and a community of descendants from Montpelier to collaborate in a new way. Therefore, this study illustrates how the knowledge from a genetic study can be of value to both the academic and public settings.

Wrobel, Gabriel (Michigan State University)

[101] *The Maya Cranial Photogrammetry Project*

The Maya Cranial Photogrammetry Project aims to create a large digital repository for the purpose of comparative shape analyses to test hypotheses relating to ethnic and political distinctions among ancient Maya groups. The shape of skeletons reflects a combination of genetic and environmental influences on development and thus comparison of skeletal variability provides an important means to reconstruct microevolutionary processes. In particular, because of its complex morphology the skull has been the focus of evolutionary biology studies, including those focused on humans. Most often in anthropological contexts, size and shape variables are quantified and compared as part of biodistance studies, relying on the basic assumption that people sharing similar morphological features share a common ancestry when compared to groups with fewer shared features. My study utilizes metric and non-metric data collected digitally from 3D photogrammetry models of crania and mandibles to perform biodistance analyses, which will allow me to map the genetic relationship between geographically-bounded and culturally distinct subgroups within Mesoamerica. Observers will have the opportunity to explore and manipulate the 3D models on a computer and will also be exposed to various visualization options for comparing shape variations.

Wu, Xiaohong [177] see Patania, Ilaria

Wu, Xiaotong (University of Science and Technology of China), Xingxiang Zhang (University of Science and Technology of China), Zhengyao Jin (University of Science and Technology of China), Rowan Flad (Harvard University) and Xinming Xue (Shanxi Provincial Institute of Archaeology)

[45] *Long-Distance Human Migration in Late Neolithic China: Isotopic Evidence from Qingliangsi Cemetery*

Around 2200BC, Qingliangsi is a large settlement to the north of the Yellow River with wealth accumulation and social stratification. The location of the site close to rich salt resources made the location a draw for emergent elites during the late Neolithic. Among the most significant lines of evidence of emergent stratification are remains of human sacrifice found in the Qingliangsi cemetery. Our carbon, oxygen, and strontium isotope analyses of human remains excavated from Qingliangsi show that some of the elites and the sacrificed juveniles during Longshan period may have come from regions near the Yangtze and Huai Rivers. Our results delineate the complex demography in Qingliangsi and reveal population movement over long distances driven by salt resources. The unusually rich salt resources in North China may have played a vital catalytic role in this evolution. Around 2200BC, Qingliangsi is a large settlement to the north of the Yellow River with wealth accumulation and social stratification. The location of the site close to rich salt resources made the location a draw for emergent elites during the late Neolithic. Among the most significant lines of evidence of emergent stratification are remains of human sacrifice found in the Qingliangsi cemetery. Our carbon, oxygen, and strontium isotope analyses of human remains excavated from Qingliangsi show that some of the elites and the sacrificed juveniles during Longshan period may have come from regions near the Yangtze and Huai Rivers. Our results delineate the complex demography in Qingliangsi and reveal population movement over long distances driven by salt resources. The unusually rich salt resources in North China may have played a vital catalytic role in this evolution.

Wurst, LouAnn (Michigan Technological University) and Stephen Mrozowski (University of Massachusetts Boston)

[247] *Historical Archaeology of Capitalism and Climate Change*

Much of the climate change literature focuses on whether it is an empirically verifiable process or how individual's behavior can ameliorate the impacts. Our common approach abstracts the environment, economy, society, and individuals as external relations that posit the cause and effects of global warming as categorically separate from endemic global poverty, starvation, and income disparities. Instead, we argue that discussions need to bring together all the social and natural aspects that people tend to abstract as separate; to see capitalism as an internally related dynamic totality. The unforeseen consequences of an ever-expanding economy built on the accumulation of wealth is that one of its "products" is the concentration of toxic gases that have contributed to global climate change. Historical archaeology provides a powerful set of vantage points from which to critically examine

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the history of capitalism in motion and case studies that can help people understand that climate change is both an internal and necessary to the laws of capitalist motion.

Wyatt, Andrew (Middle Tennessee State University)

[254] *In the Garden: Studies in the American Neotropics*

Gardens are spaces where households grow plants for food, medicine, and beauty. They provide subsistence as well as economic benefits. However, gardens are more than just economically functional. Gardens are also spaces where families interact and children are socialized, gender and status are negotiated, and ancestral memories are maintained. Archaeologically, soil chemistry, archaeobotany, and spatial analysis have enabled us to identify the locations of gardens, but addressing more anthropologically oriented questions is necessary to situate these important spaces within the household.

This presentation will discuss the history of garden studies in the American Neotropics, how archaeologists have refined their methods in identification and analysis, and how they have attempted to address more theoretical and anthropological questions. I will then present both ethnographic and archaeological data from the Precolumbian Maya site of Chan in Belize, the contemporary Lacandon Maya community of Lake Mensabak in Chiapas, Mexico, and several Precolumbian sites in Gurupá and Caxiuana, Brazil to demonstrate how we can move beyond questions of identification to discussions of meaning.

[254] *Chair*

Wygall, Brian [50] see Krasinski, Kathryn

Wyllie, Cherra

[128] *Discussant*

[128] *Chair*

Wynne-Jones, Stephanie [170] see Fleisher, Jeffrey

Xiaowei, Zhao [24] see Yingyuan, Xu

Xiuhtecutili, Nezahualcoyotl (Tulane University), Daniel Pierce (University of Missouri) and Michael D. Glascock (University of Missouri)

[31] *Tlaxcallan Pottery Manufacture and Restricted Networks*

The debate whether pottery sherds equal people or just their ideas has been ongoing since the days of pioneers such as Ford and Spaulding. The advent of new technologies has given a new wind to old debates in which the questions surrounding pottery styles are examined more closely to determine their origin. Compositional analysis has been especially helpful in shedding new light on the relations between artifacts and people. Compositional analysis carried out on Postclassic Tlaxcallan pottery from surface collections is compared with visual identification carried out in the initial technical analysis of the assemblage. While that initial analysis identified varied points of origin for stylistically foreign pottery, compositional analysis eliminates the probability that these styles were imported from faraway places, and increases the likelihood that their production was more localized, possibly tapping clay sources within Tlaxcallan itself or nearby sources. This possibility supports the idea that Tlaxcallan's access to foreign goods was limited as Aztec power increased, but also that there seems to have been a demand for these foreign objects that was met with entrepreneurial ingenuity by Pochteca merchants.

[194] *Moderator*

Xu, Jian (Sun Yat-sen University)

[336] *Formation of Early State in Highland Southwest China: Rethinking Yelang Culture*

Recent archaeological discoveries in Guizhou, China have moved some scholars to describe and argue for the material existence of a legendary state, Yelang; roughly contemporary with Chinese powers from the late Eastern Zhou to the early Western Han dynasty. Except for precious objects reserved for high ranking people, traditionally-identified indicators of early urban civilizations are largely absent in Guizhou. If the appearance of luxury objects and their applications in well-regulated contexts connote the existence of a state or proto-state, that dramatically differs from states or proto-states in either Central China or in the written accounts of Yelang. This presentation aims to define the archaeological appearance of an early Bronze-age state in the highlands, based on information collected from several sites in Guizhou.

Xu, Yiting [284] see Soleski, Anna Marie

Xue, Xinming [45] see Wu, Xiaotong

Yacubic, Matthew (Bureau of Land Management)

[38] *Rails and Trails: Archaeology of the Central Pacific Railroad along the Humboldt River*

The Humboldt River was a significant transportation route used for the movement of information, goods, and people from prehistoric through modern times. Continual use of the river as a transportation node is due to its west-southwest direction, which provides one of the few natural corridors across the Great Basin. Because of the relatively flat topography, the Central Pacific Railroad Company, motivated by the ideals of nationalism and capitalism, built their line along the Humboldt River corridor. Documenting the location and condition of the Central Pacific Railroad (CPRR) is critical to preserving and protecting this historically significant resource. However, the CPRR, including its associated features and artifacts, is more than a historic scar on the landscape; it is a clue to the social, economic, and political conditions of the late nineteenth century. Many of these historic situations can be examined from an archaeological perspective through landscape analysis. As one of the last large-scale construction projects completed by manual labor in the United States, archaeological studies of the Central Pacific also provides details on the lives of groups marginalized by history, including the Chinese laborers who worked on the line.

Yaeger, Jason (University of Texas at San Antonio) and M. Kathryn Brown (University of Texas at San Antonio)

[258] *Archaeology, History, and Ancient Political Dynamics of the Mopan River Valley*

One hallmark of Joseph Ball's research has been integration of archaeological data and ethnohistorical and historical data, put to the service of addressing larger anthropological questions. In this paper, we present new data to examine one research question studied by Joseph Ball and Jennifer Taschek: Classic Maya political dynamics in the Mopan Valley of western Belize. This valley was home to five large centers, spaced 1 to 5 km apart: Las Ruinas de Arenal, Early Xunantunich, Classic Xunantunich, Actuncan, and Buenavista del Cayo. Ball and Taschek conducted extensive fieldwork at Buenavista and Arenal, and they proposed a model of the valley's political structure as comprising a single polity with functionally distinct settlements. Following in their footsteps, we have conducted research at all of the sites listed above. We present new archaeological and epigraphic that allow for a more nuanced model of the valley's political organization. We also examine how the ideological basis of political authority and the relationships between the region and outside kingdoms both changed significantly over time.

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Yaeger, Jason [129] see Brown, M. Kathryn

Yakal, Madeleine (University of California, Los Angeles)

[225] *Origins and Movement of Tradeware Ceramics in the Bicol River, Philippines: Applying pXRF Technology to Trade and Interaction Research*
The presence of tradeware ceramics (stoneware and porcelain) in the Philippines indicates interaction and exchange with foreign traders. Of particular interest is the spread of Ming (1368–1644) porcelain, which overlapped with the Spanish colonization of the Philippines. Ming ceramics are abundant in the archaeological record of the Philippines, spanning pre- and post-contact periods. These ceramics even became one of the major trade items during the Spanish Philippines. To establish the movement of these goods in the Bicol Region and adjacent Southern Tagalog Region, I utilize portable X-ray fluorescence to analyze tradeware ceramics from sites adjacent to the Bicol River. Elemental analysis of tradeware ceramics excavated at various Philippine sites, as well as collections obtained from salvage archaeology, may provide insights into where these ceramics were made, who was trading them, and the nature of their movement across the archipelago. For comparison, I also analyze tradeware ceramics from archaeological sites in nearby Southern Tagalog Region. Through this analysis, I expect that the elemental composition of Ming porcelain in the Philippines will provide a glimpse of the exchange relationships between the sites investigated. Furthermore, these markers of culture contact are important to understanding the role of exotic, nonlocal goods in Philippine society.

Yamamoto, Atsushi

[178] *Emergence of Sociopolitical Complexity in Northern Peru: A Diachronic Perspective from the Huancabamba Valley*

This paper focuses on the emergence and diachronic development of sociopolitical complexity in northern Peru during the Initial Period and Early Horizon using new excavation and settlement pattern data from the site of Inгатambo in the Huancabamba Valley. I argue that significant changes in sociopolitical complexity occur alongside shifts and intensification in interregional interaction.

During the Pomahuaca phase (BC. 1200–800); ceremonial centers with platform architecture appear suddenly throughout the valley alongside the expansion of roads and long distant interaction networks. By the subsequent Inгатambo phase (800–550 B.C.), the number of ceremonial centers in the valley decreased despite the florescence of monumentality at the site of Inгатambo and the increase presence of foreign pottery and other exotic materials. This data suggests that the long term development of sociopolitical complexity within the Huancabamba Valley was strongly linked to its interregional relationships and that Inгатambo, as a result of its strategic location, would eventually grow into a major node for both inter-regional and intra-regional interaction.

Yaman, Irfan (AKSARAY UNIVERSITY), Cevdet Merih Ereк (GAZI UNIVERSITY), Iraz Asli Yaman (AKSARAY UNIVERSITY) and Alper Basiran (PETA AERIAL ANALYSIS)

[41] *A New Excavation In Southeast Turkey: Kece Cave*

Kece Cave is located in Kahramanmaraş—Elbistan Province in Turkey. The first excavation was carried out in 2015 and since that year, it has been continued by excavation team that includes different university experts. According to preliminary reports, first excavations were realized on terraces in front of the cave and inside. Preliminary findings have been remarkable. Although during the last season excavation, most amazing findings than before were obtained in the terrace excavation area and around of the cave. Especially, chipped stone tools concerning with the Paleolithic Age were found by archaeologists. Meanwhile, the area was settled from Early Bronze Age to Roman period. The area and the cave has exhibited significant archaeological reference point with these characteristics.

Yaman, Iraz Asli [41] see Yaman, Irfan

Yanicki, Gabriel [120] see Ives, John W.

Yao, Alice (University of Chicago)

[181] *How to Dig a Drinking Well: Watery Politics on China's Han Frontier*

Water plays an undeniable role in the constitution of politics and society, presenting an elemental force to be controlled for the expansion of agrarian economies. The political life line linked with water is perhaps nowhere better illustrated than with the Han Empire whose massive canalization and irrigation works were necessary to facilitate state expansion into deserts and tropics. The archaeological focus on water and agrarian infrastructure has however overlooked other capacities of water, for instance, as a potable substance in the production of life. Because an anthropocentric viewpoint begins with water as a matter of control, water appears as an object existing independently of the wider physical phenomenon. However, if archaeologists are to approach imperial projects as involving new ways of perceiving difference, this paper argues that water presents a contentious form at the intersection of frontier ecologies. Shifting away from infrastructures of water, this paper explores how water forms distinctive assemblages in colonial households beginning with the building of drinking wells in a newly established frontier. Where and how deep and wide to the shape of a well confronted Han settlers with water's tangibility, an encounter which enmeshed people with water's less controllable presence in soils and plants.

Yap-Chiongco, Meghan K. [187] see Valenzuela-Toro, Ana

Yaquinto, Brian [226] see Reese, Kelsey

Yaquinto, Brian (Bureau of Land Management)

[261] *Using the Past to Inform the Future: Employing Empirical Data to Guide Future Land Management Decisions*

This presentation will explore the opportunity to increase scientific driven data into the National Historic Preservation Act (NHPA) Section 106 compliance process particularly relating to Bureau of Land Management (BLM) undertakings. The absence of empirical data available to the BLM to analyze how different activities' development and/or management affect archaeological sites can result in unfounded assumptions and unnecessary complications during project planning and implementation. Using cases studies from BLM Colorado among other states, this presentation will provide the basis for highlighting the need for additional cultural resource impact studies as well as the advantage of a more scientific approach in federal cultural resource management. Federal agencies, such as the BLM, would greatly benefit from additional resource studies that promote a science driven approach to the Section 106 process. This empirical focus will lead to greater transparency and would overall foster better relations within the BLM, and with State Historic Preservation Officers (SHPO), local governments, communities, tribes, and other stakeholders.

Yaquinto, Jessica (Living Heritage Anthropology)

[305] *Tribal Connections to the Monticello Field Office*

The BLM Utah Monticello Field Office (MFO) selected Living Heritage Anthropology (LHA) to document tribes' connections to and ethnographic resources within their field office. The MFO is located in southeastern Utah and includes much of the greater Cedar Mesa area. In order to achieve this goal, LHA is currently conducting an ethnographic literature review of tribal perspectives of and connections to the MFO. As part of this process, with the field office, LHA has been initiating conversations with 32 tribes likely to have traditional connections to the area, as well contacting institutions and

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researchers about pre-existing resources within their collections. This talk will highlight initial project findings and tribal perspectives on southeastern Utah.

[233] *Discussant*

Yates, Donna (Scottish Centre for Crime and Justice Research, University of Glasgow)

[108] *Discussant*

Yelacic, David (Terracon Consultants, Inc.), Charles Frederick (The University of Texas at Austin) and Jon Lohse (Coastal Environments, Inc.)

[59] *Formation and Context of Sitio Chivacabe, Western Highland Guatemala*

Located in the Highlands of western Guatemala, Chivacabe is a Pleistocene-age bone bed and Archaic-age archaeological site. In 2009 the site was subjected to intensive geoarchaeological investigation with the goals of identifying the relationship between the faunal and archaeological remains through developing an understanding of their context. Three allostratigraphic units were identified: The oldest unit, which contains the bone bed, consists of colluvially reworked tephra bracketed by radiocarbon dates of 15,700 and 12,920 years BP (Cal. 2-sigma). The middle unit, marked by a prominent Btkb horizon, minimally dates to 10,190 years BP and likely contains the archaeological materials. The youngest unit truncates the underlying middle unit and represents relatively recent or Late Holocene erosion and deposition. Overarching conclusions from the 2009 geoarchaeological investigations include confirmation of the faunal remains in reworked tephra and dissociation of the bone bed and archaeological materials.

Yellen, John [227] see Brooks, Alison

Yépez, Willy [335] see Bautista, Stefanie

Yerka, Stephen (University of Tennessee) and Russell Townsend (Eastern Band of Cherokee Indians, THPO)

[101] *Big Picture, Little Picture: Reconstructing Rock Art and Context in Both the Virtual and Physical Word*

This presentation explores the ways in which 3D reconstruction can succeed as an innovative platform for both archaeological study and public engagement using a case study from the Hiwassee River watershed, North Carolina. The project, initiated by the Tribal Historic Preservation Office (THPO), Eastern Band of Cherokee Indians (EBCI), involves an effort to repair a vandalized petroglyph panel. The rock art panel is a complex composition of incised, interwoven petroglyphs from which a 1.5 m section was removed and carried off-site. The removed section was recently returned to the EBCI, and it was decided that an effort should be made to restore the panel to its original location. Photogrammetric 3D reconstruction was selected as the best method to non-invasively model repair efforts, and also provided a unique opportunity to study the petroglyph forms, and provide the basis for an interactive experience for members of the EBCI community.

Rock art sites and panels make a natural pairing with 3D reconstruction for archaeology, because the study of rock art requires visual and spatial analyses. Additionally, the visually striking, and often enigmatic, nature of rock art generates much public interest—making it an excellent vehicle for public archaeology and interactive virtual reality projects.

[276] *Discussant*

Yerka, Stephen [53] see Noack Myers, Kelsey

Yerkes, Richard (Ohio State University)

[245] *Chair*

Yerkes, Richard [245] see Gyucha, Attila

Yeshurun, Reuven (University of Haifa)

[124] *Contextual Taphonomy in Zooarchaeology: From Refuse Behavior to Site-Occupation Intensity in Levantine Epipaleolithic Camps*

In zooarchaeology, Contextual Taphonomy means the integration of the stratigraphic and contextual data with zooarchaeological and taphonomic data, to clarify the 'life history' of a faunal sub-assemblage in a given context. The approach uses animal remains to explain variability among site features by looking into the differential taphonomic histories of the bones, most importantly in the post-discard stage. Archaeofaunal remains are normally ubiquitous in foragers' camps and their histories are readily deciphered, potentially making them excellent indicators of site-formation processes, refuse behavior and activity areas and, by extension, of site type and occupation intensity. A contextual taphonomy approach was recently applied to Late Epipaleolithic (Natufian) animal remains in Mount Carmel, Israel (ca. 15,000–11,700 cal. BP) in order to discern the formation and function of architectural contexts of these semi-sedentary foragers. At the Natufian basecamp of el-Wad Terrace, the contextual taphonomy approach identified fluctuations in site-occupation intensity through the 3,500-year-long Natufian sequence of the site. It also showed that a sequence of structures was used for everyday living activities, probably at the household level. Conversely, at the Natufian cemetery site of Raqefet Cave, the animal remains reflected short and punctuated periods of human activity, corresponding with a specialized burial site.

Yildirim, Tayfun [71] see Dardeniz Arıkan, Gonca

Yingyuan, Xu (University of Science and Technology of China), Zhao Xiaowei (Xuzhou Museum in China), Li Zongmin (Xuzhou Museum in China) and Jin Zhengyao (University of Science and Technology of China)

[24] *Research on Materials and Manufacturing Process Used for the Imperial Inlaid Jade Lacquered Wooden Coffin from the Royal Mausoleum No.2 of the Vassal King of Jiangdu State of the Western Han Dynasty in China*

The paper focuses on the characterization of material from fragmented pieces of the imperial lacquered wooden coffin excavated in Xuji County, Jiangsu Province, whose owner was the empress of Jiangdu State in Western Han Dynasty. The samples were analyzed by scientific techniques including optical and electron microscopy, XRD, FT-IR and GS-MS. The lacquer film outside consists of a seven-layer structure, which includes (from the top): a red pigmented layer, two lacquer finish layers, three ground layers and a canvas foundation layer. The red motifs on the surface are painted by cinnabar. The lacquer finish layers are made of urushi and amorphous. The three layers of ground are feldspars, hydroxyapatite and feldspars mixed with urushi respectively and there is a layer of organics between every two of them. The foundation layer is identified as a plain weave fabric made of bast fibres. Our study revealed the manufacturing process of Chinese traditional lacquering of Vassal King in Western Han Dynasty.

Yoffee, Norman (U Michigan)

[131] *Discussant*

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Yoneda, Minoru [24] see Owlett, Tricia

Yoo, Justin [32] see Walsh, Carl

Yoon, Elias [46] see Sagripanti, Jose-Luis

Yoon, David (American Numismatic Society)

[54] *Long-Distance Trade in Late Antique Italy: Evidence from the Bova Marina Archaeological Project*

It is well known that the state plays a major role in generating and structuring economic flows in complex societies. What happens, though, when a state's ability to do this is severely reduced? One example to consider is the Roman/Byzantine state in Late Antiquity. Using survey evidence from the Bova Marina Archaeological Project, changes in the presence of long-distance imports in the ceramic assemblage show a drastic shrinkage of the scope of trade, while other economic changes were less dramatic or more gradual.

Young, D. Craig [92] see Vernon, Kenneth

Young, Eric (OSD DPAA)

[62] *Discussant*

Young, Kenneth (University of Texas at Austin)

[178] *Ecology and Human Habitation of Andean Forests*

People have altered the naturally forested areas of the tropical Andes for natural resources and as places for settlements. The forests collectively represent a global biodiversity hotspot, with many unique species. Environmental gradients are abrupt, with dramatic changes in temperature regimes with altitude, but also with switches in humidity from dry to pluvial depending on exposure to prevailing winds. The steep environmental gradients create dispersal barriers to plants and animals, resulting in highly restricted distributions. Along the >3000 m altitudinal gradient, there are zones where cooling air can form persistent fogs, leading to cloud forests that have moisture-dependent species and low stature trees, which nevertheless provide important ecosystem services. The relatively cool temperatures and steep slopes at higher elevations often discourage human colonization, but some sites include archaeological sites, suggesting that current land use may not be prescriptive of the past. Nonexclusive factors may include past climate change, enclaves with drier microenvironments, transhumance, and use of multiple ecological zones. Given a long history of Andean landscapes with people, it is important to put conservation and sustainability goals into a larger context, including data on the timing and locations of settlements, and conceptual models of human influences on Andean forests.

Young, Lisa (University of Michigan)

[218] *Continuing Collaborations at Homol'ovi: A View from the Corn Roasting Pit*

For over a century, Homol'ovi has been a place where Hopi people and archaeologists interacted and learned from each other. The creation of the Homolovi State Park and the Homol'ovi Research Project provided opportunities for collaboration. In this paper, we reflect on these changing interactions and their impact. A corn roasting pit that was built a decade ago provides important insights into ways to maintain relationships after the fieldwork component of research projects has ended.

[160] *Discussant*

[218] *Chair*

Young, Michelle (Yale University)

[141] *From Near and Far: Application of Archaeometric Techniques to Characterize Regional and Long-Distance Interaction at the Formative Period Center of Atalla, Peru*

This paper investigates the role of interregional interaction in the development of social complexity in the Central Andes during the Late Initial (c.1100–800 BC) and Early Horizon (c.800–200 BC) periods at the archaeological site of Atalla, a regional ceremonial center located in highlands of Huancavelica, Peru. Methodologically, this research integrates radiocarbon dating with stylistic, technical, and geochemical analyses of a range of materials to examine exchange and interaction on multiple scales. Formal and technical analyses of ceramic styles are compared with petrographic analyses of these ceramics, allowing the investigation to distinguish imported wares from local imitations of foreign styles. NAA and XRF analyses of obsidian flakes and tools reveal regional patterns of obsidian exchange and acquisition. The use of pXRF to verify the composition of decorative pigments illuminates temporal and spatial patterns associated with the exploitation, processing and exportation of cinnabar. The results from these combined analyses will present a more holistic understanding of regional networks and long-distance trade than the sourcing of a single material could offer. This study aims to characterize interactions with foreign communities and to explore the relationship between these interactions and the emergence of social complexity at the site of Atalla.

[177] *Chair*

Young-Wolfe, Halona (State University of New York at Binghamton)

[300] *Architectural Style and Urban Organization at the Patipampa Sector of Huari*

Defining spatial organization was a key research question for the excavations at the Patipampa sector of the Middle Horizon (AD 500–1000) site of Huari in the Ayacucho valley of Peru. In the 2017 excavations we used methods designed to expose the upper portions of walls, in order to define architectural spaces and clarify organization of the sector. Some architectural spaces were excavated more completely, fully exposing walls and architectural features.

Our excavations revealed distinct architectural styles defined by differences in scale, construction materials, and construction techniques. Analysis shows clear linkages and relationships between structures with distinct architectural styles that are maintained across time. Differences in construction materials and techniques are frequently understood to indicate distinctions in the use and purpose of buildings, and differences in who could use those buildings. Our findings at Huari challenge these assumptions, showing that finely constructed buildings and spaces with distinct architectural features were at times integrated with more quotidian architecture.

This paper will define the architectural styles at Patipampa, demonstrate how buildings with distinct architectural styles are related to one another, and explore what these findings can tell us about the everyday life of the early urban inhabitants of Huari.

[300] *Chair*

Yousif, Eisa [145] see Dunning Thierstein, Cynthia

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Yu, Pei-Lin (Boise State University) and Marcy Rockman (National Park Service)

[247] *The State of the Art in Stating Risk: Assessment of Climate Vulnerability Assessments for National Park Service Archaeology and Cultural Heritage Resources*

Across America, the National Park Service has conducted an array of vulnerability assessments for climate change impacts for cultural heritage resources, including archaeology, historic structures, cultural landscapes, and others. A project is currently underway to analyze these assessments. This process is designed to improve the practice of vulnerability assessments as well as scientific understanding of cultural resources vulnerability to climate change. In this paper we share preliminary results for an analysis of 12 vulnerability assessments and recommendations based on those results. Time for discussion will be included.

Yu, Pei-Lin [48] see Lee, Craig

Yue, Tiffany [266] see Coker, Adam

Zaia, Sara (Harvard University) and Katherine Rose (Harvard University)

[225] *Connecting the Dead: A Comparison of Pre-dynastic Nubian and Egyptian Cemeteries*

In the early 20th century, seminal Egyptologist George Reisner excavated a series of predynastic cemeteries west of the Giza plateau and farther south in modern day Sudan. While some objects from specific cemeteries were published in original manuscripts, the majority of artifacts currently housed in Harvard University's Peabody Museum remain unstudied. Through a combination of ceramic analyses, including petrography and stylistic analysis, we situate these assemblages within a discussion of intra and inter-cemetery patterns during the predynastic period. We present a study of contextualized ceramic material from selected cemeteries, such as Keneh, Sheikh Farag and Kerma, to elucidate the relationships between Egyptian and Nubian funerary material culture during the predynastic period. We aim to identify indications of connectivity, movement of goods, and transmission of technology between pre-dynastic Egypt and Nubia. We situate this comparison within a discussion of the known mortuary characteristics, practices, and organization of Nubian and Egyptian cemeteries. We aim to underline possible channels of trade of goods and the social and cultural meaning of the exchanged objects. Our objective is to contribute to the study of interconnection and relationship between Egypt and Nubia more broadly, through the study of the ceramic material from a funerary context.

Zaneri, Taylor (New York University)

[40] *Producing the City-State: GIS Modeling of Rural Land Use in Medieval Tuscany*

From 900 to 1300 AD, Italy underwent sweeping cultural changes—the rise of market economies, increased trade and commerce, and new forms of governance. Typically, the elite are cast as the drivers of these shifts, yet it was rural labor that produced the goods (particularly foodstuffs) traded in the cities, collected in the form of rent and taxes, and transformed into capital. This paper examines the impact of rural landscape strategies during the development of the medieval city-state of Lucca. Historically Lucchese rural producers had greater autonomy compared to their counterparts elsewhere in medieval Europe when it came to land choices and production. Using environmental models constructed in GIS, I examine rural settlement location in relation to land suitability for three major cultivars consumed in urban Lucca: vines, olives, and wheat. From 900 to 1300 AD, the period of city-state formation, I explore if and how rural settlement shifted to areas better or less suited to these crops, analyzing if rural producers changed their landscape occupation to engage with urban markets. In summary, I investigate the impact of the periphery on the center, by asking how rural landscape use impacted and interacted with urban transformations.

Zaragoza, Gabriella [105] see Hard, Robert

Zaragoza, Diana (INAH)

[33] *Un acercamiento al pensamiento simbólico de los Huastecos, siglos XV y XVI*

Definir una región tan antigua y compleja como la Huasteca, implica conocer las características de los grupos humanos que la habitaron; en ella existen diversas manifestaciones culturales a través del tiempo; en esta ocasión presento un primer acercamiento al mundo simbólico que encontramos durante el período Posclásico.

Inicié el estudio utilizando cuatro indicadores arqueológicos: Vasijas de cerámica, Concha labrada, Pintura Mural y Escultura. Lo primero que hice fue reconocer los símbolos que se encontraban en ellos y decidí iniciar con 24 representaciones que agrupé de acuerdo con su frecuencia, para así ir abordando la investigación sobre estos testimonios; empezando un catálogo que da una idea de los elementos que concibieron.

De esta manera emprendo un primer acercamiento hacia la interpretación de representaciones simbólicas en los indicadores, pretendiendo acercarme a sus significados a través de la identificación iconográfica de los símbolos considerados.

Con las referencias bibliográficas de esta región y para otras partes del México Antiguo, he intentado reconocer algunos de los símbolos plasmados, con el fin de poder adentrarme en el pensamiento simbólico de la Huasteca prehispánica.

Zarco Navarro, Jesús [55] see Gastelum-Strozzi, Alfonso

Zavodny, Emily (Penn State University), Martin Welker (Penn State University) and Sarah McClure (Penn State University)

[189] *A Pawsitively Interesting Prehistory of Dogs: New Stable Isotope and Morphometric Analyses from Croatia*

Though dogs are recognized as important points of comparison for archaeologists seeking to reconstruct prehistoric human diet and lifestyles (e.g., canine surrogacy approach), less attention has focused on understanding the cultural and ecological significance of dogs themselves in these same contexts. We report new morphometric and stable isotope results from prehistoric (Neolithic-Iron Age) sites from Croatia that represent different cultural and environmental contexts that potentially impacted the importance and/or functions of dogs in local communities. We also synthesize other data reported from sites throughout southeastern Europe to highlight regional differences in dog morphology and the relationships between dogs, humans, and the environment over time.

Zawadzka, Dagmara (Université du Québec à Montréal (UQAM))

[331] *Rock Art Out of Its Element? Exhibiting Places in Museums*

Unlike most material culture, rock art is firmly embedded in its place. This particular circumstance has shaped its research, as well as its reception among the general public. While famous sites, such as Lascaux, are well known and recognised despite difficulty in accessing them, other sites, especially those in Canada, are still relatively unknown. This paper will briefly address how rock art has been consumed and presented to the general public within Canada. Next, I will address how this heritage can be brought to millions through the medium of a virtual exhibit. I will then discuss the project of a virtual exhibit that has been undertaken by the Musée de la civilisation and Université du Québec à Montréal and I will focus on the advantages and challenges that new technologies can create in how rock art is presented, preserved and ultimately understood.

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Zborover, Danny (Institute for Field Research), Veronica Pacheco (UCLA), John M. D. Pohl (UCLA/CSULA) and Darren Longman (UCLA)

[264] *Alligators, Serpents, Pirates, and a Wedding: Ritualized Political Landscapes of the Oaxacan Pacific Coast, Mexico*

Straddling maritime, lowlands, and highland environments, the neighboring Chontal and Huave ethnic groups occupy one of the most diverse landscapes in southern Mexico. For over five centuries this resource-rich territory served as a junction for Indigenous and European colonial encounters, where interethnic and intercontinental political alliances and conflicts came forcefully into play. In addition to leaving material remains scattered throughout the landscape, this political history was encoded in ritualized performances still practiced today in these coastal communities, as well as in their oral traditions and territorial-narratives. Our interdisciplinary research project in the region demonstrates that mountains, caves, lagoons, and the ocean itself served as portals for both animal and human agents, moving and operating in between the physical and spiritual realms. In turn, these animated palimpsests serve as mnemonic devices to recount and reshape social relations and ancestral memory.

Zeanah, David (California State University, Sacramento)

[92] *Understanding Prearchaic Mobility and Settlement Patterns: The Role of Theory, Models, and Ethnographic Analogies*

Most evidence suggests that Prearchaic hunter-gatherers were highly mobile, and equipped with a hunting oriented lithic technology that lacked milling equipment. Nonetheless, they acquired a broad spectrum of prey and tended to camp near wetlands rich in small game and plant resources.

Archaeologists have questioned to what degree this evidence reflects an adaptation that fundamentally differed from ethnographically observed patterns in the Great Basin, as well as whether it was shaped primarily by social and political, rather than subsistence needs. We argue that the Prearchaic cannot be understood by direct analogy with ethnographic Great Basin foragers because they lived in climatic circumstances and at population densities utterly unlike those of recent times. An alternative theoretical approach informed by behavioral ecology and validated with data on global variability in hunter-gatherer mobility can yield testable expectations. Such an approach should be founded on the expectation that both social and economic incentives play critical and non-contradictory roles in structuring the settlement patterns and mobility strategies of low population density hunter-gatherers.

[92] *Chair*

Zeanah, David [5] see Weitzel, Elic

Zedalis, Morgan [106] see Whiteman, Erik

Zedeño, Maria Nieves (University of Arizona), Francois Lanoe (University of Arizona), Anna Jansson (University of Arizona), Danielle Soza (University of Arizona) and Ashleigh Thompson (University of Arizona)

[153] *Ancient Landscapes of the Rocky Mountain Front: A View from the Billy Big Springs Site, MT*

The northern Rocky Mountain Front contains critical information regarding human exploration and colonization of the continent. Yet, reconstructed paleo-landscapes in the region extending from southern Alberta to northern Montana have focused almost exclusively on the Pleistocene-Holocene transition. Billy Big Springs, a multi-component site located just east of East Glacier Park, provides new data on long-term natural (as old as 21,000 cal. BP) and cultural (post 14,000 to 700 cal. BP) landscape evolution, which is significant for modeling possible migratory routes, refugia, and settlement preference for Paleoindian, Archaic, and early Late Precontact populations in the region.

[289] *Discussant*

Zegarra, Edward (Binghamton University)

[17] *Partnerships for Patrimony: Developing a Methodology for Creating Sustainable Archaeological Site Preservation in the Central Highlands of Peru*

The growing popularity and lucrative potential of heritage tourism has made sustainability a growing concern for archaeologists, site managers, politicians, local communities, and other stakeholders including transnational individuals. However, heritage management professionals in often employ the term 'sustainable' synonymously with 'collaborative' rather than as a coherent methodology or strategic approach aimed at preserving heritage sites and landscapes. The thinness of the literature on sustainable archaeological site management may pertain to the difficulty heritage managers have in articulating frameworks as advocated for in the prevailing decolonization and indigenous theory underpinning heritage-based sustainability efforts. Throughout Latin America, this problem is further complicated by a distinct historical-colonial legacy that preserved the 'local' as well as the 'indigenous' and promulgated a criollo, or mestizo, identity as the unifying national figure of public imagination.

This paper presents original ethnographic, archaeological, pedagogical, and economic research on the outcomes of English-based theory on Spanish-speaking contexts, ethnographic research into local identities regarding pre-Hispanic archaeology, challenges to democratizing an authorized heritage discourse, and projected outlooks as they pertain to the site of Huari and the neighboring town of Pacaycasa in the Ayacucho region of Peru in the Central Andes.

[17] *Chair*

Zeidler, James (Colorado State University)

[295] *Deep Histories and Persistent Places: Repetitive Mound-Building and Mimesis in the Jama Valley Landscape, Coastal Ecuador*

This paper explores the notions of 'material memory' and human agency in deep time as expressed in the repetitive reconstruction of earthen platform mounds over some three millennia in the Jama Valley of coastal Manabí Province, Ecuador. Empirical evidence of repetitive mound-building is presented over a long stratigraphic record extending from approximately 2030 BCE to about 1260 CE, and special emphasis is given to the site of San Isidro, a major civic-ceremonial site and 'persistent place' located in the central Jama Valley. This long archaeological sequence is punctuated by evidence of three separate volcanic disasters and subsequent hiatus periods of valley abandonment. Repetitive rebuilding of monumental architecture was carried out by peoples of different cultural traditions that colonized the valley several hundred years after each natural disaster, represented by the Formative Period Terminal Valdivia and Chorrera cultures, followed by the long Jama-Coaque tradition. Finally, consideration is given to Dušan Borić's (2002) argument (following Gell 1998) that such repetition and citation of past monumental material culture, as well as its mimetic representation as miniaturized art forms, have apotropaic or protective properties that benefit society at large, or social groups and individual agents within that society.

[332] *Discussant*

Zeitlin, Nicholas (University of Massachusetts, Boston)

[167] *Iron Production at Marginal Settlements in Northern Iceland*

The environment of Iceland was rapidly and severely affected by the Norse Settlement, in particular by deforestation. In Iceland's changing environment the production of iron, an essential material, became limited not by access to iron ore but by availability of wood to make charcoal fuel. The large-scale production of iron may be one of the primary processes that led to deforestation in Iceland due to the large need for charcoal. Investigations at Stekkjarborg on the farm of Keldudalur in Hegrans, Northern Iceland discovered the remnants of a small-scale iron smelting site

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dating to post-1104, well after deforestation. The smelting site represents a specific small-scale production activity being conducted in a marginal area for domestic use. The scale of the activity suggests independent production and usage while the evidence of limited activities suggests an interconnected production network. This paper will examine how such a site managed key natural resources for production activities in marginal ecological and economic contexts.

Zelenetskaya Young, Tatiana (Temple University)

[30] *Architecture as an Expression of Maya Political Organization in the Cochuh Region, Quintana Roo during the Early Terminal Classic: The Perspective from Non-primary Sites*

Political leaders among the ancient Maya were actors performing for an audience with the intent to receive the people's support to govern. These actors often used specific architecture as stages for their performances; therefore, this architecture serves as a source of information on various aspects of political organization. Architecture embodies political symbolism and has the potential to communicate type of political institution. This paper examines the distribution of architecture that embodies the apparatus of rulership in twenty sites in the Cochuh Region occupied during the Early Terminal Classic or Florescence Phase (A.D. 750–900). The data are compared to the different expectations derived from three political models that vary in the degree of centralization of rulership present. I argue that some types of political organizations would be only visible through the examination of secondary sites and their satellites.

Zender, Marc [337] see Stuart, David

Zeng, Lingyi (Yale University)

[177] *SEM-EDS Analysis of Ceramics from the Mongol Empire*

I will use scanning electron microscope with an energy dispersive X-ray spectrometer (SEM-EDS) to investigate both elemental compositions and mineral microstructures of ceramics from the Mongol Empire. I will analyze and compare sherds from multiple contexts, including ceramic production centers, burials and residential areas to acquire qualitative and quantitative data on porcelain bodies, glazes, and pigments with the SEM-EDS technique. A high degree of similarities in chemical compositions and mineral structures of samples from different areas would suggest a single or very few production centers. I also expect official wares and civilian wares were made with different sources and recipes of raw materials, which will be indicated by comparing the compositions of sherds using SEM-EDS. My research will not only focus on how objects were produced, consumed and exchanged, but also attempt to understand the underlying sociopolitical factors that affected these processes over time and space.

[177] *Chair*

Zhang, Chengrui (Harvard University) and Rowan Flad (Harvard University)

[177] *A Song Dynasty Roof Tile Kiln at Qijiaping: Gender and Pyrotechnology in Medieval China*

During the 2016 and 2017 excavations at the site of Qijiaping, Guanghe, Gansu, China, the Tao River Archaeological Project excavated a large intact kiln that turned out to be a Song Dynasty roof tile kiln. The kiln is well preserved, and the first of its kind reported in an archaeological excavation in this region. Inside the flues of the kiln were many objects, deliberately disposed of, presumably at the moment when the kiln was put out of commission. Among these objects is a stone phallus in the central flue, potentially reflecting a gendered process of manufacturing associated with this kiln or its decommissioning. This paper aims to explore the role of gender in ceramic production and its association with pyrotechnology in medieval China within a broad social context.

Zhang, Li (Zhengzhou University)

[24] *The Landscape of China's Participation in the Bronze Age Eurasian Network*

In the last decade, much has been learned about the network of interactions in Bronze Age Eurasia, and the importance of the steppe pastoralists in the creation of this network. However, the mechanisms that enabled societies in ancient China (both those bordering on and distant from the steppe) to participate in the Bronze Age Eurasian arena are still poorly understood. Based on the latest archaeological discoveries in China, this article focuses on the participation of four regions of ancient China: the Ejin River Transfer Zone (ERTZ); the western Hexi corridor; central Inner Mongolia; and the middle Yellow River valley. The article analyzes all significant innovations, materials, and technologies transmitted via the Eurasian network and adopted in ancient China, with an emphasis on metallurgy and the variations in the mechanism of its adoption across different societies during the Bronze Age. Through analysis and comparison, this paper argues that the participation of different societies of ancient China in the Bronze Age Eurasian network can best be understood in the local and regional contexts, which were deeply embedded in their natural and cultural landscapes, rather than as the result of the pull from the steppe pastoralists alone.

Zhang, Xingxiang [45] see Wu, Xiaotong

Zhang, Zhengwei (Department of Anthropology, Washington University in St. Louis)

[336] *The Making of Agro-pastoral Landscape of the Tibetan Plateau: A Zooarchaeological Perspective*

The vertical ingredient of the Tibetan Plateau plays a unique role in making of the highland agro-pastoral landscape. We divide the Tibetan Plateau into three eco-altitudinal zones: areas below 3,000 m.a.s.l.; areas between 3,000 and 4,200 m.a.s.l.; and areas above 4,200 m.a.s.l. Today, pastoralists and farmers utilize different faunal and floral taxa in the three zones, partly as risk aversion strategies. In this paper, I review the zooarchaeological evidence dated between 6,000 and 1,000 BP from the Tibetan Plateau to explore the chronology of the expansion of animal husbandry to the highland plateau.

By the late second millennium BC, herd animals such as horse, goat, and cattle began to appear in regions below 3000 m.a.s.l. It is not until the first millennium AD, herding animals expanded to regions above 4,200 m.a.s.l.

Zhao, Chao

[45] *Chair*

Zhao, Yu-chao (University of Michigan Museum of Anthropological Archaeology) and Brian Stewart (University of Michigan Museum of Anthropological A)

[174] *Tracing Late Quaternary Highland-Dryland Social Connectivity in Southern Africa with Ostrich Eggshell Bead Strontium Values: Preliminary Results*

Humans have frequented southern Africa's highest reaches—Lesotho's Maloti-Drakensberg Mountains—for ≥90,000 years. As with many high mountain systems worldwide, the Maloti-Drakensberg cast a rainshadow over closely neighboring arid lowlands (the eastern Karoo Desert). Based on previous archaeological and paleoenvironmental work in highland Lesotho, researchers have posited that source populations for human dispersals into the mountain zone often originated in the Karoo, particularly during phases of enhanced regional aridity or climatic instability. Lesotho's mid/high-

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altitude temperate grasslands may have been attractive to lowland desert foragers because they offer topographical resource diversity and stable supplies of key resources. Such dynamics would have necessitated the existence and maintenance of strong cultural linkages between these ecologically contrasting macro-regions. To begin testing these hypotheses, we are conducting strontium isotope analyses of ostrich eggshell beads recovered from Sehonghong, a highland Lesotho rock shelter with a record of human occupation stretching from the late Holocene to early Marine Isotope Stage 3, and constructing terrestrial strontium isoscapes in both regions. This paper presents our preliminary results, which demonstrate the existence and persistence of highland-dryland exchange networks and hold implications for tracing the development of social strategies for long-term survival in the southern African interior.

Zheng, Yunfei and Haibin Gu (Hunan Provincial Institute of Cultural Relics and)

[284] *Archaeological Evidence of Multiple Domestication of Rice*

The first domestication of rice in the Yangtze river valley in China is recently informed by genetic, archaeological, palaeoenvironmental, and archaeobotanical data. Archaeological sites where rice remains between 10000 and 4000 BP have been unearthed are concentrated in the middle and the lower Yangtze valley, a distance of over 1000 km apart. This study focuses on the morphological and histological features of spikelet bases of rice between 8300 and 4800 BP found in the Liyang Plain of the middle Yangtze valley, comparing them with those found in the archaeological sites of the lower Yangtze valley in Zhejiang province. The results showed that there was a clear and complete domestication process in the Liyang Plain, with the domesticated ratios higher than those of the lower Yangtze Valley in the same times. The results indicated that there were separate domestication processes for rice in the middle and lower Yangtze River, even though rice inhabiting the two areas were the same species of the *Oryza* genus. The study suggests that there might have been multiple domestication processes of the same crop in similar ecological niches in the early Holocene.

Zhengyao, Jin [24] see Yingyuan, Xu

Zhouyong, Sun [24] see Owlett, Tricia

Zhuang, Yijie [161] see Kidder, Tristram

Ziesemer, Kirsten [143] see Mann, Allison

Zimmer-Dauphinee, James (Department of Anthropology & Spatial Analysis Research Lab Vanderbilt University), Arlen Talaverano (PATA Research Project), Kevin Jara (PATA Research Project) and Steven A. Wernke (Department of Anthropology & Spatial Analysis Rese)

[154] *pXRF in the Colca Valley: Experimenting with a Nondestructive Chemical Discrimination of Ceramic Fragments*

The choice of clay and pigment sources for ceramic production in the Andes has the potential to convey complex information about the resilience and persistence of Inca social structure in the Colca Valley throughout the imposition of Spanish imperialism. Prior to the Spanish invasion, ceramics in the Colca Valley were likely primarily produced by a handful of specialized communities which would have widely distributed their products. It is therefore expected that there would be a standardization of clay sources and production methods producing ceramics with similarly standardized chemical signatures. It has been hypothesized that during the Spanish conquest of Colca Valley the resulting political and social transformations disrupted these patterns of production and distribution, resulting in the use of more diverse and perhaps more local clay sources and production techniques. This disruption was therefore expected to result in ceramics with similarly less standardized chemical signatures. Finally, it is an outstanding question whether the traditional patterns of ceramic production and distribution were re-established following the imposition of colonial rule, or new patterns were developed. This study hopes to test each these dynamics through the nondestructive analysis of ceramics excavated from Machu Llacta using a Bruker Tracer Vi handheld pXRF unit.

Zimmer-Dauphinee, James [68] see Traslaviña, Abel

Zimmerer, Karl (Pennsylvania State University)

[249] *Discussant*

Zimmerman, Larry (IUPUI/Eiteljorg Museum)

[60] *Discussant*

Zimmerman, Larry [222] see Thomas, Jayne-Leigh

Zimmermann, Mario (Washington State University)

[76] *Examining the Bread-Basket Model: Puuc Intra and Inter-site Diversity in Plant Foods*

The Puuc mountains in the northwestern Maya lowlands have proven themselves to be double-faced in regard to pre-Columbian human settlement. On one side, the valleys exhibit the region's most fertile soils. On the other hand, rainfall is scarce and access to the underground water table is comparatively difficult. Nonetheless, authors such as Smyth (1991) have long suggested that the Puuc represented some of the bread-basket for the wider northwestern lowlands. As part of a broader study, in this paper I will present microbotanical data gathered from food consumption areas corresponding to different buildings located at the sites of Kabah, Sayil, and Oxkintok. Starch grain analyses are particularly helpful when evaluating the dietary contributions of carbohydrate-rich staple foods. Among the pre-Columbian Maya this list includes, of course, maize and beans. However, in the past different tubers as well as tree crops have been proposed as supplementary staples or famine foods.

[76] *Chair*

Zimpel, Carlos [69] see Pugliese, Francisco

Zinn, Katharina (University of Wales Trinity Saint David)

[309] *Did You Sleep Well?—The Body, the Senses and the Ancient Egyptian Headrest*

This paper explores the possibility to extract information about sensory experiences inherent in the material culture of ancient Egypt which are often overlooked due to the difficulty to track them in the material. By implementing new intellectual frameworks like New Materialism and the consequent application of methodologies from archaeology and anthropology we gain insight in the actions of ancient bodies. Taking inspiration from Latour's actants (2005), Barad's agential realism (2007) and Bennett's thing power (2010)—relating the potential of agency to materials and objects in human lives—the study discusses the physical relationship of material objects and the human body. With the additional help of experimental and experiential archaeology as well the focus on hitherto neglected objects we not only can bring the objects but also senses in the past to life.

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This is explored using unpublished headrests from Cyfarthfa Castle Museum by looking on the intersection of bodies with the material that also could be interpreted as inter-material communication. Impressions of fabric on their wooden surface are presumably the imprint of bedding intended to ensure comfortable sleep telling us about the sensual experience using these artefacts. The contact between skin and rough wood needed to be alleviated.

Zinsious, Brandon [221] see Gomes, Ana

Zipkin, Andrew (University of Illinois at Urbana-Champaign), Stanley Ambrose (University of Illinois at Urbana-Champaign), Gideon Bartov (University of Illinois at Urbana-Champaign), Alexander Taylor (University of Illinois at Urbana-Champaign) and Mercy Gakii (National Museums of Kenya)

[140] *Ethno-archaeometry of Ochre Mineral Pigment Extraction, Transport, and Use in the Kenya Rift Valley*

Ochre occurs in African archaeological sites from the later Middle Pleistocene to the ethnographic present. Ochre is used worldwide for symbolic and functional purposes, and is often considered to be evidence for symbolic behavior by cognitively modern Paleolithic humans. Geochemical provenience analysis, complemented by ethnographic studies of ochre source exploitation, transport, and use, can elucidate whether culturally mediated source exploitation differs significantly from a least-cost energetics (closest source) model of source use. In 2015–2017 we sampled 53 ochre deposits in the Kenya Rift Valley, guided by Maasai, Samburu, and Dorobo informants. The strontium isotope ratio (87/86 Sr) and elemental composition of these sources were characterized using Electron Probe MicroAnalysis and Inductively Coupled Plasma-Mass Spectrometry. Our results show that the Provenience Postulate is upheld at the regional scale by 87/86 Sr ratios and at the local scale by elemental composition, facilitating sourcing of cultural ochre. Analysis of ochre recovered from the Elmenteitan Neolithic cremation burial site of Njoro River Cave shows that the pigment is derived from two sources 110 and 150 km to the south, despite the availability of high quality ochre at deposits 20–35 km away and nearby the main sources of obsidian artifacts found at this site.

Zipkin, Andrew [198] see Ambrose, Stanley

Zoega, Gudny

[167] *The Inequalities of Households—Cemetery Management and Social Change in Early Medieval Iceland*

In AD 1000 Icelanders adopted Christianity in an apparently swift and embracing fashion. The new tradition was implemented by discrete households that built private churches and cemeteries on their farms. These cemeteries were in use until the beginning of the 12th century and interred were all individuals of the household, men and women, the old and the young, householders and servants. The establishment, management, and abandonment sequences of these cemeteries reflect the religious, social, and political transformations that took place at both societal and household levels during the 11th century. A number of these cemeteries have been excavated in Skagafljörður, North Iceland in recent years. This paper examines the resulting funerary and osteological data for evidence of social hierarchies and changes in household structure during the time of their use. The osteological data points to a population subjected to marginal environmental constraints, but the funerary data indicates a people well versed in contemporary European traditions. The internal cemetery management, such as the positioning of burials and the selective removal of individuals from graves, is suggestive of internal social divisions that may infer social inequalities at the wider societal level.

Zongmin, Li [24] see Yingyuan, Xu

Zori, Colleen

[100] *Mining, Extractive Metallurgy and Imperialism in the Inka Empire*

The Inka empire directed significant resources and labor towards the extraction of metals from the provinces. Using the examples of Porco (silver), Viña del Cerro (copper) and the Tarapacá Valley (copper and silver), this poster explores Inka strategies for obtaining metallurgical wealth. These case studies show that, as suggested by ethnohistoric sources, large-scale silver extraction was directly overseen by the state. In contrast to models of more indirect state involvement typically proposed for copper production, these case studies demonstrate that the Inka actively invested in expanding production of this metal, despite the fact that it was not destined for use in the imperial heartland. I propose several ways that the production of silver and copper—both the sequence of activities and interactions implicated in its manufacture and the metals themselves—enmeshed local people in the relationships of hierarchy, obligation, and reciprocity that constituted them as subjects of the Inka empire.

Zori, Colleen [86] see Zori, Davide

Zori, Davide (Baylor University), Colleen Zori (Baylor University), Veronica Ikeshoji-Orlati (Vanderbilt University) and Deirdre Fulton (Baylor University)

[86] *Eating and Drinking in the Medieval Castle of San Giuliano (Province of Lazio, Italy)*

The medieval Italian settlement pattern was transformed from the 8th—12th centuries as people moved to inhabit defensible hilltops. The precise timing and reasons for this historical process, known as *incastellamento*, are not well understood. We initiated the San Giuliano Archaeological Research Project to provide high-resolution archaeological data for understanding this phenomenon. Two seasons of survey and excavation atop the San Giuliano plateau have identified walls and structures comprising a fortified castle dating to the *incastellamento* period. In this paper, we present preliminary analyses of the food consumption practices evidenced in and around a large hall in use approximately AD 900–1200 in the center of the castle zone. Ceramic and glassware analyses provide insight into the medieval inhabitants' food consumption activities. The vessel analyses are complemented by an investigation of the faunal remains obtained from two specific contexts: 1) refuse from wall support trenches excavated into bedrock; and 2) a large subterranean feature used as a granary before serving as a place of refuse disposal. These data shed light on the economy and feasting practices of the medieval people within a typical small Italian castle in an area of Lazio where the process of *incastellamento* has been understudied.

Zovar, Jennifer (Whatcom Community College)

[313] *Steering through North American Archaeology: Reflections on the Effectiveness of an Open Textbook Steering Committee*

As an open educational resource, this textbook has been designed to incorporate the perspectives and expertise of a variety of different scholars and stakeholders from across North America. Early in the process, a 'steering committee' was established to try and ensure balanced coverage, maintain a relatively consistent voice, and iron out any difficulties that may arise. The steering committee has also been responsible for some of the small but important details like hunting down copyrights, identifying reviewers, and initial editing. This paper evaluates the effectiveness of the steering committee at this point, considering our successes, our disappointments, and our future challenges. We share our experiences in the hope that this discussion will be useful to others who are currently engaged in (or thinking about introducing) a similar project and in order to contribute to a larger conversation about the usefulness of open educational resources in archaeology.

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Zralka, Jaroslaw (Institute of Archaeology, Jagiellonian University) and Bernard Hermes (The Nakum Archaeological Project, Guatemala)
[252] *Monumental Architecture of Yaxha and Nakum (Northeastern Guatemala) during the Middle and Late Preclassic Periods*

Yaxha and Nakum are two important Maya centers located in northeastern part of Guatemala. Recent research carried out by different projects at both sites indicate that during the Preclassic period Yaxha and Nakum rose to power and became important polities that had many examples of monumental architecture such as E-Groups, triadic complexes, ballcourts, causeways and other constructions. The scale of monumental architecture documented at Yaxha indicates that it was one of the largest Late Preclassic cities in the Southern Maya Lowlands which must have dominated politically and economically over other neighboring centers. Nakum—although smaller in its monumentality—showed examples of various public constructions from the same epoch, some of which were embellished with beautifully rendered stucco friezes. The aim of this paper is to show the evolution of monumental architecture in both sites from its beginning in the early Middle Preclassic until the Terminal Preclassic or Protoclassic period when many Maya centers—including a large polity of El Mirador—collapsed. We will also address the subject of political organization in the Yaxha region during the Preclassic times.

Zubrow, Ezra [34] see Troskosky, Christopher

Zwyns, Nicolas [41] see Gillam, J. Christopher